

 **STOCK**

The logo features a red square icon on the left containing a white silhouette of a hand holding a vertical stack of rectangular blocks. To the right of the icon, the word "STOCK" is written in a large, bold, red, sans-serif font.

PRECISIONE

La fabbrica delle idee



Catalogo  
Generale





# STOCK

Da più di 125 anni Robert Stock AG fornisce un'ampia gamma di utensili da taglio, tant'è vero che vanta una storia immersa nella tradizione.

Nel 1891 Stock produsse la prima punta elicoidale in Germania, ponendo così le fondamenta della manifattura utensile tedesca.



Tutt'oggi, Stock offre un' ampia gamma di utensili da taglio per uso industriale nel campo della foratura, della filettatura, alesatura e fresatura , sia come standard sia come speciale, in base alle richieste del cliente, sono fatti di metallo duro, HSS, HSS-E, HSS-E-PM, Cermet o PCB con un'opzione di altri rivestimenti più duri in concordanza con le ultime tecnologie.

Portautensili, sistemi di distribuzione utensili così come il servizio attorno agli stessi, come la riaffilatura e il rivestimento, completano la nostra gamma di servizi.



Utensili di precisione da più di 125 anni. Made in Germany.



1901



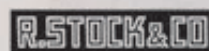
1908



1921



1953



1954



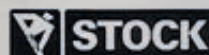
1956



1968



1969



1976





# STOCK

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## UTENSILI DI PRECISIONE

Questo catalogo sostituisce tutti i precedenti. Ristampa, anche solo in parte non è consentita.

Sono vietate riproduzioni, anche parziali. Eventuali errori di stampa o modifiche di qualsiasi tipo, intervenute nel frattempo, non danno diritto ad alcuna pretesa. Tutti i prodotti a „DIN“ possono essere forniti con dimensioni lievemente differenti da quelle stampate sul catalogo, che comunque corrispondono sempre alle norme DIN.

Printed in Germany

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HSS, HSS-Co, M42 e HSS-E-PM

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## UTENSILI A FORARE

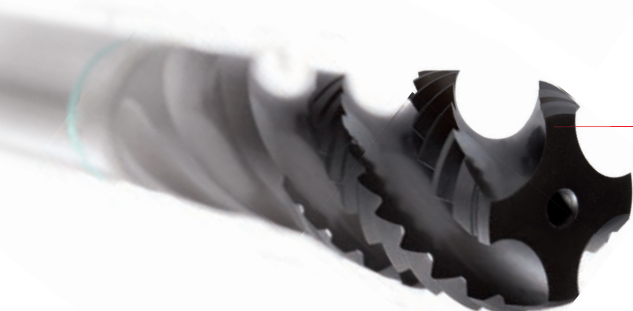
Metallo duro

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|-------------|----------|-------------------|------------|--|---------------------|-------------------|
| 51122       | 238      | DIN 338           | TiAIN nano | Punte elicoidali, corte  | HSS-Co              | V66 Ti            |
| 51132       | 261      | Norma di fab.     | TiAIN nano | Punte con codolo rinforzato  | HSS-E-PM            | V-PM              |
| 51158       | 251      | DIN 338           | TiAIN nano | Punte elicoidali, corte  | HSS-Co              | V97               |
| 51159       | 204      | DIN 1897          | TiAIN nano | Punte elicoidali, extra corte  | HSS-Co              | V97               |
| 51184       | 134      | DIN 6539          | TiAIN nano | Punte elicoidali, extra corte  | Metallo duro        | N                 |
| 51720       | 108      | Norma di fab.     | AlTiN      | Microspunte universale SuperV-M VHM                                    | Metallo duro        | SuperV-M          |
| 51764       | 97       | Norma di fab.     | AlTiN      | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-T          |
| 51765       | 98       | Norma di fab.     | AlTiN      | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-T          |
| 51766       | 99       | Norma di fab.     | AlTiN      | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-T          |
| 51767       | 100      | Norma di fab.     | AlTiN      | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-T          |
| 51768       | 101      | Norma di fab.     | AlTiN      | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-T          |
| 51770       | 76       | DIN 6537K         | AlTiN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-VA         |
| 51771       | 78       | DIN 6537K         | AlTiN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-VA         |
| 51772       | 87       | DIN 6537L         | AlTiN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-VA         |
| 51773       | 89       | DIN 6537L         | AlTiN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-VA         |
| 51776       | 72       | DIN 6537K         | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51781       | 83       | DIN 6537L         | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51787       | 68       | DIN 6537L         | TiAIN nano | Punte SuperV senza fori di refrigerazione                              | Metallo duro        | SuperV-U          |
| 51789       | 91       | Norma di fab.     | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51871       | 66       | DIN 6537K         | TiAIN nano | Punte SuperV senza fori di refrigerazione                              | Metallo duro        | SuperV-U          |
| 51873       | 64       | DIN 6537K         | TiAIN nano | Punte SuperV senza fori di refrigerazione                              | Metallo duro        | SuperV-U          |
| 51876       | 74       | DIN 6537K         | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51881       | 85       | DIN 6537L         | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51887       | 70       | DIN 6537L         | TiAIN nano | Punte SuperV senza fori di refrigerazione                              | Metallo duro        | SuperV-U          |
| 51889       | 92       | Norma di fab.     | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51893       | 95       | Norma di fab.     | TiAIN nano | Punte con refrigerazione interna SuperV                                | Metallo duro        | SuperV-IK-U       |
| 51997       | 105      | Norma di fab.     | AlTiN      | Microspunte ad alto rendimento in MD SuperV-NX con fori interni        | Metallo duro        | SuperV-IK-NX      |
| 51998       | 106      | Norma di fab.     | AlTiN      | Microspunte ad alto rendimento in MD SuperV-NX con fori interni        | Metallo duro        | SuperV-IK-NX      |
| 51999       | 107      | Norma di fab.     | AlTiN      | Microspunte ad alto rendimento in MD SuperV-NX con fori interni        | Metallo duro        | SuperV-IK-NX      |
| 52360       | 743      | Norma di fab.     | lucido     | Utensili sbavatori   | Metallo duro        | SuperE-U          |
| 52365       | 651, 742 | Norma di fab.     | AlTiN nano | Sbavatori a 90° ad avanzamento ed estrazione                           | Metallo duro        | SuperAD-90        |
| 53050       | 368      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv Synchro  |
| 53051       | 369      | DIN 376           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv Synchro  |
| 53052       | 438      | DIN 374           | TiCN       | Maschi a macchina per fil. metr. ISO passo fine                        | HSS-E-PM            | Intensiv Synchro  |
| 53053       | 362      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv Synchro |
| 53054       | 363      | DIN 376           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv Synchro |
| 53055       | 437      | DIN 374           | TiCN       | Maschi a macchina per fil. metr. ISO passo fine                        | HSS-E-PM            | Produktiv Synchro |
| 53393       | 645, 736 | Norma di fab.     | AlTiN      | Fresa frontali a 60° per sbavatura                                     | Metallo duro        | SuperAF-60        |
| 53394       | 646, 737 | Norma di fab.     | AlTiN      | Fresa frontali a 60° per sbavatura                                     | Metallo duro        | SuperAF-60        |
| 53395       | 647, 738 | Norma di fab.     | AlTiN      | Fresa frontali a 90° per sbavatura                                     | Metallo duro        | SuperAF-90        |
| 53396       | 648, 739 | Norma di fab.     | AlTiN      | Fresa frontali a 90° per sbavatura                                     | Metallo duro        | SuperAF-90        |
| 53397       | 649, 740 | Norma di fab.     | AlTiN      | Fresa frontali a 120° per sbavatura                                    | Metallo duro        | SuperAF-120       |
| 53398       | 650, 741 | Norma di fab.     | AlTiN      | Fresa frontali a 120° per sbavatura                                    | Metallo duro        | SuperAF-120       |
| 53620       | 478      | ~DIN 371          | AlCrN      | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO | HSS-E-PM            | Durativ           |
| 53621       | 479      | ~DIN 371          | AlCrN      | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO | HSS-E-PM            | Durativ           |
| 53622       | 480      | ~DIN 376          | AlCrN      | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO | HSS-E-PM            | Durativ           |
| 53640       | 397      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv H       |
| 53641       | 412      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv HD      |
| 53642       | 398      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E               | Produktiv H       |
| 53643       | 416      | DIN 376           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv HD      |
| 53661       | 404      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E               | Intensiv H        |
| 53662       | 420      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv HD       |
| 53665       | 424      | DIN 376           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv HD       |
| 53666       | 382      | DIN 371/DIN 376   | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv HDX      |
| 53667       | 377      | DIN 371/DIN 376   | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv HDX     |
| 53668       | 381      | DIN 371/DIN 376   | AlTiN      | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Intensiv HX       |
| 53669       | 376      | DIN 371/DIN 376   | AlTiN      | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | Produktiv HX      |
| 53670       | 383      | DIN 371           | TiCN       | Maschi a macchina per filettatura metrica ISO                          | HSS-E-PM            | HCX               |
| 53733       | 364      | ~DIN 371/~DIN 376 | AlTiZrN    | Maschi a macchina per filettatura metrica ISO                          | HSS-E               | Produktiv N-X     |
| 53746       | 370      | ~DIN 371/~DIN 376 | TiAIN      | Maschi a macchina per filettatura metrica ISO                          | HSS-E               | Intensiv N-X      |
| 53778       | 436      | DIN 374           | AlTiZrN    | Maschi a macchina per fil. metr. ISO passo fine                        | HSS-E               | Produktiv N-X     |
| 53780       | 435      | DIN 374           | TiAIN      | Maschi a macchina per fil. metr. ISO passo fine                        | HSS-E               | Intensiv N-X      |
| 53787       | 471      | DIN 5156          | AlTiZrN    | Maschi a macchina per filettatura Whitworth BSP                        | HSS-E               | Produktiv N-X     |
| 53788       | 466      | DIN 5156          | TiAIN      | Maschi a macchina per filettatura Whitworth BSP                        | HSS-E               | Intensiv N-X      |
| 53810       | 486      | Norma di fab.     | TiCN       | Frese a filettare con fase di svasatura per filettatura metrica ISO    | Metallo duro        | TMC SP            |
| 53820       | 487      | Norma di fab.     | TiCN       | Frese a filettare con fase di svasatura per fil. metr. ISO passo fine  | Metallo duro        | TMC SP            |
| 53830       | 490      | Norma di fab.     | TiCN       | Frese a filettare senza fase di svasatura per filettatura metrica ISO  | Metallo duro        | TM SP             |
| 54080       | 664      | Norma di fab.     | TiAIN      | Mini frese frontali (a 3 taglienti)                                    | M42                 | N                 |
| 54180       | 665      | Norma di fab.     | TiAIN      | Mini frese frontali (a 3 taglienti)                                    | M42                 | N                 |
| 54201       | 616      | Norma di fab.     | TiAIN      | Frese frontali per finitura, taglienti multipli                        | Metallo duro        | NH                |
| 54205       | 615      | Norma di fab.     | TiAIN      | Frese frontali per finitura, taglienti multipli                        | Metallo duro        | NH                |
| 54206       | 614      | DIN 6527L         | TiAIN      | Frese frontali con spigolo raggato                                     | Metallo duro        | NH                |



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| 54207       | 619    | Norma di fab. | TiAISIN    | Frese per materiali duri, taglienti multipli    | Metallo duro        | H                 |
| 54221       | 618    | Norma di fab. | TiAIN      | Frese frontali per finitura, taglienti multipli | Metallo duro        | NH                |
| 54225       | 617    | Norma di fab. | TiAIN      | Frese frontali per finitura, taglienti multipli | Metallo duro        | NH                |
| 54227       | 620    | Norma di fab. | TiAISIN    | Frese per materiali duri, taglienti multipli    | Metallo duro        | H                 |
| 54275       | 680    | DIN 327       | TiAIN      | Frese a raggio                                  | M42                 | N                 |
| 54276       | 681    | Norma di fab. | TiAIN      | Frese a raggio                                  | M42                 | N                 |
| 54294       | 662    | DIN 844L      | TiAIN      | Frese frontali (a 3 taglienti)                  | M42                 | N                 |
| 54300       | 642    | Norma di fab. | TiAISIN    | Frese a raggio per copiatori                    | Metallo duro        | N                 |
| 54301       | 643    | Norma di fab. | TiAISIN    | Frese a raggio per copiatori                    | Metallo duro        | N                 |
| 54302       | 638    | Norma di fab. | TiAISIN    | Frese per copiatori con affilatura torica       | Metallo duro        | N                 |
| 54303       | 639    | Norma di fab. | TiAISIN    | Frese per copiatori con affilatura torica       | Metallo duro        | N                 |
| 54304       | 636    | Norma di fab. | TiAISIN    | Frese per copiatori con affilatura torica       | Metallo duro        | H                 |
| 54305       | 637    | Norma di fab. | TiAISIN    | Frese per copiatori con affilatura torica       | Metallo duro        | H                 |
| 54306       | 640    | Norma di fab. | TiAISIN    | Frese a raggio per copiatori                    | Metallo duro        | H                 |
| 54307       | 641    | Norma di fab. | TiAISIN    | Frese a raggio per copiatori                    | Metallo duro        | H                 |
| 54404       | 594    | Norma di fab. | TiAIN      | Frese frontali (a 2 taglienti)                  | Metallo duro        | N                 |
| 54424       | 603    | Norma di fab. | TiAIN      | Frese frontali (a 3 taglienti)                  | Metallo duro        | N                 |
| 54444       | 611    | Norma di fab. | TiAIN      | Frese frontali (a 4 taglienti)                  | Metallo duro        | N                 |
| 54496       | 621    | DIN 6527L     | TiAIN      | Frese a sgrassare                               | Metallo duro        | NF                |
| 54497       | 622    | DIN 6527L     | TiAIN      | Frese a sgrassare                               | Metallo duro        | NF                |
| 54519       | 590    | DIN 6527L     | TiAIN      | Frese frontali (a 2 taglienti)                  | Metallo duro        | N                 |
| 54520       | 589    | DIN 6527K     | TiAIN      | Frese frontali (a 2 taglienti)                  | Metallo duro        | N                 |
| 54521       | 592    | DIN 6527L     | TiAIN      | Frese frontali (a 2 taglienti)                  | Metallo duro        | N                 |
| 54522       | 612    | DIN 6527L     | TiAIN      | Frese frontali con spigolo raggiato             | Metallo duro        | N                 |
| 54523       | 599    | DIN 6527L     | TiAIN      | Frese frontali (a 3 taglienti)                  | Metallo duro        | N                 |
| 54524       | 608    | DIN 6527L     | TiAIN      | Frese frontali (a 4 taglienti)                  | Metallo duro        | N                 |
| 54526       | 613    | DIN 6527L     | TiAIN      | Frese frontali con spigolo raggiato             | Metallo duro        | N                 |
| 54531       | 633    | DIN 6528      | TiAIN      | Frese a raggio                                  | Metallo duro        | N                 |
| 54541       | 628    | DIN 6527L     | TiAIN      | Frese a raggio                                  | Metallo duro        | N                 |
| 54551       | 521    | DIN 6527L     | TiAIN      | Frese SuperF-UT N                               | Metallo duro        | SuperF-UT N       |
| 54552       | 525    | Norma di fab. | TiAIN      | Frese SuperF-UT N                               | Metallo duro        | SuperF-UT N       |
| 54556       | 541    | DIN 6527L     | TiAIN      | Frese SuperF-UT VA                              | Metallo duro        | SuperF-UT VA      |
| 54558       | 535    | DIN 6527L     | AlTiN nano | Frese VA-X Super-UT                             | Metallo duro        | SuperF-UT VA-X    |
| 54559       | 536    | DIN 6527L     | AlTiN nano | Frese VA-X Super-UT                             | Metallo duro        | SuperF-UT VA-X    |
| 54560       | 532    | DIN 6527L     | AlTiN+     | Frese SuperF-UT Ti                              | Metallo duro        | SuperF-UT Ti      |
| 54561       | 533    | DIN 6527L     | AlTiN+     | Frese SuperF-UT Ti                              | Metallo duro        | SuperF-UT Ti      |
| 54562       | 523    | Norma di fab. | TiAIN      | Frese SuperF-UT N                               | Metallo duro        | SuperF-UT N       |
| 54563       | 524    | Norma di fab. | TiAIN      | Frese SuperF-UT N                               | Metallo duro        | SuperF-UT N       |
| 54564       | 528    | Norma di fab. | TiAIN      | Frese SuperF-UT N-3                             | Metallo duro        | SuperF-UT N-3     |
| 54565       | 529    | Norma di fab. | TiAIN      | Frese SuperF-UT N-3                             | Metallo duro        | SuperF-UT N-3     |
| 54566       | 526    | DIN 6527L     | TiAIN      | Frese SuperF-UT N-F                             | Metallo duro        | SuperF-UT N-F     |
| 54567       | 527    | DIN 6527L     | TiAIN      | Frese SuperF-UT N-F                             | Metallo duro        | SuperF-UT N-F     |
| 54568       | 539    | DIN 6527L     | AlTiN nano | Frese SuperF-UT VA-XF                           | Metallo duro        | SuperF-UT VA-XF   |
| 54569       | 540    | DIN 6527L     | AlTiN nano | Frese SuperF-UT VA-XF                           | Metallo duro        | SuperF-UT VA-XF   |
| 54570       | 546    | Norma di fab. | lucido     | Frese SuperF-UT Al-F                            | Metallo duro        | SuperF-UT Al-F    |
| 54571       | 547    | Norma di fab. | lucido     | Frese SuperF-UT Al-F                            | Metallo duro        | SuperF-UT Al-F    |
| 54572       | 550    | DIN 6527L     | TiAISIN    | Frese SuperF-UT H                               | Metallo duro        | SuperF-UT H       |
| 54573       | 551    | DIN 6527L     | TiAISIN    | Frese SuperF-UT H                               | Metallo duro        | SuperF-UT H       |
| 54574       | 537    | DIN 6527L     | AlTiN nano | Frese SuperF-UT VA-X IK                         | Metallo duro        | SuperF-UT VA-X IK |
| 54575       | 538    | DIN 6527L     | AlTiN nano | Frese SuperF-UT VA-X IK                         | Metallo duro        | SuperF-UT VA-X IK |
| 54576       | 534    | DIN 6527K     | AlTiN nano | Frese VA-X Super-UT                             | Metallo duro        | SuperF-UT VA-X    |
| 54579       | 530    | Norma di fab. | TiAIN      | Frese SuperF-UT N-5                             | Metallo duro        | SuperF-UT N-5     |
| 54580       | 531    | Norma di fab. | TiAIN      | Frese SuperF-UT N-5                             | Metallo duro        | SuperF-UT N-5     |
| 54590       | 518    | DIN 6527L     | TiAISIN    | Frese SuperF-UT NX                              | Metallo duro        | SuperF-UT NX      |
| 54591       | 519    | DIN 6527L     | TiAISIN    | Frese SuperF-UT NX                              | Metallo duro        | SuperF-UT NX      |
| 54700       | 644    | DIN 6527L     | AlTiN+     | Fresa pilota                                    | Metallo duro        | N                 |
| 54815       | 671    | DIN 844K      | TiAIN      | Frese di semifinitura                           | M42                 | NF                |
| 54816       | 675    | DIN 844K      | TiAIN      | Frese a sgrassare (4 taglienti)                 | M42                 | NR                |
| 54825       | 673    | DIN 844K      | TiAIN      | Frese a sgrassare (3 taglienti)                 | HSS-E-PM            | NRf               |
| 54836       | 679    | DIN 844L      | TiAIN      | Frese a sgrassare (4 taglienti)                 | M42                 | NR                |
| 54845       | 677    | DIN 844K      | TiAIN      | Frese a sgrassare (4 taglienti)                 | HSS-E-PM            | NRf               |
| 54847       | 669    | DIN 844L      | TiAIN      | Frese universali, taglienti multipli            | M42                 | N                 |
| 55017       | 151    | Norma di fab. | TiCN       | Punte a cannone ad 1 tagliente SuperT-NX        | Metallo duro        | SuperT-NX         |
| 55018       | 150    | Norma di fab. | TiCN       | Punte a cannone ad 1 tagliente SuperT-NX        | Metallo duro        | SuperT-NX         |
| 55020       | 157    | Norma di fab. | AlTiN+     | Punte a cannone ad 1 tagliente TBE-VHM          | Metallo duro        | TBE-VHM           |
| 55021       | 161    | Norma di fab. | AlTiN+     | Punte a cannone ad 1 tagliente TBE-VHM          | Metallo duro        | TBE-VHM           |
| 55022       | 152    | Norma di fab. | TiCN       | Punte a cannone ad 1 tagliente SuperT-NX        | Metallo duro        | SuperT-NX         |
| 55023       | 153    | Norma di fab. | TiCN       | Punte a cannone ad 1 tagliente SuperT-NX        | Metallo duro        | SuperT-NX         |
| 55024       | 155    | Norma di fab. | AlTiN+     | Punte a cannone ad 1 tagliente TBE-VHM          | Metallo duro        | TBE-VHM           |
| 55026       | 159    | Norma di fab. | AlTiN+     | Punte a cannone ad 1 tagliente TBE-VHM          | Metallo duro        | TBE-VHM           |
| 55027       | 143    | Norma di fab. | AlTiN nano | Punte a cannone ad 1 tagliente SuperT-AL        | Metallo duro        | SuperT-AL         |
| 55028       | 144    | Norma di fab. | AlTiN nano | Punte a cannone ad 1 tagliente SuperT-AL        | Metallo duro        | SuperT-AL         |

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| 55029       | 145    | Norma di fab. | AlTiN nano  | Punte a cannone ad 1 tagliente SuperT-AL                                 | Metallo duro        | SuperT-AL       |
| 56011       | 129    | Norma di fab. | TiAlN       | Inseriti intercambiabili per SuperV-AP maxi                              | Metallo duro        | SuperV-AP maxi  |
| 61112       | 207    | DIN 1897      | TiN         | Punte elicoidali, extra corte  | HSS-Co              | VX              |
| 61115       | 220    | DIN 338       | TiN - testa | Punte elicoidali, corte  | HSS                 | N               |
| 61116       | 218    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS                 | N               |
| 61118       | 197    | DIN 1897      | TiN         | Punte elicoidali, extra corte  | HSS                 | N               |
| 61120       | 257    | Norma di fab. | TiN         | Punte con codolo rinforzato  | HSS-Co              | NX              |
| 61121       | 259    | Norma di fab. | TiN         | Punte con codolo rinforzato  | HSS-Co              | NX              |
| 61124       | 243    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS                 | V70             |
| 61131       | 205    | DIN 1897      | TiN         | Punte elicoidali, extra corte  | HSS-E-PM            | V-PM            |
| 61136       | 268    | DIN 340       | TiN         | Punte elicoidali, lunghe   | HSS                 | N               |
| 61150       | 277    | DIN 340       | TiN         | Punte elicoidali, lunghe   | HSS                 | V70             |
| 61158       | 247    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS-Co              | V70             |
| 61175       | 294    | Norma di fab. | TiN         | Punte cilindriche per centri CN  | HSS                 | N               |
| 61220       | 202    | DIN 1897      | TiN         | Punte elicoidali, extra corte  | HSS-Co              | NX              |
| 61221       | 230    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS-Co              | NX              |
| 61222       | 272    | DIN 340       | TiN         | Punte elicoidali, lunghe   | HSS-Co              | NX              |
| 61223       | 236    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS-Co              | V66 Ti          |
| 61232       | 253    | DIN 338       | TiN         | Punte elicoidali, corte  | HSS-E-PM            | V-PM            |
| 61602       | 325    | DIN 333       | TiN         | Punte a centrare senza piano   | HSS                 | N               |
| 61880       | 82     | DIN 6537L     | TiN         | Punte con refrigerazione interna SuperV                                  | Metallo duro        | SuperV-IK-F     |
| 61888       | 63     | DIN 6539      | TiN         | Punte SuperV senza fori di refrigerazione                                | Metallo duro        | SuperV-F        |
| 62327       | 727    | DIN 334       | TiN         | Svasatori 60°  | HSS                 |                 |
| 62347       | 729    | DIN 335       | TiN         | Svasatori 90°  | HSS                 |                 |
| 62399       | 733    | DIN 335       | TiN         | Assortimenti di svasatori cilindrici a 90°                               | HSS                 |                 |
| 63010       | 411    | ~DIN 371      | TiCN        | Maschi a macchina per filettatura metrica ISO                            | Metallo duro        | H               |
| 63013       | 481    | ~DIN 371      | TiCN        | Maschi a rullare forati e c.canalini di lubr. per fil. metrica ISO       | Metallo duro        | Durativ         |
| 63033       | 365    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Produktiv N     |
| 63046       | 371    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv N      |
| 63048       | 373    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv N      |
| 63119       | 476    | ~DIN 371      | TiN         | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO   | HSS-E               | Durativ         |
| 63120       | 475    | ~DIN 371      | TiN         | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO   | HSS-E               | Durativ         |
| 63121       | 483    | DIN 371       | TiN         | Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO | HSS-E               | Durativ         |
| 63122       | 477    | ~DIN 376      | TiN         | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO   | HSS-E               | Durativ         |
| 63123       | 484    | ~DIN 376      | TiN         | Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO | HSS-E               | Durativ         |
| 63133       | 385    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Produktiv N     |
| 63138       | 388    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Produktiv N     |
| 63146       | 390    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv N      |
| 63148       | 394    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv N      |
| 63173       | 444    | DIN 374       | TiN         | Maschi a macchina per fil. metr. ISO passo fine                          | HSS-E               | Intensiv N      |
| 63176       | 413    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Produktiv HD    |
| 63177       | 417    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Produktiv HD    |
| 63201       | 428    | DIN 371       | AlTiN       | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | GG              |
| 63641       | 399    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E-PM            | Produktiv H     |
| 63643       | 402    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E-PM            | Produktiv H     |
| 63662       | 421    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E-PM            | Intensiv HD     |
| 63665       | 425    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E-PM            | Intensiv HD     |
| 63674       | 405    | DIN 371       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv H      |
| 63675       | 408    | DIN 376       | TiN         | Maschi a macchina per filettatura metrica ISO                            | HSS-E               | Intensiv H      |
| 64080       | 595    | Norma di fab. | TiAlN       | Mini frese frontali (a 3 taglienti)                                      | Metallo duro        | N               |
| 64180       | 596    | Norma di fab. | TiAlN       | Mini frese frontali (a 3 taglienti)                                      | Metallo duro        | NH              |
| 64478       | 606    | DIN 6527L     | TiAlN       | Frese frontali (a 3 taglienti) NH  | Metallo duro        | NH              |
| 64495       | 625    | DIN 6527L     | TiAlN       | Frese a sgrossare  | Metallo duro        | NRf             |
| 64497       | 626    | DIN 6527L     | TiAlSiN     | Frese a sgrossare  | Metallo duro        | HR              |
| 64522       | 598    | DIN 6527K     | TiAlN       | Frese frontali (a 3 taglienti)   | Metallo duro        | N               |
| 64523       | 601    | DIN 6527L     | TiAlN       | Frese frontali (a 3 taglienti)   | Metallo duro        | N               |
| 64525       | 610    | DIN 6527L     | TiAlN       | Frese frontali (a 4 taglienti)   | Metallo duro        | N               |
| 64532       | 634    | DIN 6527L     | TiAlN       | Frese a raggio   | Metallo duro        | N               |
| 64535       | 635    | Norma di fab. | TiAlN       | Frese a raggio   | Metallo duro        | N               |
| 64542       | 629    | DIN 6527L     | TiAlN       | Frese a raggio   | Metallo duro        | N               |
| 64545       | 631    | Norma di fab. | TiAlN       | Frese a raggio   | Metallo duro        | N               |
| 64550       | 520    | DIN 6527K     | TiAlN       | Frese SuperF-UT N  | Metallo duro        | SuperF-UT N     |
| 64551       | 522    | DIN 6527L     | TiAlN       | Frese SuperF-UT N  | Metallo duro        | SuperF-UT N     |
| 64557       | 542    | DIN 6527L     | TiAlN       | Frese SuperF-UT VA   | Metallo duro        | SuperF-UT VA    |
| 64558       | 552    | Norma di fab. | TiAlN       | Frese SuperF-UT FS   | Metallo duro        | SuperF-UT FS    |
| 64559       | 553    | Norma di fab. | TiAlN       | Frese SuperF-UT FS   | Metallo duro        | SuperF-UT FS    |
| 64567       | 543    | DIN 6527L     | TiAlN       | Frese SuperF-UT VA-IK  | Metallo duro        | SuperF-UT VA-IK |
| 64570       | 604    | DIN 6527K     | TiAlN       | Frese frontali (a 3 taglienti) NH  | Metallo duro        | NH              |
| 64571       | 607    | DIN 6527L     | TiAlN       | Frese frontali (a 3 taglienti) NH  | Metallo duro        | NH              |
| 64604       | 659    | DIN 327       | TiAlN       | Frese frontali (a 3 taglienti)   | M42                 | N               |
| 64640       | 653    | DIN 327       | TiAlN       | Frese frontali (a 2 taglienti)   | M42                 | N               |
| 64641       | 661    | DIN 844K      | TiAlN       | Frese frontali (a 3 taglienti)   | M42                 | N               |

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| 64667       | 667    | DIN 844K      | TiAIN             | Frese universali, taglienti multipli                | M42                 | N                 |
| 64670       | 655    | DIN 844K      | TiAIN             | Frese frontali (a 2 taglienti)                      | M42                 | N                 |
| 64671       | 657    | DIN 844L      | TiAIN             | Frese frontali (a 2 taglienti)                      | M42                 | N                 |
| 67011       | 114    | Norma di fab. | TiAIN nano        | Inseri intercambiabili per SuperV-AP mini           | Metallo duro        | SuperV-AP mini U  |
| 67012       | 117    | Norma di fab. | AlTiN nano        | Inseri intercambiabili per SuperV-AP mini           | Metallo duro        | SuperV-AP mini VA |
| 71106       | 199    | DIN 1897      | lucido            | Punte elicoidali, extra corte                       | M42                 | N                 |
| 71108       | 194    | DIN 1897      | trattati a vapore | Punte elicoidali, extra corte                       | HSS                 | N                 |
| 71109       | 196    | DIN 1897      | trattati a vapore | Punte elicoidali, extra corte                       | HSS                 | N                 |
| 71110       | 190    | DIN 1897      | lucido            | Punte elicoidali, extra corte                       | HSS                 | N                 |
| 71111       | 192    | DIN 1897      | lucido            | Punte elicoidali, extra corte                       | HSS                 | N                 |
| 71112       | 206    | DIN 1897      | trattati a vapore | Punte elicoidali, extra corte                       | HSS-Co              | VX                |
| 71113       | 210    | Norma di fab. | lucido            | Punte elicoidali, extra corte                       | HSS                 | V72               |
| 71114       | 209    | Norma di fab. | lucido            | Punte elicoidali, extra corte                       | HSS                 | V72               |
| 71115       | 215    | DIN 338       | trattati a vapore | Punte elicoidali, corte                             | HSS                 | N                 |
| 71116       | 212    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | N                 |
| 71117       | 226    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | H                 |
| 71119       | 214    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | N                 |
| 71122       | 234    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS-Co              | V66 Ti            |
| 71123       | 232    | DIN 338       | fasi nitrurate    | Punte elicoidali, corte                             | HSS-Co              | V66               |
| 71124       | 239    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | V70               |
| 71126       | 241    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | V70               |
| 71128       | 248    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | V72               |
| 71129       | 250    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS                 | V72               |
| 71130       | 264    | DIN 339       | trattati a vapore | Punte per foratura con bussola di guida             | HSS                 | N                 |
| 71135       | 266    | DIN 340       | trattati a vapore | Punte elicoidali, lunghe                            | HSS                 | N                 |
| 71136       | 265    | DIN 340       | lucido            | Punte elicoidali, lunghe                            | HSS                 | N                 |
| 71145       | 282    | DIN 1869      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 1 | HSS                 | V63               |
| 71146       | 285    | DIN 1869      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 2 | HSS                 | V63               |
| 71147       | 287    | DIN 1869      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 3 | HSS                 | V63               |
| 71148       | 224    | DIN 338       | lucido            | Punte elicoidali, corte                             | M42                 | N                 |
| 71149       | 222    | DIN 338       | trattati a vapore | Punte elicoidali, corte                             | HSS-Co              | N                 |
| 71150       | 275    | DIN 340       | lucido            | Punte elicoidali, lunghe                            | HSS                 | V70               |
| 71152       | 276    | DIN 340       | lucido            | Punte elicoidali, lunghe                            | HSS                 | V70               |
| 71154       | 278    | DIN 340       | fasi nitrurate    | Punte elicoidali, lunghe                            | HSS                 | V73               |
| 71156       | 280    | DIN 340       | fasi nitrurate    | Punte elicoidali, lunghe                            | HSS-Co              | V73               |
| 71158       | 245    | DIN 338       | fasi nitrurate    | Punte elicoidali, corte                             | HSS-Co              | V70               |
| 71168       | 262    | Norma di fab. | lucido            | Punte corte, con codolo cil. Ø 16,0 mm              | HSS-Co              | V72               |
| 71169       | 263    | Norma di fab. | lucido            | Punte corte, con codolo cil. Ø 25,4 mm              | HSS-Co              | V72               |
| 71175       | 293    | Norma di fab. | lucido            | Punte cilindriche per centri CN                     | HSS                 | N                 |
| 71176       | 295    | Norma di fab. | lucido            | Punte cilindriche per centri CN                     | HSS                 | N                 |
| 71180       | 140    | DIN 8037      | lucido            | Punte speciali, con taglienti in MD                 | Metallo duro        | N                 |
| 71184       | 132    | DIN 6539      | lucido            | Punte elicoidali, extra corte                       | Metallo duro        | N                 |
| 71187       | 291    | DIN 1899      | lucido            | Microspunte   | HSS-E-PM            | N                 |
| 71189       | 139    | Norma di fab. | lucido            | Punte cilindriche per centri CN                     | Metallo duro        | N                 |
| 71190       | 137    | Norma di fab. | lucido            | Punte cilindriche per centri CN                     | Metallo duro        | N                 |
| 71191       | 138    | Norma di fab. | lucido            | Punte cilindriche per centri CN                     | Metallo duro        | N                 |
| 71192       | 284    | DIN 1869      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 1 | HSS-Co              | V63               |
| 71193       | 286    | DIN 1869      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 2 | HSS-Co              | V63               |
| 71195       | 288    | Norma di fab. | fasi nitrurate    | Punte elicoidali, extra lunghe                      | HSS                 | V63               |
| 71196       | 289    | Norma di fab. | lucido            | Punte elicoidali, extra lunghe                      | HSS                 | V63               |
| 71220       | 200    | DIN 1897      | lucido            | Punte elicoidali, extra corte                       | HSS-Co              | NX                |
| 71221       | 228    | DIN 338       | lucido            | Punte elicoidali, corte                             | HSS-Co              | NX                |
| 71222       | 270    | DIN 340       | lucido            | Punte elicoidali, lunghe                            | HSS-Co              | NX                |
| 71225       | 274    | DIN 340       | lucido            | Punte elicoidali, lunghe                            | HSS-Co              | V66               |
| 71290       | 135    | Norma di fab. | lucido            | Punte elicoidali, corte                             | Metallo duro        | N                 |
| 71300       | 298    | DIN 345       | trattati a vapore | Punte elicoidali                                    | HSS                 | N                 |
| 71303       | 296    | Norma di fab. | lucido            | Punte elicoidali, corte                             | HSS-Co8             | N                 |
| 71304       | 297    | Norma di fab. | lucido            | Punte elicoidali, corte                             | HSS-Co8             | N                 |
| 71305       | 302    | DIN 345       | lucido            | Punte elicoidali                                    | HSS                 | V70               |
| 71312       | 303    | DIN 345       | lucido            | Punte elicoidali                                    | HSS-Co              | V66 Ti            |
| 71313       | 304    | DIN 346       | lucido            | Punte elicoidali                                    | HSS-Co              | V66 Ti            |
| 71320       | 305    | DIN 341       | trattati a vapore | Punte per foratura con bussola di guida             | HSS                 | N                 |
| 71322       | 306    | DIN 341       | lucido            | Punte per foratura con bussola di guida             | HSS                 | V70               |
| 71325       | 307    | DIN 1870      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 1 | HSS                 | V63               |
| 71326       | 308    | DIN 1870      | fasi nitrurate    | Punte elicoidali in lunghezze speciali, grandezza 2 | HSS                 | V63               |
| 71380       | 141    | DIN 8041      | lucido            | Punte speciali, con taglienti in MD                 | Metallo duro        | N                 |
| 71416       | 301    | DIN 345       | trattati a vapore | Punte elicoidali                                    | HSS-Co              | N                 |
| 71500       | 319    | DIN 8376      | trattati a vapore | Punte a gradino ad eliche indipendenti, cil.        | HSS                 | N                 |
| 71501       | 317    | DIN 8374      | trattati a vapore | Punte a gradino ad eliche indipendenti, cil.        | HSS                 | N                 |
| 71503       | 318    | DIN 8378      | trattati a vapore | Punte a gradino ad eliche indipendenti, cil.        | HSS                 | N                 |
| 71520       | 321    | DIN 8377      | trattati a vapore | Punte a gradino ad eliche indipendenti, CM          | HSS                 | N                 |
| 71523       | 320    | DIN 8379      | trattati a vapore | Punte a gradino ad eliche indipendenti, CM          | HSS                 | N                 |

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| 71550       | 310    | Norma di fab. | trattati a vapore | Punte elicoidali lunghe con refrigerazione interna                      | HSS-Co              | V70-IK       |
| 71553       | 311    | Norma di fab. | trattati a vapore | Punte elicoidali lunghe con refrigerazione interna                      | HSS-Co              | V70-IK       |
| 71554       | 309    | Norma di fab. | trattati a vapore | Punte con fori di refrigerazione  | HSS                 | N-IK         |
| 71560       | 316    | Norma di fab. |                   | Alimentatori per punte con fori di refrigerazione                       |                     |              |
| 71565       | 312    | Norma di fab. | trattati a vapore | Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.    | HSS-Co              | V63-IK       |
| 71566       | 314    | Norma di fab. | trattati a vapore | Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.    | HSS-Co              | V63-IK       |
| 71567       | 313    | Norma di fab. | trattati a vapore | Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.    | HSS-Co              | V63-IK       |
| 71568       | 315    | Norma di fab. | trattati a vapore | Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.    | HSS-Co              | V63-IK       |
| 71584       | 290    | Norma di fab. | lucido            | Punte con fori di refrigerazione  | HSS                 | V73-IK       |
| 71600       | 322    | DIN 333       | lucido            | Punte a centrare senza piano  | HSS                 | N            |
| 71601       | 323    | DIN 333       | lucido            | Punte a centrare senza piano  | HSS                 | N            |
| 71602       | 324    | DIN 333       | lucido            | Punte a centrare senza piano  | HSS                 | N            |
| 71604       | 327    | DIN 333       | lucido            | Punte a centrare senza piano  | HSS                 | N            |
| 71605       | 326    | Norma di fab. | lucido            | Punte a centrare senza piano  | HSS                 | N            |
| 71607       | 328    | Norma di fab. | lucido            | Punte a centrare con piano  | HSS                 | N            |
| 71609       | 329    | Norma di fab. | lucido            | Punte a centrare con piano  | HSS                 | N            |
| 71616       | 142    | Norma di fab. | lucido            | Punte a centrare senza piano  | Metallo duro        | N            |
| 71862       | 102    | DIN 6537L     | lucido            | Punte SuperV, 3 taglienti   | Metallo duro        | SuperV83-GAL |
| 71994       | 93     | Norma di fab. | lucido            | Punte con refrigerazione interna SuperV                                 | Metallo duro        | SuperV95-GG  |
| 71995       | 80     | Norma di fab. | lucido            | Punte con refrigerazione interna SuperV                                 | Metallo duro        | SuperV95-GG  |
| 71996       | 94     | Norma di fab. | lucido            | Punte con refrigerazione interna SuperV                                 | Metallo duro        | SuperV95-GG  |
| 71997       | 96     | Norma di fab. | lucido            | Punte con refrigerazione interna SuperV                                 | Metallo duro        | SuperV95-GN  |
| 71998       | 103    | Norma di fab. | AlTiN+            | Micropunte ad alto rendimento in MD SuperV-NX senza fori interni        | Metallo duro        | SuperV-NX    |
| 71999       | 104    | Norma di fab. | AlTiN+            | Micropunte ad alto rendimento in MD SuperV-NX senza fori interni        | Metallo duro        | SuperV-NX    |
| 72200       | 330    | DIN 344       | trattati a vapore | Allargatori cilindrici  | HSS                 | N            |
| 72210       | 331    | DIN 343       | trattati a vapore | Allargatori con attacco cono morse                                      | HSS                 | N            |
| 72304       | 734    | DIN 373       | lucido            | Frese per sedi viti con guide, esecuzione fine                          | HSS                 |              |
| 72305       | 735    | DIN 373       | lucido            | Frese per sedi viti con guide, esecuzione media                         | HSS                 |              |
| 72326       | 726    | DIN 334       | lucido            | Svasatori 60°   | HSS                 |              |
| 72345       | 731    | DIN 335       | trattati a vapore | Svasatori 90°   | HSS                 |              |
| 72346       | 728    | DIN 335       | lucido            | Svasatori 90°   | HSS                 |              |
| 72356       | 730    | DIN 335       | lucido            | Svasatori 90°   | HSS                 |              |
| 72399       | 732    | DIN 335       | lucido            | Assortimenti di svasatori cilindrici a 90°                              | HSS                 |              |
| 72600       | 724    | DIN 206       | lucido            | Alesatori a mano  | HSS                 |              |
| 72610       | 725    | DIN 206       | lucido            | Alesatori a mano  | HSS                 |              |
| 72640       | 716    | DIN 212-2     | lucido            | Alesatori a macchina  | HSS-E               |              |
| 72650       | 717    | DIN 212-2     | lucido            | Alesatori a macchina  | HSS-E               |              |
| 72654       | 714    | DIN 212-2     | lucido            | Alesatori a macchina  | HSS-E               |              |
| 72660       | 718    | DIN 208       | lucido            | Alesatori a macchina  | HSS-E               |              |
| 72670       | 719    | DIN 208       | lucido            | Alesatori a macchina  | HSS-E               |              |
| 72680       | 721    | DIN 311       | nitrurato         | Alesatori a macchina per chiodi   | HSS                 |              |
| 72690       | 720    | DIN 212-2     | lucido            | Alesatori a macchina a forte torsione                                   | HSS-E               |              |
| 72730       | 723    | DIN 9         | lucido            | Alesatori a mano cilindrici, per spine coniche                          | HSS                 |              |
| 72741       | 722    | DIN 2179      | lucido            | Alesatori a macchina per spine coniche                                  | HSS-E               |              |
| 72859       | 709    | ~DIN 8051     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72860       | 708    | ~DIN 8051     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72867       | 705    | ~DIN 8050     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72868       | 704    | ~DIN 8050     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72870       | 694    | Norma di fab. | AlTiN nano        | Alesatori ad alto rendimento VHM  | Metallo duro        | SuperR-HS-S  |
| 72871       | 695    | Norma di fab. | AlTiN nano        | Alesatori ad alto rendimento VHM  | Metallo duro        | SuperR-HS-D  |
| 72872       | 696    | Norma di fab. | AlTiN nano        | Alesatori ad alto rendimento VHM  | Metallo duro        | SuperR-HS-S  |
| 72873       | 698    | Norma di fab. | AlTiN nano        | Alesatori ad alto rendimento VHM  | Metallo duro        | SuperR-HS-D  |
| 72880       | 706    | ~DIN 8093     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72881       | 707    | ~DIN 8093     | lucido            | Alesatori a macchina in MD  | Metallo duro        |              |
| 72900       | 710    | DIN 212-3     | lucido            | Alesatori a macchina NC   | HSS-E               |              |
| 72910       | 712    | DIN 212-3     | lucido            | Alesatori a macchina NC   | HSS-E               |              |
| 72920       | 700    | Norma di fab. | lucido            | Alesatori a macchina NC   | Metallo duro        |              |
| 72930       | 702    | Norma di fab. | lucido            | Alesatori a macchina NC   | Metallo duro        |              |
| 73011       | 384    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | Metallo duro        | H            |
| 73033       | 366    | DIN 371       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv N  |
| 73038       | 367    | DIN 376       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv N  |
| 73046       | 372    | DIN 371       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Intensiv N   |
| 73047       | 375    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Intensiv N   |
| 73048       | 374    | DIN 376       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Intensiv N   |
| 73120       | 474    | ~DIN 371      | lucido            | Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO  | HSS-E               | Durativ      |
| 73121       | 482    | DIN 371       | lucido            | Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO | HSS-E               | Durativ      |
| 73126       | 380    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Massiv N     |
| 73131       | 431    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv W  |
| 73132       | 386    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv N  |
| 73133       | 387    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv N  |
| 73136       | 434    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Intensiv W   |
| 73138       | 389    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                           | HSS-E               | Produktiv N  |

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| 73145       | 391    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv N   |
| 73146       | 392    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv N   |
| 73148       | 395    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv N   |
| 73156       | 433    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv W   |
| 73173       | 443    | DIN 374       | lucido            | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Intensiv N   |
| 73176       | 414    | DIN 371       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Produktiv HD |
| 73177       | 418    | DIN 376       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Produktiv HD |
| 73178       | 446    | DIN 374       | trattati a vapore | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Produktiv HD |
| 73180       | 447    | DIN 374       | trattati a vapore | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Intensiv HD  |
| 73183       | 439    | DIN 374       | trattati a vapore | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Produktiv N  |
| 73185       | 378    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | N            |
| 73187       | 440    | DIN 374       | trattati a vapore | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Intensiv N   |
| 73189       | 432    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Produktiv W  |
| 73191       | 379    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | N            |
| 73194       | 448    | DIN 374       | nitruato          | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | GG           |
| 73201       | 429    | DIN 371       | nitruato          | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | GG           |
| 73211       | 430    | DIN 376       | nitruato          | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | GG           |
| 73221       | 393    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv N   |
| 73227       | 396    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv N   |
| 73237       | 441    | DIN 374       | lucido            | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | N            |
| 73243       | 498    | DIN 357       | lucido            | Maschi a macchina per dadi per fil. metrica ISO                       | HSS-E               | N            |
| 73248       | 497    | Norma di fab. | lucido            | Utensili combinati per fil. metrica ISO                               | HSS-E               | N            |
| 73250       | 442    | DIN 374       | lucido            | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Produktiv N  |
| 73286       | 467    | DIN 5156      | lucido            | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | Intensiv N   |
| 73288       | 469    | DIN 5156      | trattati a vapore | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | Intensiv HD  |
| 73293       | 463    | Norma di fab. | trattati a vapore | Maschi a macchina per filettatura NPT                                 | HSS-E               | VA           |
| 73295       | 473    | Norma di fab. | lucido            | Maschi corti per filettatura NPT                                      | HSS-E               | N            |
| 73296       | 472    | DIN 40432     | lucido            | Maschi a macchina per filettatura Pg                                  | HSS-E               | N            |
| 73297       | 453    | ~DIN 371      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Produktiv HD |
| 73298       | 454    | ~DIN 376      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Produktiv HD |
| 73299       | 461    | ~DIN 374      | trattati a vapore | Maschi a macchina per filettatura UNF                                 | HSS-E               | Produktiv HD |
| 73300       | 468    | DIN 5156      | trattati a vapore | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | Produktiv HD |
| 73304       | 455    | ~DIN 371      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Intensiv HD  |
| 73305       | 456    | ~DIN 376      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Intensiv HD  |
| 73306       | 462    | ~DIN 374      | trattati a vapore | Maschi a macchina per filettatura UNF                                 | HSS-E               | Intensiv HD  |
| 73308       | 449    | ~DIN 371      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Produktiv N  |
| 73309       | 450    | ~DIN 376      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Produktiv N  |
| 73310       | 459    | ~DIN 374      | trattati a vapore | Maschi a macchina per filettatura UNF                                 | HSS-E               | Produktiv N  |
| 73321       | 464    | DIN 5156      | trattati a vapore | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | Produktiv N  |
| 73322       | 451    | ~DIN 371      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Intensiv N   |
| 73323       | 452    | ~DIN 376      | trattati a vapore | Maschi a macchina per filettatura UNC                                 | HSS-E               | Intensiv N   |
| 73324       | 460    | ~DIN 374      | trattati a vapore | Maschi a macchina per filettatura UNF                                 | HSS-E               | Intensiv N   |
| 73325       | 465    | DIN 5156      | trattati a vapore | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | Intensiv N   |
| 73326       | 457    | ~DIN 371      | nitruato          | Maschi a macchina per filettatura UNC                                 | HSS-E               | GG           |
| 73327       | 458    | ~DIN 376      | nitruato          | Maschi a macchina per filettatura UNC                                 | HSS-E               | GG           |
| 73345       | 470    | DIN 5156      | nitruato          | Maschi a macchina per filettatura Whitworth BSP                       | HSS-E               | GG           |
| 73400       | 499    | DIN EN 22568  | lucido            | Filiere per filettatura metrica ISO                                   | HSS                 |              |
| 73410       | 500    | DIN EN 22568  | lucido            | Filiere per filettatura metrica ISO                                   | HSS                 |              |
| 73413       | 501    | DIN EN 22568  | nitruato          | Filiere per filettatura metrica ISO                                   | HSS-E               |              |
| 73521       | 493    | DIN 2181      | lucido            | Maschio a mano per filettatura metrica fine ISO, kit                  | HSS                 | N            |
| 73522       | 496    | DIN 5157      | lucido            | Maschio a mano per filettatura gas, kit                               | HSS                 | N            |
| 73531       | 491    | DIN 352       | lucido            | Serie di maschi a mano per filettature metriche ISO destri            | HSS                 | N            |
| 73532       | 492    | DIN 352       | lucido            | Serie di maschi a mano per filettature metriche ISO sinistri          | HSS                 | N            |
| 73534       | 495    | ~DIN 352      | lucido            | Maschio a macchina per filettatura BSW, kit                           | HSS                 | N            |
| 73535       | 494    | ~DIN 352      | lucido            | Maschio a macchina per filettatura UNC, kit                           | HSS                 | N            |
| 73619       | 406    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | H R15        |
| 73640       | 400    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | Produktiv H  |
| 73641       | 415    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | Produktiv HD |
| 73642       | 401    | DIN 371       | nitruato          | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Produktiv H  |
| 73643       | 419    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | Produktiv HD |
| 73645       | 403    | DIN 376       | nitruato          | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Produktiv H  |
| 73646       | 445    | DIN 374       | nitruato          | Maschi a macchina per fil. metr. ISO passo fine                       | HSS-E               | Produktiv H  |
| 73659       | 426    | DIN 376       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv HD  |
| 73660       | 422    | DIN 371       | trattati a vapore | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv HD  |
| 73661       | 407    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv H   |
| 73662       | 423    | DIN 371       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | Intensiv HD  |
| 73664       | 409    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E               | Intensiv H   |
| 73665       | 427    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | Intensiv HD  |
| 73666       | 410    | DIN 376       | lucido            | Maschi a macchina per filettatura metrica ISO                         | HSS-E-PM            | H R15        |
| 73810       | 485    | Norma di fab. | lucido            | Frese a filettare con fase di svasatura per filettatura metrica ISO   | Metallo duro        | TMC SP       |
| 73820       | 488    | Norma di fab. | lucido            | Frese a filettare con fase di svasatura per fil. metr. ISO passo fine | Metallo duro        | TMC SP       |
| 73830       | 489    | Norma di fab. | lucido            | Frese a filettare senza fase di svasatura per filettatura metrica ISO | Metallo duro        | TM SP        |

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| 74202       | 585    | DIN 6527L     | lucido     | Frese frontali alluminio                                       | Metallo duro        | W                 |
| 74203       | 623    | DIN 6527L     | lucido     | Frese a sgrassare  | Metallo duro        | WR                |
| 74204       | 584    | DIN 6527K     | lucido     | Frese frontali alluminio                                       | Metallo duro        | W                 |
| 74206       | 586    | Norma di fab. | lucido     | Frese frontali alluminio                                       | Metallo duro        | W                 |
| 74231       | 652    | DIN 327       | lucido     | Frese frontali (a 2 taglienti)                                 | M42                 | N                 |
| 74243       | 654    | DIN 844K      | lucido     | Frese frontali (a 2 taglienti)                                 | M42                 | N                 |
| 74244       | 656    | DIN 844L      | lucido     | Frese frontali (a 2 taglienti)                                 | M42                 | N                 |
| 74280       | 658    | DIN 327       | lucido     | Frese frontali (a 3 taglienti)                                 | M42                 | N                 |
| 74282       | 660    | DIN 844K      | lucido     | Frese frontali (a 3 taglienti)                                 | M42                 | N                 |
| 74294       | 663    | DIN 844L      | lucido     | Frese frontali (a 3 taglienti)                                 | M42                 | N                 |
| 74303       | 624    | DIN 6527L     | lucido     | Frese a sgrassare  | Metallo duro        | WR                |
| 74404       | 593    | Norma di fab. | lucido     | Frese frontali (a 2 taglienti)                                 | Metallo duro        | N                 |
| 74424       | 602    | Norma di fab. | lucido     | Frese frontali (a 3 taglienti)                                 | Metallo duro        | N                 |
| 74478       | 605    | DIN 6527L     | lucido     | Frese frontali (a 3 taglienti) NH                              | Metallo duro        | NH                |
| 74479       | 587    | Norma di fab. | lucido     | Frese frontali alluminio                                       | Metallo duro        | W                 |
| 74520       | 588    | DIN 6527K     | lucido     | Frese frontali (a 2 taglienti)                                 | Metallo duro        | N                 |
| 74521       | 591    | DIN 6527L     | lucido     | Frese frontali (a 2 taglienti)                                 | Metallo duro        | N                 |
| 74522       | 597    | DIN 6527K     | lucido     | Frese frontali (a 3 taglienti)                                 | Metallo duro        | N                 |
| 74523       | 600    | DIN 6527L     | lucido     | Frese frontali (a 3 taglienti)                                 | Metallo duro        | N                 |
| 74525       | 609    | DIN 6527L     | lucido     | Frese frontali (a 4 taglienti)                                 | Metallo duro        | N                 |
| 74531       | 632    | DIN 6528      | lucido     | Frese a raggio   | Metallo duro        | N                 |
| 74543       | 627    | DIN 6527L     | lucido     | Frese a raggio   | Metallo duro        | N                 |
| 74545       | 630    | Norma di fab. | lucido     | Frese a raggio   | Metallo duro        | N                 |
| 74552       | 548    | Norma di fab. | lucido     | Frese SuperF-UT AI-3   | Metallo duro        | SuperF-UT AI-3    |
| 74553       | 549    | Norma di fab. | lucido     | Frese SuperF-UT AI-3   | Metallo duro        | SuperF-UT AI-3    |
| 74554       | 544    | DIN 6527L     | lucido     | Frese SuperF-UT Alluminio                                      | Metallo duro        | SuperF-UT AI      |
| 74555       | 545    | DIN 6527L     | lucido     | Frese SuperF-UT Alluminio                                      | Metallo duro        | SuperF-UT AI      |
| 74617       | 666    | DIN 844K      | lucido     | Frese universali, taglienti multipli                           | M42                 | N                 |
| 74800       | 670    | Norma di fab. | lucido     | Frese frontali (a 4 taglienti)                                 | M42                 | N                 |
| 74816       | 674    | DIN 844K      | lucido     | Frese a sgrassare (4 taglienti)                                | M42                 | NR                |
| 74825       | 672    | DIN 844K      | lucido     | Frese a sgrassare (3 taglienti)                                | HSS-E-PM            | NRf               |
| 74836       | 678    | DIN 844L      | lucido     | Frese a sgrassare (4 taglienti)                                | M42                 | NR                |
| 74845       | 676    | DIN 844K      | lucido     | Frese a sgrassare (4 taglienti)                                | HSS-E-PM            | NRf               |
| 74847       | 668    | DIN 844L      | lucido     | Frese universali, taglienti multipli                           | M42                 | N                 |
| 75017       | 147    | Norma di fab. | TiN        | Punte a cannone ad 1 tagliente SuperT-N                        | Metallo duro        | SuperT-N          |
| 75018       | 146    | Norma di fab. | TiN        | Punte a cannone ad 1 tagliente SuperT-N                        | Metallo duro        | SuperT-N          |
| 75020       | 156    | Norma di fab. | lucido     | Punte a cannone ad 1 tagliente TBE-VHM                         | Metallo duro        | TBE-VHM           |
| 75021       | 160    | Norma di fab. | lucido     | Punte a cannone ad 1 tagliente TBE-VHM                         | Metallo duro        | TBE-VHM           |
| 75022       | 148    | Norma di fab. | TiN        | Punte a cannone ad 1 tagliente SuperT-N                        | Metallo duro        | SuperT-N          |
| 75023       | 149    | Norma di fab. | TiN        | Punte a cannone ad 1 tagliente SuperT-N                        | Metallo duro        | SuperT-N          |
| 75024       | 154    | Norma di fab. | lucido     | Punte a cannone ad 1 tagliente TBE-VHM                         | Metallo duro        | TBE-VHM           |
| 75026       | 158    | Norma di fab. | lucido     | Punte a cannone ad 1 tagliente TBE-VHM                         | Metallo duro        | TBE-VHM           |
| 76000       | 125    | Norma di fab. | nichelato  | Porta utensili SuperV-AP maxi                                  |                     | SuperV-AP maxi    |
| 76001       | 126    | Norma di fab. | nichelato  | Porta utensili SuperV-AP maxi                                  |                     | SuperV-AP maxi    |
| 76003       | 127    | Norma di fab. | nichelato  | Porta utensili SuperV-AP maxi                                  |                     | SuperV-AP maxi    |
| 76011       | 128    | Norma di fab. | TiN        | Inseriti intercambiabili per SuperV-AP maxi                    | Metallo duro        | SuperV-AP maxi    |
| 76020       | 130    | Norma di fab. |            | Viti di serraggio  |                     |                   |
| 76021       | 131    | Norma di fab. |            | Giravite Torx  |                     |                   |
| 77000       | 110    | Norma di fab. | nichelato  | Porta utensili SuperV-AP mini                                  |                     | SuperV-AP mini    |
| 77001       | 111    | Norma di fab. | nichelato  | Porta utensili SuperV-AP mini                                  |                     | SuperV-AP mini    |
| 77003       | 112    | Norma di fab. | nichelato  | Porta utensili SuperV-AP mini                                  |                     | SuperV-AP mini    |
| 77004       | 113    | Norma di fab. | nichelato  | Porta utensili SuperV-AP mini                                  |                     | SuperV-AP mini    |
| 77007       | 109    | Norma di fab. | nichelato  | Porta utensili SuperV-AP mini                                  |                     | SuperV-AP mini    |
| 77011       | 123    | Norma di fab. | AlTiN nano | Inseriti intercambiabili per SuperV-AP mini                    | Metallo duro        | SuperV-AP mini NC |
| 77012       | 120    | Norma di fab. | lucido     | Inseriti intercambiabili per SuperV-AP mini                    | Metallo duro        | SuperV-AP mini AL |
| 77020       | 130    | Norma di fab. |            | Viti di serraggio  |                     |                   |
| 77021       | 131    | Norma di fab. |            | Spine Torx   |                     |                   |
| 77022       | 131    | Norma di fab. |            | Chiavi dinamometriche  |                     |                   |
| 78206       | 770    |               |            | Attacchi intercambiabili per mandrini                          |                     |                   |
| 78213       | 749    | Norma di fab. | lucido     | Mandrini ad espan. idraulica SK, maggiore forza di serraggio   |                     |                   |
| 78221       | 750    | Norma di fab. | lucido     | Mandrini ad espan. idraulica MAS/BT, maggiore forza di serr.   |                     |                   |
| 78232       | 758    | DIN 69882-4   | lucido     | Attacchi cilindrici Weldon HSK-A                               |                     |                   |
| 78233       | 762    | Norma di fab. | brunito    | Attacchi per codolo cilindrico WhistleNotch MAS/BT             |                     |                   |
| 78234       | 763    | Norma di fab. | brunito    | Attacchi cilindrici Weldon MAS/BT                              |                     |                   |
| 78240       | 766    | Norma di fab. |            | Mandrini portapunte CN MAS/BT con raffreddamento interno       |                     |                   |
| 78242       | 765    | Norma di fab. |            | Mandrini portapunte CN ISO.DIN.96871 raffreddamento interno    |                     |                   |
| 78299       | 748    | DIN 69882-7   | lucido     | Mandrini ad espans. idraulica HSK-A c. maggiore forza di serr. |                     |                   |
| 78308       | 768    | Norma di fab. |            | Pinza di serraggio   |                     |                   |
| 78317       | 760    | Norma di fab. | brunito    | Attacchi cilindrici Weldon SK                                  |                     |                   |
| 78322       | 761    | Norma di fab. | brunito    | Attacchi per codolo cilindrico Whistle Notch SK                |                     |                   |
| 78326       | 767    | Norma di fab. |            | Mandrini di maschiatura sincrona cil. con raffr. interno       |                     |                   |
| 78334       | 759    | DIN 69882-5   | lucido     | Attacchi per codolo cilindrico Whistle Notch HSK-A             |                     |                   |

## Indice per catalogo no.

| Catalogo n° | Pagina | Norma         | Superficie        | Descrizione  | Materiale tagliente | Tipo |
|-------------|--------|---------------|-------------------|--|---------------------|------|
| 78335       | 772    | Norma di fab. |                   | Dischi di tenuta   |                     |      |
| 78340       | 769    | Norma di fab. |                   | Mandrini di masch. cambio rapido no refrig. interno              |                     |      |
| 78346       | 764    | Norma di fab. |                   | Mandrini portapunte CN HSK-A con raffreddamento interno          |                     |      |
| 78364       | 771    | Norma di fab. |                   | Viti di regolazione „plan“ per masch. sincro con raffr. interno  |                     |      |
| 78368       | 751    | Norma di fab. |                   | Bussole rid. per mandrini ad espansione idraulica, no refr perif |                     |      |
| 78369       | 752    | Norma di fab. |                   | Bussole di riduzione per mandrini ad esp. Idraul.                |                     |      |
| 78729       | 756    | Norma di fab. | lucido            | Mandrini di calettamento ISO                                     |                     |      |
| 78736       | 753    | DIN 69882-8   | lucido            | Mandrini di calettamento HSK-A                                   |                     |      |
| 78738       | 755    | Norma di fab. | lucido            | Mandrini di calettamento SK                                      |                     |      |
| 78739       | 757    | Norma di fab. | lucido            | Mandrini di calettamento MAS/BT                                  |                     |      |
| 78755       | 754    | Norma di fab. | lucido            | Mandrini a calettamento HSK-A con raffreddamento periferico      |                     |      |
| 78877       | 256    | Norma di fab. |                   | Serie di punte   |                     |      |
| 78878       | 256    | Norma di fab. |                   | Serie di punte   |                     |      |
| 78879       | 254    | DIN 338       | trattati a vapore | Serie di punte   | HSS                 | N    |
| 78880       | 255    | DIN 338       | TiN - testa       | Serie di punte   | HSS                 | N    |
| 79012       | 254    | DIN 338       | lucido            | Serie di punte   | HSS-Co              | NX   |







MD

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**UTENSILI A FORARE**



## CODICI ISO

|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma trovate per ciascun utensile consigli sull'idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



## LEGENDA DEI PITTOGRAMMI

|                      |                      |              |             |                |                  |                   |                   |                   |                |           |          |           |  |  |
|----------------------|----------------------|--------------|-------------|----------------|------------------|-------------------|-------------------|-------------------|----------------|-----------|----------|-----------|--|--|
| MATERIALE TAGLIANTE  | <b>VHM</b>           | <b>HM</b>    |             |                |                  |                   |                   |                   |                |           |          |           |  |  |
|                      | Int. in metallo duro |              |             |                | Metallo duro     |                   |                   |                   |                |           |          |           |  |  |
| TRATT. DI SUPERFICIE | lucido               | niche-lato   | TiN         | TiAlN nano     | AlTiN nano       | Al-TiN            | TiAlN             | TiCN              | Al-TiN+        |           |          |           |  |  |
| TOLLERANZA SUL Ø     | h5                   | h6           | h7          | h8             | m7               |                   |                   |                   |                |           |          |           |  |  |
| PROFONDITÀ DI FORO   | 1,5xD                | 3xD          | 4xD         | 5xD            | 7xD              | 8xD               | 10xD              | 12xD              | 15xD           |           |          |           |  |  |
|                      | 20xD                 | 25xD         | 30xD        | 40xD           | 50xD             | 75xD              | 80xD              | ~3xD              | ~5xD           |           |          |           |  |  |
| DIREZIONE DI TAGLIO  | <br>a destra         |              |             |                |                  |                   |                   |                   |                |           |          |           |  |  |
| FORMA DEL CODOLO     | Cyl                  | HA           | HE          | MK             | Conico Morse     |                   |                   |                   |                |           |          |           |  |  |
| ANGOLI DI AFFILATURA | 90°                  | 118°         | 120°        | 130°           | 135°             | 140°              | 142°              | 145°              |                |           |          |           |  |  |
| NORMA                | DIN 6539             | DIN 6537K    | DIN 6537L   | DIN 8037       | DIN 8041         | WN                | Norma di fabbrica |                   |                |           |          |           |  |  |
| TIPO                 | SuperV-F             | SuperV-U     | SuperV-IK-U | SuperV-VA      | SuperV-95-GG     | SuperV-IK-F       | SuperV-95-GN      | SuperV-T          | SuperV-83-GAL  | N         | TBE-VHM  |           |  |  |
|                      | SuperV-NX            | SuperV-IK-NX | SuperV-M    | SuperV-AP mini | SuperV-AP mini U | SuperV-AP mini VA | SuperV-AP mini AL | SuperV-AP mini NC | SuperV-AP maxi | SuperT-AL | SuperT-N | SuperT-NX |  |  |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte SuperV senza fori di refrigerazione

|  |   |   |   |   |   |   |          |      |     |              |            |           |                |       |    |
|--|---|---|---|---|---|---|----------|------|-----|--------------|------------|-----------|----------------|-------|----|
|  | ○ | ● | ○ | ○ | ● | ● | SuperV-F | cil. | 3xD | Metallo duro | TiN        | DIN 6539  | 3,000 - 12,000 | 61888 | 63 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-U | HA   | 3xD | Metallo duro | TiAlN-nano | DIN 6537K | 3,000 - 20,000 | 51873 | 64 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-U | HE   | 3xD | Metallo duro | TiAlN-nano | DIN 6537K | 3,000 - 20,000 | 51871 | 66 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-U | HA   | 5xD | Metallo duro | TiAlN-nano | DIN 6537L | 3,000 - 20,000 | 51787 | 68 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-U | HE   | 5xD | Metallo duro | TiAlN-nano | DIN 6537L | 3,000 - 20,000 | 51887 | 70 |

## Punte con refrigerazione interna SuperV

|  |   |   |   |   |   |   |             |    |     |              |            |               |                |       |    |
|--|---|---|---|---|---|---|-------------|----|-----|--------------|------------|---------------|----------------|-------|----|
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-IK-U | HA | 3xD | Metallo duro | TiAlN-nano | DIN 6537K     | 3,000 - 20,000 | 51776 | 72 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-IK-U | HE | 3xD | Metallo duro | TiAlN-nano | DIN 6537K     | 3,000 - 20,000 | 51876 | 74 |
|  | ○ | ○ | ○ | ○ | ○ | ○ | SuperV-VA   | HA | 3xD | Metallo duro | AlTiN nano | DIN 6537K     | 3,000 - 20,000 | 51770 | 76 |
|  | ○ | ○ | ○ | ○ | ○ | ○ | SuperV-VA   | HE | 3xD | Metallo duro | AlTiN nano | DIN 6537K     | 3,000 - 20,000 | 51771 | 78 |
|  | ○ | ○ | ○ | ○ | ○ | ○ | SuperV95-GG | HA | 4xD | Metallo duro | lucido     | Norma di fab. | 3,000 - 21,500 | 71995 | 80 |
|  | ○ | ● | ○ | ○ | ● | ● | SuperV-IK-F | HE | 5xD | Metallo duro | TiN        | DIN 6537L     | 4,000 - 25,000 | 61880 | 82 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-IK-U | HA | 5xD | Metallo duro | TiAlN-nano | DIN 6537L     | 3,000 - 20,000 | 51781 | 83 |
|  | ● | ○ | ○ | ○ | ○ | ○ | SuperV-IK-U | HE | 5xD | Metallo duro | TiAlN-nano | DIN 6537L     | 3,000 - 20,000 | 51881 | 85 |
|  | ○ | ○ | ○ | ○ | ○ | ○ | SuperV-VA   | HA | 5xD | Metallo duro | AlTiN nano | DIN 6537L     | 3,000 - 20,000 | 51772 | 87 |
|  | ○ | ○ | ○ | ○ | ○ | ○ | SuperV-VA   | HE | 5xD | Metallo duro | AlTiN nano | DIN 6537L     | 3,000 - 20,000 | 51773 | 89 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte con refrigerazione interna SuperV

|  |  |  |  |  |  |             |    |      |              |            |               |                |       |     |
|--|--|--|--|--|--|-------------|----|------|--------------|------------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | SuperV-IK-U | HA | 7xD  | Metallo duro | TiAlN-nano | Norma di fab. | 3,000 - 20,000 | 51789 | 91  |
|  |  |  |  |  |  | SuperV-IK-U | HE | 7xD  | Metallo duro | TiAlN-nano | Norma di fab. | 3,000 - 20,000 | 51889 | 92  |
|  |  |  |  |  |  | SuperV95-GG | HA | 7xD  | Metallo duro | lucido     | Norma di fab. | 3,000 - 20,000 | 71994 | 93  |
|  |  |  |  |  |  | SuperV95-GG | HA | 10xD | Metallo duro | lucido     | Norma di fab. | 3,000 - 20,000 | 71996 | 94  |
|  |  |  |  |  |  | SuperV-IK-U | HA | 12xD | Metallo duro | TiAlN-nano | Norma di fab. | 3,000 - 20,000 | 51893 | 95  |
|  |  |  |  |  |  | SuperV95-GN | HA | 15xD | Metallo duro | lucido     | Norma di fab. | 5,000 - 14,000 | 71997 | 96  |
|  |  |  |  |  |  | SuperV-T    | HA | 15xD | Metallo duro | AlTiN      | Norma di fab. | 3,000 - 14,000 | 51764 | 97  |
|  |  |  |  |  |  | SuperV-T    | HA | 20xD | Metallo duro | AlTiN      | Norma di fab. | 3,000 - 14,000 | 51765 | 98  |
|  |  |  |  |  |  | SuperV-T    | HA | 25xD | Metallo duro | AlTiN      | Norma di fab. | 3,000 - 12,000 | 51766 | 99  |
|  |  |  |  |  |  | SuperV-T    | HA | 30xD | Metallo duro | AlTiN      | Norma di fab. | 3,000 - 10,000 | 51767 | 100 |
|  |  |  |  |  |  | SuperV-T    | HA | 40xD | Metallo duro | AlTiN      | Norma di fab. | 3,000 - 8,000  | 51768 | 101 |

## Punte SuperV, 3 taglienti

|  |  |  |  |  |  |              |    |     |              |        |           |                |       |     |
|--|--|--|--|--|--|--------------|----|-----|--------------|--------|-----------|----------------|-------|-----|
|  |  |  |  |  |  | SuperV83-GAL | HA | 5xD | Metallo duro | lucido | DIN 6537L | 3,000 - 20,000 | 71862 | 102 |
|--|--|--|--|--|--|--------------|----|-----|--------------|--------|-----------|----------------|-------|-----|

## Micropunte ad alto rendimento in MD SuperV-NX senza fori interni

|  |  |  |  |  |  |           |      |     |              |        |               |               |       |     |
|--|--|--|--|--|--|-----------|------|-----|--------------|--------|---------------|---------------|-------|-----|
|  |  |  |  |  |  | SuperV-NX | cil. | 4xD | Metallo duro | AlTiN+ | Norma di fab. | 0,500 - 3,000 | 71998 | 103 |
|  |  |  |  |  |  | SuperV-NX | HA   | 7xD | Metallo duro | AlTiN+ | Norma di fab. | 0,500 - 3,000 | 71999 | 104 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

### Micropunte ad alto rendimento in MD SuperV-NX con fori interni

|  |   |   |   |   |   |              |    |      |              |       |               |               |       |     |
|--|---|---|---|---|---|--------------|----|------|--------------|-------|---------------|---------------|-------|-----|
|  | • | • | • | ○ | ○ | SuperV-IK-NX | HA | 5xD  | Metallo duro | AlTiN | Norma di fab. | 1,400 - 3,000 | 51997 | 105 |
|  | • | • | • | ○ | ○ | SuperV-IK-NX | HA | 8xD  | Metallo duro | AlTiN | Norma di fab. | 1,400 - 3,000 | 51998 | 106 |
|  | • | • | • | ○ | ○ | SuperV-IK-NX | HA | 15xD | Metallo duro | AlTiN | Norma di fab. | 1,400 - 3,000 | 51999 | 107 |

### Micropunte universale SuperV-M VHM

|  |   |   |   |   |   |          |    |  |              |       |               |               |       |     |
|--|---|---|---|---|---|----------|----|--|--------------|-------|---------------|---------------|-------|-----|
|  | • | • | • | ○ | ○ | SuperV-M | HA |  | Metallo duro | AlTiN | Norma di fab. | 0,100 - 3,000 | 51720 | 108 |
|--|---|---|---|---|---|----------|----|--|--------------|-------|---------------|---------------|-------|-----|

### Porta utensili SuperV-AP mini

|  |  |  |  |  |  |                |    |       |  |           |               |  |       |     |
|--|--|--|--|--|--|----------------|----|-------|--|-----------|---------------|--|-------|-----|
|  |  |  |  |  |  | SuperV-AP mini | HE | 1,5xD |  | nichelato | Norma di fab. |  | 77007 | 109 |
|  |  |  |  |  |  | SuperV-AP mini | HE | 3xD   |  | nichelato | Norma di fab. |  | 77000 | 110 |
|  |  |  |  |  |  | SuperV-AP mini | HE | 5xD   |  | nichelato | Norma di fab. |  | 77001 | 111 |
|  |  |  |  |  |  | SuperV-AP mini | HE | 7xD   |  | nichelato | Norma di fab. |  | 77003 | 112 |
|  |  |  |  |  |  | SuperV-AP mini | HE | 10xD  |  | nichelato | Norma di fab. |  | 77004 | 113 |

### Inserti intercambiabili per SuperV-AP mini

|  |   |   |   |   |   |                   |  |  |              |            |               |                 |       |     |
|--|---|---|---|---|---|-------------------|--|--|--------------|------------|---------------|-----------------|-------|-----|
|  | • | ○ | ○ | ○ | ○ | SuperV-AP mini U  |  |  | Metallo duro | TiAlN-nano | Norma di fab. | 11,000 - 40,000 | 67011 | 114 |
|  | • | ○ | ○ | ○ | ○ | SuperV-AP mini VA |  |  | Metallo duro | AlTiN nano | Norma di fab. | 11,000 - 40,000 | 67012 | 117 |
|  | • | ○ | ○ | ○ | ○ | SuperV-AP mini AL |  |  | Metallo duro | lucido     | Norma di fab. | 11,000 - 40,000 | 77012 | 120 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

### Inseri intercambiabili per SuperV-AP mini



|  |                   |                     |            |               |                 |              |     |
|--|-------------------|---------------------|------------|---------------|-----------------|--------------|-----|
|  | SuperV-AP mini.NC | <b>Metallo duro</b> | AlTiN nano | Norma di fab. | 11,000 - 40,000 | <b>77011</b> | 123 |
|--|-------------------|---------------------|------------|---------------|-----------------|--------------|-----|

### Porta utensili SuperV-AP maxi



|                |    |     |           |               |  |              |     |
|----------------|----|-----|-----------|---------------|--|--------------|-----|
| SuperV-AP maxi | HE | 3xD | nichelato | Norma di fab. |  | <b>76000</b> | 125 |
|----------------|----|-----|-----------|---------------|--|--------------|-----|



|                |    |     |           |               |  |              |     |
|----------------|----|-----|-----------|---------------|--|--------------|-----|
| SuperV-AP maxi | HE | 5xD | nichelato | Norma di fab. |  | <b>76001</b> | 126 |
|----------------|----|-----|-----------|---------------|--|--------------|-----|



|                |    |     |           |               |  |              |     |
|----------------|----|-----|-----------|---------------|--|--------------|-----|
| SuperV-AP maxi | HE | 7xD | nichelato | Norma di fab. |  | <b>76003</b> | 127 |
|----------------|----|-----|-----------|---------------|--|--------------|-----|

### Inseri intercambiabili per SuperV-AP maxi



|  |                |                     |     |               |                 |              |     |
|--|----------------|---------------------|-----|---------------|-----------------|--------------|-----|
|  | SuperV-AP maxi | <b>Metallo duro</b> | TiN | Norma di fab. | 16,000 - 40,500 | <b>76011</b> | 128 |
|--|----------------|---------------------|-----|---------------|-----------------|--------------|-----|



|  |                |                     |       |               |                 |              |     |
|--|----------------|---------------------|-------|---------------|-----------------|--------------|-----|
|  | SuperV-AP maxi | <b>Metallo duro</b> | TiAlN | Norma di fab. | 16,000 - 40,500 | <b>56011</b> | 129 |
|--|----------------|---------------------|-------|---------------|-----------------|--------------|-----|

### Accessori



|               |              |     |
|---------------|--------------|-----|
| Norma di fab. | <b>76020</b> | 130 |
|---------------|--------------|-----|



|               |              |     |
|---------------|--------------|-----|
| Norma di fab. | <b>77020</b> | 130 |
|---------------|--------------|-----|



|               |              |     |
|---------------|--------------|-----|
| Norma di fab. | <b>77022</b> | 131 |
|---------------|--------------|-----|



|               |              |     |
|---------------|--------------|-----|
| Norma di fab. | <b>77021</b> | 131 |
|---------------|--------------|-----|



|               |              |     |
|---------------|--------------|-----|
| Norma di fab. | <b>76021</b> | 131 |
|---------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte elicoidali, extra corte



|   |   |   |   |   |  |   |      |      |              |        |          |                |              |     |
|---|---|---|---|---|--|---|------|------|--------------|--------|----------|----------------|--------------|-----|
| • | • | • | • | • |  | N | cil. | ~3xD | Metallo duro | lucido | DIN 6539 | 1,000 - 15,000 | <b>71184</b> | 132 |
|---|---|---|---|---|--|---|------|------|--------------|--------|----------|----------------|--------------|-----|



|   |   |   |   |   |  |   |      |      |              |            |          |                |              |     |
|---|---|---|---|---|--|---|------|------|--------------|------------|----------|----------------|--------------|-----|
| • | • | • | • | • |  | N | cil. | ~3xD | Metallo duro | TiAlN-nano | DIN 6539 | 1,000 - 12,000 | <b>51184</b> | 134 |
|---|---|---|---|---|--|---|------|------|--------------|------------|----------|----------------|--------------|-----|

### Punte elicoidali, corte



|   |   |   |   |   |  |   |      |      |              |        |               |                |              |     |
|---|---|---|---|---|--|---|------|------|--------------|--------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | N | cil. | ~5xD | Metallo duro | lucido | Norma di fab. | 1,000 - 12,000 | <b>71290</b> | 135 |
|---|---|---|---|---|--|---|------|------|--------------|--------|---------------|----------------|--------------|-----|

### Punte cilindriche per centri CN



|   |   |   |   |   |  |   |    |  |              |        |               |                |              |     |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | N | HA |  | Metallo duro | lucido | Norma di fab. | 5,000 - 20,000 | <b>71190</b> | 137 |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|



|   |   |   |   |   |  |   |    |  |              |        |               |                |              |     |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | N | HA |  | Metallo duro | lucido | Norma di fab. | 5,000 - 20,000 | <b>71191</b> | 138 |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|



|   |   |   |   |   |  |   |    |  |              |        |               |                |              |     |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | N | HB |  | Metallo duro | lucido | Norma di fab. | 4,000 - 20,000 | <b>71189</b> | 139 |
|---|---|---|---|---|--|---|----|--|--------------|--------|---------------|----------------|--------------|-----|

### Punte speciali, con taglienti in MD



|   |   |   |   |   |  |   |      |  |              |        |          |                |              |     |
|---|---|---|---|---|--|---|------|--|--------------|--------|----------|----------------|--------------|-----|
| ○ | ○ | ○ | ○ | ○ |  | N | cil. |  | Metallo duro | lucido | DIN 8037 | 3,000 - 20,000 | <b>71180</b> | 140 |
|---|---|---|---|---|--|---|------|--|--------------|--------|----------|----------------|--------------|-----|



|   |   |   |   |   |  |   |    |  |              |        |          |                 |              |     |
|---|---|---|---|---|--|---|----|--|--------------|--------|----------|-----------------|--------------|-----|
| ○ | • | ○ | ○ | ○ |  | N | CM |  | Metallo duro | lucido | DIN 8041 | 11,000 - 33,000 | <b>71380</b> | 141 |
|---|---|---|---|---|--|---|----|--|--------------|--------|----------|-----------------|--------------|-----|

### Punte a centrare senza piano



|   |   |   |   |   |  |   |  |  |              |        |               |               |              |     |
|---|---|---|---|---|--|---|--|--|--------------|--------|---------------|---------------|--------------|-----|
| • | ○ | • | • | ○ |  | N |  |  | Metallo duro | lucido | Norma di fab. | 1,000 - 6,300 | <b>71616</b> | 142 |
|---|---|---|---|---|--|---|--|--|--------------|--------|---------------|---------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte a cannone ad 1 tagliente SuperT-AL

|  |           |    |      |              |            |               |                |              |     |
|--|-----------|----|------|--------------|------------|---------------|----------------|--------------|-----|
|  | SuperT-AL | HA | 25xD | Metallo duro | AlTiN nano | Norma di fab. | 2,380 - 12,000 | <b>55027</b> | 143 |
|  | SuperT-AL | HA | 50xD | Metallo duro | AlTiN nano | Norma di fab. | 2,380 - 8,000  | <b>55028</b> | 144 |
|  | SuperT-AL | HA | 75xD | Metallo duro | AlTiN nano | Norma di fab. | 2,380 - 6,000  | <b>55029</b> | 145 |

### Punte a cannone ad 1 tagliente SuperT-N

|  |          |    |      |              |     |               |                |              |     |
|--|----------|----|------|--------------|-----|---------------|----------------|--------------|-----|
|  | SuperT-N | HA | 20xD | Metallo duro | TiN | Norma di fab. | 4,000 - 12,000 | <b>75018</b> | 146 |
|  | SuperT-N | HA | 30xD | Metallo duro | TiN | Norma di fab. | 4,000 - 12,000 | <b>75017</b> | 147 |
|  | SuperT-N | HA | 40xD | Metallo duro | TiN | Norma di fab. | 4,000 - 12,000 | <b>75022</b> | 148 |
|  | SuperT-N | HA | 80xD | Metallo duro | TiN | Norma di fab. | 4,950 - 11,950 | <b>75023</b> | 149 |

### Punte a cannone ad 1 tagliente SuperT-NX

|  |           |    |      |              |      |               |                |              |     |
|--|-----------|----|------|--------------|------|---------------|----------------|--------------|-----|
|  | SuperT-NX | HA | 20xD | Metallo duro | TiCN | Norma di fab. | 3,970 - 12,700 | <b>55018</b> | 150 |
|  | SuperT-NX | HA | 30xD | Metallo duro | TiCN | Norma di fab. | 3,970 - 12,700 | <b>55017</b> | 151 |
|  | SuperT-NX | HA | 40xD | Metallo duro | TiCN | Norma di fab. | 3,970 - 12,700 | <b>55022</b> | 152 |
|  | SuperT-NX | HA | 80xD | Metallo duro | TiCN | Norma di fab. | 4,950 - 12,650 | <b>55023</b> | 153 |

### Punte a cannone ad 1 tagliente TBE-VHM

|  |         |    |        |              |        |               |               |              |     |
|--|---------|----|--------|--------------|--------|---------------|---------------|--------------|-----|
|  | TBE-VHM | HA | 45.000 | Metallo duro | lucido | Norma di fab. | 1,200 - 3,200 | <b>75024</b> | 154 |
|  | TBE-VHM | HA | 45.000 | Metallo duro | AlTiN+ | Norma di fab. | 2,000 - 3,200 | <b>55024</b> | 155 |



| P | M | K | N | S | H | Tipo | Forma dell'attacco | Profondità di foro | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte a cannone ad 1 tagliente TBE-VHM

|  |   |   |   |   |   |         |    |         |              |        |               |               |              |     |
|--|---|---|---|---|---|---------|----|---------|--------------|--------|---------------|---------------|--------------|-----|
|  | • | • | ○ | ○ | ○ | TBE-VHM | HA | 80.000  | Metallo duro | lucido | Norma di fab. | 1,200 - 5,000 | <b>75020</b> | 156 |
|  | • | • | • | ○ | ○ | TBE-VHM | HA | 80.000  | Metallo duro | AlTiN+ | Norma di fab. | 2,000 - 5,000 | <b>55020</b> | 157 |
|  | • | • | ○ | • | ○ | TBE-VHM | HA | 120.000 | Metallo duro | lucido | Norma di fab. | 1,500 - 5,000 | <b>75026</b> | 158 |
|  | • | • | • | ○ | ○ | TBE-VHM | HA | 120.000 | Metallo duro | AlTiN+ | Norma di fab. | 2,000 - 5,000 | <b>55026</b> | 159 |
|  | • | • | ○ | • | ○ | TBE-VHM | HA | 160.000 | Metallo duro | lucido | Norma di fab. | 1,500 - 8,000 | <b>75021</b> | 160 |
|  | • | • | • | ○ | ○ | TBE-VHM | HA | 160.000 | Metallo duro | AlTiN+ | Norma di fab. | 2,000 - 8,000 | <b>55021</b> | 161 |

# Applicazione

Per materiale

| Tipo              | Tipo di catalogo |             | metalli non ferrosi,<br>aluminiumio  | acciaio | ghisa | acciaio inossidabile<br>resistente e acido | nichel,<br>leghe di titanio | acciai<br>temprati |
|-------------------|------------------|-------------|--------------------------------------|---------|-------|--|-----------------------------|--------------------|
|                   | senza refr.      | con refrig. |                                      |         |       |  |                             |                    |
| SuperV-U          | 51873            | 51776       |                                      |         |       |  |                             |                    |
|                   | 51871            | 51876       |                                      |         |       |  |                             |                    |
|                   | 51787            | 51781       |                                      |         |       |  |                             |                    |
|                   | 51887            | 51881       |                                      |         |       |  |                             |                    |
|                   |                  | 51789       |                                      |         |       |  |                             |                    |
|                   |                  | 51889       |                                      |         |       |  |                             |                    |
|                   |                  | 51893       |                                      |         |       |  |                             |                    |
| SuperV-VA         |                  | 51770       |                                      |         |       |  |                             |                    |
|                   |                  | 51771       |                                      |         |       |  |                             |                    |
|                   |                  | 51772       |                                      |         |       |  |                             |                    |
|                   |                  | 51773       |                                      |         |       |  |                             |                    |
| SuperV-F          | 61888            | 61880       |                                      |         |       |  |                             |                    |
| SuperV-NX         |                  | 51997       |                                      |         |       |  |                             |                    |
|                   | 71998            | 51998       |                                      |         |       |  |                             |                    |
|                   | 71999            | 51999       |                                      |         |       |  |                             |                    |
| SuperV-M          |                  | 51720       |                                      |         |       |  |                             |                    |
| SuperV-T          |                  | 51764       |                                      |         |       |  |                             |                    |
|                   |                  | 51765       |                                      |         |       |  |                             |                    |
|                   |                  | 51766       |                                      |         |       |  |                             |                    |
|                   |                  | 51767       |                                      |         |       |  |                             |                    |
|                   |                  | 51768       |                                      |         |       |  |                             |                    |
| SuperV95-GG       |                  | 71995       |                                      |         |       |  |                             |                    |
|                   |                  | 71994       |                                      |         |       |  |                             |                    |
|                   |                  | 71996       |                                      |         |       |  |                             |                    |
| SuperV95-GN       |                  | 71997       |                                      |         |       |  |                             |                    |
| SuperV83-GAL      |                  | 71862       |                                      |         |       |  |                             |                    |
| SuperV-AP<br>mini |                  | 67011       |                                      |         |       |  |                             |                    |
|                   |                  | 77012       |                                      |         |       |  |                             |                    |
|                   |                  | 67012       |                                      |         |       |  |                             |                    |
|                   |                  | 77011       | inserti NC per foro pilota/svasatura |         |       |  |                             |                    |
| SuperV-AP<br>maxi |                  | 76011       |                                      |         |       |  |                             |                    |
|                   |                  | 56011       |                                      |         |       |  |                             |                    |

■ ottimale    ■ adatto bene

## Per resistenza alla trazione



## Parametri di lavoro indicativi per punte SuperV

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |
|                      | 50,00 | 0,250 | 0,310 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,250 |
|                      | 63,00 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 |
|                      | 80,00 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 | 2,000 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante  |
|---|---|--|--------------------------|---|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/>   |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/>   |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/>   |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/>   |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/>   |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/>   |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/>   |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>  |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Mat. plastiche termoindurenti                                 | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>  |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/>   |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>  |
| a fibre di vetro/C rinforzate                                 | GFK/CFK   |  | -                        | <input type="checkbox"/>  |

# ≤3×D Profondità

# ≤4×D

|                 |               |               |               |               |               |               |               |                  |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|
| Catalogo n°     | <b>61888</b>  | <b>51873</b>  | <b>51871</b>  | <b>51770</b>  | <b>51771</b>  | <b>51776</b>  | <b>51876</b>  | <b>71995</b>     |
| Mat. da taglio  | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b>    |
| Gruppo impiego  | K/P           | K/P           | K/P           | K/P           | K/P           | K/P           | K/P           | K                |
| Superficie      | TiN           | TiAlN nano    | TiAlN nano    | AlTiN nano    | AlTiN nano    | TiAlN nano    | TiAlN nano    | lucide           |
| DIN/Forma       | <b>6539</b>   | <b>6537K</b>  | <b>6537K</b>  | <b>6537K</b>  | <b>6537K</b>  | <b>6537K</b>  | <b>6537K</b>  | <b>Stock std</b> |
| Tipo            | F             | U             | U             | VA            | VA            | U             | U             | GG               |
| Refrig. interna |               |               |               | <b>axial</b>  | <b>axial</b>  | <b>axial</b>  | <b>axial</b>  | <b>axial</b>     |
| Pagina          | 63            | 64            | 66            | 76            | 78            | 72            | 74            | 80               |



| V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |   | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |     | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |   | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|-------------------------|--------------------|---|-------------------------|--------------------|-----|-------------------------|--------------------|---|-------------------------|--------------------|
| 100                     | F                  | 130                     | G                  | G |                         |                    |     | 145                     | G                  | G |                         |                    |
| 85                      | E                  | 110                     | F                  | F |                         |                    |     | 120                     | F                  | F |                         |                    |
| 110                     | G                  | 145                     | H                  | H |                         |                    |     | 170                     | H                  | H |                         |                    |
| 85                      | F                  | 110                     | G                  | G |                         |                    |     | 145                     | H                  | H |                         |                    |
| 90                      | F                  | 120                     | G                  | G |                         |                    |     | 130                     | H                  | H |                         |                    |
| 85                      | F                  | 110                     | G                  | G |                         |                    |     | 125                     | G                  | G |                         |                    |
| 80                      | F                  | 105                     | G                  | G |                         |                    |     | 120                     | G                  | G |                         |                    |
| 80                      | F                  | 105                     | G                  | G |                         |                    |     | 120                     | G                  | G |                         |                    |
| 75                      | E                  | 100                     | F                  | F |                         |                    |     | 105                     | G                  | G |                         |                    |
| 100                     | G                  | 130                     | H                  | H |                         |                    |     | 145                     | H                  | H |                         |                    |
| 90                      | F                  | 120                     | G                  | G |                         |                    |     | 120                     | G                  | G |                         |                    |
| 65                      | D                  | 85                      | E                  | E |                         |                    |     | 85                      | E                  | E |                         |                    |
| 75                      | E                  | 100                     | F                  | F |                         |                    |     | 110                     | G                  | G |                         |                    |
| 70                      | D                  | 90                      | E                  | E |                         |                    |     | 105                     | E                  | E |                         |                    |
| 50                      | E                  | 65                      | F                  | F |                         |                    |     | 80                      | F                  | F |                         |                    |
| 40                      | D                  | 55                      | E                  | E |                         |                    |     | 65                      | E                  | E |                         |                    |
| 40                      | C                  |                         |                    |   |                         |                    |     | 60                      | D                  | D |                         |                    |
| 45                      | B                  | 45                      | C                  | C |                         |                    |     | 60                      | C                  | C |                         |                    |
| 35                      | B                  | 40                      | A                  | A |                         |                    |     | 55                      | C                  | C |                         |                    |
| 20                      | A                  | 20                      | A                  | A |                         |                    |     | 35                      | B                  | B |                         |                    |
| 40                      | C                  | 40                      | B                  | B | 80                      | E                  | E   | 60                      | E                  | E |                         |                    |
| 35                      | C                  | 15                      | A                  | A | 60                      | B-C                | B-C | 55                      | B                  | B |                         |                    |
| 35                      | B                  | 35                      | B                  | B | 80                      | E                  | E   | 45                      | E                  | E |                         |                    |
| 160                     | G                  | 210                     | H                  | H |                         |                    |     | 210                     | I                  | I | 120                     | G                  |
| 120                     | G                  | 155                     | H                  | H |                         |                    |     | 160                     | I                  | I | 100                     | G                  |
| 120                     | G                  | 155                     | G                  | G |                         |                    |     | 140                     | I                  | I | 90                      | G                  |
| 95                      | G                  | 125                     | G                  | G |                         |                    |     | 130                     | H                  | H | 80                      | G                  |
| 25                      | B                  | 35                      | C                  | C |                         |                    |     | 40                      | C                  | C | 40                      | B                  |
|                         |                    |                         |                    |   |                         |                    |     |                         |                    |   |                         |                    |
|                         |                    |                         |                    |   |                         |                    |     |                         |                    |   |                         |                    |
|                         |                    |                         |                    |   |                         |                    |     |                         |                    |   |                         |                    |
| 20                      | C                  | 25                      | D                  | D | 30                      | D                  | D   | 30                      | D                  | D |                         |                    |
| 30                      | B                  | 15                      | A                  | A | 45                      | D                  | D   | 45                      | D                  | D |                         |                    |
| 25                      | B                  | 15                      | A                  | A | 40                      | C                  | C   | 40                      | C                  | C |                         |                    |
| 200                     | H                  | 260                     | I                  | I |                         |                    |     | 310                     | I                  | I | 410                     | I                  |
| 200                     | H                  | 260                     | I                  | I |                         |                    |     | 310                     | I                  | I | 410                     | I                  |
| 170                     | H                  | 220                     | H                  | H |                         |                    |     | 260                     | I                  | I | 380                     | I                  |
| 140                     | G                  | 180                     | H                  | H |                         |                    |     | 220                     | I                  | I | 330                     | I                  |
| 200                     | G                  | 260                     | H                  | H |                         |                    |     | 280                     | H                  | H |                         |                    |
| 80                      | F                  | 105                     | G                  | G |                         |                    |     | 125                     | G                  | G |                         |                    |
| 210                     | G                  | 270                     | H                  | H |                         |                    |     | 325                     | H                  | H | 280                     | I                  |
| 140                     | F                  | 180                     | G                  | G |                         |                    |     | 220                     | G                  | G |                         |                    |
| 80                      | E                  | 105                     | F                  | F |                         |                    |     | 125                     | G                  | G | 110                     | F                  |
| 65                      | E                  | 85                      | F                  | F |                         |                    |     | 105                     | F                  | F | 80                      | E                  |
| 60                      | D                  | 80                      | E                  | E |                         |                    |     | 90                      | F                  | F |                         |                    |
| 45                      | D                  | 60                      | E                  | E |                         |                    |     | 80                      | F                  | F |                         |                    |

## Parametri di lavoro indicativi per punte SuperV

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |
|                      | 50,00 | 0,250 | 0,310 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,250 |                            |
| 63,00                | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 |       |                            |
| 80,00                | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 | 2,000 |       |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante  |
|---|---|--|--------------------------|---|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/>   |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/>   |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/>   |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/>   |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/>   |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/>   |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/>   |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>  |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>  |
| Mat. plastiche termoindurenti                                 | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>  |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/>   |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>  |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>  |

# ≤5×D Profondità

|                 |               |               |
|-----------------|---------------|---------------|
| Catalogo n°     | <b>51887</b>  | <b>51787</b>  |
| Mat. da taglio  | <b>M.D.I.</b> | <b>M.D.I.</b> |
| Gruppo impiego  | K/P           | K/P           |
| Superficie      | TiAlN nano    | TiAlN nano    |
| DIN/Forma       | <b>6537L</b>  | <b>6537L</b>  |
| Tipo            | U             | U             |
| Refrig. interna |               |               |
| Pagina          | 70            | 68            |

|               |               |
|---------------|---------------|
| <b>51781</b>  | <b>51881</b>  |
| <b>M.D.I.</b> | <b>M.D.I.</b> |
| K/P           | K/P           |
| TiAlN nano    | TiAlN nano    |
| <b>6537L</b>  | <b>6537L</b>  |
| U             | U             |
| <b>axial</b>  | <b>axial</b>  |
| 83            | 85            |

|               |
|---------------|
| <b>71862</b>  |
| <b>M.D.I.</b> |
| K             |
| blank         |
| <b>6537L</b>  |
| GAL           |
| 102           |

|               |               |
|---------------|---------------|
| <b>51772</b>  | <b>51773</b>  |
| <b>M.D.I.</b> | <b>M.D.I.</b> |
| K/P           | K/P           |
| AlTiN nano    | AlTiN nano    |
| <b>6537L</b>  | <b>6537L</b>  |
| VA            | VA            |
| <b>axial</b>  | <b>axial</b>  |
| 87            | 89            |

|               |
|---------------|
| <b>61880</b>  |
| <b>M.D.I.</b> |
| K/P           |
| TiN           |
| <b>6537L</b>  |
| F             |
| <b>axial</b>  |
| 82            |



| V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |
|-------------------------|-------------------------|---|
| 130                     | G                       | G |
| 110                     | F                       | F |
| 145                     | H                       | H |
| 110                     | G                       | G |
| 120                     | G                       | G |
| 110                     | G                       | G |
| 105                     | G                       | G |
| 105                     | G                       | G |
| 100                     | F                       | F |
| 130                     | H                       | H |
| 120                     | G                       | G |
| 85                      | E                       | E |
| 100                     | F                       | F |
| 90                      | E                       | E |
| 65                      | F                       | F |
| 55                      | E                       | E |
| 45                      | C                       | C |
| 35                      | A                       | A |
| 20                      | A                       | A |
| 40                      | B                       | B |
| 15                      | A                       | A |
| 35                      | B                       | B |
| 210                     | H                       | H |
| 155                     | H                       | H |
| 145                     | G                       | G |
| 125                     | G                       | G |
| 35                      | C                       | C |
| 25                      | D                       | D |
| 15                      | A                       | A |
| 15                      | A                       | C |
| 260                     | I                       | I |
| 260                     | I                       | I |
| 235                     | I                       | I |
| 170                     | H                       | H |
| 260                     | H                       | H |
| 105                     | G                       | G |
| 270                     | H                       | H |
| 180                     | G                       | G |
| 105                     | F                       | F |
| 85                      | F                       | F |
| 80                      | E                       | E |
| 60                      | E                       | E |

| V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |
|-------------------------|-------------------------|---|
| 145                     | G                       | G |
| 120                     | F                       | F |
| 170                     | H                       | H |
| 145                     | H                       | H |
| 130                     | H                       | H |
| 125                     | G                       | G |
| 120                     | G                       | G |
| 120                     | G                       | G |
| 105                     | G                       | G |
| 145                     | H                       | H |
| 120                     | G                       | G |
| 85                      | E                       | E |
| 105                     | G                       | G |
| 100                     | E                       | E |
| 70                      | F                       | F |
| 55                      | E                       | E |
| 60                      | E                       | E |
| 60                      | C                       | C |
| 55                      | C                       | C |
| 35                      | B                       | B |
| 60                      | E                       | E |
| 55                      | B                       | B |
| 50                      | E                       | E |
| 195                     | I                       | I |
| 160                     | I                       | I |
| 140                     | I                       | I |
| 130                     | H                       | H |
| 40                      | C                       | C |
| 35                      | D                       | D |
| 45                      | D                       | D |
| 40                      | C                       | C |
| 310                     | I                       | I |
| 310                     | I                       | I |
| 260                     | I                       | I |
| 220                     | I                       | I |
| 280                     | H                       | H |
| 125                     | G                       | G |
| 325                     | H                       | H |
| 220                     | G                       | G |
| 125                     | G                       | G |
| 105                     | F                       | F |
| 90                      | F                       | F |
| 80                      | F                       | F |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 100                     | F                  |
| 80                      | F                  |
| 80                      | F                  |
| 70                      | F                  |
| 180                     | G                  |
| 160                     | G                  |
| 150                     | G                  |
| 120                     | F                  |
| 180                     | F                  |
| 180                     | F                  |

| V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |     |
|-------------------------|-------------------------|-----|
| 80                      | E                       | E   |
| 60                      | B-C                     | B-C |
| 80                      | E                       | E   |
| 30                      | D                       | D   |
| 45                      | D                       | D   |
| 40                      | C                       | C   |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 110                     | F                  |
| 90                      | E                  |
| 130                     | G                  |
| 110                     | G                  |
| 100                     | G                  |
| 95                      | F                  |
| 90                      | F                  |
| 90                      | F                  |
| 80                      | F                  |
| 110                     | G                  |
| 90                      | F                  |
| 65                      | D                  |
| 85                      | F                  |
| 80                      | E                  |
| 60                      | E                  |
| 50                      | D                  |
| 45                      | D                  |
| 45                      | B                  |
| 40                      | B                  |
| 25                      | A                  |
| 45                      | D                  |
| 40                      | B                  |
| 35                      | D                  |
| 160                     | H                  |
| 120                     | H                  |
| 100                     | H                  |
| 95                      | G                  |
| 30                      | B                  |
| 25                      | C                  |
| 35                      | C                  |
| 30                      | B                  |
| 240                     | H                  |
| 240                     | H                  |
| 200                     | H                  |
| 170                     | H                  |
| 230                     | G                  |
| 95                      | F                  |
| 250                     | G                  |
| 170                     | F                  |
| 95                      | F                  |
| 80                      | E                  |
| 70                      | E                  |
| 60                      | E                  |

## Parametri di lavoro indicativi per punte SuperV

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |
|                      | 50,00 | 0,250 | 0,310 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,250 |                            |
| 63,00                | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 |       |                            |
| 80,00                | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 | 2,000 |       |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale                     | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--------------------------------------|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici       | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500) | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici                    | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati        | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati            | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati    | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati        | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione               | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile                   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4                                    | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi                        | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle                     | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati                      | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati       | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9  | ≤850   |                          | <input checked="" type="checkbox"/> |
| austenitici                          | <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)  | ≤850   |                          | <input checked="" type="checkbox"/> |
| martensitici                         | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2   | ≤850   |                          | <input checked="" type="checkbox"/> |
| Ghisa                                | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata          | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura                           | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV                      | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI                      | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali                       | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe                  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1                                       | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe                | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si      | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | <input checked="" type="checkbox"/> |
| > 10 % Si                            | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio                    | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato                    | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto             | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2   | ≤600   |                          | <input checked="" type="checkbox"/> |
| a truciolo lungo                     | <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto              | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo              | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti        | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche               | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche       | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate        | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# ≤7×D Profondità

# ≤10×D

# ≤12×D

# ≤15×D

|                 |                  |                  |
|-----------------|------------------|------------------|
| Catalogo n°     | <b>51789</b>     | <b>51889</b>     |
| Mat. da taglio  | <b>M.D.</b>      | <b>M.D.I.</b>    |
| Gruppo impiego  | K/P              | K/P              |
| Superficie      | TiAlN nano       |                  |
| DIN/Forma       | <b>Stock std</b> | <b>Stock std</b> |
| Tipo            | U                | U                |
| Refrig. interna | <b>axial</b>     | <b>axial</b>     |
| Pagina          | 91               | 92               |

|                  |
|------------------|
| <b>71994</b>     |
| <b>M.D.I.</b>    |
| K                |
| blank            |
| <b>Stock std</b> |
| GG               |
| <b>axial</b>     |
| 93               |

|                  |
|------------------|
| <b>71996</b>     |
| <b>M.D.I.</b>    |
| K                |
| blank            |
| <b>Stock std</b> |
| GG               |
| <b>axial</b>     |
| 94               |

|                  |
|------------------|
| <b>51893</b>     |
| <b>M.D.I.</b>    |
| K/P              |
| TiAlN nano       |
| <b>Stock std</b> |
| U                |
| <b>axial</b>     |
| 95               |

|                  |
|------------------|
| <b>71997</b>     |
| <b>M.D.I.</b>    |
| K                |
| blank            |
| <b>Stock std</b> |
| GN               |
| <b>axial</b>     |
| 96               |



| V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |
|-------------------------|-------------------------|---|
| 145                     | F                       | F |
| 120                     | E                       | E |
| 170                     | G                       | G |
| 145                     | G                       | G |
| 130                     | G                       | G |
| 125                     | F                       | F |
| 120                     | F                       | F |
| 120                     | F                       | F |
| 105                     | F                       | F |
| 145                     | G                       | G |
| 120                     | F                       | F |
| 85                      | D                       | D |
| 110                     | F                       | F |
| 105                     | D                       | D |
| 80                      | E                       | E |
| 65                      | D                       | D |
| 60                      | D                       | D |
| 60                      | B                       | B |
| 55                      | B                       | B |
|                         |                         |   |
| 195                     | H                       | H |
| 160                     | H                       | H |
| 140                     | H                       | H |
| 130                     | G                       | G |
| 40                      | B                       | B |
|                         |                         |   |
| 35                      | C                       | C |
|                         |                         |   |
| 310                     | H                       | H |
| 310                     | H                       | H |
| 260                     | H                       | H |
| 220                     | H                       | H |
| 280                     | G                       | G |
| 125                     | F                       | F |
| 325                     | G                       | G |
| 220                     | F                       | F |
| 125                     | F                       | F |
| 105                     | E                       | E |
| 90                      | E                       | E |
| 80                      | E                       | E |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 120                     | F                  |
| 100                     | F                  |
| 90                      | F                  |
| 80                      | F                  |
| 40                      | B                  |
|                         |                    |
| 120                     | F                  |
| 100                     | F                  |
| 90                      | F                  |
| 80                      | F                  |
| 40                      | B                  |
|                         |                    |
| 410                     | H                  |
| 410                     | H                  |
| 380                     | H                  |
| 330                     | H                  |
|                         |                    |
| 280                     | G                  |
|                         |                    |
| 110                     | F                  |
| 80                      | E                  |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 120                     | F                  |
| 100                     | F                  |
| 90                      | F                  |
| 80                      | F                  |
| 40                      | A                  |
|                         |                    |
| 120                     | F                  |
| 100                     | F                  |
| 90                      | F                  |
| 80                      | F                  |
| 40                      | A                  |
|                         |                    |
| 410                     | H                  |
| 410                     | H                  |
| 380                     | H                  |
| 330                     | H                  |
|                         |                    |
| 280                     | G                  |
|                         |                    |
| 110                     | F                  |
| 80                      | E                  |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 110                     | F                  |
| 110                     | E                  |
| 110                     | G                  |
| 100                     | G                  |
| 110                     | G                  |
| 110                     | F                  |
| 100                     | F                  |
| 110                     | F                  |
| 105                     | F                  |
| 110                     | G                  |
| 110                     | F                  |
| 85                      | D                  |
| 100                     | F                  |
| 80                      | D                  |
| 80                      | E                  |
| 65                      | D                  |
| 50                      | D                  |
| 50                      | B                  |
|                         |                    |
| 60                      | D                  |
| 55                      | B                  |
| 45                      | D                  |
| 120                     | H                  |
| 120                     | H                  |
| 100                     | H                  |
| 90                      | G                  |
| 40                      | A                  |
|                         |                    |
| 150                     | H                  |
| 150                     | H                  |
| 150                     | H                  |
| 120                     | H                  |
| 150                     | G                  |
| 80                      | F                  |
| 120                     | G                  |
| 120                     | F                  |
| 40                      | F                  |
| 110                     | E                  |
| 40                      | E                  |

| V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 120                     | E                  |
| 100                     | E                  |
| 90                      | E                  |
| 80                      | E                  |
| 40                      | A                  |
|                         |                    |
| 120                     | E                  |
| 100                     | E                  |
| 90                      | E                  |
| 80                      | E                  |
| 40                      | A                  |
|                         |                    |
| 410                     | F                  |
| 410                     | F                  |
| 380                     | G                  |
| 330                     | G                  |
|                         |                    |
| 280                     | F                  |
|                         |                    |
| 110                     | D                  |
| 80                      | D                  |

## Parametri di lavoro indicativi per punte SuperV

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Diametro utensile mm | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
| 16,00                | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |       |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

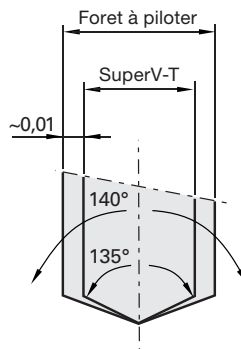
### Indicazioni generali:

Molto importante è che per motivi di sicurezza nessuna punta possa ruotare liberamente senza supporto, con un numero maggiore di  $n = 6000$  giri/min! La forza centrifuga potrebbe altrimenti rompere gli utensili già prima del raggiungimento della finitura superficiale del pezzo!

### Procedimento per punte SuperV-T:

Per produrre fori profondi con la RT 100 T con risultati ottimali consigliamo di procedere con i seguenti passi:

1. fresare una superficie, p. es. con fresa Ratio Gühring RF 100 U con tagliente al centro. La superficie deve essere eseguita con angolo a destra, rispetto all'angolo di entrata del foro da produrre.
2. Eseguire un foro pilota cilindrico (tolleranza F9), con una profondità di almeno  $1 \times D$ . Consigliamo le nostre punte Ratio RT 100 U oppure RT 100 F. Per il loro angolo di affilatura a  $140^\circ$  e la tolleranza sul  $\varnothing m7$ , queste punte Ratio sono le più indicate per tale operazione.
3. Entrare con la punta elic. per fori profondi RT 100 T nel foro pilota con un nr di giri di ca 300 giri/min ed un avanzamento di ca. 500 mm/min.
4. Regolare la pressione del refrigerante ed il numero di giri.
5. Forare in continuo sull'intera lunghezza, senza scaricare.
6. Per fori passanti con uscita del foro obliqua, ridurre la velocità di avanzamento  $v_f$  del 40% a ca. 1 mm prima dell'uscita.
7. Al raggiungimento della profondità di foro, spegnere giri ed adduzione refrigerante; corsa di ritorno con max. 5000 mm/min.



### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

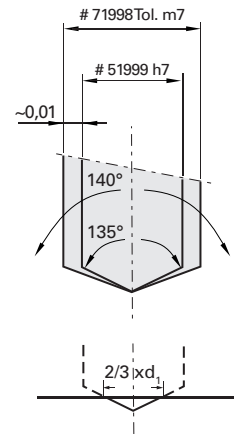
| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# Micropunta SuperV-NX in metallo duro ad alte prestazioni

## Parametri di lavoro indicativi

| Serie d'avanzamento  |      |       |       |       |       |       |       |       |       |       |       |       |       |                         |
|----------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|
| Lettera d'identi.    | AA   | BB    | CC    | DD    | EE    | FF    | GG    | HH    | II    | JJ    | KK    | LL    | MM    |                         |
| Diametro utensile mm | 0,50 | 0,006 | 0,012 | 0,018 | 0,022 | 0,030 | 0,035 | 0,040 | 0,045 | 0,050 | 0,050 | 0,055 | 0,060 | 0,060                   |
|                      | 0,80 | 0,008 | 0,016 | 0,024 | 0,032 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,080 | 0,080 | 0,090 | 0,090                   |
|                      | 1,00 | 0,012 | 0,022 | 0,032 | 0,042 | 0,060 | 0,070 | 0,080 | 0,090 | 0,100 | 0,100 | 0,110 | 0,110 | 0,120                   |
|                      | 1,50 | 0,021 | 0,036 | 0,051 | 0,066 | 0,090 | 0,100 | 0,120 | 0,130 | 0,150 | 0,150 | 0,160 | 0,170 | 0,180                   |
|                      | 2,00 | 0,032 | 0,052 | 0,072 | 0,092 | 0,120 | 0,140 | 0,160 | 0,180 | 0,200 | 0,210 | 0,220 | 0,230 | 0,240                   |
|                      | 2,50 | 0,045 | 0,070 | 0,095 | 0,120 | 0,150 | 0,170 | 0,200 | 0,220 | 0,250 | 0,260 | 0,270 | 0,280 | 0,300                   |
|                      | 3,00 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 | 0,210 | 0,240 | 0,270 | 0,300 | 0,310 | 0,330 | 0,340 | 0,360                   |
|                      |      |       |       |       |       |       |       |       |       |       |       |       |       | Avanzamenti f (mm/giri) |



**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**Consigli per la sicurezza:** molto importante: per motivi di sicurezza nessuna punta può ruotare liberamente senza un numero di giri più elevato di  $n = 6000$  giri al minuto. Altrimenti le forze centrifughe potrebbero rompere gli utensili lunghi già prima di ottenere la finitura del pezzo!

**Indicazioni generali:** Mandrini con poco gioco, attacchi utensili con allineamento preciso. Consigliamo l'utilizzo di mandrini ad espansione idraulica o di mandrini di calettamento. Consigliamo di refrigerare

con emulsione od olio; pressione minima del refrigerante 40 bar.

### Foro pilota

Impiegando la micropunta in MD 15xD consigliamo di produrre un foro pilota con profondità da 1xD fino a 2xD. La micropunta in MD da 4xD è l'utensile ottimale per questo foro pilota, dato che il suo angolo di affilatura e la sua tolleranza sul diametro sono specifici che per questo scopo.

### Centrare

Per potere sfruttare a pieno il rendimento delle micropunte per profondità di foro da 8xD, consigliamo una centratura. A questo scopo si può usare la micropunta da 4xD, articolo 6400. Il diametro di centratura dovrebbe essere ca. 2/3xD. In alternativa, il centraggio essere creato con Stock

punte cilindriche per centri CN 142°, catalogo no. 71189.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale                            | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN   | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|--|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici              | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)        | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici                           | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)  | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati               | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)   | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                   | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4   | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati           | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)   | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati               | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5   | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione                      | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7   | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile                          | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi                               | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3  | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle                            | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)  |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati                             | -  |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati austenitici  | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A) | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati martensitici | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2  | ≤850   |                          | <input checked="" type="checkbox"/> |
| Ghisa                                       | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)   | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                 | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMw-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)   |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura                                  | -  |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV                             | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6  |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI                             | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)   | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali                              | Nimonic, Inconel, Monel, Hastelloy   | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe                         | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1  | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe                       | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica        | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5  | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si             | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9  | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio > 10 % Si             | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio                           | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1  | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato                           | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto a truciolo lungo   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                     | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb  | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                     | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |



# Il sistema di foratura tipo V-AP mini

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

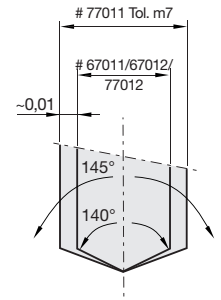
- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                 | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# Portainsero $\leq 1,5 \times D$ , utensile pilota

## Catalogo n° 77007



| Catalogo n°      | 67011      | 67012      | 77012      | 77011      |
|------------------|------------|------------|------------|------------|
| Mat. da taglio   | <b>MDI</b> | <b>MDI</b> | <b>MDI</b> | <b>MDI</b> |
| Gruppo d'imp. MD | K/P        | K/P        | K/P        | K/P        |
| Superficie       | TiAlN nano | AlTiN nano | lucide     | AlTiN nano |
| Tipo             | U          | VA         | AL         | NC         |
| Refrig. interna  | assiale    | assiale    | assiale    | assiale    |
| Pagina           | 114        | 117        | 120        | 123        |



| $v_c$<br>m/min | Codigo<br>avanzamento | $v_c$<br>m/min | Codigo<br>avanzamento | $v_c$<br>m/min | Codigo<br>avanzamento | $v_c$<br>m/min | Codigo<br>avanzamento |
|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|
| 130            | F                     |                |                       |                |                       | 130            | F                     |
| 110            | E                     |                |                       |                |                       | 110            | E                     |
| 130            | G                     |                |                       |                |                       | 130            | G                     |
| 110            | F                     |                |                       |                |                       | 110            | F                     |
| 130            | F                     |                |                       |                |                       | 130            | F                     |
| 125            | F                     |                |                       |                |                       | 125            | F                     |
| 110            | E                     |                |                       |                |                       | 110            | E                     |
| 110            | F                     |                |                       |                |                       | 110            | F                     |
| 90             | E                     |                |                       |                |                       | 90             | E                     |
| 130            | G                     |                |                       |                |                       | 130            | G                     |
| 110            | F                     |                |                       |                |                       | 110            | F                     |
| 70             | D                     |                |                       |                |                       | 70             | D                     |
| 105            | E                     |                |                       |                |                       | 105            | E                     |
| 70             | D                     |                |                       |                |                       | 70             | D                     |
| 60             | E                     |                |                       |                |                       | 60             | E                     |
| 55             | D                     |                |                       |                |                       | 55             | D                     |
| 55             | C                     |                |                       |                |                       | 55             | C                     |
| 50             | B                     |                |                       |                |                       | 50             | B                     |
|                |                       | 25             | B                     |                |                       | 25             | B                     |
|                |                       | 55             | C                     |                |                       | 55             | C                     |
|                |                       | 40             | C                     |                |                       | 40             | C                     |
|                |                       | 35             | C                     |                |                       | 35             | C                     |
|                |                       |                |                       |                |                       | 100            | F                     |
|                |                       |                |                       |                |                       | 90             | F                     |
|                |                       |                |                       |                |                       | 120            | G                     |
|                |                       |                |                       |                |                       | 100            | F                     |
|                |                       | 90             | F                     |                |                       | 80             | E                     |
|                |                       |                |                       |                |                       | 80             | E                     |
|                |                       |                |                       |                |                       | 80             | E                     |
|                |                       |                |                       |                |                       | 80             | E                     |
|                |                       |                |                       |                |                       | 90             | F                     |
|                |                       | 25             | B                     |                |                       | 25             | B                     |
|                |                       | 40             | C                     |                |                       | 40             | C                     |
|                |                       | 35             | B                     |                |                       | 35             | B                     |
|                |                       |                |                       |                |                       | 200            | G                     |
|                |                       |                |                       |                |                       | 180            | G                     |
|                |                       |                |                       |                |                       | 150            | G                     |
|                |                       |                |                       |                |                       | 120            | G                     |
|                |                       |                |                       |                |                       | 180            | G                     |
|                |                       |                |                       |                |                       | 70             | F                     |
|                |                       |                |                       |                |                       | 180            | G                     |
|                |                       |                |                       |                |                       | 120            | F                     |
|                |                       |                |                       |                |                       | 70             | F                     |
|                |                       |                |                       |                |                       | 50             | F                     |
|                |                       |                |                       |                |                       | 45             | F                     |
|                |                       |                |                       |                |                       | 35             | E                     |

# Il sistema di foratura tipo V-AP mini

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |





# Il sistema di foratura tipo V-AP mini

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                          | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici                                       | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                           | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                               | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                       | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                           | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione                                  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile                                      | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati austenitici martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                             | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe                                     | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe                                   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si > 10 % Si               | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio                                       | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato                                       | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto a truciolo lungo               | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                 | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                 | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                            | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche                                  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre aramidiche                          | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate               | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# Il sistema di foratura tipo V-AP mini

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# Il sistema di foratura tipo V-AP mini

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in **grassetto**, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# Il sistema di foratura tipo V-AP maxi

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                 | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# Portainserito $\leq 3 \times D$

## Catalogo n° 76000



|                  |                |
|------------------|----------------|
| Catalogo n°      | <b>56011</b>   |
| Mat. da taglio   | <b>MDI</b>     |
| Gruppo d'imp. MD | K/P            |
| Superficie       | TiAIN          |
| Tipo             | SuperV-AP maxi |
| Refrig. interna  | axial          |
| Pagina           | 129            |

|  |                |
|--|----------------|
|  | <b>76011</b>   |
|  | <b>MDI</b>     |
|  | K/P            |
|  | TiN            |
|  | SuperV-AP maxi |
|  | axial          |
|  | 128            |



| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 130                     | F                     |
| 110                     | E                     |
| 130                     | G                     |
| 110                     | F                     |
| 130                     | F                     |
| 125                     | F                     |
| 110                     | E                     |
| 110                     | F                     |
| 90                      | E                     |
| 130                     | G                     |
| 110                     | F                     |
| 70                      | D                     |
| 105                     | E                     |
| 70                      | D                     |
| 55                      | E                     |
| 50                      | D                     |
| 55                      | C                     |
| 50                      | B                     |
| 25                      | B                     |
| 55                      | C                     |
| 40                      | C                     |
| 35                      | C                     |
| 210                     | G                     |
| 155                     | G                     |
| 155                     | G                     |
| 130                     | F                     |
| 35                      | B                     |
| 40                      | C                     |
| 35                      | B                     |
| 290                     | G                     |
| 260                     | G                     |
| 235                     | G                     |
| 195                     | G                     |
| 260                     | G                     |
| 105                     | F                     |
| 270                     | G                     |
| 180                     | F                     |
| 105                     | F                     |
| 85                      | F                     |
| 65                      | F                     |
| 55                      | E                     |
| 105                     | E                     |
| 105                     | E                     |
| 105                     | E                     |
| 105                     | E                     |

| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 100                     | F                     |
| 85                      | E                     |
| 100                     | G                     |
| 85                      | F                     |
| 100                     | F                     |
| 95                      | F                     |
| 85                      | E                     |
| 85                      | F                     |
| 70                      | E                     |
| 100                     | G                     |
| 85                      | F                     |
| 55                      | D                     |
| 80                      | E                     |
| 55                      | D                     |
| 40                      | E                     |
| 35                      | D                     |
| 40                      | C                     |
| 35                      | B                     |
| 20                      | B                     |
| 40                      | C                     |
| 30                      | C                     |
| 25                      | C                     |
| 160                     | G                     |
| 80                      | G                     |
| 120                     | G                     |
| 100                     | F                     |
| 25                      | B                     |
| 30                      | C                     |
| 25                      | B                     |
| 220                     | G                     |
| 200                     | G                     |
| 180                     | G                     |
| 150                     | G                     |
| 200                     | G                     |
| 80                      | F                     |
| 210                     | G                     |
| 140                     | F                     |
| 80                      | F                     |
| 65                      | F                     |
| 50                      | F                     |
| 40                      | E                     |
| 80                      | E                     |
| 80                      | E                     |
| 80                      | E                     |
| 80                      | E                     |

# Il sistema di foratura tipo V-AP maxi

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |                            |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 | Avanzamenti<br>f (mm/giro) |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# Portainserito $\leq 5 \times D$

## Catalogo n° 76001



|                  |                |
|------------------|----------------|
| Catalogo n°      | <b>56011</b>   |
| Mat. da taglio   | <b>MDI</b>     |
| Gruppo d'imp. MD | K/P            |
| Superficie       | TiAIN          |
| Tipo             | SuperV-AP maxi |
| Refrig. interna  | axial          |
| Pagina           | 129            |

|  |                |
|--|----------------|
|  | <b>76011</b>   |
|  | <b>MDI</b>     |
|  | K/P            |
|  | TiN            |
|  | SuperV-AP maxi |
|  | axial          |
|  | 128            |



| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 125                     | F                     |
| 105                     | E                     |
| 125                     | G                     |
| 105                     | F                     |
| 125                     | F                     |
| 120                     | F                     |
| 105                     | E                     |
| 105                     | F                     |
| 85                      | E                     |
| 125                     | G                     |
| 105                     | F                     |
| 70                      | D                     |
| 105                     | E                     |
| 70                      | D                     |
| 55                      | E                     |
| 50                      | D                     |
| 55                      | C                     |
| 50                      | B                     |
| 25                      | B                     |
| 55                      | C                     |
| 40                      | C                     |
| 35                      | C                     |
| 195                     | G                     |
| 145                     | G                     |
| 145                     | G                     |
| 120                     | F                     |
| 35                      | B                     |
| 25                      | B                     |
| 40                      | C                     |
| 35                      | B                     |
| 260                     | G                     |
| 260                     | G                     |
| 220                     | G                     |
| 180                     | G                     |
| 260                     | G                     |
| 105                     | F                     |
| 270                     | G                     |
| 180                     | F                     |
| 105                     | F                     |
| 85                      | F                     |
| 65                      | F                     |
| 55                      | E                     |
| 105                     | E                     |
| 105                     | E                     |
| 105                     | E                     |
| 105                     | E                     |

| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 95                      | F                     |
| 80                      | E                     |
| 95                      | G                     |
| 80                      | F                     |
| 95                      | F                     |
| 90                      | F                     |
| 80                      | E                     |
| 80                      | F                     |
| 65                      | E                     |
| 95                      | G                     |
| 80                      | F                     |
| 55                      | D                     |
| 80                      | E                     |
| 55                      | D                     |
| 40                      | E                     |
| 35                      | D                     |
| 40                      | C                     |
| 35                      | B                     |
| 20                      | B                     |
| 40                      | C                     |
| 30                      | C                     |
| 25                      | C                     |
| 150                     | G                     |
| 110                     | G                     |
| 110                     | G                     |
| 90                      | F                     |
| 25                      | B                     |
| 20                      | B                     |
| 30                      | C                     |
| 25                      | B                     |
| 200                     | G                     |
| 200                     | G                     |
| 170                     | G                     |
| 140                     | G                     |
| 200                     | G                     |
| 80                      | F                     |
| 210                     | G                     |
| 140                     | F                     |
| 80                      | F                     |
| 65                      | F                     |
| 50                      | F                     |
| 40                      | E                     |
| 80                      | E                     |
| 80                      | E                     |
| 80                      | E                     |
| 80                      | E                     |

# Il sistema di foratura tipo V-AP maxi

## Parametri di lavoro indicativi

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Dia. utensile mm    | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                     | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                     | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                     | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                     | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                     | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                     | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Con le lettere d'identificazione d'avanzamento stampate in **grassetto**, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**K, P, K/P** l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale  | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici   | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                 | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                     | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                             | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                 | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione  | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile  | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi   | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle  | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati   | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitici | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa   | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                   | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV   | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI   | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali  | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe   | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe   | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica                          | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                  | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio   | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato   | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                  | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                                       | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                                       | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoidurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche  | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                     | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# Portainsero $\leq 7 \times D$

## Catalogo n° 76003



|                  |                |
|------------------|----------------|
| Catalogo n°      | <b>56011</b>   |
| Mat. da taglio   | <b>MDI</b>     |
| Gruppo d'imp. MD | K/P            |
| Superficie       | TiAIN          |
| Tipo             | SuperV-AP maxi |
| Refrig. interna  | axial          |
| Pagina           | 129            |

|                  |                |
|------------------|----------------|
| Catalogo n°      | <b>76011</b>   |
| Mat. da taglio   | <b>MDI</b>     |
| Gruppo d'imp. MD | K/P            |
| Superficie       | TiN            |
| Tipo             | SuperV-AP maxi |
| Refrig. interna  | axial          |
| Pagina           | 128            |



| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 120                     | E                     |
| 105                     | D                     |
| 120                     | F                     |
| 105                     | E                     |
| 120                     | E                     |
| 110                     | E                     |
| 100                     | D                     |
| 100                     | E                     |
| 85                      | D                     |
| 120                     | F                     |
| 100                     | E                     |
| 70                      | D                     |
| 105                     | D                     |
| 70                      | C                     |
| 55                      | D                     |
| 50                      | C                     |
| 55                      | B                     |
| 50                      | B                     |
| 25                      | A                     |
| 55                      | B                     |
| 40                      | B                     |
| 35                      | B                     |
| 195                     | F                     |
| 145                     | F                     |
| 145                     | F                     |
| 120                     | E                     |
| 35                      | B                     |
| 25                      | A                     |
| 40                      | B                     |
| 35                      | A                     |
| 260                     | F                     |
| 260                     | F                     |
| 220                     | F                     |
| 180                     | F                     |
| 260                     | F                     |
| 105                     | E                     |
| 270                     | F                     |
| 180                     | E                     |
| 105                     | E                     |
| 85                      | E                     |
| 65                      | E                     |
| 55                      | D                     |
| 105                     | D                     |
| 105                     | D                     |
| 105                     | D                     |
| 105                     | D                     |

| v <sub>c</sub><br>m/min | Codigo<br>avanzamento |
|-------------------------|-----------------------|
| 90                      | E                     |
| 80                      | D                     |
| 90                      | F                     |
| 80                      | E                     |
| 90                      | E                     |
| 85                      | E                     |
| 75                      | D                     |
| 75                      | E                     |
| 65                      | D                     |
| 90                      | F                     |
| 75                      | E                     |
| 55                      | D                     |
| 80                      | D                     |
| 55                      | C                     |
| 40                      | D                     |
| 35                      | C                     |
| 40                      | B                     |
| 35                      | B                     |
| 20                      | A                     |
| 40                      | B                     |
| 30                      | B                     |
| 25                      | B                     |
| 150                     | F                     |
| 110                     | F                     |
| 110                     | F                     |
| 90                      | E                     |
| 25                      | B                     |
| 20                      | A                     |
| 30                      | B                     |
| 25                      | A                     |
| 200                     | F                     |
| 200                     | F                     |
| 170                     | F                     |
| 140                     | F                     |
| 200                     | F                     |
| 80                      | E                     |
| 210                     | F                     |
| 140                     | E                     |
| 80                      | E                     |
| 65                      | E                     |
| 50                      | E                     |
| 40                      | D                     |
| 80                      | D                     |
| 80                      | D                     |
| 80                      | D                     |
| 80                      | D                     |

## Parametri di lavoro indicativi per punte in MD

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |
|                      | 50,00 | 0,250 | 0,310 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,250 |
|                      | 63,00 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 |
|                      | 80,00 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 | 2,000 |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale                     | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--------------------------------------|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici       | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500) | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici                    | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati        | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati            | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati    | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati        | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione               | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile                   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4                                    | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi                        | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle                     | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati                      | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati       | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9  | ≤850   |                          | <input checked="" type="checkbox"/> |
| austenitici                          | <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)  | ≤850   |                          | <input checked="" type="checkbox"/> |
| martensitici                         | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2   | ≤850   |                          | <input checked="" type="checkbox"/> |
| Ghisa                                | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata          | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura                           | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV                      | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI                      | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali                       | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe                  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1                                       | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe                | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lav. plastica | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si      | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | <input checked="" type="checkbox"/> |
| > 10 % Si                            | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio                    | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato                    | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto             | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2   | ≤600   |                          | <input checked="" type="checkbox"/> |
| a truciolo lungo                     | <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto              | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo              | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti        | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche               | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche       | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate        | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

## ≤3×D prof. di foro

## ≤5×D

|                 |               |
|-----------------|---------------|
| Catalogo no.    | <b>71184</b>  |
| Mat. da taglio  | <b>M.D.I.</b> |
| Gruppo impiego  | K10/K20       |
| Superficie      | lucida        |
| DIN/Forma       | <b>6539</b>   |
| Tipo            | N             |
| Refrig. interna |               |
| Pagina          | 132           |

|                 |               |
|-----------------|---------------|
| Catalogo no.    | <b>51184</b>  |
| Mat. da taglio  | <b>M.D.I.</b> |
| Gruppo impiego  | K/P           |
| Superficie      | TiAlN nano    |
| DIN/Forma       | <b>6539</b>   |
| Tipo            | N             |
| Refrig. interna |               |
| Pagina          | 134           |

|                 |              |              |
|-----------------|--------------|--------------|
| Catalogo no.    | <b>71380</b> | <b>71180</b> |
| Mat. da taglio  | <b>M.D.</b>  | <b>M.D.</b>  |
| Gruppo impiego  | K10/K20      | K10/K20      |
| Superficie      | lucida       | lucida       |
| DIN/Forma       | <b>8041</b>  | <b>8037</b>  |
| Tipo            | N            | N            |
| Refrig. interna |              |              |
| Pagina          | 141          | 140          |

|                 |                  |
|-----------------|------------------|
| Catalogo no.    | <b>71290</b>     |
| Mat. da taglio  | <b>M.D.I.</b>    |
| Gruppo impiego  | K10/K20          |
| Superficie      | lucida           |
| DIN/Forma       | <b>Stock std</b> |
| Tipo            | N                |
| Refrig. interna |                  |
| Pagina          | 135              |



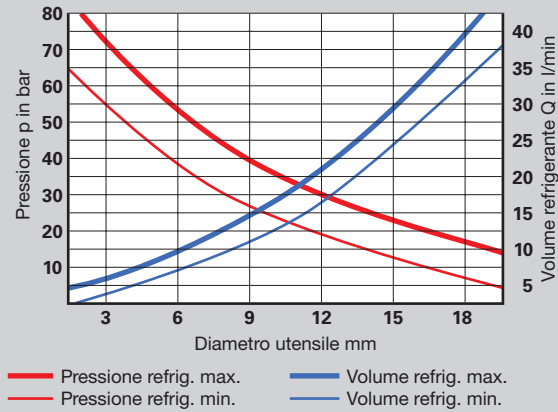
| V <sub>c</sub><br>m/min | Codice<br>d'avanzamento | V <sub>c</sub><br>m/min | Codice<br>d'avanzamento | V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   | V <sub>c</sub><br>m/min | Codice<br>d'avanzamento |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|---|-------------------------|-------------------------|
| 80                      | D                       | 104                     | E                       |                         |                         |   | 80                      | D                       |
| 70                      | D                       | 91                      | E                       |                         |                         |   | 70                      | D                       |
| 80                      | E                       | 104                     | F                       | 80                      | D                       | D | 80                      | E                       |
| 70                      | D                       | 91                      | E                       | 70                      | C                       | C | 70                      | D                       |
| 80                      | D                       | 104                     | E                       |                         |                         |   | 80                      | D                       |
| 70                      | D                       | 91                      | E                       |                         |                         |   | 70                      | D                       |
| 60                      | D                       | 78                      | E                       |                         |                         |   | 60                      | D                       |
| 60                      | D                       | 78                      | E                       |                         |                         |   | 60                      | D                       |
| 80                      | E                       | 104                     | F                       |                         |                         |   | 80                      | E                       |
| 60                      | D                       | 78                      | E                       |                         |                         |   | 60                      | D                       |
| 50                      | D                       | 65                      | E                       |                         |                         |   | 50                      | D                       |
| 50                      | C                       | 65                      | D                       |                         |                         |   | 50                      | C                       |
| 25                      | B                       | 32                      | C                       | 25                      | B                       | B | 25                      | B                       |
| 20                      | C                       | 26                      | D                       | 20                      | C                       | C | 20                      | B                       |
|                         |                         |                         |                         | 10                      | B                       | B |                         |                         |
| 25                      | B                       | 32                      | E                       |                         |                         |   | 25                      | B                       |
| 15                      | A                       | 32                      | D                       |                         |                         |   | 15                      | A                       |
| 25                      | B                       | 32                      | D                       |                         |                         |   | 25                      | B                       |
| 90                      | D                       | 117                     | E                       | 90                      | D                       | D | 90                      | D                       |
| 80                      | D                       | 104                     | E                       | 80                      | D                       | D | 80                      | D                       |
| 80                      | D                       | 91                      | E                       | 80                      | D                       | D | 70                      | D                       |
| 70                      | D                       | 104                     | E                       | 70                      | D                       | D | 80                      | D                       |
|                         |                         |                         |                         | 10                      | A                       | A |                         |                         |
| 15                      | B                       | 20                      | C                       |                         |                         |   | 15                      | B                       |
| 15                      | A                       | 26                      | D                       |                         |                         |   | 15                      | A                       |
| 15                      | A                       | 20                      | C                       |                         |                         |   | 15                      | A                       |
| 200                     | G                       | 260                     | H                       |                         |                         |   | 200                     | G                       |
| 200                     | G                       | 260                     | H                       |                         |                         |   | 200                     | G                       |
| 150                     | F                       | 195                     | G                       |                         |                         |   | 150                     | F                       |
| 120                     | F                       | 156                     | G                       |                         |                         |   | 120                     | F                       |
| 180                     | F                       | 234                     | F                       |                         |                         |   | 180                     | E                       |
| 80                      | E                       | 104                     | F                       |                         |                         |   | 80                      | E                       |
| 180                     | E                       | 234                     | F                       | 180                     | E                       | E | 180                     | E                       |
| 180                     | E                       | 234                     | F                       | 180                     | E                       | E | 180                     | E                       |
| 120                     | E                       | 156                     | F                       |                         |                         |   | 120                     | E                       |
| 120                     | E                       | 156                     | F                       |                         |                         |   | 120                     | E                       |
| 70                      | D                       | 91                      | E                       |                         |                         |   | 70                      | D                       |
| 50                      | C                       | 65                      | D                       |                         |                         |   | 50                      | C                       |
| 50                      | D                       | 65                      | E                       |                         |                         |   | 50                      | D                       |
| 40                      | C                       | 52                      | D                       |                         |                         |   | 40                      | C                       |
| 80                      | C                       | 104                     | D                       |                         |                         |   | 80                      | C                       |

# Stock Punte SuperV

## Valori per la refrigerazione

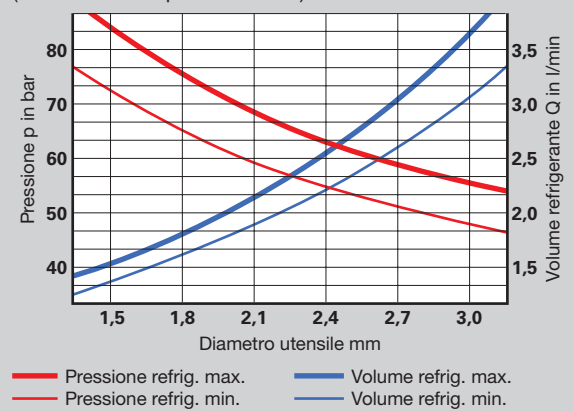
### Valori refrigerante SuperV-T

(Valori indicativi per emulsione)



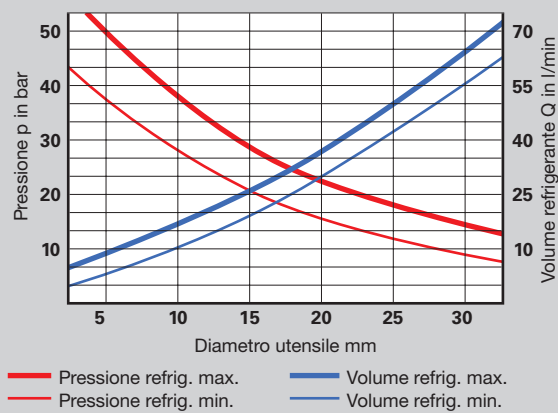
### Valori refrigerante SuperV-NX

(Valori indicativi per emulsione)



### Valori refrigerante SuperV 95-GG/GN

(Valori indicativi per emulsione)





# Sistema di foratura V-AP

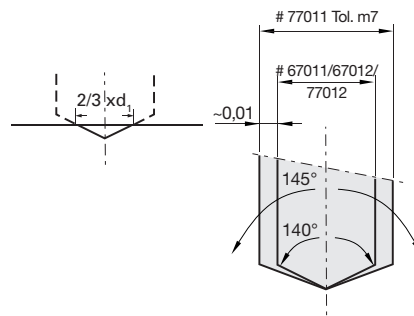
## Raccomandazione generali

per tutti i portautensili

- Per fori passanti
- Non utilizzare l'utensile di foratura senza il processo per i tagli interrotti (scanalature, fori trasversali). Per taglio interrotto (max.  $0.2 \times D$ ) è raccomandato ridurre l'avanzamento appena è possibile.
- In contrasto con gli inserti convenzionali, l'utensile Super V-AP è adatto anche per la foratura di lamiera.
- Sul tornio (utensile fisso) occorre garantire che l'utensile sia accuratamente centrato.
- Pre-condizione per un'ottimale lavorazione è un'alimentazione del refrigerante a olio intero o emulsionato.
- L'utensile è adatto solo per lavorazione a secco o MQL. Contattate i nostri ingegneri per ulteriori informazioni.

Raccomandazione aggiuntive per portautensili a partire **da  $5 \times D$**

- Per profondità di foro da  $5 \times D$  noi raccomandiamo per l'utensile la foratura da centro o pilota. Catalogo n° 77007 ed inserti pilota catalogo n° 77011.  
In alternativa - dipendente dal materiale da lavorare - Punta SuperV tipo U, GG o VA oppure le punte NC catalogo n° 71189.
- Per fori passanti raccomandando la riduzione dell'avanzamento prima dell'uscita dal foro.



Per SuperV-AP mini:

Quando si cambia l'inserto osservare le seguenti coppie di serraggio per la vite di serraggio. E' assolutamente necessario rispettarle per ottenere ottimi risultati di lavorazione.

|                          |              |              |              |              |              |              |              |             |
|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Gamma diametrale mm      | 11,0 - 12,99 | 13,0 - 13,99 | 14,0 - 15,99 | 16,0 - 17,99 | 18,0 - 19,99 | 20,0 - 21,99 | 22,0 - 29,99 | 30,0 - 40,0 |
| Filetto                  | M2,2         | M2,5         | M3           | M3,5         | M4           | M4,5         | M5           | M6          |
| Dimensioni Torx          | T7           | T8           | T9           | T10          | T15          | T15          | T20          | T25         |
| Coppia di serraggio (Nm) | 0,8          | 1,0          | 1,7          | 2,7          | 4,0          | 6,0          | 8,0          | 14,0        |

Dettagli applicazione vite di bloccaggio ( Loctite ).

# Parametri di lavoro indicativi per punte a cannone

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |                            |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Codice lettera      | K     | L     | M     | N     | O     | P     | Q     | R     |       |                            |
| Ø utensile mm       | 1,50  | 0,002 | 0,004 | 0,006 | 0,008 | 0,012 | 0,020 | 0,032 | 0,045 | Avanzamento<br>f (mm/giro) |
|                     | 2,00  | 0,003 | 0,005 | 0,007 | 0,010 | 0,016 | 0,028 | 0,046 | 0,055 |                            |
|                     | 2,50  | 0,004 | 0,006 | 0,008 | 0,012 | 0,018 | 0,030 | 0,054 | 0,070 |                            |
|                     | 4,00  | 0,005 | 0,007 | 0,010 | 0,016 | 0,025 | 0,043 | 0,065 | 0,085 |                            |
|                     | 6,00  | 0,007 | 0,009 | 0,013 | 0,024 | 0,035 | 0,061 | 0,085 | 0,120 |                            |
|                     | 8,00  | 0,010 | 0,014 | 0,022 | 0,032 | 0,045 | 0,068 | 0,100 | 0,150 |                            |
|                     | 10,00 | 0,012 | 0,016 | 0,028 | 0,040 | 0,055 | 0,075 | 0,120 | 0,160 |                            |
|                     | 14,00 | 0,020 | 0,025 | 0,035 | 0,050 | 0,065 | 0,085 | 0,130 | 0,180 |                            |
|                     | 18,00 | 0,025 | 0,030 | 0,040 | 0,055 | 0,070 | 0,095 | 0,145 | 0,200 |                            |
|                     | 20,00 | 0,026 | 0,035 | 0,045 | 0,060 | 0,080 | 0,110 | 0,180 | 0,250 |                            |
|                     | 24,00 | 0,027 | 0,036 | 0,047 | 0,065 | 0,085 | 0,130 | 0,185 | 0,300 |                            |
|                     | 28,00 | 0,028 | 0,038 | 0,049 | 0,068 | 0,090 | 0,140 | 0,195 | 0,350 |                            |
|                     | 30,00 | 0,030 | 0,040 | 0,050 | 0,070 | 0,100 | 0,150 | 0,200 | 0,400 |                            |
|                     | 35,00 | 0,035 | 0,045 | 0,055 | 0,075 | 0,120 | 0,180 | 0,250 | 0,450 |                            |
|                     | 40,00 | 0,040 | 0,050 | 0,060 | 0,080 | 0,150 | 0,200 | 0,300 | 0,500 |                            |

\*\* I valori di avanzamento di basano sempre su utensili con il rivestimento consigliato.  
In alcuni casi la funzionalità degli utensili non può essere garantita senza rivestimento.



Tutte le punte a cannone devono essere guidate da un foro pilota. Le punte a cannone non devono essere mai mosse libere al massimo dei giri nello spazio macchina.

Informazioni aggiuntive a pagina 62!

### Lubrificanti:

olio da taglio, attivo ■  
olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante.

emulsione ■

senza lubrificante □

solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■            |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■            |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■            |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoidurenti                                   | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | □            |

Catalogo n°

55027

55028  
55029

75024  
75020  
75026  
75021

55024  
55020  
55026  
55021

75018  
75017  
75022  
75023

55018  
55017  
55022  
55023

Materiale tagliente

**M.D.I.**

**M.D.I.**

**M.D.I.**

**M.D.I.**

**M.D. testa**

**M.D. testa**

Superficie

AlTiN nano

AlTiN nano

lucido

AlTiN +

TiN

TiCN

Tipo

**SuperT-AI**

**SuperT-AI**

**TBE-VHM**

**TBE-VHM**

**SuperT-N**

**SuperT-NX**

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150/151/152/153



| v <sub>c</sub><br>m/min | VR-Code | v <sub>c</sub><br>m/min | VR-Code | v <sub>c</sub><br>m/min | VR-Code | v <sub>c</sub><br>m/min | VR-Code | v <sub>c</sub><br>m/min | VR-Code | v <sub>c</sub><br>m/min | VR-Code |
|-------------------------|---------|-------------------------|---------|-------------------------|---------|-------------------------|---------|-------------------------|---------|-------------------------|---------|
| 100                     | O       | 95                      | N       | 95                      | N       | 95                      | N       | 95                      | M       | 95                      | M       |
| 85                      | O       | 80                      | N       | 80                      | N       | 80                      | N       | 80                      | M       | 80                      | M       |
| 90                      | O       | 85                      | N       | 85                      | N       | 85                      | N       | 85                      | M       | 85                      | M       |
| 80                      | O       | 75                      | N       | 75                      | N       | 75                      | N       | 75                      | M       | 75                      | M       |
| 90                      | N       | 85                      | M       | 85                      | M       | 85                      | M       | 85                      | L       | 85                      | L       |
| 80                      | N       | 75                      | M       | 75                      | M       | 75                      | M       | 75                      | L       | 75                      | L       |
| 75                      | N       | 70                      | M       | 70                      | M       | 70                      | M       | 70                      | L       | 70                      | L       |
| 75                      | N       | 70                      | M       | 70                      | M       | 70                      | M       | 70                      | L       | 70                      | L       |
| 65                      | N       | 60                      | M       | 60                      | M       | 60                      | M       | 60                      | L       | 60                      | L       |
| 80                      | O       | 75                      | N       | 75                      | N       | 75                      | N       | 75                      | M       | 75                      | M       |
| 75                      | N       | 70                      | M       | 70                      | M       | 70                      | M       | 70                      | L       | 70                      | L       |
| 65                      | N       | 60                      | M       | 60                      | M       | 60                      | M       | 60                      | L       | 60                      | L       |
| 75                      | N       | 70                      | M       | 70                      | M       | 70                      | M       | 70                      | L       | 70                      | L       |
| 65                      | N       | 60                      | M       | 60                      | M       | 60                      | M       | 60                      | L       | 60                      | L       |
| 75                      | M       | 70                      | L       | 70                      | L       | 70                      | L       | 70                      | K       | 70                      | K       |
| 65                      | M       | 60                      | L       | 60                      | L       | 60                      | L       | 60                      | K       | 60                      | K       |
| 55                      | L       | 50                      | K       | 50                      | K       | 50                      | K       | 50                      | K       | 50                      | K       |
| 65                      | M       | 60                      | L       | 60                      | L       | 60                      | L       | 60                      | L       | 60                      | L       |
| 30                      | M       | 25                      | L       | 25                      | L       | 25                      | L       | 25                      | K       | 25                      | K       |
| 55                      | N       | 50                      | M       | 50                      | M       | 50                      | M       | 50                      | L       | 50                      | L       |
| 45                      | N       | 40                      | M       | 40                      | M       | 40                      | M       | 40                      | L       | 40                      | L       |
| 35                      | N       | 35                      | M       | 35                      | M       | 35                      | M       | 35                      | L       | 35                      | L       |
| 85                      | P       | 80                      | O       | 80                      | O       | 80                      | O       | 80                      | N       | 80                      | N       |
| 80                      | P       | 75                      | O       | 75                      | O       | 75                      | O       | 75                      | N       | 75                      | N       |
| 80                      | O       | 75                      | N       | 75                      | N       | 75                      | N       | 75                      | M       | 75                      | M       |
| 70                      | O       | 65                      | N       | 65                      | N       | 65                      | N       | 65                      | M       | 65                      | M       |
| 55                      | N       | 50                      | M       | 50                      | M       | 50                      | M       | 50                      | L       | 50                      | L       |
| 80                      | P       | 70                      | O       | 70                      | N       | 70                      | N       | 70                      | M       | 70                      | M       |
| 70                      | P       | 65                      | O       | 65                      | N       | 65                      | N       | 65                      | M       | 65                      | M       |
| 65                      | O       | 60                      | N       | 65                      | M       | 65                      | M       | 65                      | L       | 65                      | L       |
| 60                      | O       | 55                      | N       | 55                      | M       | 55                      | M       | 55                      | L       | 55                      | L       |
| 25                      | L       | 20                      | K       | 20                      | K       | 20                      | K       | 20                      | K       | 20                      | K       |
| 35                      | L       | 30                      | K       | 30                      | K       | 30                      | K       | 30                      | K       | 30                      | K       |
| 30                      | L       | 25                      | K       | 25                      | K       | 25                      | K       | 25                      | K       | 25                      | K       |
| 150                     | Q       | 140                     | P       | 140                     | P       | 140                     | P       | 140                     | N       | 140                     | N       |
| 120                     | Q       | 115                     | P       | 115                     | P       | 115                     | P       | 115                     | N       | 115                     | N       |
| 150                     | R       | 140                     | Q       | 140                     | Q       | 140                     | Q       | 140                     | P       | 140                     | P       |
| 130                     | R       | 120                     | Q       | 120                     | Q       | 120                     | Q       | 120                     | P       | 120                     | P       |
| 110                     | Q       | 100                     | P       | 100                     | P       | 100                     | P       | 90                      | O       | 90                      | O       |
| 75                      | O       | 70                      | N       | 70                      | N       | 70                      | N       | 70                      | M       | 70                      | M       |
| 120                     | R       | 115                     | Q       | 115                     | Q       | 115                     | Q       | 115                     | P       | 115                     | P       |
| 90                      | R       | 85                      | Q       | 85                      | Q       | 85                      | Q       | 85                      | P       | 85                      | P       |
| 95                      | Q       | 90                      | P       | 90                      | P       | 90                      | P       | 90                      | O       | 90                      | O       |
| 75                      | Q       | 70                      | P       | 70                      | P       | 70                      | P       | 70                      | O       | 70                      | O       |
| 70                      | Q       | 65                      | P       | 65                      | P       | 65                      | P       | 65                      | O       | 65                      | O       |
| 60                      | Q       | 55                      | P       | 55                      | P       | 55                      | P       | 55                      | O       | 55                      | O       |
| 75                      | O       | 70                      | N       | 70                      | N       | 70                      | N       | 70                      | M       | 70                      | M       |
| 70                      | O       | 65                      | N       | 65                      | N       | 65                      | N       | 65                      | M       | 65                      | M       |
| 60                      | N       | 55                      | M       | 55                      | M       | 55                      | M       | 55                      | L       | 55                      | L       |
| 50                      | N       | 45                      | M       | 45                      | M       | 45                      | M       | 45                      | L       | 45                      | L       |

# Punte a cannone ad 1 tagl. SuperT-N/SuperT-NX

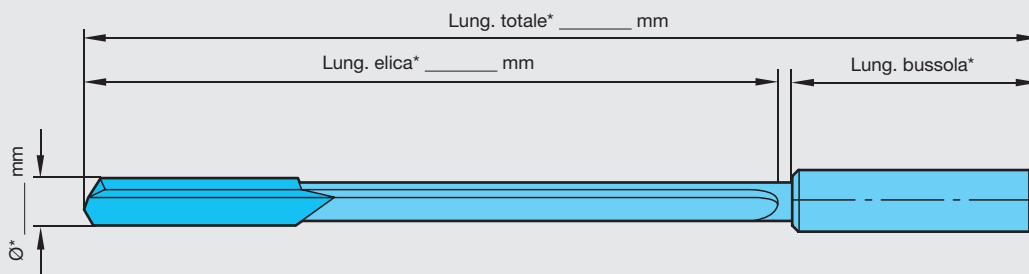
## Modulo soluzione speciali

Punte a cannone:

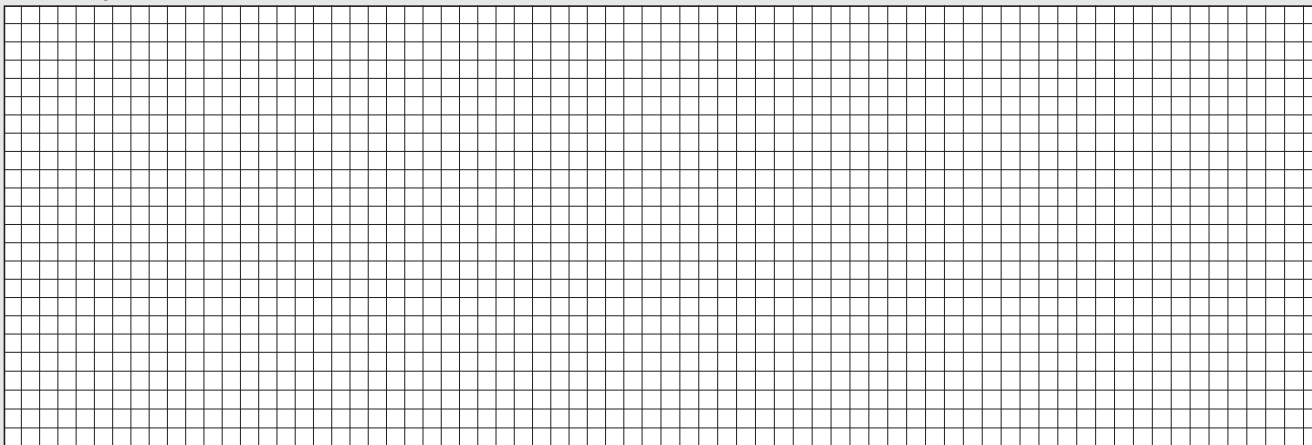
- SuperT-N  
 SuperT-NX

Quantità richiesta: Utensile \_\_\_\_\_ pezzi

\* Ø 2,0 - 40,0 mm  
 Lung. totale max. 3000 mm  
 Lung. totale e lung. bussola dipendono  
 dalla bussola di serraggio scelta



### Schizzo posizione di foratura



necessario solo per casi speciali

Bussola di serraggio:

- nessuna  nr. ident.: \_\_\_\_\_  a disegno allegato

Rivestimento:

- TiN  TiCN  lucide  \_\_\_\_\_

Pezzo da lavorare:

Prof. di foro: \_\_\_\_\_ Tolleranza del foro: \_\_\_\_\_ Mat./designazione: \_\_\_\_\_  
 Resist. a traz./Durezza: \_\_\_\_\_

Macchina-tipo:

- macc. per punte a cannone  macchina utensile convenz.

Lubrorefrigerante:

- olio per punte a cannone  emulsione  
 Pressione \_\_\_\_\_ bar Quantità \_\_\_\_\_ l/min

Ditta: \_\_\_\_\_

Timbro società: \_\_\_\_\_

Telefono/Fax: \_\_\_\_\_

Responsabile: \_\_\_\_\_

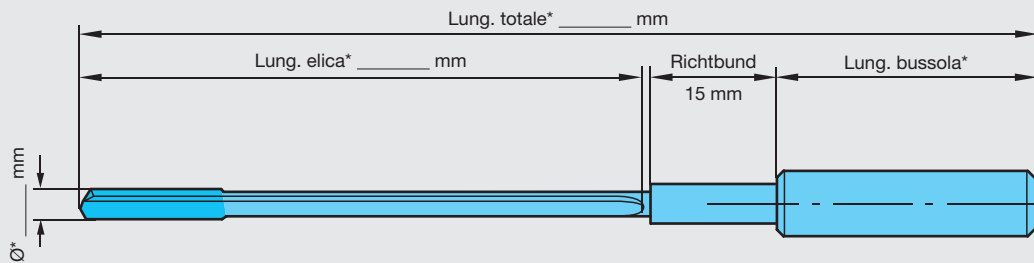
Firma: \_\_\_\_\_

# Punte a cannone ad 1 tagl. TBE-VHM

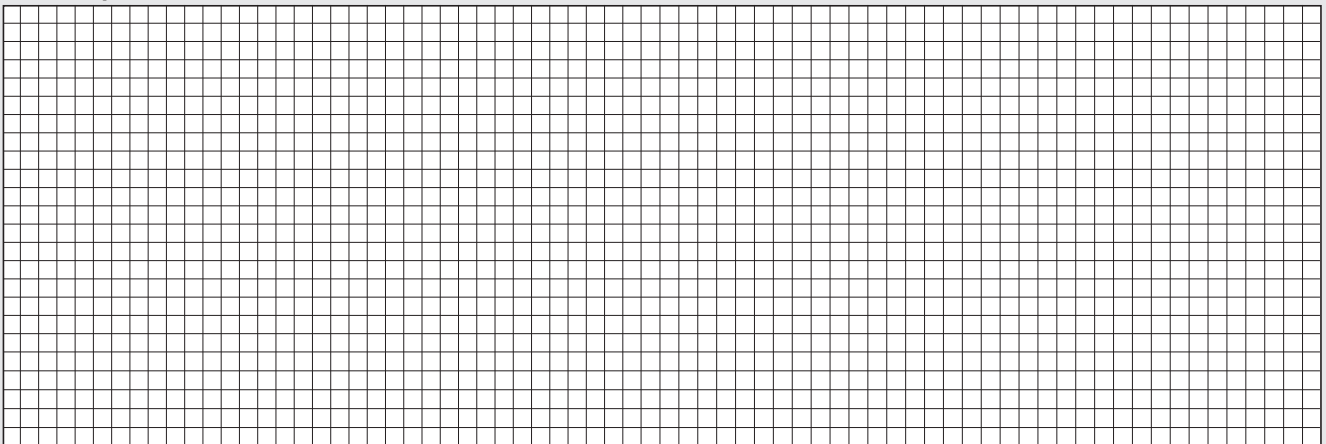
## Modulo soluzione speciali

Punte a cannone:  TBE-VHM  Quantità richiesta: Utensile \_\_\_\_\_ pezzi

\* Ø 0,9 - 12,0 mm  
 Lung. elica max. 500 mm  
 Lung. totale e lung. bussola dipendono  
 dalla bussola di serraggio scelta



### Schizzo posizione di foratura



necessario solo per casi speciali

**Bussola di serraggio:**  nessuna  nr. ident.: \_\_\_\_\_  a disegno allegato

**Rivestimento:**  TiN  TiAlN  AlTiN nano  AlTiN+  lucide  \_\_\_\_\_

**Pezzo da lavorare:** Prof. di foro: \_\_\_\_\_ Tolleranza del foro: \_\_\_\_\_ Mat./designazione: \_\_\_\_\_  
 Resist. a traz./Durezza: \_\_\_\_\_

**Macchina-tipo:**  macc. per punte a cannone  macchina utensile convenz.

**Lubrorefrigerante:**  olio per punte a cannone  emulsione  
 Pressione \_\_\_\_\_ bar Quantità \_\_\_\_\_ l/min

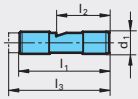
**Ditta:** \_\_\_\_\_ **Timbro società:** \_\_\_\_\_

**Telefono/Fax:** \_\_\_\_\_

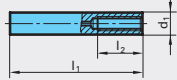
**Responsabile:** \_\_\_\_\_ **Firma:** \_\_\_\_\_

# Accessori

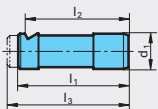
## Bussole per forature profonde



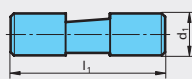
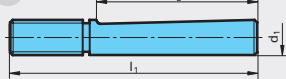
5



6

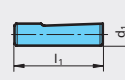


7



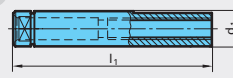
## Bussole a DIN 1835

9 forma E



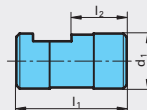
## Bussole a VDI-progetto

12



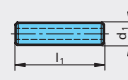
## Bussole a sistema Speed-Bit

13



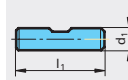
## Bussole a DIN 6535

10 forma HA

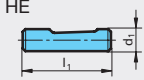


8 forma HB

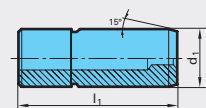
con codice 8,6, 8,7, 8,8



11 forma HE

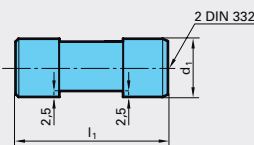


16 sim. forma HA



| code no. | d <sub>1</sub> | l <sub>1</sub> |
|----------|----------------|----------------|
| 16,1     | 10             | 50             |
| 16,2     | 16             | 64             |
| 16,3     | 20             | 70             |
| 16,4     | 25             | 81             |
| 16,5     | 32             | 92             |

17 sim. forma HE



| code no. | d <sub>1</sub> | l <sub>1</sub> |
|----------|----------------|----------------|
| 17,1     | 19,05          | 70             |
| 17,2     | 25,40          | 70             |
| 17,3     | 31,75          | 70             |
| 17,4     | 38,1           | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> |
|--------|----------------|----------------|----------------|----------------|
| 1,1    | 10             | 40             | 24             | -              |
| 1,2    | 10             | 40             | 24             | 45             |
| 1,3    | 10             | 40             | 24             | 55             |
| 1,4    | 16             | 45             | 31,2           | -              |
| 1,5    | 25             | 70             | 34             | -              |
| 1,6    | 25             | 70             | 34             | 78             |

| codice | d <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> |
|--------|----------------|----------------|----------------|
| 5,1    | 10             | 60             | 20             |
| 5,2    | 16             | 80             | 28             |
| 5,3    | 25             | 100            | 50             |
| 5,4    | 10             | 100            | -              |
| 5,5    | 10             | 110            | -              |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 9,1    | 8              | 36             |
| 9,2    | 10             | 40             |
| 9,3    | 12             | 45             |
| 9,4    | 16             | 48             |
| 9,5    | 20             | 50             |
| 9,6    | 25             | 56             |
| 9,7    | 32             | 60             |
| 9,8    | 31,75          | 70             |
| 9,9    | 38,1           | 70             |
| 9,10   | 40             | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 10,1   | 8              | 36             |
| 10,2   | 10             | 40             |
| 10,3   | 12             | 45             |
| 10,4   | 16             | 48             |
| 10,5   | 20             | 50             |
| 10,6   | 25             | 56             |
| 10,7   | 32             | 60             |
| 10,8   | 25             | 70             |
| 10,9   | 40             | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> |
|--------|----------------|----------------|----------------|----------------|
| 2,1    | 16             | 50             | 47             | -              |
| 2,2    | 16             | 50             | 47             | 55             |
| 2,3    | 16             | 50             | 47             | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 6,1    | 12,7           | 38             |
| 6,2    | 19,05          | 70             |
| 6,3    | 38,1           | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 12,1   | 10             | 68             |
| 12,2   | 16             | 90             |
| 12,3   | 25             | 112            |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 8,1    | 8              | 36             |
| 8,2    | 10             | 40             |
| 8,3    | 12             | 45             |
| 8,4    | 16             | 48             |
| 8,5    | 20             | 50             |
| 8,6    | 25             | 56             |
| 8,7    | 32             | 60             |
| 8,8    | 40             | 70             |

| codice | d <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> |
|--------|----------------|----------------|----------------|----------------|
| 3,1    | 25             | 70             | 34             | 100            |

| codice | d <sub>1</sub> | l <sub>1</sub> | l <sub>2</sub> |
|--------|----------------|----------------|----------------|
| 7,1    | 16             | 112            | 73             |
| 7,2    | 20             | 126            | 82             |

| codice | d <sub>1</sub> | l <sub>1</sub> |
|--------|----------------|----------------|
| 4,1    | 19,05          | 70             |
| 4,2    | 12,70          | 70             |
| 4,3    | 25,40          | 70             |
| 4,4    | 31,75          | 70             |
| 4,5    | 38,10          | 70             |

Abbiamo a magazzino le bussole del programma qui raffigurato, esso rappresenta però solo una scelta di bussole. Naturalmente noi produciamo anche bussole di massima precisione a disegno del cliente.

**Attenzione! Per TBE-VHM** sono necessarie bussole con perno di allineamento. Informazioni a richiesta

### Accessori per macchine per punte a cannone

Contrariamente all'uso su macchine convenzionali, per impiego su specifiche macchine per punte a cannone occorrono determinati accessori, p.es.: bussole di guida, dischi a tenuta stagna, bussole a lunetta, ecc., che appartengono alla dotazione standard. Nella figura a lato trovate una scelta di tali prodotti.

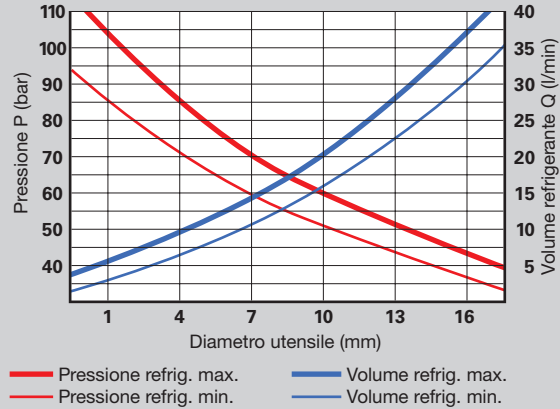


# Stock Punte a cannone

## Valori per la refrigerazione

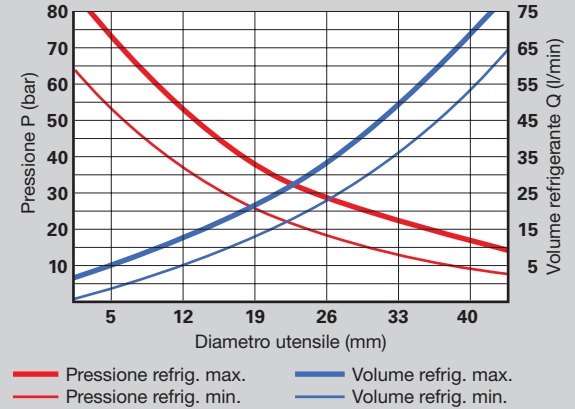
### Valori refrigerante TBE-VHM/SuperT-AL

(Valori indicativi per emulsione)



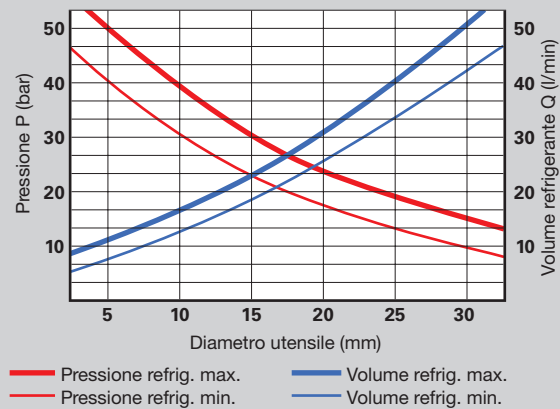
### Valori refrigerante SuperT-N/-NX

(Valori indicativi per emulsione)



### Valori refrigerante SuperT-GG

(Valori indicativi per emulsione)



# Stock Punta a cannone

## Valori per la refrigerazione

### Procedimento per impiego di tutte le punte a cannone

- Produzione di un foro pilota (tolleranza H8).
- Entrare con un numero di giri di ca. 200 giri/min, avanzamento ca. 500 mm/min
- Regolazione della pressione del lubrificante e del nr. di giri
- Foratura in continuo sull'intera lunghezza, senza scaricare. Impiegando punte a cannone con un grosso rapporto lunghezza-diametro (p. es. EB 100 da lunghezza elica 160 mm), consigliamo di lavorare fino ad una profondità di foro di ca. 25 mm con parametri di taglio ridotti (ca. 75% della velocità di taglio ottimale).
- Spegnimento dell'adduzione refrigerante al raggiungimento della profondità di foro voluta
- Corsa di ritorno rapida con mandrino fermo.

**I parametri di taglio possono essere ridotti se i parametri di refrigerazione sono insufficienti.**

**Un'altra opzione è aumentare la pressione del sistema.**

### Procedimento

Per produrre fori profondi con la SuperV-T con risultati ottimali, specialmente con entrata su raggi o su una struttura superficiale non livellata, consigliamo di procedere con i seguenti passi:

1. Fresare una superficie, p. es. con fresa tipo SuperF-UT-N con tagliente al centro. La superficie deve essere eseguita con angolo a destra, rispetto all'angolo di entrata del foro da produrre.
2. Eseguire un foro pilota cilindrico (tolleranza F9), con una profondità di almeno  $1 \times D$ . Consigliamo le nostre punte SuperV. Per il loro angolo di affilatura a  $140^\circ$  e la tolleranza sul  $\varnothing m7$ , queste punte sono le più indicate per tale operazione.
3. Entrare con la punta elicoidale per fori profondi nel foro pilota con un numero di giri di ca 300 giri/min ed un avanzamento di ca. 500 mm/min.
4. Regolare la pressione del refrigerante ed il numero di giri.
5. Forare in continuo sull'intera lunghezza, senza scaricare.
6. Per fori passanti con uscita a  $90^\circ$  ridurre la velocità di avanzamento al 50% a circa 1 mm prima dell'uscita.
7. Per fori passanti con uscita del foro obliqua, ridurre la velocità di avanzamento  $v_f$  del 40% a ca. 1 mm prima dell'uscita.
8. Al raggiungimento della profondità di foro, spegnere giri ed adduzione refrigerante; corsa di ritorno rapida con max. 5000 mm/min.



## Punte SuperV

### Punte SuperV senza fori di refrigerazione



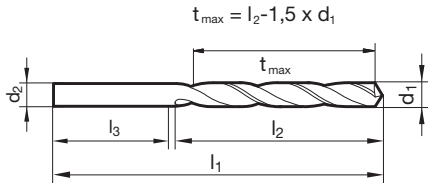
Catalogo n° 61888



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● | ○ | ○ | ● | ● |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- geometria dei taglienti ottimizzata
- sharp cutting behaviour



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 3,000    | 3,000    | 46,000   | 16,000   | 30,000   |
| 3,100    | 3,100    | 49,000   | 18,000   | 31,000   |
| 3,200    | 3,200    | 49,000   | 18,000   | 31,000   |
| 3,400    | 3,400    | 52,000   | 20,000   | 32,000   |
| 3,500    | 3,500    | 52,000   | 20,000   | 32,000   |
| 3,600    | 3,600    | 52,000   | 20,000   | 32,000   |
| 4,000    | 4,000    | 55,000   | 22,000   | 33,000   |
| 4,200    | 4,200    | 55,000   | 22,000   | 33,000   |
| 4,300    | 4,300    | 58,000   | 24,000   | 34,000   |
| 4,500    | 4,500    | 58,000   | 24,000   | 34,000   |
| 4,700    | 4,700    | 58,000   | 24,000   | 34,000   |
| 5,000    | 5,000    | 62,000   | 26,000   | 36,000   |
| 5,100    | 5,100    | 62,000   | 26,000   | 36,000   |
| 5,200    | 5,200    | 62,000   | 26,000   | 36,000   |
| 5,500    | 5,500    | 66,000   | 28,000   | 38,000   |
| 5,700    | 5,700    | 66,000   | 28,000   | 38,000   |
| 5,800    | 5,800    | 66,000   | 28,000   | 38,000   |
| 6,000    | 6,000    | 66,000   | 28,000   | 38,000   |
| 6,100    | 6,100    | 70,000   | 31,000   | 39,000   |
| 6,200    | 6,200    | 70,000   | 31,000   | 39,000   |
| 6,400    | 6,400    | 70,000   | 31,000   | 39,000   |
| 6,500    | 6,500    | 70,000   | 31,000   | 39,000   |
| 6,600    | 6,600    | 70,000   | 31,000   | 39,000   |
| 6,700    | 6,700    | 70,000   | 31,000   | 39,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 6,800    | 6,800    | 74,000   | 34,000   | 40,000   |
| 7,000    | 7,000    | 74,000   | 34,000   | 40,000   |
| 7,200    | 7,200    | 74,000   | 34,000   | 40,000   |
| 7,300    | 7,300    | 74,000   | 34,000   | 40,000   |
| 7,500    | 7,500    | 74,000   | 34,000   | 40,000   |
| 7,700    | 7,700    | 79,000   | 37,000   | 42,000   |
| 7,800    | 7,800    | 79,000   | 37,000   | 42,000   |
| 8,000    | 8,000    | 79,000   | 37,000   | 42,000   |
| 8,400    | 8,400    | 79,000   | 37,000   | 42,000   |
| 8,500    | 8,500    | 79,000   | 37,000   | 42,000   |
| 8,700    | 8,700    | 84,000   | 40,000   | 44,000   |
| 8,900    | 8,900    | 84,000   | 40,000   | 44,000   |
| 9,000    | 9,000    | 84,000   | 40,000   | 44,000   |
| 9,100    | 9,100    | 84,000   | 40,000   | 44,000   |
| 9,200    | 9,200    | 84,000   | 40,000   | 44,000   |
| 9,300    | 9,300    | 84,000   | 40,000   | 44,000   |
| 9,400    | 9,400    | 84,000   | 40,000   | 44,000   |
| 9,500    | 9,500    | 84,000   | 40,000   | 44,000   |
| 9,700    | 9,700    | 89,000   | 43,000   | 46,000   |
| 10,000   | 10,000   | 89,000   | 43,000   | 46,000   |
| 10,100   | 10,100   | 89,000   | 43,000   | 46,000   |
| 10,200   | 10,200   | 89,000   | 43,000   | 46,000   |
| 12,000   | 12,000   | 102,000  | 51,000   | 51,000   |

## Punte SuperV

### Punte SuperV senza fori di refrigerazione



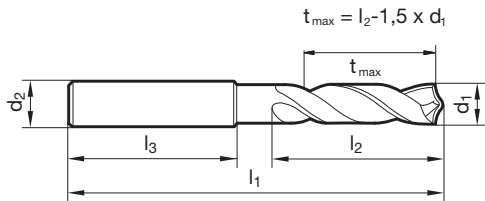
Catalogo n° 51873



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 26

- Assott. del nocch.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3,000    | 6,000    | 62,000   | 20,000   | 36,000   | 7,600    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,100    | 6,000    | 62,000   | 20,000   | 36,000   | 7,700    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,200    | 6,000    | 62,000   | 20,000   | 36,000   | 7,800    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,300    | 6,000    | 62,000   | 20,000   | 36,000   | 7,900    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,400    | 6,000    | 62,000   | 20,000   | 36,000   | 8,000    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,500    | 6,000    | 62,000   | 20,000   | 36,000   | 8,100    | 10,000   | 89,000   | 47,000   | 40,000   |
| 3,600    | 6,000    | 62,000   | 20,000   | 36,000   | 8,200    | 10,000   | 89,000   | 47,000   | 40,000   |
| 3,700    | 6,000    | 62,000   | 20,000   | 36,000   | 8,300    | 10,000   | 89,000   | 47,000   | 40,000   |
| 3,800    | 6,000    | 66,000   | 24,000   | 36,000   | 8,400    | 10,000   | 89,000   | 47,000   | 40,000   |
| 3,900    | 6,000    | 66,000   | 24,000   | 36,000   | 8,500    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,000    | 6,000    | 66,000   | 24,000   | 36,000   | 8,600    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,100    | 6,000    | 66,000   | 24,000   | 36,000   | 8,700    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,200    | 6,000    | 66,000   | 24,000   | 36,000   | 8,800    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,300    | 6,000    | 66,000   | 24,000   | 36,000   | 8,900    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,400    | 6,000    | 66,000   | 24,000   | 36,000   | 9,000    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,500    | 6,000    | 66,000   | 24,000   | 36,000   | 9,100    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,600    | 6,000    | 66,000   | 24,000   | 36,000   | 9,200    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,650    | 6,000    | 66,000   | 24,000   | 36,000   | 9,250    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,700    | 6,000    | 66,000   | 24,000   | 36,000   | 9,300    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,800    | 6,000    | 66,000   | 28,000   | 36,000   | 9,400    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,900    | 6,000    | 66,000   | 28,000   | 36,000   | 9,500    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,000    | 6,000    | 66,000   | 28,000   | 36,000   | 9,600    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,100    | 6,000    | 66,000   | 28,000   | 36,000   | 9,700    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,200    | 6,000    | 66,000   | 28,000   | 36,000   | 9,800    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,300    | 6,000    | 66,000   | 28,000   | 36,000   | 9,900    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,400    | 6,000    | 66,000   | 28,000   | 36,000   | 10,000   | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,500    | 6,000    | 66,000   | 28,000   | 36,000   | 10,100   | 12,000   | 102,000  | 55,000   | 45,000   |
| 5,550    | 6,000    | 66,000   | 28,000   | 36,000   | 10,200   | 12,000   | 102,000  | 55,000   | 45,000   |
| 5,600    | 6,000    | 66,000   | 28,000   | 36,000   | 10,300   | 12,000   | 102,000  | 55,000   | 45,000   |
| 5,700    | 6,000    | 66,000   | 28,000   | 36,000   | 10,400   | 12,000   | 102,000  | 55,000   | 45,000   |
| 5,800    | 6,000    | 66,000   | 28,000   | 36,000   | 10,500   | 12,000   | 102,000  | 55,000   | 45,000   |
| 5,900    | 6,000    | 66,000   | 28,000   | 36,000   | 10,600   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,000    | 6,000    | 66,000   | 28,000   | 36,000   | 10,700   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,100    | 8,000    | 79,000   | 34,000   | 36,000   | 10,800   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,200    | 8,000    | 79,000   | 34,000   | 36,000   | 10,900   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,300    | 8,000    | 79,000   | 34,000   | 36,000   | 11,000   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,400    | 8,000    | 79,000   | 34,000   | 36,000   | 11,100   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,500    | 8,000    | 79,000   | 34,000   | 36,000   | 11,200   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,600    | 8,000    | 79,000   | 34,000   | 36,000   | 11,300   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,700    | 8,000    | 79,000   | 34,000   | 36,000   | 11,400   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,800    | 8,000    | 79,000   | 34,000   | 36,000   | 11,500   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,900    | 8,000    | 79,000   | 34,000   | 36,000   | 11,600   | 12,000   | 102,000  | 55,000   | 45,000   |
| 7,000    | 8,000    | 79,000   | 34,000   | 36,000   | 11,700   | 12,000   | 102,000  | 55,000   | 45,000   |
| 7,100    | 8,000    | 79,000   | 41,000   | 36,000   | 11,800   | 12,000   | 102,000  | 55,000   | 45,000   |
| 7,200    | 8,000    | 79,000   | 41,000   | 36,000   | 11,900   | 12,000   | 102,000  | 55,000   | 45,000   |
| 7,300    | 8,000    | 79,000   | 41,000   | 36,000   | 12,000   | 12,000   | 102,000  | 55,000   | 45,000   |
| 7,400    | 8,000    | 79,000   | 41,000   | 36,000   | 12,200   | 14,000   | 107,000  | 60,000   | 45,000   |
| 7,500    | 8,000    | 79,000   | 41,000   | 36,000   | 12,500   | 14,000   | 107,000  | 60,000   | 45,000   |

| d1<br>mm      | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm      | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|---------------|----------|----------|----------|----------|---------------|----------|----------|----------|----------|
| <b>12,700</b> | 14,000   | 107,000  | 60,000   | 45,000   | <b>16,000</b> | 16,000   | 115,000  | 65,000   | 48,000   |
| <b>13,000</b> | 14,000   | 107,000  | 60,000   | 45,000   | <b>16,500</b> | 18,000   | 123,000  | 73,000   | 48,000   |
| <b>13,500</b> | 14,000   | 107,000  | 60,000   | 45,000   | <b>17,000</b> | 18,000   | 123,000  | 73,000   | 48,000   |
| <b>13,700</b> | 14,000   | 107,000  | 60,000   | 45,000   | <b>17,500</b> | 18,000   | 123,000  | 73,000   | 48,000   |
| <b>14,000</b> | 14,000   | 107,000  | 60,000   | 45,000   | <b>18,000</b> | 18,000   | 123,000  | 73,000   | 48,000   |
| <b>14,200</b> | 16,000   | 115,000  | 65,000   | 48,000   | <b>18,500</b> | 20,000   | 131,000  | 79,000   | 50,000   |
| <b>14,500</b> | 16,000   | 115,000  | 65,000   | 48,000   | <b>19,000</b> | 20,000   | 131,000  | 79,000   | 50,000   |
| <b>14,700</b> | 16,000   | 115,000  | 65,000   | 48,000   | <b>19,500</b> | 20,000   | 131,000  | 79,000   | 50,000   |
| <b>15,000</b> | 16,000   | 115,000  | 65,000   | 48,000   | <b>20,000</b> | 20,000   | 131,000  | 79,000   | 50,000   |
| <b>15,200</b> | 16,000   | 115,000  | 65,000   | 48,000   |               |          |          |          |          |
| <b>15,500</b> | 16,000   | 115,000  | 65,000   | 48,000   |               |          |          |          |          |
| <b>15,700</b> | 16,000   | 115,000  | 65,000   | 48,000   |               |          |          |          |          |

## Punte SuperV

### Punte SuperV senza fori di refrigerazione



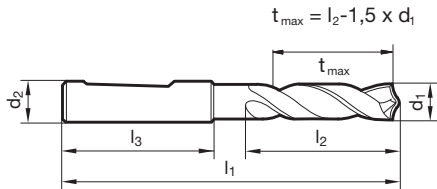
Catalogo n° 51871



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3,000    | 6,000    | 62,000   | 20,000   | 36,000   | 6,750    | 8,000    | 79,000   | 34,000   | 36,000   |
| 3,100    | 6,000    | 62,000   | 20,000   | 36,000   | 6,800    | 8,000    | 79,000   | 34,000   | 36,000   |
| 3,170    | 6,000    | 62,000   | 20,000   | 36,000   | 6,900    | 8,000    | 79,000   | 34,000   | 36,000   |
| 3,200    | 6,000    | 62,000   | 20,000   | 36,000   | 7,000    | 8,000    | 79,000   | 34,000   | 36,000   |
| 3,300    | 6,000    | 62,000   | 20,000   | 36,000   | 7,100    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,400    | 6,000    | 62,000   | 20,000   | 36,000   | 7,140    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,500    | 6,000    | 62,000   | 20,000   | 36,000   | 7,200    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,570    | 6,000    | 62,000   | 20,000   | 36,000   | 7,300    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,600    | 6,000    | 62,000   | 20,000   | 36,000   | 7,400    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,700    | 6,000    | 62,000   | 20,000   | 36,000   | 7,500    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,800    | 6,000    | 66,000   | 24,000   | 36,000   | 7,540    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,900    | 6,000    | 66,000   | 24,000   | 36,000   | 7,600    | 8,000    | 79,000   | 41,000   | 36,000   |
| 3,970    | 6,000    | 66,000   | 24,000   | 36,000   | 7,700    | 8,000    | 79,000   | 41,000   | 36,000   |
| 4,000    | 6,000    | 66,000   | 24,000   | 36,000   | 7,800    | 8,000    | 79,000   | 41,000   | 36,000   |
| 4,100    | 6,000    | 66,000   | 24,000   | 36,000   | 7,900    | 8,000    | 79,000   | 41,000   | 36,000   |
| 4,200    | 6,000    | 66,000   | 24,000   | 36,000   | 7,940    | 8,000    | 79,000   | 41,000   | 36,000   |
| 4,300    | 6,000    | 66,000   | 24,000   | 36,000   | 8,000    | 8,000    | 79,000   | 41,000   | 36,000   |
| 4,370    | 6,000    | 66,000   | 24,000   | 36,000   | 8,100    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,400    | 6,000    | 66,000   | 24,000   | 36,000   | 8,200    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,500    | 6,000    | 66,000   | 24,000   | 36,000   | 8,300    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,600    | 6,000    | 66,000   | 24,000   | 36,000   | 8,330    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,700    | 6,000    | 66,000   | 24,000   | 36,000   | 8,400    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,760    | 6,000    | 66,000   | 28,000   | 36,000   | 8,500    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,800    | 6,000    | 66,000   | 28,000   | 36,000   | 8,600    | 10,000   | 89,000   | 47,000   | 40,000   |
| 4,900    | 6,000    | 66,000   | 28,000   | 36,000   | 8,700    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,000    | 6,000    | 66,000   | 28,000   | 36,000   | 8,730    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,100    | 6,000    | 66,000   | 28,000   | 36,000   | 8,800    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,160    | 6,000    | 66,000   | 28,000   | 36,000   | 8,900    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,200    | 6,000    | 66,000   | 28,000   | 36,000   | 9,000    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,300    | 6,000    | 66,000   | 28,000   | 36,000   | 9,100    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,400    | 6,000    | 66,000   | 28,000   | 36,000   | 9,130    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,500    | 6,000    | 66,000   | 28,000   | 36,000   | 9,200    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,550    | 6,000    | 66,000   | 28,000   | 36,000   | 9,250    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,560    | 6,000    | 66,000   | 28,000   | 36,000   | 9,300    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,600    | 6,000    | 66,000   | 28,000   | 36,000   | 9,400    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,700    | 6,000    | 66,000   | 28,000   | 36,000   | 9,500    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,800    | 6,000    | 66,000   | 28,000   | 36,000   | 9,520    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,900    | 6,000    | 66,000   | 28,000   | 36,000   | 9,600    | 10,000   | 89,000   | 47,000   | 40,000   |
| 5,950    | 6,000    | 66,000   | 28,000   | 36,000   | 9,700    | 10,000   | 89,000   | 47,000   | 40,000   |
| 6,000    | 6,000    | 66,000   | 28,000   | 36,000   | 9,800    | 10,000   | 89,000   | 47,000   | 40,000   |
| 6,100    | 8,000    | 79,000   | 34,000   | 36,000   | 9,900    | 10,000   | 89,000   | 47,000   | 40,000   |
| 6,200    | 8,000    | 79,000   | 34,000   | 36,000   | 9,920    | 10,000   | 89,000   | 47,000   | 40,000   |
| 6,300    | 8,000    | 79,000   | 34,000   | 36,000   | 10,000   | 10,000   | 89,000   | 47,000   | 40,000   |
| 6,350    | 8,000    | 79,000   | 34,000   | 36,000   | 10,100   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,400    | 8,000    | 79,000   | 34,000   | 36,000   | 10,200   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,500    | 8,000    | 79,000   | 34,000   | 36,000   | 10,300   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,600    | 8,000    | 79,000   | 34,000   | 36,000   | 10,400   | 12,000   | 102,000  | 55,000   | 45,000   |
| 6,700    | 8,000    | 79,000   | 34,000   | 36,000   | 10,500   | 12,000   | 102,000  | 55,000   | 45,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 10,600   | 12,000   | 102,000  | 55,000   | 45,000   | 14,200   | 16,000   | 115,000  | 65,000   | 48,000   |
| 10,700   | 12,000   | 102,000  | 55,000   | 45,000   | 14,300   | 16,000   | 115,000  | 65,000   | 48,000   |
| 10,800   | 12,000   | 102,000  | 55,000   | 45,000   | 14,400   | 16,000   | 115,000  | 65,000   | 48,000   |
| 10,900   | 12,000   | 102,000  | 55,000   | 45,000   | 14,500   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,000   | 12,000   | 102,000  | 55,000   | 45,000   | 14,700   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,100   | 12,000   | 102,000  | 55,000   | 45,000   | 15,000   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,200   | 12,000   | 102,000  | 55,000   | 45,000   | 15,200   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,300   | 12,000   | 102,000  | 55,000   | 45,000   | 15,500   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,400   | 12,000   | 102,000  | 55,000   | 45,000   | 15,600   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,500   | 12,000   | 102,000  | 55,000   | 45,000   | 15,700   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,600   | 12,000   | 102,000  | 55,000   | 45,000   | 15,800   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,700   | 12,000   | 102,000  | 55,000   | 45,000   | 16,000   | 16,000   | 115,000  | 65,000   | 48,000   |
| 11,800   | 12,000   | 102,000  | 55,000   | 45,000   | 16,100   | 18,000   | 123,000  | 73,000   | 48,000   |
| 11,900   | 12,000   | 102,000  | 55,000   | 45,000   | 16,200   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,000   | 12,000   | 102,000  | 55,000   | 45,000   | 16,300   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,100   | 14,000   | 107,000  | 60,000   | 45,000   | 16,500   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,200   | 14,000   | 107,000  | 60,000   | 45,000   | 17,000   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,300   | 14,000   | 107,000  | 60,000   | 45,000   | 17,500   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,400   | 14,000   | 107,000  | 60,000   | 45,000   | 18,000   | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,500   | 14,000   | 107,000  | 60,000   | 45,000   | 18,300   | 20,000   | 131,000  | 79,000   | 50,000   |
| 12,600   | 14,000   | 107,000  | 60,000   | 45,000   | 18,500   | 20,000   | 131,000  | 79,000   | 50,000   |
| 12,700   | 14,000   | 107,000  | 60,000   | 45,000   | 19,000   | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,000   | 14,000   | 107,000  | 60,000   | 45,000   | 19,500   | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,200   | 14,000   | 107,000  | 60,000   | 45,000   | 20,000   | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,300   | 14,000   | 107,000  | 60,000   | 45,000   |          |          |          |          |          |
| 13,500   | 14,000   | 107,000  | 60,000   | 45,000   |          |          |          |          |          |
| 13,700   | 14,000   | 107,000  | 60,000   | 45,000   |          |          |          |          |          |
| 13,800   | 14,000   | 107,000  | 60,000   | 45,000   |          |          |          |          |          |
| 14,000   | 14,000   | 107,000  | 60,000   | 45,000   |          |          |          |          |          |
| 14,100   | 16,000   | 115,000  | 65,000   | 48,000   |          |          |          |          |          |

## Punte SuperV

### Punte SuperV senza fori di refrigerazione



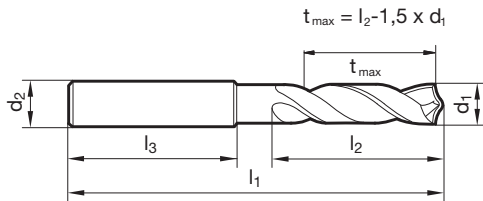
Catalogo n° 51787



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ | ○ | ○ |

Parametri di lav. ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 3,000    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,100    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,200    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,300    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,400    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,500    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,600    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,700    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,800    | 6,000    | 74,000   | 36,000   | 36,000   |
| 3,900    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,000    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,100    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,200    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,300    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,400    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,500    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,600    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,700    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,760    | 6,000    | 82,000   | 44,000   | 36,000   |
| 4,800    | 6,000    | 82,000   | 44,000   | 36,000   |
| 4,900    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,000    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,100    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,200    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,300    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,400    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,500    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,600    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,700    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,800    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,900    | 6,000    | 82,000   | 44,000   | 36,000   |
| 6,000    | 6,000    | 82,000   | 44,000   | 36,000   |
| 6,100    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,200    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,300    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,350    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,400    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,500    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,600    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,700    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,900    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,100    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,200    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,300    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,400    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,500    | 8,000    | 91,000   | 53,000   | 36,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 7,600    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,700    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,900    | 8,000    | 91,000   | 53,000   | 36,000   |
| 8,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 8,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,200    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,300    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,330    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,400    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,500    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,600    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,700    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,900    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,000    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,200    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,300    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,400    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,500    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,600    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,700    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,900    | 10,000   | 103,000  | 61,000   | 40,000   |
| 10,000   | 10,000   | 103,000  | 61,000   | 40,000   |
| 10,100   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,200   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,300   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,400   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,500   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,600   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,700   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,800   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,900   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,000   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,100   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,200   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,300   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,400   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,500   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,600   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,700   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,800   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,900   | 12,000   | 118,000  | 71,000   | 45,000   |
| 12,000   | 12,000   | 118,000  | 71,000   | 45,000   |
| 12,200   | 14,000   | 124,000  | 77,000   | 45,000   |
| 12,500   | 14,000   | 124,000  | 77,000   | 45,000   |

| d1<br>mm      | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm      | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|---------------|----------|----------|----------|----------|---------------|----------|----------|----------|----------|
| <b>12,700</b> | 14,000   | 124,000  | 77,000   | 45,000   | <b>16,000</b> | 16,000   | 133,000  | 83,000   | 48,000   |
| <b>13,000</b> | 14,000   | 124,000  | 77,000   | 45,000   | <b>16,500</b> | 18,000   | 143,000  | 93,000   | 48,000   |
| <b>13,500</b> | 14,000   | 124,000  | 77,000   | 45,000   | <b>17,000</b> | 18,000   | 143,000  | 93,000   | 48,000   |
| <b>13,700</b> | 14,000   | 124,000  | 77,000   | 45,000   | <b>17,500</b> | 18,000   | 143,000  | 93,000   | 48,000   |
| <b>14,000</b> | 14,000   | 124,000  | 77,000   | 45,000   | <b>18,000</b> | 18,000   | 143,000  | 93,000   | 48,000   |
| <b>14,200</b> | 16,000   | 133,000  | 83,000   | 48,000   | <b>18,500</b> | 20,000   | 153,000  | 101,000  | 50,000   |
| <b>14,500</b> | 16,000   | 133,000  | 83,000   | 48,000   | <b>19,000</b> | 20,000   | 153,000  | 101,000  | 50,000   |
| <b>14,700</b> | 16,000   | 133,000  | 83,000   | 48,000   | <b>19,500</b> | 20,000   | 153,000  | 101,000  | 50,000   |
| <b>15,000</b> | 16,000   | 133,000  | 83,000   | 48,000   | <b>20,000</b> | 20,000   | 153,000  | 101,000  | 50,000   |
| <b>15,200</b> | 16,000   | 133,000  | 83,000   | 48,000   |               |          |          |          |          |
| <b>15,500</b> | 16,000   | 133,000  | 83,000   | 48,000   |               |          |          |          |          |
| <b>15,700</b> | 16,000   | 133,000  | 83,000   | 48,000   |               |          |          |          |          |

## Punte SuperV

### Punte SuperV senza fori di refrigerazione



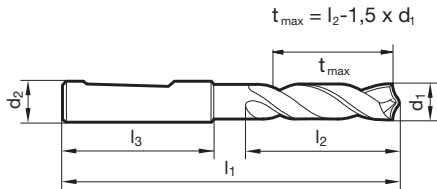
Catalogo n° 51887



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3,000    | 6,000    | 66,000   | 28,000   | 36,000   | 6,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,100    | 6,000    | 66,000   | 28,000   | 36,000   | 6,900    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,170    | 6,000    | 66,000   | 28,000   | 36,000   | 7,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,200    | 6,000    | 66,000   | 28,000   | 36,000   | 7,100    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,300    | 6,000    | 66,000   | 28,000   | 36,000   | 7,140    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,400    | 6,000    | 66,000   | 28,000   | 36,000   | 7,200    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,500    | 6,000    | 66,000   | 28,000   | 36,000   | 7,300    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,570    | 6,000    | 66,000   | 28,000   | 36,000   | 7,400    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,600    | 6,000    | 66,000   | 28,000   | 36,000   | 7,500    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,700    | 6,000    | 66,000   | 28,000   | 36,000   | 7,540    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,800    | 6,000    | 74,000   | 36,000   | 36,000   | 7,600    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,900    | 6,000    | 74,000   | 36,000   | 36,000   | 7,700    | 8,000    | 91,000   | 53,000   | 36,000   |
| 3,970    | 6,000    | 74,000   | 36,000   | 36,000   | 7,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 4,000    | 6,000    | 74,000   | 36,000   | 36,000   | 7,900    | 8,000    | 91,000   | 53,000   | 36,000   |
| 4,100    | 6,000    | 74,000   | 36,000   | 36,000   | 7,940    | 8,000    | 91,000   | 53,000   | 36,000   |
| 4,200    | 6,000    | 74,000   | 36,000   | 36,000   | 8,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 4,300    | 6,000    | 74,000   | 36,000   | 36,000   | 8,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,370    | 6,000    | 74,000   | 36,000   | 36,000   | 8,200    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,400    | 6,000    | 74,000   | 36,000   | 36,000   | 8,300    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,500    | 6,000    | 74,000   | 36,000   | 36,000   | 8,330    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,600    | 6,000    | 74,000   | 36,000   | 36,000   | 8,400    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,700    | 6,000    | 74,000   | 36,000   | 36,000   | 8,500    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,760    | 6,000    | 82,000   | 44,000   | 36,000   | 8,600    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,800    | 6,000    | 82,000   | 44,000   | 36,000   | 8,700    | 10,000   | 103,000  | 61,000   | 40,000   |
| 4,900    | 6,000    | 82,000   | 44,000   | 36,000   | 8,730    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,000    | 6,000    | 82,000   | 44,000   | 36,000   | 8,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,100    | 6,000    | 82,000   | 44,000   | 36,000   | 8,900    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,160    | 6,000    | 82,000   | 44,000   | 36,000   | 9,000    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,200    | 6,000    | 82,000   | 44,000   | 36,000   | 9,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,300    | 6,000    | 82,000   | 44,000   | 36,000   | 9,130    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,400    | 6,000    | 82,000   | 44,000   | 36,000   | 9,200    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,500    | 6,000    | 82,000   | 44,000   | 36,000   | 9,300    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,560    | 6,000    | 82,000   | 44,000   | 36,000   | 9,400    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,600    | 6,000    | 82,000   | 44,000   | 36,000   | 9,500    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,700    | 6,000    | 82,000   | 44,000   | 36,000   | 9,520    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,800    | 6,000    | 82,000   | 44,000   | 36,000   | 9,600    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,900    | 6,000    | 82,000   | 44,000   | 36,000   | 9,700    | 10,000   | 103,000  | 61,000   | 40,000   |
| 5,950    | 6,000    | 82,000   | 44,000   | 36,000   | 9,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 6,000    | 6,000    | 82,000   | 44,000   | 36,000   | 9,900    | 10,000   | 103,000  | 61,000   | 40,000   |
| 6,100    | 8,000    | 91,000   | 53,000   | 36,000   | 9,920    | 10,000   | 103,000  | 61,000   | 40,000   |
| 6,200    | 8,000    | 91,000   | 53,000   | 36,000   | 10,000   | 10,000   | 103,000  | 61,000   | 40,000   |
| 6,300    | 8,000    | 91,000   | 53,000   | 36,000   | 10,100   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,350    | 8,000    | 91,000   | 53,000   | 36,000   | 10,200   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,400    | 8,000    | 91,000   | 53,000   | 36,000   | 10,300   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,500    | 8,000    | 91,000   | 53,000   | 36,000   | 10,400   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,600    | 8,000    | 91,000   | 53,000   | 36,000   | 10,500   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,700    | 8,000    | 91,000   | 53,000   | 36,000   | 10,600   | 12,000   | 118,000  | 71,000   | 45,000   |
| 6,750    | 8,000    | 91,000   | 53,000   | 36,000   | 10,700   | 12,000   | 118,000  | 71,000   | 45,000   |



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 10,800   | 12,000   | 118,000  | 71,000   | 45,000   | 14,700   | 16,000   | 133,000  | 83,000   | 48,000   |
| 10,900   | 12,000   | 118,000  | 71,000   | 45,000   | 15,000   | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,000   | 12,000   | 118,000  | 71,000   | 45,000   | 15,200   | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,100   | 12,000   | 118,000  | 71,000   | 45,000   | 15,500   | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,200   | 12,000   | 118,000  | 71,000   | 45,000   | 15,700   | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,300   | 12,000   | 118,000  | 71,000   | 45,000   | 16,000   | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,400   | 12,000   | 118,000  | 71,000   | 45,000   | 16,500   | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,500   | 12,000   | 118,000  | 71,000   | 45,000   | 17,000   | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,600   | 12,000   | 118,000  | 71,000   | 45,000   | 17,500   | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,700   | 12,000   | 118,000  | 71,000   | 45,000   | 18,000   | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,800   | 12,000   | 118,000  | 71,000   | 45,000   | 18,500   | 20,000   | 153,000  | 101,000  | 50,000   |
| 11,900   | 12,000   | 118,000  | 71,000   | 45,000   | 19,000   | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,000   | 12,000   | 118,000  | 71,000   | 45,000   | 19,500   | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,100   | 14,000   | 124,000  | 77,000   | 45,000   | 20,000   | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,200   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 12,500   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 12,700   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 13,000   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 13,500   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 13,700   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 14,000   | 14,000   | 124,000  | 77,000   | 45,000   |          |          |          |          |          |
| 14,100   | 16,000   | 133,000  | 83,000   | 48,000   |          |          |          |          |          |
| 14,200   | 16,000   | 133,000  | 83,000   | 48,000   |          |          |          |          |          |
| 14,500   | 16,000   | 133,000  | 83,000   | 48,000   |          |          |          |          |          |

## Punte SuperV

### Punte con refrigerazione interna SuperV



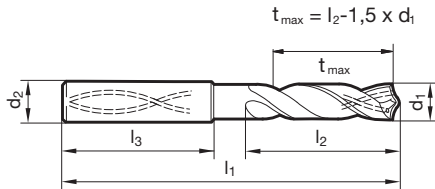
Catalogo n° 51776



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1    | inch | d2    | l1     | l2     | l3     | d1     | inch | d2     | l1      | l2     | l3     |
|-------|------|-------|--------|--------|--------|--------|------|--------|---------|--------|--------|
| mm    |      | mm    | mm     | mm     | mm     | mm     |      | mm     | mm      | mm     | mm     |
| 3,000 |      | 6,000 | 62,000 | 20,000 | 36,000 | 7,500  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,100 |      | 6,000 | 62,000 | 20,000 | 36,000 | 7,600  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,200 |      | 6,000 | 62,000 | 20,000 | 36,000 | 7,700  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,300 |      | 6,000 | 62,000 | 20,000 | 36,000 | 7,800  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,400 |      | 6,000 | 62,000 | 20,000 | 36,000 | 7,900  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,500 |      | 6,000 | 62,000 | 20,000 | 36,000 | 8,000  |      | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,600 |      | 6,000 | 62,000 | 20,000 | 36,000 | 8,100  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 3,700 |      | 6,000 | 62,000 | 20,000 | 36,000 | 8,200  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 3,800 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,300  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 3,900 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,400  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,000 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,500  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,100 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,600  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,200 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,700  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,300 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,800  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,400 |      | 6,000 | 66,000 | 24,000 | 36,000 | 8,900  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,500 |      | 6,000 | 66,000 | 24,000 | 36,000 | 9,000  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,600 |      | 6,000 | 66,000 | 24,000 | 36,000 | 9,100  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,650 |      | 6,000 | 66,000 | 24,000 | 36,000 | 9,200  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,700 |      | 6,000 | 66,000 | 24,000 | 36,000 | 9,250  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,800 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,300  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,900 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,400  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,000 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,500  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,100 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,600  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,200 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,700  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,300 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,800  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,400 |      | 6,000 | 66,000 | 28,000 | 36,000 | 9,900  |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,500 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,000 |      | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,550 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,100 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 5,600 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,200 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 5,700 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,300 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 5,800 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,400 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 5,900 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,500 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,000 |      | 6,000 | 66,000 | 28,000 | 36,000 | 10,600 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,100 |      | 8,000 | 79,000 | 34,000 | 36,000 | 10,700 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,200 |      | 8,000 | 79,000 | 34,000 | 36,000 | 10,800 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,300 |      | 8,000 | 79,000 | 34,000 | 36,000 | 10,900 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,350 | 1/4  | 8,000 | 79,000 | 34,000 | 36,000 | 11,000 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,400 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,100 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,500 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,200 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,600 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,300 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,700 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,400 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,800 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,500 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,900 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,600 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,000 |      | 8,000 | 79,000 | 34,000 | 36,000 | 11,700 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,100 |      | 8,000 | 79,000 | 41,000 | 36,000 | 11,800 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,200 |      | 8,000 | 79,000 | 41,000 | 36,000 | 11,900 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,300 |      | 8,000 | 79,000 | 41,000 | 36,000 | 12,000 |      | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,400 |      | 8,000 | 79,000 | 41,000 | 36,000 | 12,200 |      | 14,000 | 107,000 | 60,000 | 45,000 |

| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|------|----------|----------|----------|----------|----------|------|----------|----------|----------|----------|
| 12,500   |      | 14,000   | 107,000  | 60,000   | 45,000   | 18,000   |      | 18,000   | 123,000  | 73,000   | 48,000   |
| 12,700   | 1/2  | 14,000   | 107,000  | 60,000   | 45,000   | 18,500   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,000   |      | 14,000   | 107,000  | 60,000   | 45,000   | 18,700   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,500   |      | 14,000   | 107,000  | 60,000   | 45,000   | 19,000   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 13,700   |      | 14,000   | 107,000  | 60,000   | 45,000   | 19,500   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 14,000   |      | 14,000   | 107,000  | 60,000   | 45,000   | 19,700   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 14,200   |      | 16,000   | 115,000  | 65,000   | 48,000   | 20,000   |      | 20,000   | 131,000  | 79,000   | 50,000   |
| 14,500   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 14,700   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 15,000   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 15,200   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 15,500   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 15,700   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 16,000   |      | 16,000   | 115,000  | 65,000   | 48,000   |          |      |          |          |          |          |
| 16,500   |      | 18,000   | 123,000  | 73,000   | 48,000   |          |      |          |          |          |          |
| 16,700   |      | 18,000   | 123,000  | 73,000   | 48,000   |          |      |          |          |          |          |
| 17,000   |      | 18,000   | 123,000  | 73,000   | 48,000   |          |      |          |          |          |          |
| 17,500   |      | 18,000   | 123,000  | 73,000   | 48,000   |          |      |          |          |          |          |

## Punte SuperV

### Punte con refrigerazione interna SuperV



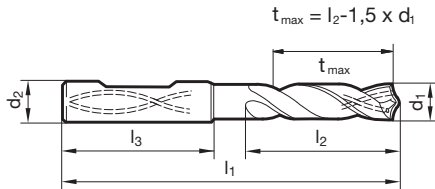
Catalogo n° 51876



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ●        | ○        | ○        | ○        |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1    |       | d2    | l1     | l2     | l3     | d1     |       | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     | mm     | inch  | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,100  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,100 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,140  | 9/32  | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,200 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,200  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,300 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,300  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,400 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,400  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,500 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,500  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,600 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,540  | 19/64 | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,700 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,600  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,800 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,700  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,900 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,800  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,000 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,900  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,100 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,940  | 5/16  | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,200 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,000  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,300 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,370 | 11/64 | 6,000 | 66,000 | 24,000 | 36,000 | 8,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,400 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,500 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,330  | 21/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,600 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,700 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,760 | 3/16  | 6,000 | 66,000 | 28,000 | 36,000 | 8,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,800 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,900 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,730  | 11/32 | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,100 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 66,000 | 28,000 | 36,000 | 9,000  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,200 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,300 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,130  | 23/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,400 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,500 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 66,000 | 28,000 | 36,000 | 9,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,600 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,700 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,520  | 3/8   | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,800 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,900 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 66,000 | 28,000 | 36,000 | 9,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,100 |       | 8,000 | 79,000 | 34,000 | 36,000 | 9,920  | 25/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,200 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,000 |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,300 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,100 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,350 | 1/4   | 8,000 | 79,000 | 34,000 | 36,000 | 10,200 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,400 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,300 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,500 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,320 | 13/32 | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,600 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,400 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,700 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,500 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,750 | 17/64 | 8,000 | 79,000 | 34,000 | 36,000 | 10,600 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,800 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,700 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,900 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,800 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 7,000 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,900 |       | 12,000 | 102,000 | 55,000 | 45,000 |

| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2     | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|--------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm     | mm     |
| 11,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,100 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,100 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,200 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,110 | 7/16  | 12,000 | 102,000 | 55,000 | 45,000 | 14,290 | 9/16 | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,200 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,300 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,300 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,400 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,500 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,900 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,600 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,700 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,200 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,800 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,900 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,600 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,910 | 15/32 | 12,000 | 102,000 | 55,000 | 45,000 | 15,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 12,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 12,100 |       | 14,000 | 107,000 | 60,000 | 45,000 | 16,100 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 12,200 |       | 14,000 | 107,000 | 60,000 | 45,000 | 16,200 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 12,300 | 31/64 | 14,000 | 107,000 | 60,000 | 45,000 | 16,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 12,400 |       | 14,000 | 107,000 | 60,000 | 45,000 | 17,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 12,500 |       | 14,000 | 107,000 | 60,000 | 45,000 | 17,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 12,700 | 1/2   | 14,000 | 107,000 | 60,000 | 45,000 | 17,700 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 13,000 |       | 14,000 | 107,000 | 60,000 | 45,000 | 18,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 13,200 |       | 14,000 | 107,000 | 60,000 | 45,000 | 18,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 13,500 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 13,700 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 14,000 |       | 14,000 | 107,000 | 60,000 | 45,000 | 20,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



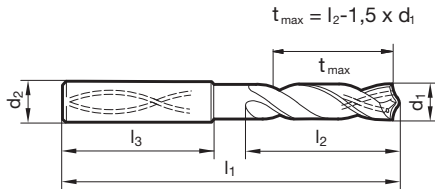
Catalogo n° 51770



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



| d1    |       | d2    | l1     | l2     | l3     | d1     |       | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     | mm     | inch  | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 62,000 | 20,000 | 36,000 | 6,600  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,100 |       | 6,000 | 62,000 | 20,000 | 36,000 | 6,700  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,170 | 1/8   | 6,000 | 62,000 | 20,000 | 36,000 | 6,750  | 17/64 | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,200 |       | 6,000 | 62,000 | 20,000 | 36,000 | 6,800  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,250 |       | 6,000 | 62,000 | 20,000 | 36,000 | 6,900  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,300 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,000  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 3,400 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,100  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,500 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,140  | 9/32  | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,570 | 9/64  | 6,000 | 62,000 | 20,000 | 36,000 | 7,200  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,600 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,300  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,700 |       | 6,000 | 62,000 | 20,000 | 36,000 | 7,400  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,800 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,500  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,900 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,540  | 19/64 | 8,000  | 79,000  | 41,000 | 36,000 |
| 3,970 | 5/32  | 6,000 | 66,000 | 24,000 | 36,000 | 7,600  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,000 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,700  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,100 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,800  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,200 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,900  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,300 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,940  | 5/16  | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,370 | 11/64 | 6,000 | 66,000 | 24,000 | 36,000 | 8,000  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 4,400 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,500 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,600 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,650 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,330  | 21/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,700 |       | 6,000 | 66,000 | 24,000 | 36,000 | 8,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,760 | 3/16  | 6,000 | 66,000 | 28,000 | 36,000 | 8,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,800 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 4,900 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,730  | 11/32 | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,100 |       | 6,000 | 66,000 | 28,000 | 36,000 | 8,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 66,000 | 28,000 | 36,000 | 8,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,200 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,000  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,300 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,400 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,130  | 23/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,500 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,550 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,250  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 66,000 | 28,000 | 36,000 | 9,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,600 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,700 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,800 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,520  | 3/8   | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,900 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 66,000 | 28,000 | 36,000 | 9,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 9,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,100 |       | 8,000 | 79,000 | 34,000 | 36,000 | 9,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,200 |       | 8,000 | 79,000 | 34,000 | 36,000 | 9,920  | 25/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,300 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,000 |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 6,350 | 1/4   | 8,000 | 79,000 | 34,000 | 36,000 | 10,100 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,400 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,200 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 6,500 |       | 8,000 | 79,000 | 34,000 | 36,000 | 10,300 |       | 12,000 | 102,000 | 55,000 | 45,000 |

| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2     | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|--------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm     | mm     |
| 10,320 | 13/32 | 12,000 | 102,000 | 55,000 | 45,000 | 14,290 | 9/16 | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,400 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,300 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,500 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,600 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,700 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,800 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,200 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,900 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,300 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,100 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,110 | 7/16  | 12,000 | 102,000 | 55,000 | 45,000 | 16,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,200 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,300 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,300 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,400 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,900 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,500 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,600 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,300 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,700 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,800 |       | 12,000 | 102,000 | 55,000 | 45,000 | 18,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,900 |       | 12,000 | 102,000 | 55,000 | 45,000 | 18,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 11,910 | 15/32 | 12,000 | 102,000 | 55,000 | 45,000 | 18,900 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 19,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,200 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,300 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,500 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,700 | 1/2   | 14,000 | 107,000 | 60,000 | 45,000 | 20,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,800 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,000 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,300 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,500 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,700 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 14,000 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 14,200 |       | 16,000 | 115,000 | 65,000 | 48,000 |        |      |        |         |        |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



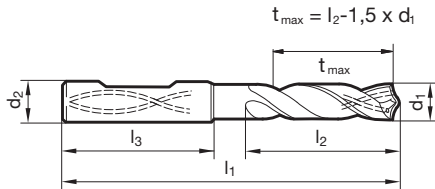
Catalogo n° 51771



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



| d1    |       | d2    | l1     | l2     | l3     |
|-------|-------|-------|--------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     |
| 3,000 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,100 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,170 | 1/8   | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,200 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,250 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,300 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,400 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,500 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,570 | 9/64  | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,600 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,700 |       | 6,000 | 62,000 | 20,000 | 36,000 |
| 3,800 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 3,900 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 3,970 | 5/32  | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,000 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,100 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,200 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,300 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,370 | 11/64 | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,400 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,500 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,600 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,650 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,700 |       | 6,000 | 66,000 | 24,000 | 36,000 |
| 4,760 | 3/16  | 6,000 | 66,000 | 28,000 | 36,000 |
| 4,800 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 4,900 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,000 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,100 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,160 | 13/64 | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,200 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,300 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,400 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,500 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,550 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,560 | 7/32  | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,600 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,700 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,800 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,900 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 5,950 | 15/64 | 6,000 | 66,000 | 28,000 | 36,000 |
| 6,000 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 6,100 |       | 8,000 | 79,000 | 34,000 | 36,000 |
| 6,200 |       | 8,000 | 79,000 | 34,000 | 36,000 |
| 6,300 |       | 8,000 | 79,000 | 34,000 | 36,000 |
| 6,350 | 1/4   | 8,000 | 79,000 | 34,000 | 36,000 |
| 6,400 |       | 8,000 | 79,000 | 34,000 | 36,000 |
| 6,500 |       | 8,000 | 79,000 | 34,000 | 36,000 |

| d1     |       | d2     | l1      | l2     | l3     |
|--------|-------|--------|---------|--------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     |
| 6,600  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 6,700  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 6,750  | 17/64 | 8,000  | 79,000  | 34,000 | 36,000 |
| 6,800  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 6,900  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 7,000  |       | 8,000  | 79,000  | 34,000 | 36,000 |
| 7,100  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,140  | 9/32  | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,200  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,300  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,400  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,500  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,540  | 19/64 | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,600  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,700  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,800  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,900  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 7,940  | 5/16  | 8,000  | 79,000  | 41,000 | 36,000 |
| 8,000  |       | 8,000  | 79,000  | 41,000 | 36,000 |
| 8,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,330  | 21/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,730  | 11/32 | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 8,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,000  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,100  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,130  | 23/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,200  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,250  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,300  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,400  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,500  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,520  | 3/8   | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,600  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,700  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,800  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,900  |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 9,920  | 25/64 | 10,000 | 89,000  | 47,000 | 40,000 |
| 10,000 |       | 10,000 | 89,000  | 47,000 | 40,000 |
| 10,100 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 10,200 |       | 12,000 | 102,000 | 55,000 | 45,000 |
| 10,300 |       | 12,000 | 102,000 | 55,000 | 45,000 |



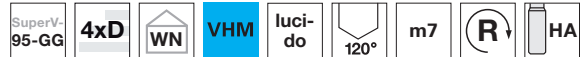
| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2     | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|--------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm     | mm     |
| 10,320 | 13/32 | 12,000 | 102,000 | 55,000 | 45,000 | 14,290 | 9/16 | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,400 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,300 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,500 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,600 |       | 12,000 | 102,000 | 55,000 | 45,000 | 14,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,700 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,800 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,200 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 10,900 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,300 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,500 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,100 |       | 12,000 | 102,000 | 55,000 | 45,000 | 15,700 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,110 | 7/16  | 12,000 | 102,000 | 55,000 | 45,000 | 16,000 |      | 16,000 | 115,000 | 65,000 | 48,000 |
| 11,200 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,300 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,300 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,400 |       | 12,000 | 102,000 | 55,000 | 45,000 | 16,900 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,500 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,600 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,300 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,700 |       | 12,000 | 102,000 | 55,000 | 45,000 | 17,500 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,800 |       | 12,000 | 102,000 | 55,000 | 45,000 | 18,000 |      | 18,000 | 123,000 | 73,000 | 48,000 |
| 11,900 |       | 12,000 | 102,000 | 55,000 | 45,000 | 18,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 11,910 | 15/32 | 12,000 | 102,000 | 55,000 | 45,000 | 18,900 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,000 |       | 12,000 | 102,000 | 55,000 | 45,000 | 19,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,200 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,300 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,500 |       | 14,000 | 107,000 | 60,000 | 45,000 | 19,500 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,700 | 1/2   | 14,000 | 107,000 | 60,000 | 45,000 | 20,000 |      | 20,000 | 131,000 | 79,000 | 50,000 |
| 12,800 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,000 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,300 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,500 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 13,700 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 14,000 |       | 14,000 | 107,000 | 60,000 | 45,000 |        |      |        |         |        |        |
| 14,200 |       | 16,000 | 115,000 | 65,000 | 48,000 |        |      |        |         |        |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



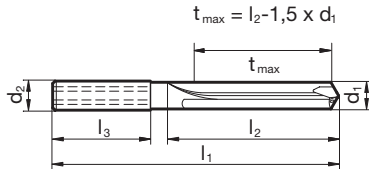
Catalogo n° 71995



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | ● | ○ |   |   |

Parametri di lav. ind. a pag. 26

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



| d1    | inch  | d2    | l1     | l2     | l3     | d1     | inch  | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    |       | mm    | mm     | mm     | mm     | mm     |       | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,100 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,300  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,200 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,400  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,300 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,400 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,540  | 19/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,500 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,600 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,700 |       | 6,000 | 66,000 | 24,000 | 36,000 | 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,800 |       | 6,000 | 74,000 | 30,000 | 36,000 | 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,900 |       | 6,000 | 74,000 | 30,000 | 36,000 | 7,940  | 5/16  | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,000 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,100 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,200 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,300 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,400 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,330  | 21/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,500 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,600 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,700 |       | 6,000 | 74,000 | 30,000 | 36,000 | 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,800 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,900 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,730  | 11/32 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,000 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,100 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 74,000 | 36,000 | 36,000 | 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,200 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,300 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,130  | 23/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,400 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,500 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 74,000 | 36,000 | 36,000 | 9,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,600 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,700 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,520  | 3/8   | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,800 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,900 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 74,000 | 36,000 | 36,000 | 9,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,000 |       | 6,000 | 74,000 | 36,000 | 36,000 | 9,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,100 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,920  | 25/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,200 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,300 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,350 | 1/4   | 8,000 | 91,000 | 53,000 | 36,000 | 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,400 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,720 | 27/64 | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,500 |       | 8,000 | 91,000 | 53,000 | 36,000 | 11,000 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,600 |       | 8,000 | 91,000 | 53,000 | 36,000 | 11,110 | 7/16  | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,700 |       | 8,000 | 91,000 | 53,000 | 36,000 | 11,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,750 | 17/64 | 8,000 | 91,000 | 53,000 | 36,000 | 11,500 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,800 |       | 8,000 | 91,000 | 53,000 | 36,000 | 11,510 | 29/64 | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,900 |       | 8,000 | 91,000 | 53,000 | 36,000 | 11,910 | 15/32 | 12,000 | 118,000 | 71,000 | 45,000 |
| 7,000 |       | 8,000 | 91,000 | 53,000 | 36,000 | 12,000 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 7,100 |       | 8,000 | 91,000 | 53,000 | 36,000 | 12,300 | 31/64 | 14,000 | 124,000 | 74,000 | 45,000 |
| 7,140 | 9/32  | 8,000 | 91,000 | 53,000 | 36,000 | 12,500 |       | 14,000 | 124,000 | 74,000 | 45,000 |

| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|------|----------|----------|----------|----------|----------|------|----------|----------|----------|----------|
| 12,700   | 1/2  | 14,000   | 124,000  | 74,000   | 45,000   | 18,500   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 13,000   |      | 14,000   | 124,000  | 74,000   | 45,000   | 19,000   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 13,500   |      | 14,000   | 124,000  | 74,000   | 45,000   | 19,500   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 14,000   |      | 14,000   | 124,000  | 74,000   | 45,000   | 20,000   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 14,500   |      | 16,000   | 133,000  | 83,000   | 48,000   | 21,500   |      | 25,000   | 168,000  | 110,000  | 56,000   |
| 15,000   |      | 16,000   | 133,000  | 83,000   | 48,000   |          |      |          |          |          |          |
| 15,500   |      | 16,000   | 133,000  | 83,000   | 48,000   |          |      |          |          |          |          |
| 16,000   |      | 16,000   | 133,000  | 83,000   | 48,000   |          |      |          |          |          |          |
| 16,500   |      | 18,000   | 143,000  | 93,000   | 48,000   |          |      |          |          |          |          |
| 17,000   |      | 18,000   | 143,000  | 93,000   | 48,000   |          |      |          |          |          |          |
| 17,500   |      | 18,000   | 143,000  | 93,000   | 48,000   |          |      |          |          |          |          |
| 18,000   |      | 18,000   | 143,000  | 93,000   | 48,000   |          |      |          |          |          |          |

## Punte SuperV

### Punte con refrigerazione interna SuperV



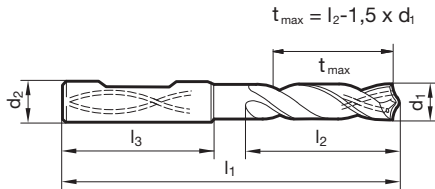
Catalogo n° 61880



| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | ○ | ○ | ● | ● |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 4,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- geometria dei taglienti ottimizzata
- sharp cutting behaviour



| d1     | inch  | d2     | l1      | l2     | l3     | d1     | inch  | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|--------|--------|--------|-------|--------|---------|---------|--------|
| mm     |       | mm     | mm      | mm     | mm     | mm     |       | mm     | mm      | mm      | mm     |
| 4,000  |       | 6,000  | 74,000  | 36,000 | 36,000 | 11,000 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,100  |       | 6,000  | 74,000  | 36,000 | 36,000 | 11,400 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,200  |       | 6,000  | 74,000  | 36,000 | 36,000 | 11,500 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,300  |       | 6,000  | 74,000  | 36,000 | 36,000 | 11,600 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,500  |       | 6,000  | 74,000  | 36,000 | 36,000 | 11,700 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,800  |       | 6,000  | 82,000  | 44,000 | 36,000 | 11,800 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 4,900  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,000 |       | 12,000 | 118,000 | 71,000  | 45,000 |
| 5,000  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,100 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,100  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,200 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,200  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,500 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,400  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,800 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,500  |       | 6,000  | 82,000  | 44,000 | 36,000 | 12,900 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,700  |       | 6,000  | 82,000  | 44,000 | 36,000 | 13,000 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,800  |       | 6,000  | 82,000  | 44,000 | 36,000 | 13,200 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 5,900  |       | 6,000  | 82,000  | 44,000 | 36,000 | 13,500 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 6,000  |       | 6,000  | 82,000  | 44,000 | 36,000 | 13,800 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 6,100  |       | 8,000  | 91,000  | 53,000 | 36,000 | 14,000 |       | 14,000 | 124,000 | 77,000  | 45,000 |
| 6,200  |       | 8,000  | 91,000  | 53,000 | 36,000 | 14,100 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 6,500  |       | 8,000  | 91,000  | 53,000 | 36,000 | 14,200 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 6,600  |       | 8,000  | 91,000  | 53,000 | 36,000 | 14,500 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 6,750  | 17/64 | 8,000  | 91,000  | 53,000 | 36,000 | 15,000 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 6,800  |       | 8,000  | 91,000  | 53,000 | 36,000 | 15,500 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 6,900  |       | 8,000  | 91,000  | 53,000 | 36,000 | 15,800 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 7,000  |       | 8,000  | 91,000  | 53,000 | 36,000 | 16,000 |       | 16,000 | 133,000 | 83,000  | 48,000 |
| 7,140  | 9/32  | 8,000  | 91,000  | 53,000 | 36,000 | 16,500 |       | 18,000 | 143,000 | 93,000  | 48,000 |
| 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 | 17,000 |       | 18,000 | 143,000 | 93,000  | 48,000 |
| 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 | 17,500 |       | 18,000 | 143,000 | 93,000  | 48,000 |
| 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 | 18,000 |       | 18,000 | 143,000 | 93,000  | 48,000 |
| 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 | 18,500 |       | 20,000 | 153,000 | 101,000 | 50,000 |
| 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 | 19,000 |       | 20,000 | 153,000 | 101,000 | 50,000 |
| 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 | 20,000 |       | 20,000 | 153,000 | 101,000 | 50,000 |
| 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 | 21,000 |       | 25,000 | 165,000 | 105,000 | 56,000 |
| 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 | 22,000 |       | 25,000 | 165,000 | 105,000 | 56,000 |
| 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 | 23,500 |       | 25,000 | 180,000 | 117,000 | 56,000 |
| 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 | 24,000 |       | 25,000 | 180,000 | 117,000 | 56,000 |
| 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 | 24,500 |       | 25,000 | 180,000 | 117,000 | 56,000 |
| 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 | 25,000 | 63/64 | 25,000 | 180,000 | 117,000 | 56,000 |
| 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |        |       |        |         |         |        |
| 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |        |       |        |         |         |        |
| 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 |        |       |        |         |         |        |
| 10,800 |       | 12,000 | 118,000 | 71,000 | 45,000 |        |       |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



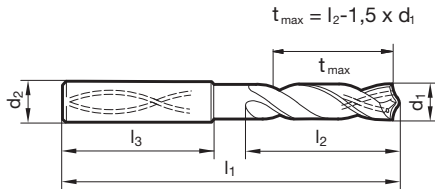
Catalogo n° 51781



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1    |       | d2    | l1     | l2     | l3     | d1     |       | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     | mm     | inch  | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 6,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,100 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,200 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,100  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,300 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,140  | 9/32  | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,400 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,500 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,300  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,600 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,400  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,700 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,800 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,540  | 19/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,900 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,000 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,100 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,200 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,300 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,940  | 5/16  | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,370 | 11/64 | 6,000 | 74,000 | 36,000 | 36,000 | 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,400 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,500 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,600 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,650 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,330  | 21/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,700 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,760 | 3/16  | 6,000 | 82,000 | 44,000 | 36,000 | 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,730  | 11/32 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,100 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 82,000 | 44,000 | 36,000 | 8,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,200 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,300 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,400 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,130  | 23/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,500 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,550 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,250  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 82,000 | 44,000 | 36,000 | 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,600 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,700 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,520  | 3/8   | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 82,000 | 44,000 | 36,000 | 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,100 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,200 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,920  | 25/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,300 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,350 | 1/4   | 8,000 | 91,000 | 53,000 | 36,000 | 10,100 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,400 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,500 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,300 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,600 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,320 | 13/32 | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,700 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,400 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,750 | 17/64 | 8,000 | 91,000 | 53,000 | 36,000 | 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,800 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,600 |       | 12,000 | 118,000 | 71,000 | 45,000 |

| d1<br>mm | inch  | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|-------|----------|----------|----------|----------|----------|------|----------|----------|----------|----------|
| 10,700   |       | 12,000   | 118,000  | 71,000   | 45,000   | 14,000   |      | 14,000   | 124,000  | 77,000   | 45,000   |
| 10,720   | 27/64 | 12,000   | 118,000  | 71,000   | 45,000   | 14,100   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 10,800   |       | 12,000   | 118,000  | 71,000   | 45,000   | 14,200   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 10,900   |       | 12,000   | 118,000  | 71,000   | 45,000   | 14,290   | 9/16 | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,000   |       | 12,000   | 118,000  | 71,000   | 45,000   | 14,500   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,100   |       | 12,000   | 118,000  | 71,000   | 45,000   | 14,700   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,110   | 7/16  | 12,000   | 118,000  | 71,000   | 45,000   | 15,000   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,200   |       | 12,000   | 118,000  | 71,000   | 45,000   | 15,200   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,300   |       | 12,000   | 118,000  | 71,000   | 45,000   | 15,500   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,400   |       | 12,000   | 118,000  | 71,000   | 45,000   | 15,600   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,500   |       | 12,000   | 118,000  | 71,000   | 45,000   | 15,700   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,600   |       | 12,000   | 118,000  | 71,000   | 45,000   | 15,800   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,700   |       | 12,000   | 118,000  | 71,000   | 45,000   | 16,000   |      | 16,000   | 133,000  | 83,000   | 48,000   |
| 11,800   |       | 12,000   | 118,000  | 71,000   | 45,000   | 16,500   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,900   |       | 12,000   | 118,000  | 71,000   | 45,000   | 16,700   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 11,910   | 15/32 | 12,000   | 118,000  | 71,000   | 45,000   | 17,000   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 12,000   |       | 12,000   | 118,000  | 71,000   | 45,000   | 17,500   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 12,100   |       | 14,000   | 124,000  | 77,000   | 45,000   | 17,700   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 12,200   |       | 14,000   | 124,000  | 77,000   | 45,000   | 18,000   |      | 18,000   | 143,000  | 93,000   | 48,000   |
| 12,300   | 31/64 | 14,000   | 124,000  | 77,000   | 45,000   | 18,500   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,400   |       | 14,000   | 124,000  | 77,000   | 45,000   | 18,700   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,500   |       | 14,000   | 124,000  | 77,000   | 45,000   | 19,000   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 12,700   | 1/2   | 14,000   | 124,000  | 77,000   | 45,000   | 19,500   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 13,000   |       | 14,000   | 124,000  | 77,000   | 45,000   | 19,700   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 13,200   |       | 14,000   | 124,000  | 77,000   | 45,000   | 20,000   |      | 20,000   | 153,000  | 101,000  | 50,000   |
| 13,500   |       | 14,000   | 124,000  | 77,000   | 45,000   |          |      |          |          |          |          |
| 13,600   |       | 14,000   | 124,000  | 77,000   | 45,000   |          |      |          |          |          |          |
| 13,700   |       | 14,000   | 124,000  | 77,000   | 45,000   |          |      |          |          |          |          |
| 13,800   |       | 14,000   | 124,000  | 77,000   | 45,000   |          |      |          |          |          |          |
| 13,900   |       | 14,000   | 124,000  | 77,000   | 45,000   |          |      |          |          |          |          |

## Punte SuperV

### Punte con refrigerazione interna SuperV



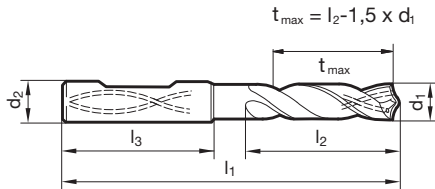
Catalogo n° 51881



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc. ≥ Ø 3,000
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



| d1    |       | d2    | l1     | l2     | l3     | d1     |       | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     | mm     | inch  | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,100  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,100 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,140  | 9/32  | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,200 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,300 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,300  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,400 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,400  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,500 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,600 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,540  | 19/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,700 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,800 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,900 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,000 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,100 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,940  | 5/16  | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,200 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,300 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,370 | 11/64 | 6,000 | 74,000 | 36,000 | 36,000 | 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,400 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,500 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,330  | 21/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,600 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,700 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,760 | 3/16  | 6,000 | 82,000 | 44,000 | 36,000 | 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,730  | 11/32 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,100 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 82,000 | 44,000 | 36,000 | 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,200 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,300 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,130  | 23/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,400 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,500 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 82,000 | 44,000 | 36,000 | 9,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,600 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,700 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,520  | 3/8   | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 82,000 | 44,000 | 36,000 | 9,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,100 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,920  | 25/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,200 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,300 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,100 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,350 | 1/4   | 8,000 | 91,000 | 53,000 | 36,000 | 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,400 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,300 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,500 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,320 | 13/32 | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,600 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,400 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,700 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,750 | 17/64 | 8,000 | 91,000 | 53,000 | 36,000 | 10,600 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,800 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,700 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,900 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,800 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 7,000 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,900 |       | 12,000 | 118,000 | 71,000 | 45,000 |

| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|---------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm      | mm     |
| 11,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,000 |      | 14,000 | 124,000 | 77,000  | 45,000 |
| 11,100 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,100 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,110 | 7/16  | 12,000 | 118,000 | 71,000 | 45,000 | 14,200 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,200 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,290 | 9/16 | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,300 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,400 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,500 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,600 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,200 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,700 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,800 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,900 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,800 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,910 | 15/32 | 12,000 | 118,000 | 71,000 | 45,000 | 16,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 12,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 12,100 |       | 14,000 | 124,000 | 77,000 | 45,000 | 17,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 12,200 |       | 14,000 | 124,000 | 77,000 | 45,000 | 17,300 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 12,300 | 31/64 | 14,000 | 124,000 | 77,000 | 45,000 | 17,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 12,400 |       | 14,000 | 124,000 | 77,000 | 45,000 | 18,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 12,500 |       | 14,000 | 124,000 | 77,000 | 45,000 | 18,200 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,700 | 1/2   | 14,000 | 124,000 | 77,000 | 45,000 | 18,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,000 |       | 14,000 | 124,000 | 77,000 | 45,000 | 18,600 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,500 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,700 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,800 |       | 14,000 | 124,000 | 77,000 | 45,000 | 20,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,900 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |



## Punte SuperV

### Punte con refrigerazione interna SuperV



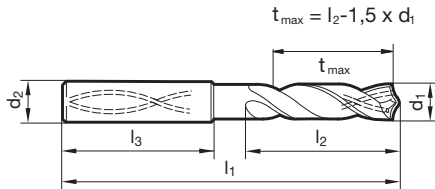
Catalogo n° 51772



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



| d1    |       | d2    | l1     | l2     | l3     | d1     |       | d2     | l1      | l2     | l3     |
|-------|-------|-------|--------|--------|--------|--------|-------|--------|---------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     | mm     | inch  | mm     | mm      | mm     | mm     |
| 3,000 |       | 6,000 | 66,000 | 28,000 | 36,000 | 6,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,100 |       | 6,000 | 66,000 | 28,000 | 36,000 | 6,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,170 | 1/8   | 6,000 | 66,000 | 28,000 | 36,000 | 6,750  | 17/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,200 |       | 6,000 | 66,000 | 28,000 | 36,000 | 6,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,250 |       | 6,000 | 66,000 | 28,000 | 36,000 | 6,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,300 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,400 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,100  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,500 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,140  | 9/32  | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,570 | 9/64  | 6,000 | 66,000 | 28,000 | 36,000 | 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,600 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,300  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,700 |       | 6,000 | 66,000 | 28,000 | 36,000 | 7,400  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,800 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,900 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,540  | 19/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 3,970 | 5/32  | 6,000 | 74,000 | 36,000 | 36,000 | 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,000 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,100 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,200 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,300 |       | 6,000 | 74,000 | 36,000 | 36,000 | 7,940  | 5/16  | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,370 | 11/64 | 6,000 | 74,000 | 36,000 | 36,000 | 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 4,400 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,500 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,600 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,650 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,330  | 21/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,700 |       | 6,000 | 74,000 | 36,000 | 36,000 | 8,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,760 | 3/16  | 6,000 | 82,000 | 44,000 | 36,000 | 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 4,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,730  | 11/32 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,100 |       | 6,000 | 82,000 | 44,000 | 36,000 | 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,160 | 13/64 | 6,000 | 82,000 | 44,000 | 36,000 | 8,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,200 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,300 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,400 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,130  | 23/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,500 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,550 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,250  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,560 | 7/32  | 6,000 | 82,000 | 44,000 | 36,000 | 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,600 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,700 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,800 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,520  | 3/8   | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,900 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 5,950 | 15/64 | 6,000 | 82,000 | 44,000 | 36,000 | 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,000 |       | 6,000 | 82,000 | 44,000 | 36,000 | 9,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,100 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,200 |       | 8,000 | 91,000 | 53,000 | 36,000 | 9,920  | 25/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,300 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 6,350 | 1/4   | 8,000 | 91,000 | 53,000 | 36,000 | 10,100 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,400 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 6,500 |       | 8,000 | 91,000 | 53,000 | 36,000 | 10,300 |       | 12,000 | 118,000 | 71,000 | 45,000 |

| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|---------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm      | mm     |
| 10,320 | 13/32 | 12,000 | 118,000 | 71,000 | 45,000 | 14,290 | 9/16 | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,400 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,300 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,600 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,700 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,800 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,200 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,900 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,300 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,100 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,110 | 7/16  | 12,000 | 118,000 | 71,000 | 45,000 | 16,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,200 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,300 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,300 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,400 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,900 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,500 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,600 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,300 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,700 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,800 |       | 12,000 | 118,000 | 71,000 | 45,000 | 18,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,900 |       | 12,000 | 118,000 | 71,000 | 45,000 | 18,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 11,910 | 15/32 | 12,000 | 118,000 | 71,000 | 45,000 | 18,900 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 19,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,200 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,050 | 3/4  | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,500 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,300 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,700 | 1/2   | 14,000 | 124,000 | 77,000 | 45,000 | 19,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,800 |       | 14,000 | 124,000 | 77,000 | 45,000 | 20,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,000 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,300 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,500 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,700 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 14,000 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 14,200 |       | 16,000 | 133,000 | 83,000 | 48,000 |        |      |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



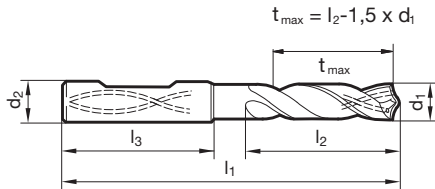
Catalogo n° 51773



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



| d1    |       | d2    | l1     | l2     | l3     |
|-------|-------|-------|--------|--------|--------|
| mm    | inch  | mm    | mm     | mm     | mm     |
| 3,000 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,100 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,170 | 1/8   | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,200 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,250 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,300 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,400 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,500 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,570 | 9/64  | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,600 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,700 |       | 6,000 | 66,000 | 28,000 | 36,000 |
| 3,800 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 3,900 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 3,970 | 5/32  | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,000 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,100 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,200 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,300 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,370 | 11/64 | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,400 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,500 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,600 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,650 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,700 |       | 6,000 | 74,000 | 36,000 | 36,000 |
| 4,760 | 3/16  | 6,000 | 82,000 | 44,000 | 36,000 |
| 4,800 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 4,900 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,000 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,100 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,160 | 13/64 | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,200 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,300 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,400 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,500 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,550 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,560 | 7/32  | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,600 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,700 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,800 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,900 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 5,950 | 15/64 | 6,000 | 82,000 | 44,000 | 36,000 |
| 6,000 |       | 6,000 | 82,000 | 44,000 | 36,000 |
| 6,100 |       | 8,000 | 91,000 | 53,000 | 36,000 |
| 6,200 |       | 8,000 | 91,000 | 53,000 | 36,000 |
| 6,300 |       | 8,000 | 91,000 | 53,000 | 36,000 |
| 6,350 | 1/4   | 8,000 | 91,000 | 53,000 | 36,000 |
| 6,400 |       | 8,000 | 91,000 | 53,000 | 36,000 |
| 6,500 |       | 8,000 | 91,000 | 53,000 | 36,000 |

| d1     |       | d2     | l1      | l2     | l3     |
|--------|-------|--------|---------|--------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     |
| 6,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 6,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 6,750  | 17/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 6,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 6,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,100  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,140  | 9/32  | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,200  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,300  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,400  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,500  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,540  | 19/64 | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,600  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,700  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,800  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,900  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 7,940  | 5/16  | 8,000  | 91,000  | 53,000 | 36,000 |
| 8,000  |       | 8,000  | 91,000  | 53,000 | 36,000 |
| 8,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,330  | 21/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,730  | 11/32 | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 8,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,000  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,100  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,130  | 23/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,200  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,250  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,300  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,400  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,500  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,520  | 3/8   | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,600  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,700  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,800  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,900  |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 9,920  | 25/64 | 10,000 | 103,000 | 61,000 | 40,000 |
| 10,000 |       | 10,000 | 103,000 | 61,000 | 40,000 |
| 10,100 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 10,200 |       | 12,000 | 118,000 | 71,000 | 45,000 |
| 10,300 |       | 12,000 | 118,000 | 71,000 | 45,000 |

| d1     |       | d2     | l1      | l2     | l3     | d1     |      | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|--------|--------|--------|------|--------|---------|---------|--------|
| mm     | inch  | mm     | mm      | mm     | mm     | mm     | inch | mm     | mm      | mm      | mm     |
| 10,320 | 13/32 | 12,000 | 118,000 | 71,000 | 45,000 | 14,290 | 9/16 | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,400 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,300 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,500 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,600 |       | 12,000 | 118,000 | 71,000 | 45,000 | 14,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,700 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,800 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,200 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 10,900 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,300 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,500 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,100 |       | 12,000 | 118,000 | 71,000 | 45,000 | 15,700 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,110 | 7/16  | 12,000 | 118,000 | 71,000 | 45,000 | 16,000 |      | 16,000 | 133,000 | 83,000  | 48,000 |
| 11,200 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,300 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,300 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,400 |       | 12,000 | 118,000 | 71,000 | 45,000 | 16,900 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,500 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,600 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,300 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,700 |       | 12,000 | 118,000 | 71,000 | 45,000 | 17,500 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,800 |       | 12,000 | 118,000 | 71,000 | 45,000 | 18,000 |      | 18,000 | 143,000 | 93,000  | 48,000 |
| 11,900 |       | 12,000 | 118,000 | 71,000 | 45,000 | 18,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 11,910 | 15/32 | 12,000 | 118,000 | 71,000 | 45,000 | 18,900 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,000 |       | 12,000 | 118,000 | 71,000 | 45,000 | 19,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,200 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,050 | 3/4  | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,500 |       | 14,000 | 124,000 | 77,000 | 45,000 | 19,300 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,700 | 1/2   | 14,000 | 124,000 | 77,000 | 45,000 | 19,500 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 12,800 |       | 14,000 | 124,000 | 77,000 | 45,000 | 20,000 |      | 20,000 | 153,000 | 101,000 | 50,000 |
| 13,000 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,300 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,500 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 13,700 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 14,000 |       | 14,000 | 124,000 | 77,000 | 45,000 |        |      |        |         |         |        |
| 14,200 |       | 16,000 | 133,000 | 83,000 | 48,000 |        |      |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



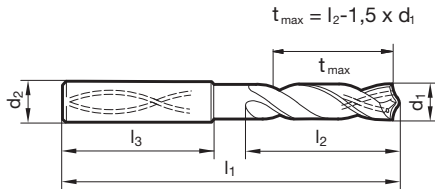
Catalogo n° 51789



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ | ○ |

Parametri di lav. ind. a pag. 30

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida



| d1    | inch | d2    | l1      | l2     | l3     | d1     | inch | d2     | l1      | l2      | l3     |
|-------|------|-------|---------|--------|--------|--------|------|--------|---------|---------|--------|
| mm    |      | mm    | mm      | mm     | mm     | mm     |      | mm     | mm      | mm      | mm     |
| 3,000 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,000  |      | 8,000  | 116,000 | 76,000  | 36,000 |
| 3,100 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,100  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,170 | 1/8  | 6,000 | 70,000  | 30,000 | 36,000 | 8,200  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,200 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,400  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,250 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,500  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,300 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,600  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,400 |      | 6,000 | 75,000  | 35,500 | 36,000 | 8,700  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,500 |      | 6,000 | 75,000  | 35,500 | 36,000 | 8,800  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,570 | 9/64 | 6,000 | 75,000  | 35,500 | 36,000 | 9,000  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,600 |      | 6,000 | 75,000  | 35,500 | 36,000 | 9,100  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,700 |      | 6,000 | 75,000  | 35,500 | 36,000 | 9,200  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,800 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,300  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,900 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,400  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,970 | 5/32 | 6,000 | 75,000  | 37,500 | 36,000 | 9,500  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,000 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,700  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,100 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,800  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,200 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,900  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,300 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,000 |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,400 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,200 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,500 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,500 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,600 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,800 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,700 |      | 6,000 | 85,000  | 45,000 | 36,000 | 11,000 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,800 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,200 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 4,900 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,500 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,000 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,800 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,100 |      | 6,000 | 90,000  | 50,000 | 36,000 | 12,000 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,200 |      | 6,000 | 90,000  | 50,000 | 36,000 | 12,200 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,300 |      | 6,000 | 90,000  | 50,000 | 36,000 | 12,500 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,400 |      | 6,000 | 97,000  | 57,000 | 36,000 | 12,700 | 1/2  | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,500 |      | 6,000 | 97,000  | 57,000 | 36,000 | 13,000 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,700 |      | 6,000 | 97,000  | 57,000 | 36,000 | 13,500 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,800 |      | 6,000 | 97,000  | 57,000 | 36,000 | 14,000 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,900 |      | 6,000 | 97,000  | 57,000 | 36,000 | 14,200 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,000 |      | 6,000 | 97,000  | 57,000 | 36,000 | 14,500 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,200 |      | 8,000 | 106,000 | 66,000 | 36,000 | 15,000 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,300 |      | 8,000 | 106,000 | 66,000 | 36,000 | 15,500 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,500 |      | 8,000 | 106,000 | 66,000 | 36,000 | 16,000 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,600 |      | 8,000 | 106,000 | 66,000 | 36,000 | 16,500 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 6,700 |      | 8,000 | 106,000 | 66,000 | 36,000 | 17,000 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 6,800 |      | 8,000 | 106,000 | 66,000 | 36,000 | 17,500 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 6,900 |      | 8,000 | 116,000 | 76,000 | 36,000 | 18,000 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 7,000 |      | 8,000 | 116,000 | 76,000 | 36,000 | 18,500 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,100 |      | 8,000 | 116,000 | 76,000 | 36,000 | 19,000 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,200 |      | 8,000 | 116,000 | 76,000 | 36,000 | 19,500 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,500 |      | 8,000 | 116,000 | 76,000 | 36,000 | 20,000 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,600 |      | 8,000 | 116,000 | 76,000 | 36,000 |        |      |        |         |         |        |
| 7,700 |      | 8,000 | 116,000 | 76,000 | 36,000 |        |      |        |         |         |        |
| 7,800 |      | 8,000 | 116,000 | 76,000 | 36,000 |        |      |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



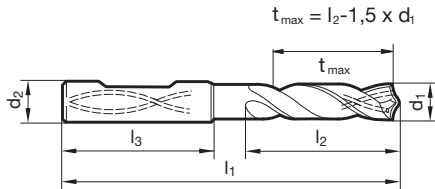
Catalogo n° 51889



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 30

- Assott. del noc. ≥ Ø 3,000
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida



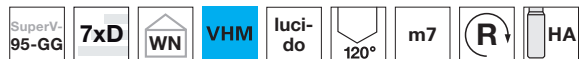
| d1    | inch | d2    | l1      | l2     | l3     | d1     | inch | d2     | l1      | l2      | l3     |
|-------|------|-------|---------|--------|--------|--------|------|--------|---------|---------|--------|
| mm    |      | mm    | mm      | mm     | mm     | mm     |      | mm     | mm      | mm      | mm     |
| 3,000 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,000  |      | 8,000  | 116,000 | 76,000  | 36,000 |
| 3,100 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,100  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,170 | 1/8  | 6,000 | 70,000  | 30,000 | 36,000 | 8,200  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,200 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,400  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,250 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,500  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,300 |      | 6,000 | 70,000  | 30,000 | 36,000 | 8,600  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,400 |      | 6,000 | 75,000  | 35,500 | 36,000 | 8,700  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,500 |      | 6,000 | 75,000  | 35,500 | 36,000 | 8,800  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,570 | 9/64 | 6,000 | 75,000  | 35,500 | 36,000 | 8,900  |      | 10,000 | 131,000 | 87,000  | 40,000 |
| 3,600 |      | 6,000 | 75,000  | 35,500 | 36,000 | 9,100  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,700 |      | 6,000 | 75,000  | 35,500 | 36,000 | 9,200  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,800 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,300  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,900 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,400  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,970 | 5/32 | 6,000 | 75,000  | 37,500 | 36,000 | 9,500  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,000 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,700  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,100 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,800  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,200 |      | 6,000 | 75,000  | 37,500 | 36,000 | 9,900  |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,300 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,000 |      | 10,000 | 139,000 | 95,000  | 40,000 |
| 4,400 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,200 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,500 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,300 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,600 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,500 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,700 |      | 6,000 | 85,000  | 45,000 | 36,000 | 10,800 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,800 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,000 |      | 12,000 | 155,000 | 106,000 | 45,000 |
| 4,900 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,200 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,000 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,500 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,100 |      | 6,000 | 90,000  | 50,000 | 36,000 | 11,800 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,200 |      | 6,000 | 90,000  | 50,000 | 36,000 | 12,000 |      | 12,000 | 163,000 | 114,000 | 45,000 |
| 5,300 |      | 6,000 | 90,000  | 50,000 | 36,000 | 12,100 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,400 |      | 6,000 | 97,000  | 57,000 | 36,000 | 12,200 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,500 |      | 6,000 | 97,000  | 57,000 | 36,000 | 12,500 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,700 |      | 6,000 | 97,000  | 57,000 | 36,000 | 12,700 | 1/2  | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,800 |      | 6,000 | 97,000  | 57,000 | 36,000 | 13,000 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 5,900 |      | 6,000 | 97,000  | 57,000 | 36,000 | 13,500 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 6,000 |      | 6,000 | 97,000  | 57,000 | 36,000 | 14,000 |      | 14,000 | 182,000 | 133,000 | 45,000 |
| 6,200 |      | 8,000 | 106,000 | 66,000 | 36,000 | 14,100 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,300 |      | 8,000 | 106,000 | 66,000 | 36,000 | 14,200 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,500 |      | 8,000 | 106,000 | 66,000 | 36,000 | 14,500 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,600 |      | 8,000 | 106,000 | 66,000 | 36,000 | 15,000 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,700 |      | 8,000 | 106,000 | 66,000 | 36,000 | 15,500 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,800 |      | 8,000 | 106,000 | 66,000 | 36,000 | 16,000 |      | 16,000 | 204,000 | 152,000 | 48,000 |
| 6,900 |      | 8,000 | 116,000 | 76,000 | 36,000 | 16,500 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 7,000 |      | 8,000 | 116,000 | 76,000 | 36,000 | 17,000 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 7,100 |      | 8,000 | 116,000 | 76,000 | 36,000 | 17,500 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 7,200 |      | 8,000 | 116,000 | 76,000 | 36,000 | 18,000 |      | 18,000 | 223,000 | 171,000 | 48,000 |
| 7,500 |      | 8,000 | 116,000 | 76,000 | 36,000 | 18,500 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,600 |      | 8,000 | 116,000 | 76,000 | 36,000 | 19,000 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,700 |      | 8,000 | 116,000 | 76,000 | 36,000 | 19,500 |      | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,800 |      | 8,000 | 116,000 | 76,000 | 36,000 | 20,000 |      | 20,000 | 244,000 | 190,000 | 50,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



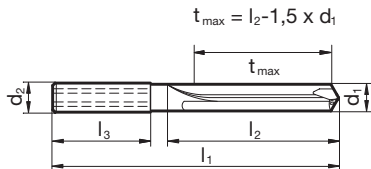
Catalogo n° 71994



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 30

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



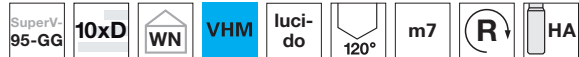
| d1    | inch | d2     | l1      | l2     | l3     | d1     | inch  | d2     | l1      | l2      | l3     |
|-------|------|--------|---------|--------|--------|--------|-------|--------|---------|---------|--------|
| mm    |      | mm     | mm      | mm     | mm     | mm     |       | mm     | mm      | mm      | mm     |
| 3,000 |      | 6,000  | 74,000  | 32,000 | 36,000 | 9,500  |       | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,100 |      | 6,000  | 74,000  | 32,000 | 36,000 | 10,000 |       | 10,000 | 139,000 | 95,000  | 40,000 |
| 3,200 |      | 6,000  | 74,000  | 32,000 | 36,000 | 10,200 |       | 12,000 | 163,000 | 114,000 | 45,000 |
| 3,300 |      | 6,000  | 74,000  | 32,000 | 36,000 | 10,500 |       | 12,000 | 163,000 | 114,000 | 45,000 |
| 3,400 |      | 6,000  | 74,000  | 34,000 | 36,000 | 11,000 |       | 12,000 | 163,000 | 114,000 | 45,000 |
| 3,500 |      | 6,000  | 74,000  | 34,000 | 36,000 | 11,500 |       | 12,000 | 163,000 | 114,000 | 45,000 |
| 3,600 |      | 6,000  | 74,000  | 34,000 | 36,000 | 12,000 |       | 12,000 | 163,000 | 114,000 | 45,000 |
| 3,700 |      | 6,000  | 74,000  | 34,000 | 36,000 | 12,300 | 31/64 | 14,000 | 182,000 | 133,000 | 45,000 |
| 3,800 |      | 6,000  | 97,000  | 45,000 | 36,000 | 12,500 |       | 14,000 | 182,000 | 133,000 | 45,000 |
| 3,900 |      | 6,000  | 97,000  | 45,000 | 36,000 | 12,700 | 1/2   | 14,000 | 182,000 | 133,000 | 45,000 |
| 4,000 |      | 6,000  | 97,000  | 45,000 | 36,000 | 13,000 |       | 14,000 | 182,000 | 133,000 | 45,000 |
| 4,100 |      | 6,000  | 97,000  | 45,000 | 36,000 | 13,500 |       | 14,000 | 182,000 | 133,000 | 45,000 |
| 4,200 |      | 6,000  | 97,000  | 45,000 | 36,000 | 14,000 |       | 14,000 | 182,000 | 133,000 | 45,000 |
| 4,300 |      | 6,000  | 97,000  | 45,000 | 36,000 | 14,500 |       | 16,000 | 204,000 | 152,000 | 48,000 |
| 4,400 |      | 6,000  | 97,000  | 45,000 | 36,000 | 15,000 |       | 16,000 | 204,000 | 152,000 | 48,000 |
| 4,500 |      | 6,000  | 97,000  | 45,000 | 36,000 | 15,500 |       | 16,000 | 204,000 | 152,000 | 48,000 |
| 4,700 |      | 6,000  | 97,000  | 45,000 | 36,000 | 16,000 |       | 16,000 | 204,000 | 152,000 | 48,000 |
| 4,800 |      | 6,000  | 97,000  | 57,000 | 36,000 | 16,500 |       | 18,000 | 223,000 | 171,000 | 48,000 |
| 4,900 |      | 6,000  | 97,000  | 57,000 | 36,000 | 17,000 |       | 18,000 | 223,000 | 171,000 | 48,000 |
| 5,000 |      | 6,000  | 97,000  | 57,000 | 36,000 | 17,500 |       | 18,000 | 223,000 | 171,000 | 48,000 |
| 5,500 |      | 6,000  | 97,000  | 57,000 | 36,000 | 18,000 |       | 18,000 | 223,000 | 171,000 | 48,000 |
| 6,000 |      | 6,000  | 97,000  | 57,000 | 36,000 | 18,500 |       | 20,000 | 244,000 | 190,000 | 50,000 |
| 6,500 |      | 8,000  | 116,000 | 76,000 | 36,000 | 19,000 |       | 20,000 | 244,000 | 190,000 | 50,000 |
| 6,800 |      | 8,000  | 116,000 | 76,000 | 36,000 | 19,500 |       | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,000 |      | 8,000  | 116,000 | 76,000 | 36,000 | 20,000 |       | 20,000 | 244,000 | 190,000 | 50,000 |
| 7,500 |      | 8,000  | 116,000 | 76,000 | 36,000 |        |       |        |         |         |        |
| 7,800 |      | 8,000  | 116,000 | 76,000 | 36,000 |        |       |        |         |         |        |
| 8,000 |      | 8,000  | 116,000 | 76,000 | 36,000 |        |       |        |         |         |        |
| 8,500 |      | 10,000 | 139,000 | 95,000 | 40,000 |        |       |        |         |         |        |
| 9,000 |      | 10,000 | 139,000 | 95,000 | 40,000 |        |       |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



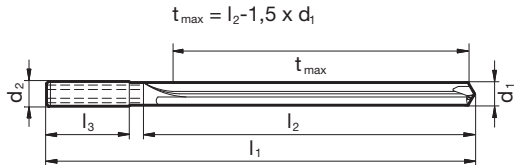
Catalogo n° 71996



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 30

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



| d1     | inch | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     |      | mm     | mm      | mm      | mm     |
| 3,000  |      | 6,000  | 91,000  | 42,000  | 36,000 |
| 3,300  |      | 6,000  | 91,000  | 42,000  | 36,000 |
| 3,500  |      | 6,000  | 91,000  | 48,000  | 36,000 |
| 3,800  |      | 6,000  | 121,000 | 77,000  | 36,000 |
| 4,000  |      | 6,000  | 121,000 | 77,000  | 36,000 |
| 4,200  |      | 6,000  | 121,000 | 77,000  | 36,000 |
| 4,500  |      | 6,000  | 121,000 | 77,000  | 36,000 |
| 4,700  |      | 6,000  | 121,000 | 77,000  | 36,000 |
| 4,800  |      | 6,000  | 121,000 | 82,000  | 36,000 |
| 5,000  |      | 6,000  | 121,000 | 82,000  | 36,000 |
| 5,500  |      | 6,000  | 121,000 | 82,000  | 36,000 |
| 6,000  |      | 6,000  | 121,000 | 82,000  | 36,000 |
| 6,350  | 1/4  | 8,000  | 146,000 | 106,000 | 36,000 |
| 6,500  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 6,800  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 7,000  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 7,500  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 7,800  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 8,000  |      | 8,000  | 146,000 | 106,000 | 36,000 |
| 8,500  |      | 10,000 | 175,000 | 130,000 | 40,000 |
| 9,000  |      | 10,000 | 175,000 | 130,000 | 40,000 |
| 9,500  |      | 10,000 | 175,000 | 130,000 | 40,000 |
| 10,000 |      | 10,000 | 175,000 | 130,000 | 40,000 |
| 10,200 |      | 12,000 | 209,000 | 159,000 | 45,000 |

| d1     | inch | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     |      | mm     | mm      | mm      | mm     |
| 10,500 |      | 12,000 | 209,000 | 159,000 | 45,000 |
| 11,000 |      | 12,000 | 209,000 | 159,000 | 45,000 |
| 11,500 |      | 12,000 | 209,000 | 159,000 | 45,000 |
| 12,000 |      | 12,000 | 209,000 | 159,000 | 45,000 |
| 12,500 |      | 14,000 | 233,000 | 183,000 | 45,000 |
| 12,700 | 1/2  | 14,000 | 233,000 | 183,000 | 45,000 |
| 13,000 |      | 14,000 | 233,000 | 183,000 | 45,000 |
| 13,500 |      | 14,000 | 233,000 | 183,000 | 45,000 |
| 14,000 |      | 14,000 | 233,000 | 183,000 | 45,000 |
| 14,500 |      | 16,000 | 260,000 | 207,000 | 48,000 |
| 15,000 |      | 16,000 | 260,000 | 207,000 | 48,000 |
| 15,500 |      | 16,000 | 260,000 | 207,000 | 48,000 |
| 16,000 |      | 16,000 | 260,000 | 207,000 | 48,000 |
| 16,500 |      | 18,000 | 284,000 | 231,000 | 48,000 |
| 17,000 |      | 18,000 | 284,000 | 231,000 | 48,000 |
| 17,500 |      | 18,000 | 284,000 | 231,000 | 48,000 |
| 18,000 |      | 18,000 | 284,000 | 231,000 | 48,000 |
| 18,500 |      | 20,000 | 308,000 | 255,000 | 50,000 |
| 19,000 |      | 20,000 | 308,000 | 255,000 | 50,000 |
| 19,500 |      | 20,000 | 308,000 | 255,000 | 50,000 |
| 20,000 |      | 20,000 | 308,000 | 255,000 | 50,000 |



## Punte SuperV

### Punte con refrigerazione interna SuperV



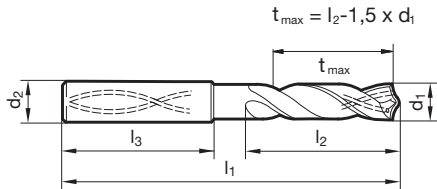
Catalogo n° 51893



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 30

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura su piani
- rivestimento in testa
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1    | inch | d2    | l1      | l2      | l3     | d1     | inch | d2     | l1      | l2      | l3     |
|-------|------|-------|---------|---------|--------|--------|------|--------|---------|---------|--------|
| mm    |      | mm    | mm      | mm      | mm     | mm     |      | mm     | mm      | mm      | mm     |
| 3,000 |      | 6,000 | 90,000  | 50,000  | 36,000 | 7,800  |      | 8,000  | 146,000 | 108,000 | 36,000 |
| 3,100 |      | 6,000 | 90,000  | 50,000  | 36,000 | 7,900  |      | 8,000  | 146,000 | 108,000 | 36,000 |
| 3,200 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,000  |      | 8,000  | 146,000 | 108,000 | 36,000 |
| 3,300 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,100  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,400 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,200  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,500 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,300  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,600 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,400  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,700 |      | 6,000 | 90,000  | 50,000  | 36,000 | 8,500  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,800 |      | 6,000 | 102,000 | 64,000  | 36,000 | 8,600  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 3,900 |      | 6,000 | 102,000 | 64,000  | 36,000 | 8,700  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,000 |      | 6,000 | 102,000 | 64,000  | 36,000 | 8,800  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,100 |      | 6,000 | 102,000 | 64,000  | 36,000 | 8,900  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,200 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,000  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,300 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,100  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,400 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,200  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,500 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,300  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,600 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,400  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,700 |      | 6,000 | 102,000 | 64,000  | 36,000 | 9,500  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,800 |      | 6,000 | 116,000 | 78,000  | 36,000 | 9,600  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 4,900 |      | 6,000 | 116,000 | 78,000  | 36,000 | 9,700  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 5,000 |      | 6,000 | 116,000 | 78,000  | 36,000 | 9,800  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 5,100 |      | 6,000 | 116,000 | 78,000  | 36,000 | 9,900  |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 5,200 |      | 6,000 | 116,000 | 78,000  | 36,000 | 10,000 |      | 10,000 | 162,000 | 120,000 | 40,000 |
| 5,300 |      | 6,000 | 116,000 | 78,000  | 36,000 | 10,200 |      | 12,000 | 204,000 | 156,000 | 45,000 |
| 5,400 |      | 6,000 | 116,000 | 78,000  | 36,000 | 10,500 |      | 12,000 | 204,000 | 156,000 | 45,000 |
| 5,500 |      | 6,000 | 116,000 | 78,000  | 36,000 | 11,000 |      | 12,000 | 204,000 | 156,000 | 45,000 |
| 5,600 |      | 6,000 | 116,000 | 78,000  | 36,000 | 11,500 |      | 12,000 | 204,000 | 156,000 | 45,000 |
| 5,700 |      | 6,000 | 116,000 | 78,000  | 36,000 | 12,000 |      | 12,000 | 204,000 | 156,000 | 45,000 |
| 5,800 |      | 6,000 | 116,000 | 78,000  | 36,000 | 12,500 |      | 14,000 | 230,000 | 182,000 | 45,000 |
| 5,900 |      | 6,000 | 116,000 | 78,000  | 36,000 | 12,700 | 1/2  | 14,000 | 230,000 | 182,000 | 45,000 |
| 6,000 |      | 6,000 | 116,000 | 78,000  | 36,000 | 13,000 |      | 14,000 | 230,000 | 182,000 | 45,000 |
| 6,100 |      | 8,000 | 146,000 | 108,000 | 36,000 | 13,500 |      | 14,000 | 230,000 | 182,000 | 45,000 |
| 6,200 |      | 8,000 | 146,000 | 108,000 | 36,000 | 14,000 |      | 14,000 | 230,000 | 182,000 | 45,000 |
| 6,300 |      | 8,000 | 146,000 | 108,000 | 36,000 | 14,500 |      | 16,000 | 260,000 | 208,000 | 48,000 |
| 6,400 |      | 8,000 | 146,000 | 108,000 | 36,000 | 15,000 |      | 16,000 | 260,000 | 208,000 | 48,000 |
| 6,500 |      | 8,000 | 146,000 | 108,000 | 36,000 | 15,500 |      | 16,000 | 260,000 | 208,000 | 48,000 |
| 6,600 |      | 8,000 | 146,000 | 108,000 | 36,000 | 16,000 |      | 16,000 | 260,000 | 208,000 | 48,000 |
| 6,700 |      | 8,000 | 146,000 | 108,000 | 36,000 | 16,500 |      | 18,000 | 285,000 | 234,000 | 48,000 |
| 6,800 |      | 8,000 | 146,000 | 108,000 | 36,000 | 17,000 |      | 18,000 | 285,000 | 234,000 | 48,000 |
| 6,900 |      | 8,000 | 146,000 | 108,000 | 36,000 | 17,500 |      | 18,000 | 285,000 | 234,000 | 48,000 |
| 7,000 |      | 8,000 | 146,000 | 108,000 | 36,000 | 18,000 |      | 18,000 | 285,000 | 234,000 | 48,000 |
| 7,100 |      | 8,000 | 146,000 | 108,000 | 36,000 | 18,500 |      | 20,000 | 310,000 | 258,000 | 50,000 |
| 7,200 |      | 8,000 | 146,000 | 108,000 | 36,000 | 19,000 |      | 20,000 | 310,000 | 258,000 | 50,000 |
| 7,300 |      | 8,000 | 146,000 | 108,000 | 36,000 | 19,500 |      | 20,000 | 310,000 | 258,000 | 50,000 |
| 7,400 |      | 8,000 | 146,000 | 108,000 | 36,000 | 20,000 |      | 20,000 | 310,000 | 258,000 | 50,000 |
| 7,500 |      | 8,000 | 146,000 | 108,000 | 36,000 |        |      |        |         |         |        |
| 7,600 |      | 8,000 | 146,000 | 108,000 | 36,000 |        |      |        |         |         |        |
| 7,700 |      | 8,000 | 146,000 | 108,000 | 36,000 |        |      |        |         |         |        |

## Punte SuperV

### Punte con refrigerazione interna SuperV



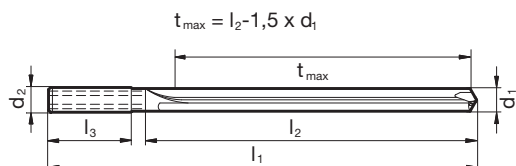
Catalogo n° 71997



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 30

- Assott. del nocc.  $\geq \varnothing 5,000$
- spoglia sul cono tagliente
- passo negativo
- per fori molto precisi
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



| d1     |      | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     | inch | mm     | mm      | mm      | mm     |
| 5,000  |      | 6,000  | 145,000 | 105,000 | 36,000 |
| 6,000  |      | 6,000  | 145,000 | 105,000 | 36,000 |
| 8,000  |      | 8,000  | 180,000 | 137,000 | 36,000 |
| 9,000  |      | 10,000 | 217,000 | 170,000 | 40,000 |
| 10,000 |      | 10,000 | 217,000 | 170,000 | 40,000 |
| 11,000 |      | 12,000 | 258,000 | 205,000 | 45,000 |

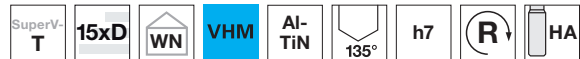
| d1     |      | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     | inch | mm     | mm      | mm      | mm     |
| 12,000 |      | 12,000 | 258,000 | 205,000 | 45,000 |
| 14,000 |      | 14,000 | 290,000 | 236,000 | 45,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



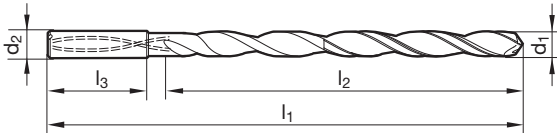
Catalogo n° 51764



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 32

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- applicazione nei mandrini idraulici
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1    |       | d2    | l1      | l2      | l3     |
|-------|-------|-------|---------|---------|--------|
| mm    | inch  | mm    | mm      | mm      | mm     |
| 3,000 |       | 6,000 | 95,000  | 55,000  | 36,000 |
| 3,170 | 1/8   | 6,000 | 106,000 | 67,000  | 36,000 |
| 3,500 |       | 6,000 | 116,000 | 76,000  | 36,000 |
| 3,570 | 9/64  | 6,000 | 116,000 | 76,000  | 36,000 |
| 3,970 | 5/32  | 6,000 | 116,000 | 76,000  | 36,000 |
| 4,000 |       | 6,000 | 116,000 | 76,000  | 36,000 |
| 4,370 | 11/64 | 6,000 | 133,000 | 93,000  | 36,000 |
| 4,500 |       | 6,000 | 133,000 | 93,000  | 36,000 |
| 4,760 | 3/16  | 6,000 | 133,000 | 93,000  | 36,000 |
| 5,000 |       | 6,000 | 133,000 | 93,000  | 36,000 |
| 5,100 |       | 6,000 | 150,000 | 110,000 | 36,000 |
| 5,160 | 13/64 | 6,000 | 150,000 | 110,000 | 36,000 |
| 5,410 |       | 6,000 | 150,000 | 110,000 | 36,000 |
| 5,500 |       | 6,000 | 150,000 | 110,000 | 36,000 |
| 5,560 | 7/32  | 6,000 | 150,000 | 110,000 | 36,000 |
| 5,950 | 15/64 | 6,000 | 150,000 | 110,000 | 36,000 |
| 6,000 |       | 6,000 | 150,000 | 110,000 | 36,000 |
| 6,350 | 1/4   | 8,000 | 167,000 | 127,000 | 36,000 |
| 6,500 |       | 8,000 | 167,000 | 127,000 | 36,000 |
| 6,750 | 17/64 | 8,000 | 167,000 | 127,000 | 36,000 |
| 7,000 |       | 8,000 | 167,000 | 127,000 | 36,000 |
| 7,140 | 9/32  | 8,000 | 183,000 | 143,000 | 36,000 |
| 7,500 |       | 8,000 | 183,000 | 143,000 | 36,000 |
| 7,540 | 19/64 | 8,000 | 183,000 | 143,000 | 36,000 |

| d1     |       | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|---------|--------|
| mm     | inch  | mm     | mm      | mm      | mm     |
| 7,940  | 5/16  | 8,000  | 183,000 | 143,000 | 36,000 |
| 8,000  |       | 8,000  | 183,000 | 143,000 | 36,000 |
| 8,330  | 21/64 | 10,000 | 204,000 | 160,000 | 40,000 |
| 8,500  |       | 10,000 | 204,000 | 160,000 | 40,000 |
| 8,730  | 11/32 | 10,000 | 204,000 | 160,000 | 40,000 |
| 9,000  |       | 10,000 | 204,000 | 160,000 | 40,000 |
| 9,130  | 23/64 | 10,000 | 221,000 | 177,000 | 40,000 |
| 9,520  | 3/8   | 10,000 | 221,000 | 177,000 | 40,000 |
| 9,920  | 25/64 | 10,000 | 221,000 | 177,000 | 40,000 |
| 10,000 |       | 10,000 | 221,000 | 177,000 | 40,000 |
| 10,320 | 13/32 | 12,000 | 247,000 | 198,000 | 45,000 |
| 10,720 | 27/64 | 12,000 | 247,000 | 198,000 | 45,000 |
| 11,000 |       | 12,000 | 247,000 | 198,000 | 45,000 |
| 11,110 | 7/16  | 12,000 | 263,000 | 214,000 | 45,000 |
| 11,510 | 29/64 | 12,000 | 263,000 | 214,000 | 45,000 |
| 11,910 | 15/32 | 12,000 | 263,000 | 214,000 | 45,000 |
| 12,000 |       | 12,000 | 263,000 | 214,000 | 45,000 |
| 12,300 | 31/64 | 14,000 | 297,000 | 248,000 | 45,000 |
| 12,700 | 1/2   | 14,000 | 297,000 | 248,000 | 45,000 |
| 13,100 | 33/64 | 14,000 | 297,000 | 248,000 | 45,000 |
| 13,490 | 17/32 | 14,000 | 297,000 | 248,000 | 45,000 |
| 13,890 | 35/64 | 14,000 | 297,000 | 248,000 | 45,000 |
| 14,000 |       | 14,000 | 297,000 | 248,000 | 45,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



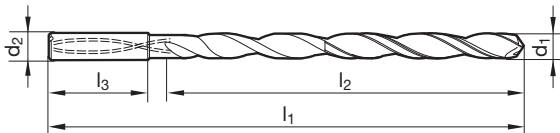
Catalogo n° 51765



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 32

- Assott. del nocch.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1    |      | d2     | l1      | l2      | l3     |
|-------|------|--------|---------|---------|--------|
| mm    | inch | mm     | mm      | mm      | mm     |
| 3,000 |      | 6,000  | 110,000 | 70,000  | 36,000 |
| 3,500 |      | 6,000  | 136,000 | 96,000  | 36,000 |
| 3,970 | 5/32 | 6,000  | 136,000 | 96,000  | 36,000 |
| 4,000 |      | 6,000  | 136,000 | 96,000  | 36,000 |
| 4,500 |      | 6,000  | 158,000 | 118,000 | 36,000 |
| 4,760 | 3/16 | 6,000  | 158,000 | 118,000 | 36,000 |
| 5,000 |      | 6,000  | 158,000 | 118,000 | 36,000 |
| 5,100 |      | 6,000  | 180,000 | 140,000 | 36,000 |
| 5,500 |      | 6,000  | 180,000 | 140,000 | 36,000 |
| 5,560 | 7/32 | 6,000  | 180,000 | 140,000 | 36,000 |
| 6,000 |      | 6,000  | 180,000 | 140,000 | 36,000 |
| 6,350 | 1/4  | 8,000  | 202,000 | 162,000 | 36,000 |
| 6,500 |      | 8,000  | 202,000 | 162,000 | 36,000 |
| 7,000 |      | 8,000  | 202,000 | 162,000 | 36,000 |
| 7,140 | 9/32 | 8,000  | 223,000 | 183,000 | 36,000 |
| 7,500 |      | 8,000  | 223,000 | 183,000 | 36,000 |
| 8,000 |      | 8,000  | 223,000 | 183,000 | 36,000 |
| 8,500 |      | 10,000 | 249,000 | 205,000 | 40,000 |

| d1     |       | d2     | l1      | l2      | l3     |
|--------|-------|--------|---------|---------|--------|
| mm     | inch  | mm     | mm      | mm      | mm     |
| 9,000  |       | 10,000 | 249,000 | 205,000 | 40,000 |
| 10,000 |       | 10,000 | 271,000 | 227,000 | 40,000 |
| 11,000 |       | 12,000 | 302,000 | 253,000 | 45,000 |
| 12,000 |       | 12,000 | 323,000 | 274,000 | 45,000 |
| 12,700 | 1/2   | 14,000 | 367,000 | 318,000 | 45,000 |
| 13,490 | 17/32 | 14,000 | 367,000 | 318,000 | 45,000 |
| 14,000 |       | 14,000 | 367,000 | 318,000 | 45,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



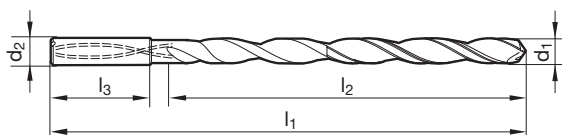
Catalogo n° 51766



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 32

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1    |      | d2    | l1      | l2      | l3     |
|-------|------|-------|---------|---------|--------|
| mm    | inch | mm    | mm      | mm      | mm     |
| 3,000 |      | 6,000 | 125,000 | 85,000  | 36,000 |
| 3,100 |      | 6,000 | 141,000 | 101,000 | 36,000 |
| 3,500 |      | 6,000 | 156,000 | 116,000 | 36,000 |
| 3,800 |      | 6,000 | 156,000 | 116,000 | 36,000 |
| 3,970 | 5/32 | 6,000 | 156,000 | 116,000 | 36,000 |
| 4,000 |      | 6,000 | 156,000 | 116,000 | 36,000 |
| 4,200 |      | 6,000 | 183,000 | 143,000 | 36,000 |
| 4,500 |      | 6,000 | 183,000 | 143,000 | 36,000 |
| 4,760 | 3/16 | 6,000 | 183,000 | 143,000 | 36,000 |
| 5,000 |      | 6,000 | 183,000 | 143,000 | 36,000 |
| 5,100 |      | 6,000 | 210,000 | 170,000 | 36,000 |
| 5,500 |      | 6,000 | 210,000 | 170,000 | 36,000 |
| 5,560 | 7/32 | 6,000 | 210,000 | 170,000 | 36,000 |
| 6,000 |      | 6,000 | 210,000 | 170,000 | 36,000 |
| 6,300 |      | 8,000 | 237,000 | 197,000 | 36,000 |
| 6,350 | 1/4  | 8,000 | 237,000 | 197,000 | 36,000 |
| 6,500 |      | 8,000 | 237,000 | 197,000 | 36,000 |
| 7,000 |      | 8,000 | 237,000 | 197,000 | 36,000 |

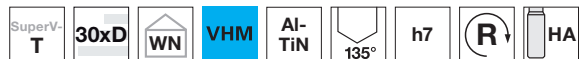
| d1     |      | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     | inch | mm     | mm      | mm      | mm     |
| 7,140  | 9/32 | 8,000  | 263,000 | 223,000 | 36,000 |
| 7,500  |      | 8,000  | 263,000 | 223,000 | 36,000 |
| 8,000  |      | 8,000  | 263,000 | 223,000 | 36,000 |
| 8,500  |      | 10,000 | 294,000 | 250,000 | 40,000 |
| 8,800  |      | 10,000 | 294,000 | 250,000 | 40,000 |
| 9,000  |      | 10,000 | 294,000 | 250,000 | 40,000 |
| 10,000 |      | 10,000 | 321,000 | 277,000 | 40,000 |
| 11,000 |      | 12,000 | 359,000 | 310,000 | 45,000 |
| 12,000 |      | 12,000 | 386,000 | 337,000 | 45,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



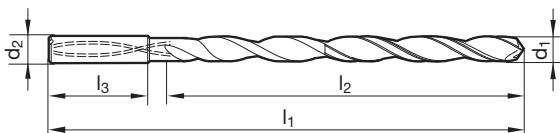
Catalogo n° 51767



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 32

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1    |      | d2    | l1      | l2      | l3     |
|-------|------|-------|---------|---------|--------|
| mm    | inch | mm    | mm      | mm      | mm     |
| 3,000 |      | 6,000 | 140,000 | 100,000 | 36,000 |
| 3,100 |      | 6,000 | 158,000 | 118,000 | 36,000 |
| 3,500 |      | 6,000 | 176,000 | 136,000 | 36,000 |
| 3,800 |      | 6,000 | 176,000 | 136,000 | 36,000 |
| 3,970 | 5/32 | 6,000 | 176,000 | 136,000 | 36,000 |
| 4,000 |      | 6,000 | 176,000 | 136,000 | 36,000 |
| 4,200 |      | 6,000 | 208,000 | 168,000 | 36,000 |
| 4,500 |      | 6,000 | 208,000 | 168,000 | 36,000 |
| 4,760 | 3/16 | 6,000 | 208,000 | 168,000 | 36,000 |
| 5,000 |      | 6,000 | 208,000 | 168,000 | 36,000 |
| 5,100 |      | 6,000 | 240,000 | 200,000 | 36,000 |
| 5,500 |      | 6,000 | 240,000 | 200,000 | 36,000 |
| 5,560 | 7/32 | 6,000 | 240,000 | 200,000 | 36,000 |
| 6,000 |      | 6,000 | 240,000 | 200,000 | 36,000 |
| 6,300 |      | 8,000 | 272,000 | 232,000 | 36,000 |
| 6,350 | 1/4  | 8,000 | 272,000 | 232,000 | 36,000 |
| 6,500 |      | 8,000 | 272,000 | 232,000 | 36,000 |
| 7,000 |      | 8,000 | 272,000 | 232,000 | 36,000 |

| d1     |      | d2     | l1      | l2      | l3     |
|--------|------|--------|---------|---------|--------|
| mm     | inch | mm     | mm      | mm      | mm     |
| 7,140  | 9/32 | 8,000  | 303,000 | 263,000 | 36,000 |
| 7,500  |      | 8,000  | 303,000 | 263,000 | 36,000 |
| 8,000  |      | 8,000  | 303,000 | 263,000 | 36,000 |
| 8,500  |      | 10,000 | 339,000 | 295,000 | 40,000 |
| 8,800  |      | 10,000 | 339,000 | 295,000 | 40,000 |
| 9,000  |      | 10,000 | 339,000 | 295,000 | 40,000 |
| 10,000 |      | 10,000 | 371,000 | 327,000 | 40,000 |

## Punte SuperV

### Punte con refrigerazione interna SuperV



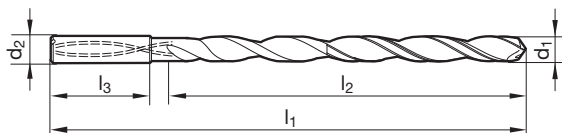
Catalogo n° 51768



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 32

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|------|----------|----------|----------|----------|
| 3,000    |      | 6,000    | 170,000  | 130,000  | 36,000   |
| 3,100    |      | 6,000    | 193,000  | 153,000  | 36,000   |
| 3,170    | 1/8  | 6,000    | 193,000  | 153,000  | 36,000   |
| 3,500    |      | 6,000    | 193,000  | 153,000  | 36,000   |
| 3,800    |      | 6,000    | 216,000  | 176,000  | 36,000   |
| 3,970    | 5/32 | 6,000    | 216,000  | 176,000  | 36,000   |
| 4,000    |      | 6,000    | 216,000  | 176,000  | 36,000   |
| 4,200    |      | 6,000    | 238,000  | 198,000  | 36,000   |
| 4,500    |      | 6,000    | 238,000  | 198,000  | 36,000   |
| 4,760    | 3/16 | 6,000    | 258,000  | 218,000  | 36,000   |
| 5,000    |      | 6,000    | 258,000  | 218,000  | 36,000   |
| 5,100    |      | 6,000    | 280,000  | 240,000  | 36,000   |

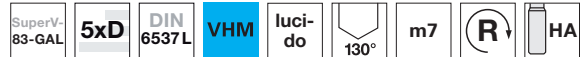
| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|------|----------|----------|----------|----------|
| 5,500    |      | 6,000    | 280,000  | 240,000  | 36,000   |
| 5,560    | 7/32 | 6,000    | 300,000  | 260,000  | 36,000   |
| 6,000    |      | 6,000    | 300,000  | 260,000  | 36,000   |
| 6,300    |      | 8,000    | 322,000  | 282,000  | 36,000   |
| 6,350    | 1/4  | 8,000    | 322,000  | 282,000  | 36,000   |
| 6,500    |      | 8,000    | 322,000  | 282,000  | 36,000   |
| 7,000    |      | 8,000    | 342,000  | 302,000  | 36,000   |
| 7,140    | 9/32 | 8,000    | 363,000  | 323,000  | 36,000   |
| 7,500    |      | 8,000    | 363,000  | 323,000  | 36,000   |
| 8,000    |      | 8,000    | 383,000  | 343,000  | 36,000   |

## Punte SuperV

### Punte SuperV, 3 taglienti



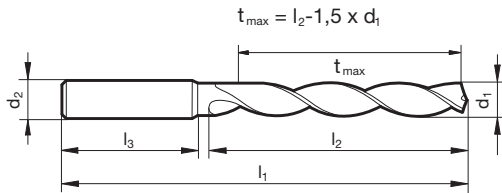
Catalogo n° 71862



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 28

- Assott. del noc.  $\geq \varnothing 3,000$
- affilatura spiropoint
- scanalature larghe
- ottimale centraggio
- utilizzabile per taglio interrotto



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 3,000    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,100    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,200    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,300    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,500    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,700    | 6,000    | 66,000   | 28,000   | 36,000   |
| 3,800    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,000    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,100    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,200    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,500    | 6,000    | 74,000   | 36,000   | 36,000   |
| 4,800    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,000    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,100    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,200    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,300    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,500    | 6,000    | 82,000   | 44,000   | 36,000   |
| 5,800    | 6,000    | 82,000   | 44,000   | 36,000   |
| 6,000    | 6,000    | 82,000   | 44,000   | 36,000   |
| 6,100    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,200    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,400    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,500    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,700    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 6,900    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,100    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,400    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,500    | 8,000    | 91,000   | 53,000   | 36,000   |
| 7,800    | 8,000    | 91,000   | 53,000   | 36,000   |
| 8,000    | 8,000    | 91,000   | 53,000   | 36,000   |
| 8,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,200    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,400    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,500    | 10,000   | 103,000  | 61,000   | 40,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 8,600    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,700    | 10,000   | 103,000  | 61,000   | 40,000   |
| 8,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,000    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,100    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,500    | 10,000   | 103,000  | 61,000   | 40,000   |
| 9,800    | 10,000   | 103,000  | 61,000   | 40,000   |
| 10,000   | 10,000   | 103,000  | 61,000   | 40,000   |
| 10,100   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,200   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,300   | 12,000   | 118,000  | 71,000   | 45,000   |
| 10,500   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,000   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,200   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,500   | 12,000   | 118,000  | 71,000   | 45,000   |
| 11,800   | 12,000   | 118,000  | 71,000   | 45,000   |
| 12,000   | 12,000   | 118,000  | 71,000   | 45,000   |
| 12,100   | 14,000   | 124,000  | 77,000   | 45,000   |
| 12,500   | 14,000   | 124,000  | 77,000   | 45,000   |
| 13,000   | 14,000   | 124,000  | 77,000   | 45,000   |
| 13,500   | 14,000   | 124,000  | 77,000   | 45,000   |
| 14,000   | 14,000   | 124,000  | 77,000   | 45,000   |
| 14,100   | 16,000   | 133,000  | 83,000   | 48,000   |
| 14,500   | 16,000   | 133,000  | 83,000   | 48,000   |
| 15,000   | 16,000   | 133,000  | 83,000   | 48,000   |
| 15,500   | 16,000   | 133,000  | 83,000   | 48,000   |
| 16,000   | 16,000   | 133,000  | 83,000   | 48,000   |
| 16,500   | 18,000   | 143,000  | 93,000   | 48,000   |
| 17,000   | 18,000   | 143,000  | 93,000   | 48,000   |
| 17,500   | 18,000   | 143,000  | 93,000   | 48,000   |
| 18,000   | 18,000   | 143,000  | 93,000   | 48,000   |
| 18,500   | 20,000   | 153,000  | 101,000  | 50,000   |
| 19,000   | 20,000   | 153,000  | 101,000  | 50,000   |
| 19,500   | 20,000   | 153,000  | 101,000  | 50,000   |
| 20,000   | 20,000   | 153,000  | 101,000  | 50,000   |



## Punte SuperV

### Micropunte ad alto rendimento in MD SuperV-NX senza fori interni



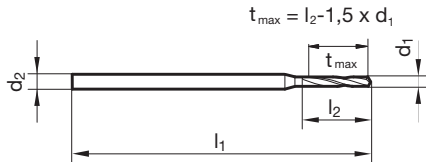
Catalogo n° 71998



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 34

- Assott. del noc.  $\geq \varnothing 0,500$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti



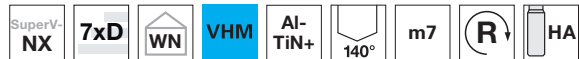
| d1    | inch | d2    | l1     | l2     | d1    | inch | d2    | l1     | l2     |
|-------|------|-------|--------|--------|-------|------|-------|--------|--------|
| mm    |      | mm    | mm     | mm     | mm    |      | mm    | mm     | mm     |
| 0,500 |      | 3,000 | 47,000 | 3,000  | 1,950 |      | 3,000 | 52,000 | 11,700 |
| 0,550 |      | 3,000 | 47,000 | 3,300  | 1,980 | 5/64 | 4,000 | 59,000 | 12,000 |
| 0,600 |      | 3,000 | 47,000 | 3,600  | 2,000 |      | 4,000 | 59,000 | 12,000 |
| 0,650 |      | 3,000 | 47,000 | 3,900  | 2,050 |      | 4,000 | 59,000 | 12,300 |
| 0,700 |      | 3,000 | 47,000 | 4,200  | 2,100 |      | 4,000 | 59,000 | 12,600 |
| 0,750 |      | 3,000 | 47,000 | 4,500  | 2,150 |      | 4,000 | 59,000 | 12,900 |
| 0,800 |      | 3,000 | 47,000 | 4,800  | 2,200 |      | 4,000 | 59,000 | 13,200 |
| 0,850 |      | 3,000 | 47,000 | 5,100  | 2,250 |      | 4,000 | 59,000 | 13,500 |
| 0,900 |      | 3,000 | 47,000 | 5,400  | 2,300 |      | 4,000 | 59,000 | 13,800 |
| 0,950 |      | 3,000 | 47,000 | 5,700  | 2,350 |      | 4,000 | 59,000 | 14,100 |
| 1,000 |      | 3,000 | 47,000 | 6,000  | 2,380 | 3/32 | 4,000 | 59,000 | 14,400 |
| 1,050 |      | 3,000 | 47,000 | 6,300  | 2,400 |      | 4,000 | 59,000 | 14,400 |
| 1,100 |      | 3,000 | 47,000 | 6,600  | 2,450 |      | 4,000 | 59,000 | 14,700 |
| 1,150 |      | 3,000 | 47,000 | 6,900  | 2,500 |      | 4,000 | 59,000 | 15,000 |
| 1,200 |      | 3,000 | 47,000 | 7,200  | 2,550 |      | 4,000 | 59,000 | 15,300 |
| 1,250 |      | 3,000 | 47,000 | 7,500  | 2,600 |      | 4,000 | 59,000 | 15,600 |
| 1,300 |      | 3,000 | 47,000 | 7,800  | 2,650 |      | 4,000 | 59,000 | 15,900 |
| 1,350 |      | 3,000 | 47,000 | 8,100  | 2,700 |      | 4,000 | 59,000 | 16,200 |
| 1,400 |      | 3,000 | 47,000 | 8,400  | 2,750 |      | 4,000 | 59,000 | 16,500 |
| 1,450 |      | 3,000 | 47,000 | 8,700  | 2,780 | 7/64 | 4,000 | 59,000 | 16,800 |
| 1,500 |      | 3,000 | 47,000 | 9,000  | 2,800 |      | 4,000 | 59,000 | 16,800 |
| 1,550 |      | 3,000 | 47,000 | 9,300  | 2,850 |      | 4,000 | 59,000 | 17,100 |
| 1,590 | 1/16 | 3,000 | 47,000 | 9,600  | 2,900 |      | 4,000 | 59,000 | 17,400 |
| 1,600 |      | 3,000 | 47,000 | 9,600  | 2,950 |      | 4,000 | 59,000 | 17,700 |
| 1,650 |      | 3,000 | 47,000 | 9,900  | 3,000 |      | 4,000 | 59,000 | 18,000 |
| 1,700 |      | 3,000 | 47,000 | 10,200 |       |      |       |        |        |
| 1,750 |      | 3,000 | 47,000 | 10,500 |       |      |       |        |        |
| 1,800 |      | 3,000 | 52,000 | 10,800 |       |      |       |        |        |
| 1,850 |      | 3,000 | 52,000 | 11,100 |       |      |       |        |        |
| 1,900 |      | 3,000 | 52,000 | 11,400 |       |      |       |        |        |

## Punte SuperV

### Micropunte ad alto rendimento in MD SuperV-NX senza fori interni



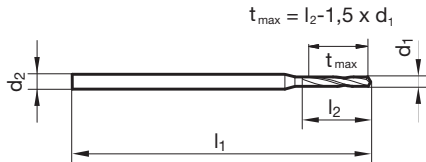
Catalogo n° 71999



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 34

- Assott. del noc.  $\geq \varnothing 0,500$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti



| d1    | inch | d2    | l1     | l2     | d1    | inch | d2    | l1     | l2     |
|-------|------|-------|--------|--------|-------|------|-------|--------|--------|
| mm    |      | mm    | mm     | mm     | mm    |      | mm    | mm     | mm     |
| 0,500 |      | 3,000 | 47,000 | 4,000  | 1,950 |      | 3,000 | 52,000 | 17,600 |
| 0,550 |      | 3,000 | 47,000 | 4,400  | 1,980 | 5/64 | 4,000 | 63,000 | 18,000 |
| 0,600 |      | 3,000 | 47,000 | 4,800  | 2,000 |      | 4,000 | 63,000 | 18,000 |
| 0,650 |      | 3,000 | 47,000 | 5,200  | 2,050 |      | 4,000 | 63,000 | 18,500 |
| 0,700 |      | 3,000 | 47,000 | 5,600  | 2,100 |      | 4,000 | 63,000 | 18,900 |
| 0,750 |      | 3,000 | 47,000 | 6,000  | 2,150 |      | 4,000 | 63,000 | 19,400 |
| 0,800 |      | 3,000 | 47,000 | 6,400  | 2,200 |      | 4,000 | 63,000 | 19,800 |
| 0,850 |      | 3,000 | 47,000 | 6,800  | 2,250 |      | 4,000 | 63,000 | 20,300 |
| 0,900 |      | 3,000 | 47,000 | 7,200  | 2,300 |      | 4,000 | 63,000 | 20,700 |
| 0,950 |      | 3,000 | 47,000 | 7,600  | 2,350 |      | 4,000 | 63,000 | 21,200 |
| 1,000 |      | 3,000 | 47,000 | 8,000  | 2,380 | 3/32 | 4,000 | 63,000 | 21,600 |
| 1,050 |      | 3,000 | 47,000 | 8,400  | 2,400 |      | 4,000 | 63,000 | 21,600 |
| 1,100 |      | 3,000 | 47,000 | 8,800  | 2,450 |      | 4,000 | 63,000 | 22,100 |
| 1,150 |      | 3,000 | 47,000 | 9,200  | 2,500 |      | 4,000 | 63,000 | 22,500 |
| 1,200 |      | 3,000 | 52,000 | 10,800 | 2,550 |      | 4,000 | 63,000 | 23,000 |
| 1,250 |      | 3,000 | 52,000 | 11,300 | 2,600 |      | 4,000 | 67,000 | 23,400 |
| 1,300 |      | 3,000 | 52,000 | 11,700 | 2,650 |      | 4,000 | 67,000 | 23,900 |
| 1,350 |      | 3,000 | 52,000 | 12,200 | 2,700 |      | 4,000 | 67,000 | 24,300 |
| 1,400 |      | 3,000 | 52,000 | 12,600 | 2,750 |      | 4,000 | 67,000 | 24,800 |
| 1,450 |      | 3,000 | 52,000 | 13,100 | 2,780 | 7/64 | 4,000 | 67,000 | 25,200 |
| 1,500 |      | 3,000 | 52,000 | 13,500 | 2,800 |      | 4,000 | 67,000 | 25,200 |
| 1,550 |      | 3,000 | 52,000 | 14,000 | 2,850 |      | 4,000 | 67,000 | 25,700 |
| 1,590 | 1/16 | 3,000 | 52,000 | 14,400 | 2,900 |      | 4,000 | 67,000 | 26,100 |
| 1,600 |      | 3,000 | 52,000 | 14,400 | 2,950 |      | 4,000 | 67,000 | 26,600 |
| 1,650 |      | 3,000 | 52,000 | 14,900 | 3,000 |      | 4,000 | 67,000 | 27,000 |
| 1,700 |      | 3,000 | 52,000 | 15,300 |       |      |       |        |        |
| 1,750 |      | 3,000 | 52,000 | 15,800 |       |      |       |        |        |
| 1,800 |      | 3,000 | 52,000 | 16,200 |       |      |       |        |        |
| 1,850 |      | 3,000 | 52,000 | 16,700 |       |      |       |        |        |
| 1,900 |      | 3,000 | 52,000 | 17,100 |       |      |       |        |        |

## Punte SuperV

### Micropunte ad alto rendimento in MD SuperV-NX con fori interni



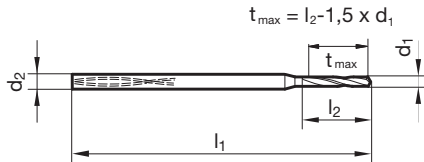
Catalogo n° 51997



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 34

- Assott. del noc.  $\geq \varnothing 1,400$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|
| 1,400    |      | 4,000    | 52,000   | 11,000   |
| 1,450    |      | 4,000    | 52,000   | 12,000   |
| 1,500    |      | 4,000    | 52,000   | 12,000   |
| 1,550    |      | 4,000    | 52,000   | 12,000   |
| 1,590    | 1/16 | 4,000    | 52,000   | 13,000   |
| 1,600    |      | 4,000    | 52,000   | 13,000   |
| 1,650    |      | 4,000    | 52,000   | 13,000   |
| 1,700    |      | 4,000    | 56,000   | 14,000   |
| 1,750    |      | 4,000    | 56,000   | 14,000   |
| 1,800    |      | 4,000    | 56,000   | 14,000   |
| 1,850    |      | 4,000    | 56,000   | 15,000   |
| 1,900    |      | 4,000    | 56,000   | 15,000   |
| 1,950    |      | 4,000    | 56,000   | 16,000   |
| 1,980    | 5/64 | 4,000    | 56,000   | 16,000   |
| 2,000    |      | 4,000    | 56,000   | 16,000   |
| 2,050    |      | 4,000    | 56,000   | 16,000   |
| 2,100    |      | 4,000    | 62,000   | 17,000   |
| 2,150    |      | 4,000    | 62,000   | 17,000   |
| 2,200    |      | 4,000    | 62,000   | 18,000   |
| 2,250    |      | 4,000    | 62,000   | 18,000   |
| 2,300    |      | 4,000    | 62,000   | 18,000   |
| 2,350    |      | 4,000    | 62,000   | 19,000   |
| 2,380    | 3/32 | 4,000    | 62,000   | 19,000   |
| 2,400    |      | 4,000    | 62,000   | 19,000   |

| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|
| 2,450    |      | 4,000    | 62,000   | 20,000   |
| 2,500    |      | 4,000    | 62,000   | 20,000   |
| 2,550    |      | 4,000    | 62,000   | 20,000   |
| 2,600    |      | 4,000    | 66,000   | 21,000   |
| 2,650    |      | 4,000    | 66,000   | 21,000   |
| 2,700    |      | 4,000    | 66,000   | 22,000   |
| 2,750    |      | 4,000    | 66,000   | 22,000   |
| 2,780    | 7/64 | 4,000    | 66,000   | 22,000   |
| 2,800    |      | 4,000    | 66,000   | 22,000   |
| 2,850    |      | 4,000    | 66,000   | 23,000   |
| 2,900    |      | 4,000    | 66,000   | 23,000   |
| 2,950    |      | 4,000    | 66,000   | 24,000   |
| 3,000    |      | 4,000    | 66,000   | 24,000   |

## Punte SuperV

### Micropunte ad alto rendimento in MD SuperV-NX con fori interni



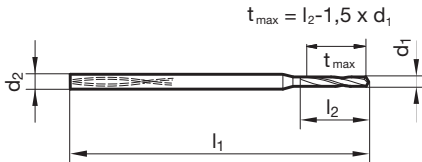
Catalogo n° 51998



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 34

- Assott. del noc.  $\geq \varnothing 1,400$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|
| 1,400    |      | 4,000    | 52,000   | 15,000   |
| 1,450    |      | 4,000    | 52,000   | 16,000   |
| 1,500    |      | 4,000    | 52,000   | 17,000   |
| 1,550    |      | 4,000    | 52,000   | 17,000   |
| 1,590    | 1/16 | 4,000    | 52,000   | 18,000   |
| 1,600    |      | 4,000    | 52,000   | 18,000   |
| 1,650    |      | 4,000    | 52,000   | 18,000   |
| 1,700    |      | 4,000    | 56,000   | 19,000   |
| 1,750    |      | 4,000    | 56,000   | 19,000   |
| 1,800    |      | 4,000    | 56,000   | 20,000   |
| 1,850    |      | 4,000    | 56,000   | 20,000   |
| 1,900    |      | 4,000    | 56,000   | 21,000   |
| 1,950    |      | 4,000    | 56,000   | 21,000   |
| 1,980    | 5/64 | 4,000    | 56,000   | 22,000   |
| 2,000    |      | 4,000    | 56,000   | 22,000   |
| 2,050    |      | 4,000    | 56,000   | 23,000   |
| 2,100    |      | 4,000    | 62,000   | 23,000   |
| 2,150    |      | 4,000    | 62,000   | 24,000   |
| 2,200    |      | 4,000    | 62,000   | 24,000   |
| 2,250    |      | 4,000    | 62,000   | 25,000   |
| 2,300    |      | 4,000    | 62,000   | 25,000   |
| 2,350    |      | 4,000    | 62,000   | 26,000   |
| 2,380    | 3/32 | 4,000    | 62,000   | 26,000   |
| 2,400    |      | 4,000    | 62,000   | 26,000   |

| d1<br>mm | inch | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|
| 2,450    |      | 4,000    | 62,000   | 27,000   |
| 2,500    |      | 4,000    | 62,000   | 28,000   |
| 2,550    |      | 4,000    | 62,000   | 28,000   |
| 2,600    |      | 4,000    | 66,000   | 29,000   |
| 2,650    |      | 4,000    | 66,000   | 29,000   |
| 2,700    |      | 4,000    | 66,000   | 30,000   |
| 2,750    |      | 4,000    | 66,000   | 30,000   |
| 2,780    | 7/64 | 4,000    | 66,000   | 31,000   |
| 2,800    |      | 4,000    | 66,000   | 31,000   |
| 2,850    |      | 4,000    | 66,000   | 31,000   |
| 2,900    |      | 4,000    | 66,000   | 32,000   |
| 2,950    |      | 4,000    | 66,000   | 32,000   |
| 3,000    |      | 4,000    | 66,000   | 33,000   |

## Punte SuperV

### Micropunte ad alto rendimento in MD SuperV-NX con fori interni



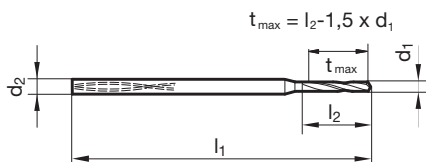
Catalogo n° 51999



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 34

- Assott. del nocc.  $\geq \varnothing 1,400$
- affilatura su piani
- rivestimento in testa
- forma del tagliente principale diritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



| d1    |      | d2    | l1     | l2     |
|-------|------|-------|--------|--------|
| mm    | inch | mm    | mm     | mm     |
| 1,400 |      | 4,000 | 62,000 | 25,000 |
| 1,500 |      | 4,000 | 62,000 | 27,000 |
| 1,590 | 1/16 | 4,000 | 62,000 | 29,000 |
| 1,600 |      | 4,000 | 62,000 | 29,000 |
| 1,700 |      | 4,000 | 70,000 | 31,000 |
| 1,800 |      | 4,000 | 70,000 | 32,000 |
| 1,900 |      | 4,000 | 70,000 | 34,000 |
| 1,980 | 5/64 | 4,000 | 70,000 | 36,000 |
| 2,000 |      | 4,000 | 70,000 | 36,000 |
| 2,100 |      | 4,000 | 78,000 | 38,000 |
| 2,200 |      | 4,000 | 78,000 | 40,000 |
| 2,300 |      | 4,000 | 78,000 | 42,000 |

| d1    |      | d2    | l1     | l2     |
|-------|------|-------|--------|--------|
| mm    | inch | mm    | mm     | mm     |
| 2,380 | 3/32 | 4,000 | 78,000 | 44,000 |
| 2,400 |      | 4,000 | 78,000 | 44,000 |
| 2,500 |      | 4,000 | 78,000 | 45,000 |
| 2,600 |      | 4,000 | 87,000 | 47,000 |
| 2,700 |      | 4,000 | 87,000 | 48,000 |
| 2,780 | 7/64 | 4,000 | 87,000 | 50,000 |
| 2,800 |      | 4,000 | 87,000 | 50,000 |
| 2,900 |      | 4,000 | 87,000 | 52,000 |
| 3,000 |      | 4,000 | 87,000 | 54,000 |

## Punte SuperV

### Micropunte universale SuperV-M VHM



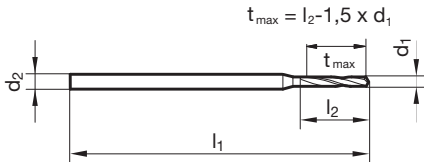
Catalogo n° 51720



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   |   |   |

Parametri di lav.  
ind. a pag. 34

- Assott. del noc.  $\geq \varnothing 0,800$
- affilatura su piani
- forma del tagliente principale dritta



| d1    | inch | d2    | l1     | l2     | d1    | inch | d2    | l1     | l2     |
|-------|------|-------|--------|--------|-------|------|-------|--------|--------|
| mm    |      | mm    | mm     | mm     | mm    |      | mm    | mm     | mm     |
| 0,100 |      | 3,000 | 38,000 | 1,200  | 1,400 |      | 3,000 | 38,000 | 10,000 |
| 0,150 |      | 3,000 | 38,000 | 2,000  | 1,450 |      | 3,000 | 38,000 | 10,000 |
| 0,200 |      | 3,000 | 38,000 | 2,500  | 1,500 |      | 3,000 | 38,000 | 10,000 |
| 0,250 |      | 3,000 | 38,000 | 3,000  | 1,510 |      | 3,000 | 38,000 | 10,000 |
| 0,300 |      | 3,000 | 38,000 | 5,000  | 1,520 |      | 3,000 | 38,000 | 10,000 |
| 0,310 |      | 3,000 | 38,000 | 5,000  | 1,550 |      | 3,000 | 38,000 | 10,000 |
| 0,350 |      | 3,000 | 38,000 | 6,000  | 1,600 |      | 3,000 | 38,000 | 12,000 |
| 0,370 |      | 3,000 | 38,000 | 6,000  | 1,650 |      | 3,000 | 38,000 | 12,000 |
| 0,400 |      | 3,000 | 38,000 | 7,000  | 1,700 |      | 3,000 | 38,000 | 12,000 |
| 0,450 |      | 3,000 | 38,000 | 7,000  | 1,800 |      | 3,000 | 38,000 | 12,000 |
| 0,500 |      | 3,000 | 38,000 | 7,000  | 1,810 |      | 3,000 | 38,000 | 12,000 |
| 0,550 |      | 3,000 | 38,000 | 7,000  | 1,830 |      | 3,000 | 38,000 | 12,000 |
| 0,600 |      | 3,000 | 38,000 | 7,000  | 1,850 |      | 3,000 | 38,000 | 12,000 |
| 0,640 |      | 3,000 | 38,000 | 7,000  | 1,900 |      | 3,000 | 38,000 | 12,000 |
| 0,650 |      | 3,000 | 38,000 | 7,000  | 1,920 |      | 3,000 | 38,000 | 12,000 |
| 0,700 |      | 3,000 | 38,000 | 8,000  | 1,950 |      | 3,000 | 38,000 | 12,000 |
| 0,710 |      | 3,000 | 38,000 | 8,000  | 1,980 | 5/64 | 3,000 | 38,000 | 12,000 |
| 0,720 |      | 3,000 | 38,000 | 8,000  | 2,000 |      | 3,000 | 38,000 | 12,000 |
| 0,740 |      | 3,000 | 38,000 | 8,000  | 2,100 |      | 3,000 | 38,000 | 12,000 |
| 0,750 |      | 3,000 | 38,000 | 8,000  | 2,400 |      | 3,000 | 38,000 | 12,000 |
| 0,790 | 1/32 | 3,000 | 38,000 | 8,000  | 2,500 |      | 3,000 | 38,000 | 12,000 |
| 0,800 |      | 3,000 | 38,000 | 10,000 | 2,600 |      | 3,000 | 38,000 | 12,000 |
| 0,810 |      | 3,000 | 38,000 | 10,000 | 2,750 |      | 3,000 | 38,000 | 12,000 |
| 0,820 |      | 3,000 | 38,000 | 10,000 | 2,950 |      | 3,000 | 38,000 | 12,000 |
| 0,840 |      | 3,000 | 38,000 | 10,000 | 3,000 |      | 3,000 | 38,000 | 12,000 |
| 0,900 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,910 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,920 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,930 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,940 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,950 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 0,990 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 1,000 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 1,100 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 1,150 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |
| 1,200 |      | 3,000 | 38,000 | 10,000 |       |      |       |        |        |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP mini

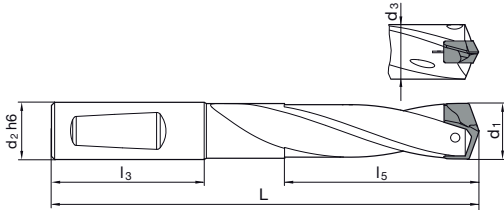


Catalogo n° 77007



Parametri di lav. ind. a pag. 36

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2 h6<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|-------------|----------|---------|----------|----------|-----------|
| 11,00-11,49 | <b>11,000</b> | 12,000      | 10,700   | 84,000  | 45,000   | 19,300   | 110       |
| 11,50-11,99 | <b>11,500</b> | 12,000      | 11,200   | 85,000  | 45,000   | 20,100   | 115       |
| 12,00-12,49 | <b>12,000</b> | 12,000      | 11,700   | 87,000  | 45,000   | 21,000   | 120       |
| 12,50-12,99 | <b>12,500</b> | 14,000      | 12,200   | 89,000  | 45,000   | 21,900   | 125       |
| 13,00-13,49 | <b>13,000</b> | 14,000      | 12,700   | 90,000  | 45,000   | 22,600   | 130       |
| 13,50-13,99 | <b>13,500</b> | 14,000      | 13,200   | 92,000  | 45,000   | 23,600   | 135       |
| 14,00-14,49 | <b>14,000</b> | 14,000      | 13,700   | 93,000  | 45,000   | 24,500   | 140       |
| 14,50-14,99 | <b>14,500</b> | 16,000      | 14,200   | 98,000  | 48,000   | 25,300   | 145       |
| 15,00-15,49 | <b>15,000</b> | 16,000      | 14,700   | 100,000 | 48,000   | 26,100   | 150       |
| 15,50-15,99 | <b>15,500</b> | 16,000      | 15,200   | 101,000 | 48,000   | 27,000   | 155       |
| 16,00-16,49 | <b>16,000</b> | 16,000      | 15,700   | 102,000 | 48,000   | 27,800   | 160       |
| 16,50-16,99 | <b>16,500</b> | 18,000      | 16,200   | 105,000 | 48,000   | 28,700   | 165       |
| 17,00-17,49 | <b>17,000</b> | 18,000      | 16,700   | 106,000 | 48,000   | 29,600   | 170       |
| 17,50-17,99 | <b>17,500</b> | 18,000      | 17,200   | 107,000 | 48,000   | 30,400   | 175       |
| 18,00-18,49 | <b>18,000</b> | 18,000      | 17,700   | 109,000 | 48,000   | 31,200   | 180       |
| 18,50-18,99 | <b>18,500</b> | 20,000      | 18,200   | 113,000 | 50,000   | 32,100   | 185       |
| 19,00-19,49 | <b>19,000</b> | 20,000      | 18,700   | 114,000 | 50,000   | 32,900   | 190       |
| 19,50-19,99 | <b>19,500</b> | 20,000      | 19,200   | 116,000 | 50,000   | 33,700   | 195       |
| 20,00-20,49 | <b>20,000</b> | 20,000      | 19,700   | 117,000 | 50,000   | 34,600   | 200       |
| 20,50-20,99 | <b>20,500</b> | 25,000      | 20,200   | 128,000 | 56,000   | 35,500   | 205       |
| 21,00-21,49 | <b>21,000</b> | 25,000      | 20,700   | 129,000 | 56,000   | 36,400   | 210       |
| 21,50-21,99 | <b>21,500</b> | 25,000      | 21,200   | 130,000 | 56,000   | 37,200   | 215       |
| 22,00-22,49 | <b>22,000</b> | 25,000      | 21,700   | 131,000 | 56,000   | 38,000   | 220       |
| 22,50-22,99 | <b>22,500</b> | 25,000      | 22,200   | 134,000 | 56,000   | 38,900   | 225       |
| 23,00-23,49 | <b>23,000</b> | 25,000      | 22,700   | 135,000 | 56,000   | 39,800   | 230       |
| 23,50-23,99 | <b>23,500</b> | 25,000      | 23,200   | 137,000 | 56,000   | 40,600   | 235       |
| 24,00-24,49 | <b>24,000</b> | 25,000      | 23,700   | 138,000 | 56,000   | 41,500   | 240       |
| 24,50-24,99 | <b>24,500</b> | 25,000      | 24,200   | 140,000 | 56,000   | 42,300   | 245       |
| 25,00-25,49 | <b>25,000</b> | 25,000      | 24,700   | 142,000 | 56,000   | 43,200   | 250       |
| 25,50-25,99 | <b>25,500</b> | 32,000      | 25,200   | 148,000 | 60,000   | 44,000   | 255       |
| 26,00-26,49 | <b>26,000</b> | 32,000      | 25,700   | 151,000 | 60,000   | 44,300   | 260       |
| 26,50-26,99 | <b>26,500</b> | 32,000      | 26,200   | 153,000 | 60,000   | 45,100   | 265       |
| 27,00-27,49 | <b>27,000</b> | 32,000      | 26,700   | 155,000 | 60,000   | 46,000   | 270       |
| 27,50-27,99 | <b>27,500</b> | 32,000      | 27,200   | 156,000 | 60,000   | 46,800   | 275       |
| 28,00-28,49 | <b>28,000</b> | 32,000      | 27,700   | 157,000 | 60,000   | 47,700   | 280       |
| 28,50-28,99 | <b>28,500</b> | 32,000      | 28,200   | 159,000 | 60,000   | 48,500   | 285       |
| 29,00-29,49 | <b>29,000</b> | 32,000      | 28,700   | 161,000 | 60,000   | 49,400   | 290       |
| 29,50-29,99 | <b>29,500</b> | 32,000      | 29,200   | 162,000 | 60,000   | 50,200   | 295       |
| 30,00-30,49 | <b>30,000</b> | 32,000      | 29,700   | 164,000 | 60,000   | 50,900   | 300       |
| 30,50-30,99 | <b>30,500</b> | 32,000      | 30,200   | 166,000 | 60,000   | 51,700   | 305       |
| 31,00-31,49 | <b>31,000</b> | 32,000      | 30,700   | 167,000 | 60,000   | 52,600   | 310       |
| 31,50-31,99 | <b>31,500</b> | 32,000      | 31,200   | 168,000 | 60,000   | 53,400   | 315       |
| 32,00-32,99 | <b>32,000</b> | 32,000      | 31,700   | 172,000 | 60,000   | 55,100   | 320       |
| 33,00-33,99 | <b>33,000</b> | 32,000      | 32,700   | 175,000 | 60,000   | 56,800   | 330       |
| 34,00-34,99 | <b>34,000</b> | 32,000      | 33,700   | 178,000 | 60,000   | 58,500   | 340       |
| 35,00-35,99 | <b>35,000</b> | 32,000      | 34,700   | 181,000 | 60,000   | 60,200   | 350       |
| 36,00-36,99 | <b>36,000</b> | 32,000      | 35,700   | 184,000 | 60,000   | 61,800   | 360       |
| 37,00-37,99 | <b>37,000</b> | 32,000      | 36,700   | 188,000 | 60,000   | 63,500   | 370       |
| 38,00-38,99 | <b>38,000</b> | 32,000      | 37,700   | 191,000 | 60,000   | 65,200   | 380       |
| 39,00-40,00 | <b>39,000</b> | 32,000      | 38,700   | 194,000 | 60,000   | 66,900   | 390       |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP mini

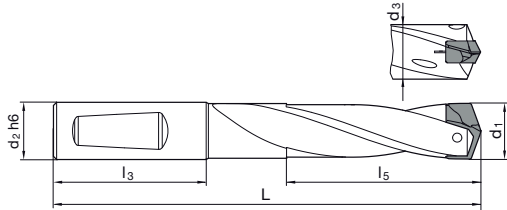


Catalogo n° 77000



Parametri di lav. ind. a pag. 38

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2 h6<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|-------------|----------|---------|----------|----------|-----------|
| 11,00-11,49 | <b>11,000</b> | 12,000      | 10,700   | 101,000 | 45,000   | 36,600   | 110       |
| 11,50-11,99 | <b>11,500</b> | 12,000      | 11,200   | 103,000 | 45,000   | 38,100   | 115       |
| 12,00-12,49 | <b>12,000</b> | 12,000      | 11,700   | 106,000 | 45,000   | 39,700   | 120       |
| 12,50-12,99 | <b>12,500</b> | 14,000      | 12,200   | 108,000 | 45,000   | 41,300   | 125       |
| 13,00-13,49 | <b>13,000</b> | 14,000      | 12,700   | 110,000 | 45,000   | 42,900   | 130       |
| 13,50-13,99 | <b>13,500</b> | 14,000      | 13,200   | 113,000 | 45,000   | 44,600   | 135       |
| 14,00-14,49 | <b>14,000</b> | 14,000      | 13,700   | 115,000 | 45,000   | 46,200   | 140       |
| 14,50-14,99 | <b>14,500</b> | 16,000      | 14,200   | 120,000 | 48,000   | 47,800   | 145       |
| 15,00-15,49 | <b>15,000</b> | 16,000      | 14,700   | 123,000 | 48,000   | 49,300   | 150       |
| 15,50-15,99 | <b>15,500</b> | 16,000      | 15,200   | 125,000 | 48,000   | 50,900   | 155       |
| 16,00-16,49 | <b>16,000</b> | 16,000      | 15,700   | 127,000 | 48,000   | 52,900   | 160       |
| 16,50-16,99 | <b>16,500</b> | 18,000      | 16,200   | 130,000 | 48,000   | 54,100   | 165       |
| 17,00-17,49 | <b>17,000</b> | 18,000      | 16,700   | 132,000 | 48,000   | 55,800   | 170       |
| 17,50-17,99 | <b>17,500</b> | 18,000      | 17,200   | 134,000 | 48,000   | 57,400   | 175       |
| 18,00-18,49 | <b>18,000</b> | 18,000      | 17,700   | 137,000 | 48,000   | 58,900   | 180       |
| 18,50-18,99 | <b>18,500</b> | 20,000      | 18,200   | 141,000 | 50,000   | 60,500   | 185       |
| 19,00-19,49 | <b>19,000</b> | 20,000      | 18,700   | 143,000 | 50,000   | 62,100   | 190       |
| 19,50-19,99 | <b>19,500</b> | 20,000      | 19,200   | 146,000 | 50,000   | 63,700   | 195       |
| 20,00-20,49 | <b>20,000</b> | 20,000      | 19,700   | 148,000 | 50,000   | 65,300   | 200       |
| 20,50-20,99 | <b>20,500</b> | 25,000      | 20,200   | 159,000 | 56,000   | 67,000   | 205       |
| 21,00-21,49 | <b>21,000</b> | 25,000      | 20,700   | 161,000 | 56,000   | 68,600   | 210       |
| 21,50-21,99 | <b>21,500</b> | 25,000      | 21,200   | 163,000 | 56,000   | 70,100   | 215       |
| 22,00-22,49 | <b>22,000</b> | 25,000      | 21,700   | 165,000 | 56,000   | 71,700   | 220       |
| 22,50-22,99 | <b>22,500</b> | 25,000      | 22,200   | 168,000 | 56,000   | 73,300   | 225       |
| 23,00-23,49 | <b>23,000</b> | 25,000      | 22,700   | 170,000 | 56,000   | 74,900   | 230       |
| 23,50-23,99 | <b>23,500</b> | 25,000      | 23,200   | 173,000 | 56,000   | 76,500   | 235       |
| 24,00-24,49 | <b>24,000</b> | 25,000      | 23,700   | 175,000 | 56,000   | 78,100   | 240       |
| 24,50-24,99 | <b>24,500</b> | 25,000      | 24,200   | 177,000 | 56,000   | 79,700   | 245       |
| 25,00-25,49 | <b>25,000</b> | 25,000      | 24,700   | 180,000 | 56,000   | 81,300   | 250       |
| 25,50-25,99 | <b>25,500</b> | 32,000      | 25,200   | 187,000 | 60,000   | 82,900   | 255       |
| 26,00-26,49 | <b>26,000</b> | 32,000      | 25,700   | 191,000 | 60,000   | 84,000   | 260       |
| 26,50-26,99 | <b>26,500</b> | 32,000      | 26,200   | 193,000 | 60,000   | 86,100   | 265       |
| 27,00-27,49 | <b>27,000</b> | 32,000      | 26,700   | 196,000 | 60,000   | 87,200   | 270       |
| 27,50-27,99 | <b>27,500</b> | 32,000      | 27,200   | 198,000 | 60,000   | 88,900   | 275       |
| 28,00-28,49 | <b>28,000</b> | 32,000      | 27,700   | 200,000 | 60,000   | 90,400   | 280       |
| 28,50-28,99 | <b>28,500</b> | 32,000      | 28,200   | 202,000 | 60,000   | 92,500   | 285       |
| 29,00-29,49 | <b>29,000</b> | 32,000      | 28,700   | 205,000 | 60,000   | 94,600   | 290       |
| 29,50-29,99 | <b>29,500</b> | 32,000      | 29,200   | 207,000 | 60,000   | 95,100   | 295       |
| 30,00-30,49 | <b>30,000</b> | 32,000      | 29,700   | 210,000 | 60,000   | 96,700   | 300       |
| 30,50-30,99 | <b>30,500</b> | 32,000      | 30,200   | 212,000 | 60,000   | 98,300   | 305       |
| 31,00-31,49 | <b>31,000</b> | 32,000      | 30,700   | 214,000 | 60,000   | 99,800   | 310       |
| 31,50-31,99 | <b>31,500</b> | 32,000      | 31,200   | 216,000 | 60,000   | 101,400  | 315       |
| 32,00-32,99 | <b>32,000</b> | 32,000      | 31,700   | 221,000 | 60,000   | 104,600  | 320       |
| 33,00-33,99 | <b>33,000</b> | 32,000      | 32,700   | 226,000 | 60,000   | 107,800  | 330       |
| 34,00-34,99 | <b>34,000</b> | 32,000      | 33,700   | 230,000 | 60,000   | 111,000  | 340       |
| 35,00-35,99 | <b>35,000</b> | 32,000      | 34,700   | 235,000 | 60,000   | 114,200  | 350       |
| 36,00-36,99 | <b>36,000</b> | 32,000      | 35,700   | 240,000 | 60,000   | 117,300  | 360       |
| 37,00-37,99 | <b>37,000</b> | 32,000      | 36,700   | 245,000 | 60,000   | 120,500  | 370       |
| 38,00-38,99 | <b>38,000</b> | 32,000      | 37,700   | 249,000 | 60,000   | 123,700  | 380       |
| 39,00-40,00 | <b>39,000</b> | 32,000      | 38,700   | 254,000 | 60,000   | 126,900  | 390       |



## Sistema di foratura SuperV

### Porta utensili SuperV-AP mini

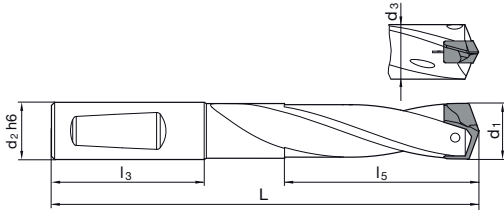


Catalogo n° 77001



Parametri di lav. ind. a pag. 40

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2 h6<br>mm | d3<br>mm | L<br>mm | I3<br>mm | I5<br>mm | Grandezza |
|-------------|---------------|-------------|----------|---------|----------|----------|-----------|
| 11,00-11,49 | <b>11,000</b> | 12,000      | 10,700   | 124,000 | 45,000   | 59,600   | 110       |
| 11,50-11,99 | <b>11,500</b> | 12,000      | 11,200   | 127,000 | 45,000   | 62,100   | 115       |
| 12,00-12,49 | <b>12,000</b> | 12,000      | 11,700   | 131,000 | 45,000   | 64,700   | 120       |
| 12,50-12,99 | <b>12,500</b> | 14,000      | 12,200   | 134,000 | 45,000   | 67,300   | 125       |
| 13,00-13,49 | <b>13,000</b> | 14,000      | 12,700   | 137,000 | 45,000   | 69,900   | 130       |
| 13,50-13,99 | <b>13,500</b> | 14,000      | 13,200   | 141,000 | 45,000   | 72,600   | 135       |
| 14,00-14,49 | <b>14,000</b> | 14,000      | 13,700   | 144,000 | 45,000   | 75,200   | 140       |
| 14,50-14,99 | <b>14,500</b> | 16,000      | 14,200   | 150,000 | 48,000   | 77,800   | 145       |
| 15,00-15,49 | <b>15,000</b> | 16,000      | 14,700   | 154,000 | 48,000   | 80,300   | 150       |
| 15,50-15,99 | <b>15,500</b> | 16,000      | 15,200   | 157,000 | 48,000   | 82,900   | 155       |
| 16,00-16,49 | <b>16,000</b> | 16,000      | 15,700   | 160,000 | 48,000   | 85,900   | 160       |
| 16,50-16,99 | <b>16,500</b> | 18,000      | 16,200   | 164,000 | 48,000   | 88,100   | 165       |
| 17,00-17,49 | <b>17,000</b> | 18,000      | 16,700   | 167,000 | 48,000   | 90,800   | 170       |
| 17,50-17,99 | <b>17,500</b> | 18,000      | 17,200   | 170,000 | 48,000   | 93,400   | 175       |
| 18,00-18,49 | <b>18,000</b> | 18,000      | 17,700   | 174,000 | 48,000   | 95,900   | 180       |
| 18,50-18,99 | <b>18,500</b> | 20,000      | 18,200   | 179,000 | 50,000   | 98,500   | 185       |
| 19,00-19,49 | <b>19,000</b> | 20,000      | 18,700   | 182,000 | 50,000   | 101,100  | 190       |
| 19,50-19,99 | <b>19,500</b> | 20,000      | 19,200   | 186,000 | 50,000   | 103,700  | 195       |
| 20,00-20,49 | <b>20,000</b> | 20,000      | 19,700   | 189,000 | 50,000   | 106,300  | 200       |
| 20,50-20,99 | <b>20,500</b> | 25,000      | 20,200   | 201,000 | 56,000   | 109,000  | 205       |
| 21,00-21,49 | <b>21,000</b> | 25,000      | 20,700   | 204,000 | 56,000   | 111,600  | 210       |
| 21,50-21,99 | <b>21,500</b> | 25,000      | 21,200   | 207,000 | 56,000   | 114,100  | 215       |
| 22,00-22,49 | <b>22,000</b> | 25,000      | 21,700   | 210,000 | 56,000   | 116,700  | 220       |
| 22,50-22,99 | <b>22,500</b> | 25,000      | 22,200   | 214,000 | 56,000   | 119,300  | 225       |
| 23,00-23,49 | <b>23,000</b> | 25,000      | 22,700   | 217,000 | 56,000   | 121,900  | 230       |
| 23,50-23,99 | <b>23,500</b> | 25,000      | 23,200   | 221,000 | 56,000   | 124,500  | 235       |
| 24,00-24,49 | <b>24,000</b> | 25,000      | 23,700   | 224,000 | 56,000   | 127,100  | 240       |
| 24,50-24,99 | <b>24,500</b> | 25,000      | 24,200   | 227,000 | 56,000   | 129,700  | 245       |
| 25,00-25,49 | <b>25,000</b> | 25,000      | 24,700   | 231,000 | 56,000   | 132,300  | 250       |
| 25,50-25,99 | <b>25,500</b> | 32,000      | 25,200   | 239,000 | 60,000   | 134,900  | 255       |
| 26,00-26,49 | <b>26,000</b> | 32,000      | 25,700   | 244,000 | 60,000   | 137,000  | 260       |
| 26,50-26,99 | <b>26,500</b> | 32,000      | 26,200   | 247,000 | 60,000   | 140,000  | 265       |
| 27,00-27,49 | <b>27,000</b> | 32,000      | 26,700   | 251,000 | 60,000   | 142,200  | 270       |
| 27,50-27,99 | <b>27,500</b> | 32,000      | 27,200   | 254,000 | 60,000   | 144,800  | 275       |
| 28,00-28,49 | <b>28,000</b> | 32,000      | 27,700   | 257,000 | 60,000   | 147,400  | 280       |
| 28,50-28,99 | <b>28,500</b> | 32,000      | 28,200   | 260,000 | 60,000   | 150,400  | 285       |
| 29,00-29,49 | <b>29,000</b> | 32,000      | 28,700   | 264,000 | 60,000   | 153,500  | 290       |
| 30,00-30,49 | <b>30,000</b> | 32,000      | 29,700   | 271,000 | 60,000   | 157,600  | 300       |
| 30,50-30,99 | <b>30,500</b> | 32,000      | 30,200   | 274,000 | 60,000   | 160,200  | 305       |
| 31,00-31,49 | <b>31,000</b> | 32,000      | 30,700   | 277,000 | 60,000   | 162,800  | 310       |
| 31,50-31,99 | <b>31,500</b> | 32,000      | 31,200   | 280,000 | 60,000   | 165,400  | 315       |
| 32,00-32,99 | <b>32,000</b> | 32,000      | 31,700   | 287,000 | 60,000   | 170,600  | 320       |
| 33,00-33,99 | <b>33,000</b> | 32,000      | 32,700   | 294,000 | 60,000   | 175,800  | 330       |
| 34,00-34,99 | <b>34,000</b> | 32,000      | 33,700   | 300,000 | 60,000   | 181,000  | 340       |
| 35,00-35,99 | <b>35,000</b> | 32,000      | 34,700   | 307,000 | 60,000   | 186,200  | 350       |
| 36,00-36,99 | <b>36,000</b> | 32,000      | 35,700   | 314,000 | 60,000   | 191,300  | 360       |
| 37,00-37,99 | <b>37,000</b> | 32,000      | 36,700   | 321,000 | 60,000   | 196,500  | 370       |
| 38,00-38,99 | <b>38,000</b> | 32,000      | 37,700   | 327,000 | 60,000   | 201,700  | 380       |
| 39,00-40,00 | <b>39,000</b> | 32,000      | 38,700   | 334,000 | 60,000   | 206,900  | 390       |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP mini

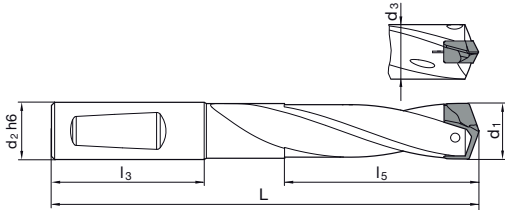


Catalogo n° 77003



Parametri di lav. ind. a pag. 42

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2 h6<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|-------------|----------|---------|----------|----------|-----------|
| 11,00-11,49 | <b>11,000</b> | 12,000      | 10,700   | 147,000 | 45,000   | 82,600   | 110       |
| 11,50-11,99 | <b>11,500</b> | 12,000      | 11,200   | 151,000 | 45,000   | 86,100   | 115       |
| 12,00-12,49 | <b>12,000</b> | 12,000      | 11,700   | 156,000 | 45,000   | 89,700   | 120       |
| 12,50-12,99 | <b>12,500</b> | 14,000      | 12,200   | 160,000 | 45,000   | 93,300   | 125       |
| 13,00-13,49 | <b>13,000</b> | 14,000      | 12,700   | 164,000 | 45,000   | 96,900   | 130       |
| 13,50-13,99 | <b>13,500</b> | 14,000      | 13,200   | 169,000 | 45,000   | 100,600  | 135       |
| 14,00-14,49 | <b>14,000</b> | 14,000      | 13,700   | 173,000 | 45,000   | 104,200  | 140       |
| 14,50-14,99 | <b>14,500</b> | 16,000      | 14,200   | 180,000 | 48,000   | 107,800  | 145       |
| 15,00-15,49 | <b>15,000</b> | 16,000      | 14,700   | 185,000 | 48,000   | 111,300  | 150       |
| 15,50-15,99 | <b>15,500</b> | 16,000      | 15,200   | 189,000 | 48,000   | 114,900  | 155       |
| 16,00-16,49 | <b>16,000</b> | 16,000      | 15,700   | 193,000 | 48,000   | 118,900  | 160       |
| 16,50-16,99 | <b>16,500</b> | 18,000      | 16,200   | 198,000 | 48,000   | 122,100  | 165       |
| 17,00-17,49 | <b>17,000</b> | 18,000      | 16,700   | 202,000 | 48,000   | 125,800  | 170       |
| 17,50-17,99 | <b>17,500</b> | 18,000      | 17,200   | 206,000 | 48,000   | 129,400  | 175       |
| 18,00-18,49 | <b>18,000</b> | 18,000      | 17,700   | 211,000 | 48,000   | 132,900  | 180       |
| 18,50-18,99 | <b>18,500</b> | 20,000      | 18,200   | 217,000 | 50,000   | 136,500  | 185       |
| 19,00-19,49 | <b>19,000</b> | 20,000      | 18,700   | 221,000 | 50,000   | 140,100  | 190       |
| 19,50-19,99 | <b>19,500</b> | 20,000      | 19,200   | 226,000 | 50,000   | 143,700  | 195       |
| 20,00-20,49 | <b>20,000</b> | 20,000      | 19,700   | 230,000 | 50,000   | 147,300  | 200       |
| 20,50-20,99 | <b>20,500</b> | 25,000      | 20,200   | 243,000 | 56,000   | 151,000  | 205       |
| 21,00-21,49 | <b>21,000</b> | 25,000      | 20,700   | 247,000 | 56,000   | 154,600  | 210       |
| 21,50-21,99 | <b>21,500</b> | 25,000      | 21,200   | 251,000 | 56,000   | 158,100  | 215       |
| 22,00-22,49 | <b>22,000</b> | 25,000      | 21,700   | 255,000 | 56,000   | 161,700  | 220       |
| 22,50-22,99 | <b>22,500</b> | 25,000      | 22,200   | 260,000 | 56,000   | 165,300  | 225       |
| 23,00-23,49 | <b>23,000</b> | 25,000      | 22,700   | 264,000 | 56,000   | 168,900  | 230       |
| 23,50-23,99 | <b>23,500</b> | 25,000      | 23,200   | 269,000 | 56,000   | 172,500  | 235       |
| 24,00-24,49 | <b>24,000</b> | 25,000      | 23,700   | 273,000 | 56,000   | 176,100  | 240       |
| 24,50-24,99 | <b>24,500</b> | 25,000      | 24,200   | 277,000 | 56,000   | 179,700  | 245       |
| 25,00-25,49 | <b>25,000</b> | 25,000      | 24,700   | 282,000 | 56,000   | 183,300  | 250       |
| 25,50-25,99 | <b>25,500</b> | 32,000      | 25,200   | 291,000 | 60,000   | 186,900  | 255       |
| 26,00-26,49 | <b>26,000</b> | 32,000      | 25,700   | 297,000 | 60,000   | 190,000  | 260       |
| 26,50-26,99 | <b>26,500</b> | 32,000      | 26,200   | 301,000 | 60,000   | 194,000  | 265       |
| 27,00-27,49 | <b>27,000</b> | 32,000      | 26,700   | 306,000 | 60,000   | 197,200  | 270       |
| 27,50-27,99 | <b>27,500</b> | 32,000      | 27,200   | 310,000 | 60,000   | 200,800  | 275       |
| 28,00-28,49 | <b>28,000</b> | 32,000      | 27,700   | 314,000 | 60,000   | 204,400  | 280       |
| 28,50-28,99 | <b>28,500</b> | 32,000      | 28,200   | 318,000 | 60,000   | 208,400  | 285       |
| 29,00-29,49 | <b>29,000</b> | 32,000      | 28,700   | 323,000 | 60,000   | 212,500  | 290       |
| 29,50-29,99 | <b>29,500</b> | 32,000      | 29,200   | 327,000 | 60,000   | 215,100  | 295       |
| 30,00-30,49 | <b>30,000</b> | 32,000      | 29,700   | 332,000 | 60,000   | 218,600  | 300       |
| 30,50-30,99 | <b>30,500</b> | 32,000      | 30,200   | 336,000 | 60,000   | 222,200  | 305       |
| 31,00-31,49 | <b>31,000</b> | 32,000      | 30,700   | 340,000 | 60,000   | 225,800  | 310       |
| 31,50-31,99 | <b>31,500</b> | 32,000      | 31,200   | 344,000 | 60,000   | 229,400  | 315       |
| 33,00-33,99 | <b>33,000</b> | 32,000      | 32,700   | 362,000 | 60,000   | 244,600  | 330       |
| 36,00-36,99 | <b>36,000</b> | 32,000      | 35,700   | 387,000 | 60,000   | 265,800  | 360       |
| 39,00-40,00 | <b>39,000</b> | 32,000      | 38,700   | 413,000 | 60,000   | 287,400  | 390       |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP mini

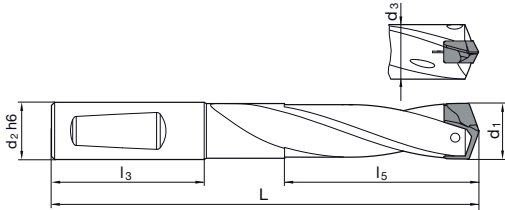


Catalogo n° 77004



Parametri di lav. ind. a pag. 44

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2 h6<br>mm | d3<br>mm | L<br>mm | I3<br>mm | I5<br>mm | Grandezza |
|-------------|---------------|-------------|----------|---------|----------|----------|-----------|
| 11,00-11,49 | <b>11,000</b> | 12,000      | 10,700   | 182,000 | 45,000   | 117,100  | 110       |
| 11,50-11,99 | <b>11,500</b> | 12,000      | 11,200   | 187,000 | 45,000   | 122,100  | 115       |
| 12,00-12,49 | <b>12,000</b> | 12,000      | 11,700   | 194,000 | 45,000   | 127,200  | 120       |
| 12,50-12,99 | <b>12,500</b> | 14,000      | 12,200   | 199,000 | 45,000   | 132,300  | 125       |
| 13,00-13,49 | <b>13,000</b> | 14,000      | 12,700   | 205,000 | 45,000   | 137,500  | 130       |
| 13,50-13,99 | <b>13,500</b> | 14,000      | 13,200   | 211,000 | 45,000   | 142,500  | 135       |
| 14,00-14,49 | <b>14,000</b> | 14,000      | 13,700   | 217,000 | 45,000   | 147,700  | 140       |
| 14,50-14,99 | <b>14,500</b> | 16,000      | 14,200   | 225,000 | 48,000   | 152,800  | 145       |
| 15,00-15,49 | <b>15,000</b> | 16,000      | 14,700   | 232,000 | 48,000   | 157,800  | 150       |
| 15,50-15,99 | <b>15,500</b> | 16,000      | 15,200   | 237,000 | 48,000   | 162,900  | 155       |
| 16,00-16,49 | <b>16,000</b> | 16,000      | 15,700   | 243,000 | 48,000   | 168,000  | 160       |
| 16,50-16,99 | <b>16,500</b> | 18,000      | 16,200   | 249,000 | 48,000   | 170,000  | 165       |
| 17,00-17,49 | <b>17,000</b> | 18,000      | 16,700   | 255,000 | 48,000   | 178,300  | 170       |
| 17,50-17,99 | <b>17,500</b> | 18,000      | 17,200   | 260,000 | 48,000   | 183,500  | 175       |
| 18,00-18,49 | <b>18,000</b> | 18,000      | 17,700   | 267,000 | 48,000   | 188,400  | 180       |
| 18,50-18,99 | <b>18,500</b> | 20,000      | 18,200   | 274,000 | 50,000   | 193,500  | 185       |
| 19,00-19,49 | <b>19,000</b> | 20,000      | 18,700   | 280,000 | 50,000   | 198,700  | 190       |
| 19,50-19,99 | <b>19,500</b> | 20,000      | 19,200   | 286,000 | 50,000   | 203,700  | 195       |
| 20,00-20,49 | <b>20,000</b> | 20,000      | 19,700   | 292,000 | 50,000   | 208,900  | 200       |
| 20,50-20,99 | <b>20,500</b> | 25,000      | 20,200   | 306,000 | 56,000   | 214,000  | 205       |
| 21,00-21,49 | <b>21,000</b> | 25,000      | 20,700   | 312,000 | 56,000   | 219,100  | 210       |
| 21,50-21,99 | <b>21,500</b> | 25,000      | 21,200   | 317,000 | 56,000   | 224,200  | 215       |
| 22,00-22,49 | <b>22,000</b> | 25,000      | 21,700   | 323,000 | 56,000   | 229,300  | 220       |
| 22,50-22,99 | <b>22,500</b> | 25,000      | 22,200   | 329,000 | 56,000   | 234,400  | 225       |
| 23,00-23,49 | <b>23,000</b> | 25,000      | 22,700   | 335,000 | 56,000   | 239,500  | 230       |
| 23,50-23,99 | <b>23,500</b> | 25,000      | 23,200   | 341,000 | 56,000   | 244,600  | 235       |
| 24,00-24,49 | <b>24,000</b> | 25,000      | 23,700   | 347,000 | 56,000   | 249,700  | 240       |
| 24,50-24,99 | <b>24,500</b> | 25,000      | 24,200   | 352,000 | 56,000   | 254,800  | 245       |
| 25,00-25,49 | <b>25,000</b> | 25,000      | 24,700   | 359,000 | 56,000   | 259,900  | 250       |
| 25,50-25,99 | <b>25,500</b> | 32,000      | 25,200   | 369,000 | 60,000   | 265,000  | 255       |
| 26,00-26,49 | <b>26,000</b> | 32,000      | 25,700   | 377,000 | 60,000   | 270,000  | 260       |
| 26,50-26,99 | <b>26,500</b> | 32,000      | 26,200   | 382,000 | 60,000   | 275,000  | 265       |
| 27,00-27,49 | <b>27,000</b> | 32,000      | 26,700   | 388,000 | 60,000   | 280,100  | 270       |
| 27,50-27,99 | <b>27,500</b> | 32,000      | 27,200   | 394,000 | 60,000   | 285,200  | 275       |
| 28,00-28,49 | <b>28,000</b> | 32,000      | 27,700   | 400,000 | 60,000   | 290,300  | 280       |
| 28,50-28,99 | <b>28,500</b> | 32,000      | 28,200   | 405,000 | 60,000   | 295,400  | 285       |
| 29,00-29,49 | <b>29,000</b> | 32,000      | 28,700   | 412,000 | 60,000   | 300,500  | 290       |
| 29,50-29,99 | <b>29,500</b> | 32,000      | 29,200   | 418,000 | 60,000   | 305,600  | 295       |
| 30,00-30,49 | <b>30,000</b> | 32,000      | 29,700   | 424,000 | 60,000   | 310,600  | 300       |
| 30,50-30,99 | <b>30,500</b> | 32,000      | 30,200   | 429,000 | 60,000   | 315,700  | 305       |
| 31,00-31,49 | <b>31,000</b> | 32,000      | 30,700   | 435,000 | 60,000   | 320,800  | 310       |
| 31,50-31,99 | <b>31,500</b> | 32,000      | 31,200   | 441,000 | 60,000   | 325,900  | 315       |

## Sistema di foratura SuperV

### Inserti intercambiabili per SuperV-AP mini



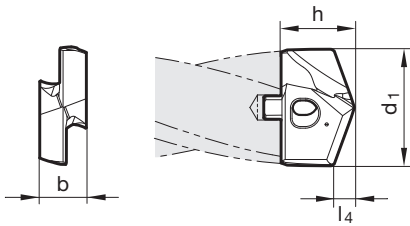
Catalogo n° 67011



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 36-44

- Assott. del noc.  $\geq \varnothing 11,000$
- affilatura su piani
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa



| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 11,000   |            | <b>11,000</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,200   |            | <b>11,200</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,500   |            | <b>11,500</b> | 2,100    | 4,500   | 7,500   | 115       |
| 11,510   | 29/64      | <b>11,510</b> | 2,100    | 4,500   | 7,500   | 115       |
| 11,700   |            | <b>11,700</b> | 2,200    | 4,500   | 7,500   | 115       |
| 11,800   |            | <b>11,800</b> | 2,200    | 4,500   | 7,500   | 115       |
| 11,910   | 15/32      | <b>11,910</b> | 2,200    | 4,500   | 7,500   | 115       |
| 12,000   |            | <b>12,000</b> | 2,200    | 5,000   | 7,700   | 120       |
| 12,100   |            | <b>12,100</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,200   |            | <b>12,200</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,300   | 31/64      | <b>12,300</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,500   |            | <b>12,500</b> | 2,300    | 5,000   | 7,700   | 125       |
| 12,600   |            | <b>12,600</b> | 2,300    | 5,000   | 7,700   | 125       |
| 12,700   | 1/2        | <b>12,700</b> | 2,400    | 5,000   | 7,700   | 125       |
| 12,800   |            | <b>12,800</b> | 2,400    | 5,000   | 7,700   | 125       |
| 12,900   |            | <b>12,900</b> | 2,400    | 5,000   | 7,700   | 125       |
| 13,000   |            | <b>13,000</b> | 2,400    | 5,500   | 8,500   | 130       |
| 13,100   | 33/64      | <b>13,100</b> | 2,400    | 5,500   | 8,500   | 130       |
| 13,490   | 17/32      | <b>13,490</b> | 2,500    | 5,500   | 8,500   | 130       |
| 13,500   |            | <b>13,500</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,600   |            | <b>13,600</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,700   |            | <b>13,700</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,800   |            | <b>13,800</b> | 2,600    | 5,500   | 8,500   | 135       |
| 13,890   | 35/64      | <b>13,890</b> | 2,600    | 5,500   | 8,500   | 135       |
| 14,000   |            | <b>14,000</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,100   |            | <b>14,100</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,290   | 9/16       | <b>14,290</b> | 2,700    | 6,000   | 9,600   | 140       |
| 14,400   |            | <b>14,400</b> | 2,700    | 6,000   | 9,600   | 140       |
| 14,500   |            | <b>14,500</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,600   |            | <b>14,600</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,680   | 37/64      | <b>14,680</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,700   |            | <b>14,700</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,800   |            | <b>14,800</b> | 2,700    | 6,000   | 9,600   | 145       |
| 15,000   |            | <b>15,000</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,080   | 19/32      | <b>15,080</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,100   |            | <b>15,100</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,200   |            | <b>15,200</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,300   |            | <b>15,300</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,480   | 39/64      | <b>15,480</b> | 2,900    | 6,000   | 9,800   | 150       |
| 15,500   |            | <b>15,500</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,600   |            | <b>15,600</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,700   |            | <b>15,700</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,800   |            | <b>15,800</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,870   | 5/8        | <b>15,870</b> | 2,900    | 6,000   | 9,800   | 155       |
| 16,000   |            | <b>16,000</b> | 3,000    | 7,000   | 11,000  | 160       |
| 16,270   | 41/64      | <b>16,270</b> | 3,000    | 7,000   | 11,000  | 160       |
| 16,500   |            | <b>16,500</b> | 3,100    | 7,000   | 11,000  | 165       |
| 16,670   | 21/32      | <b>16,670</b> | 3,100    | 7,000   | 11,000  | 165       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 17,000   |            | <b>17,000</b> | 3,100    | 7,000   | 11,000  | 170       |
| 17,070   | 43/64      | <b>17,070</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,250   |            | <b>17,250</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,460   | 11/16      | <b>17,460</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,500   |            | <b>17,500</b> | 3,200    | 7,000   | 11,000  | 175       |
| 17,600   |            | <b>17,600</b> | 3,300    | 7,000   | 11,000  | 175       |
| 17,860   | 45/64      | <b>17,860</b> | 3,300    | 7,000   | 11,000  | 175       |
| 18,000   |            | <b>18,000</b> | 3,300    | 8,000   | 12,600  | 180       |
| 18,260   | 23/32      | <b>18,260</b> | 3,400    | 8,000   | 12,600  | 180       |
| 18,500   |            | <b>18,500</b> | 3,400    | 8,000   | 12,600  | 185       |
| 18,650   | 47/64      | <b>18,650</b> | 3,400    | 8,000   | 12,600  | 185       |
| 19,000   |            | <b>19,000</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,050   | 3/4        | <b>19,050</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,250   |            | <b>19,250</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,450   | 49/64      | <b>19,450</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,500   |            | <b>19,500</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,600   |            | <b>19,600</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,840   | 25/32      | <b>19,840</b> | 3,700    | 8,000   | 12,600  | 195       |
| 20,000   |            | <b>20,000</b> | 3,700    | 9,000   | 13,900  | 200       |
| 20,240   | 51/64      | <b>20,240</b> | 3,700    | 9,000   | 13,900  | 200       |
| 20,500   |            | <b>20,500</b> | 3,800    | 9,000   | 13,900  | 205       |
| 20,640   | 13/16      | <b>20,640</b> | 3,800    | 9,000   | 13,900  | 205       |
| 21,000   |            | <b>21,000</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,030   | 53/64      | <b>21,030</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,100   |            | <b>21,100</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,430   | 27/32      | <b>21,430</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,500   |            | <b>21,500</b> | 4,000    | 9,000   | 13,900  | 215       |
| 21,830   | 55/64      | <b>21,830</b> | 4,000    | 9,000   | 13,900  | 215       |
| 22,000   |            | <b>22,000</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,220   | 7/8        | <b>22,220</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,500   |            | <b>22,500</b> | 4,100    | 10,000  | 15,300  | 225       |
| 22,620   | 57/64      | <b>22,620</b> | 4,200    | 10,000  | 15,300  | 225       |
| 23,000   |            | <b>23,000</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,020   | 29/32      | <b>23,020</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,420   | 59/64      | <b>23,420</b> | 4,300    | 10,000  | 15,300  | 230       |
| 23,500   |            | <b>23,500</b> | 4,300    | 10,000  | 15,300  | 235       |
| 23,810   | 15/16      | <b>23,810</b> | 4,400    | 10,000  | 15,300  | 235       |
| 24,000   |            | <b>24,000</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,100   |            | <b>24,100</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,210   | 61/64      | <b>24,210</b> | 4,500    | 11,000  | 15,800  | 240       |
| 24,500   |            | <b>24,500</b> | 4,500    | 11,000  | 15,800  | 245       |
| 24,610   | 31/32      | <b>24,610</b> | 4,500    | 11,000  | 15,800  | 245       |
| 25,000   | 63/64      | <b>25,000</b> | 4,600    | 11,000  | 15,800  | 250       |
| 25,250   |            | <b>25,250</b> | 4,600    | 11,000  | 15,800  | 250       |
| 25,400   | 1          | <b>25,400</b> | 4,700    | 11,000  | 15,800  | 250       |
| 25,500   |            | <b>25,500</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,650   |            | <b>25,650</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,670   |            | <b>25,670</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,700   |            | <b>25,700</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,810   |            | <b>25,810</b> | 4,700    | 11,000  | 15,800  | 255       |
| 26,000   |            | <b>26,000</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,190   | 1 1/32     | <b>26,190</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,500   |            | <b>26,500</b> | 4,900    | 12,000  | 20,000  | 265       |
| 26,590   | 1 3/64     | <b>26,590</b> | 4,900    | 12,000  | 20,000  | 265       |
| 27,000   |            | <b>27,000</b> | 5,000    | 12,000  | 20,000  | 270       |
| 27,500   |            | <b>27,500</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,700   |            | <b>27,700</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,780   | 1 3/32     | <b>27,780</b> | 5,100    | 12,000  | 20,000  | 275       |
| 28,000   |            | <b>28,000</b> | 5,100    | 13,000  | 20,700  | 280       |
| 28,180   | 1 7/64     | <b>28,180</b> | 5,200    | 13,000  | 20,700  | 280       |
| 28,500   |            | <b>28,500</b> | 5,200    | 13,000  | 20,700  | 285       |
| 28,580   |            | <b>28,580</b> | 5,300    | 13,000  | 20,700  | 285       |
| 29,000   |            | <b>29,000</b> | 5,300    | 13,000  | 20,700  | 290       |
| 29,370   | 1 5/32     | <b>29,370</b> | 5,400    | 13,000  | 20,700  | 290       |
| 29,500   |            | <b>29,500</b> | 5,400    | 13,000  | 20,700  | 295       |
| 29,600   |            | <b>29,600</b> | 5,400    | 13,000  | 20,700  | 295       |
| 29,770   | 1 11/64    | <b>29,770</b> | 5,500    | 13,000  | 20,700  | 295       |
| 30,000   |            | <b>30,000</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,160   | 1 3/16     | <b>30,160</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,500   |            | <b>30,500</b> | 5,600    | 14,000  | 22,300  | 305       |
| 30,960   | 1 7/32     | <b>30,960</b> | 5,700    | 14,000  | 22,300  | 305       |
| 31,000   |            | <b>31,000</b> | 5,700    | 14,000  | 22,300  | 310       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 31,500   |            | <b>31,500</b> | 5,800    | 14,000  | 22,300  | 315       |
| 31,750   | 1 1/4      | <b>31,750</b> | 5,800    | 14,000  | 22,300  | 315       |
| 32,000   |            | <b>32,000</b> | 5,900    | 15,000  | 23,100  | 320       |
| 32,500   |            | <b>32,500</b> | 6,000    | 15,000  | 23,100  | 320       |
| 32,540   | 1 9/32     | <b>32,540</b> | 6,000    | 15,000  | 23,100  | 320       |
| 32,940   | 1 19/64    | <b>32,940</b> | 6,000    | 15,000  | 23,100  | 320       |
| 33,000   |            | <b>33,000</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,340   | 1 5/16     | <b>33,340</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,500   |            | <b>33,500</b> | 6,100    | 15,000  | 23,100  | 330       |
| 34,000   |            | <b>34,000</b> | 6,200    | 15,000  | 23,100  | 340       |
| 34,130   | 1 11/32    | <b>34,130</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,500   |            | <b>34,500</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,930   |            | <b>34,930</b> | 6,400    | 15,000  | 23,100  | 340       |
| 35,000   |            | <b>35,000</b> | 6,400    | 15,000  | 23,100  | 350       |
| 35,500   |            | <b>35,500</b> | 6,500    | 15,000  | 23,100  | 350       |
| 35,720   | 1 13/32    | <b>35,720</b> | 6,600    | 15,000  | 23,100  | 350       |
| 36,000   |            | <b>36,000</b> | 6,600    | 16,000  | 23,900  | 360       |
| 36,500   |            | <b>36,500</b> | 6,700    | 16,000  | 23,900  | 360       |
| 36,510   | 1 7/16     | <b>36,510</b> | 6,700    | 16,000  | 23,900  | 360       |
| 37,000   |            | <b>37,000</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,310   | 1 15/32    | <b>37,310</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,500   |            | <b>37,500</b> | 6,900    | 16,000  | 23,900  | 370       |
| 38,000   |            | <b>38,000</b> | 7,000    | 16,000  | 23,900  | 380       |
| 38,100   | 1 1/2      | <b>38,100</b> | 7,000    | 16,000  | 23,900  | 380       |
| 38,500   | 1 33/64    | <b>38,500</b> | 7,100    | 16,000  | 23,900  | 380       |
| 39,000   |            | <b>39,000</b> | 7,100    | 16,000  | 23,900  | 390       |
| 39,500   |            | <b>39,500</b> | 7,200    | 16,000  | 23,900  | 390       |
| 40,000   |            | <b>40,000</b> | 7,300    | 16,000  | 23,900  | 400       |

## Sistema di foratura SuperV

### Inserti intercambiabili per SuperV-AP mini



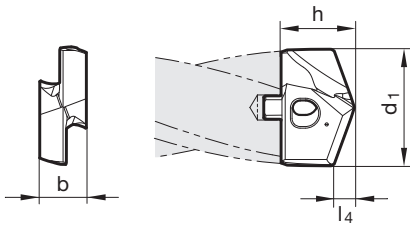
Catalogo n° 67012



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • | ○ |   | ○ |   |

Parametri di lav.  
ind. a pag. 36-44

- Assott. del noc.  $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa



| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 11,000   |            | <b>11,000</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,200   |            | <b>11,200</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,500   |            | <b>11,500</b> | 2,100    | 4,500   | 7,500   | 115       |
| 11,510   | 29/64      | <b>11,510</b> | 2,100    | 4,500   | 7,500   | 115       |
| 11,700   |            | <b>11,700</b> | 2,200    | 4,500   | 7,500   | 115       |
| 11,800   |            | <b>11,800</b> | 2,200    | 4,500   | 7,500   | 115       |
| 11,910   | 15/32      | <b>11,910</b> | 2,200    | 4,500   | 7,500   | 115       |
| 12,000   |            | <b>12,000</b> | 2,200    | 5,000   | 7,700   | 120       |
| 12,100   |            | <b>12,100</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,200   |            | <b>12,200</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,300   | 31/64      | <b>12,300</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,500   |            | <b>12,500</b> | 2,300    | 5,000   | 7,700   | 125       |
| 12,600   |            | <b>12,600</b> | 2,300    | 5,000   | 7,700   | 125       |
| 12,700   | 1/2        | <b>12,700</b> | 2,400    | 5,000   | 7,700   | 125       |
| 12,800   |            | <b>12,800</b> | 2,400    | 5,000   | 7,700   | 125       |
| 12,900   |            | <b>12,900</b> | 2,400    | 5,000   | 7,700   | 125       |
| 13,000   |            | <b>13,000</b> | 2,400    | 5,500   | 8,500   | 130       |
| 13,100   | 33/64      | <b>13,100</b> | 2,400    | 5,500   | 8,500   | 130       |
| 13,490   | 17/32      | <b>13,490</b> | 2,500    | 5,500   | 8,500   | 130       |
| 13,500   |            | <b>13,500</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,600   |            | <b>13,600</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,700   |            | <b>13,700</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,800   |            | <b>13,800</b> | 2,600    | 5,500   | 8,500   | 135       |
| 13,890   | 35/64      | <b>13,890</b> | 2,600    | 5,500   | 8,500   | 135       |
| 14,000   |            | <b>14,000</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,100   |            | <b>14,100</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,290   | 9/16       | <b>14,290</b> | 2,700    | 6,000   | 9,600   | 140       |
| 14,400   |            | <b>14,400</b> | 2,700    | 6,000   | 9,600   | 140       |
| 14,500   |            | <b>14,500</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,600   |            | <b>14,600</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,700   |            | <b>14,700</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,800   |            | <b>14,800</b> | 2,700    | 6,000   | 9,600   | 145       |
| 15,000   |            | <b>15,000</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,080   | 19/32      | <b>15,080</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,100   |            | <b>15,100</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,200   |            | <b>15,200</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,300   |            | <b>15,300</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,500   |            | <b>15,500</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,600   |            | <b>15,600</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,700   |            | <b>15,700</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,800   |            | <b>15,800</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,870   | 5/8        | <b>15,870</b> | 2,900    | 6,000   | 9,800   | 155       |
| 16,000   |            | <b>16,000</b> | 3,000    | 7,000   | 11,000  | 160       |
| 16,270   | 41/64      | <b>16,270</b> | 3,000    | 7,000   | 11,000  | 160       |
| 16,500   |            | <b>16,500</b> | 3,100    | 7,000   | 11,000  | 165       |
| 16,670   | 21/32      | <b>16,670</b> | 3,100    | 7,000   | 11,000  | 165       |
| 17,000   |            | <b>17,000</b> | 3,100    | 7,000   | 11,000  | 170       |
| 17,070   | 43/64      | <b>17,070</b> | 3,200    | 7,000   | 11,000  | 170       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 17,250   |            | <b>17,250</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,460   | 11/16      | <b>17,460</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,500   |            | <b>17,500</b> | 3,200    | 7,000   | 11,000  | 175       |
| 17,600   |            | <b>17,600</b> | 3,300    | 7,000   | 11,000  | 175       |
| 17,860   | 45/64      | <b>17,860</b> | 3,300    | 7,000   | 11,000  | 175       |
| 18,000   |            | <b>18,000</b> | 3,300    | 8,000   | 12,600  | 180       |
| 18,260   | 23/32      | <b>18,260</b> | 3,400    | 8,000   | 12,600  | 180       |
| 18,500   |            | <b>18,500</b> | 3,400    | 8,000   | 12,600  | 185       |
| 18,650   | 47/64      | <b>18,650</b> | 3,400    | 8,000   | 12,600  | 185       |
| 19,000   |            | <b>19,000</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,050   | 3/4        | <b>19,050</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,250   |            | <b>19,250</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,450   | 49/64      | <b>19,450</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,500   |            | <b>19,500</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,600   |            | <b>19,600</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,840   | 25/32      | <b>19,840</b> | 3,700    | 8,000   | 12,600  | 195       |
| 20,000   |            | <b>20,000</b> | 3,700    | 9,000   | 13,900  | 200       |
| 20,240   | 51/64      | <b>20,240</b> | 3,700    | 9,000   | 13,900  | 200       |
| 20,500   |            | <b>20,500</b> | 3,800    | 9,000   | 13,900  | 205       |
| 20,640   | 13/16      | <b>20,640</b> | 3,800    | 9,000   | 13,900  | 205       |
| 21,000   |            | <b>21,000</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,030   | 53/64      | <b>21,030</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,100   |            | <b>21,100</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,430   | 27/32      | <b>21,430</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,500   |            | <b>21,500</b> | 4,000    | 9,000   | 13,900  | 215       |
| 21,830   | 55/64      | <b>21,830</b> | 4,000    | 9,000   | 13,900  | 215       |
| 22,000   |            | <b>22,000</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,220   | 7/8        | <b>22,220</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,500   |            | <b>22,500</b> | 4,100    | 10,000  | 15,300  | 225       |
| 22,620   | 57/64      | <b>22,620</b> | 4,200    | 10,000  | 15,300  | 225       |
| 23,000   |            | <b>23,000</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,020   | 29/32      | <b>23,020</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,420   | 59/64      | <b>23,420</b> | 4,300    | 10,000  | 15,300  | 230       |
| 23,500   |            | <b>23,500</b> | 4,300    | 10,000  | 15,300  | 235       |
| 23,810   | 15/16      | <b>23,810</b> | 4,400    | 10,000  | 15,300  | 235       |
| 24,000   |            | <b>24,000</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,100   |            | <b>24,100</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,210   | 61/64      | <b>24,210</b> | 4,500    | 11,000  | 15,800  | 240       |
| 24,500   |            | <b>24,500</b> | 4,500    | 11,000  | 15,800  | 245       |
| 24,610   | 31/32      | <b>24,610</b> | 4,500    | 11,000  | 15,800  | 245       |
| 25,000   | 63/64      | <b>25,000</b> | 4,600    | 11,000  | 15,800  | 250       |
| 25,250   |            | <b>25,250</b> | 4,600    | 11,000  | 15,800  | 250       |
| 25,400   | 1          | <b>25,400</b> | 4,700    | 11,000  | 15,800  | 250       |
| 25,500   |            | <b>25,500</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,650   |            | <b>25,650</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,670   |            | <b>25,670</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,700   |            | <b>25,700</b> | 4,700    | 11,000  | 15,800  | 255       |
| 26,000   |            | <b>26,000</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,190   | 1 1/32     | <b>26,190</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,500   |            | <b>26,500</b> | 4,900    | 12,000  | 20,000  | 265       |
| 27,000   |            | <b>27,000</b> | 5,000    | 12,000  | 20,000  | 270       |
| 27,500   |            | <b>27,500</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,700   |            | <b>27,700</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,780   | 1 3/32     | <b>27,780</b> | 5,100    | 12,000  | 20,000  | 275       |
| 28,000   |            | <b>28,000</b> | 5,100    | 13,000  | 20,700  | 280       |
| 28,180   | 1 7/64     | <b>28,180</b> | 5,200    | 13,000  | 20,700  | 280       |
| 28,500   |            | <b>28,500</b> | 5,200    | 13,000  | 20,700  | 285       |
| 28,580   |            | <b>28,580</b> | 5,300    | 13,000  | 20,700  | 285       |
| 29,000   |            | <b>29,000</b> | 5,300    | 13,000  | 20,700  | 290       |
| 29,370   | 1 5/32     | <b>29,370</b> | 5,400    | 13,000  | 20,700  | 290       |
| 29,500   |            | <b>29,500</b> | 5,400    | 13,000  | 20,700  | 295       |
| 29,600   |            | <b>29,600</b> | 5,400    | 13,000  | 20,700  | 295       |
| 30,000   |            | <b>30,000</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,160   | 1 3/16     | <b>30,160</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,500   |            | <b>30,500</b> | 5,600    | 14,000  | 22,300  | 305       |
| 30,960   | 1 7/32     | <b>30,960</b> | 5,700    | 14,000  | 22,300  | 305       |
| 31,000   |            | <b>31,000</b> | 5,700    | 14,000  | 22,300  | 310       |
| 31,500   |            | <b>31,500</b> | 5,800    | 14,000  | 22,300  | 315       |
| 31,750   | 1 1/4      | <b>31,750</b> | 5,800    | 14,000  | 22,300  | 315       |
| 32,000   |            | <b>32,000</b> | 5,900    | 15,000  | 23,100  | 320       |
| 32,500   |            | <b>32,500</b> | 6,000    | 15,000  | 23,100  | 320       |
| 32,540   | 1 9/32     | <b>32,540</b> | 6,000    | 15,000  | 23,100  | 320       |



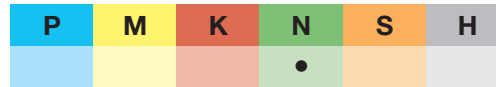
| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 33,000   |            | <b>33,000</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,340   | 1 5/16     | <b>33,340</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,500   |            | <b>33,500</b> | 6,100    | 15,000  | 23,100  | 330       |
| 34,000   |            | <b>34,000</b> | 6,200    | 15,000  | 23,100  | 340       |
| 34,130   | 1 11/32    | <b>34,130</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,500   |            | <b>34,500</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,930   |            | <b>34,930</b> | 6,400    | 15,000  | 23,100  | 340       |
| 35,000   |            | <b>35,000</b> | 6,400    | 15,000  | 23,100  | 350       |
| 35,500   |            | <b>35,500</b> | 6,500    | 15,000  | 23,100  | 350       |
| 35,720   | 1 13/32    | <b>35,720</b> | 6,600    | 15,000  | 23,100  | 350       |
| 36,000   |            | <b>36,000</b> | 6,600    | 16,000  | 23,900  | 360       |
| 36,500   |            | <b>36,500</b> | 6,700    | 16,000  | 23,900  | 360       |
| 36,510   | 1 7/16     | <b>36,510</b> | 6,700    | 16,000  | 23,900  | 360       |
| 37,000   |            | <b>37,000</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,310   | 1 15/32    | <b>37,310</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,500   |            | <b>37,500</b> | 6,900    | 16,000  | 23,900  | 370       |
| 38,000   |            | <b>38,000</b> | 7,000    | 16,000  | 23,900  | 380       |
| 38,100   | 1 1/2      | <b>38,100</b> | 7,000    | 16,000  | 23,900  | 380       |
| 38,500   | 1 33/64    | <b>38,500</b> | 7,100    | 16,000  | 23,900  | 380       |
| 39,000   |            | <b>39,000</b> | 7,100    | 16,000  | 23,900  | 390       |
| 39,500   |            | <b>39,500</b> | 7,200    | 16,000  | 23,900  | 390       |
| 40,000   |            | <b>40,000</b> | 7,300    | 16,000  | 23,900  | 400       |

## Sistema di foratura SuperV

### Inserti intercambiabili per SuperV-AP mini

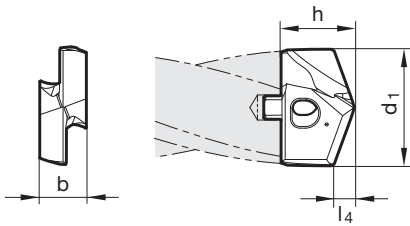


Catalogo n° 77012



Parametri di lav.  
ind. a pag. 36-44

- Assott. del noc.  $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- vite di serraggio catalogo-Nr. 77020 inclusa



| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 11,000   |            | <b>11,000</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,200   |            | <b>11,200</b> | 2,100    | 4,500   | 7,500   | 110       |
| 11,510   | 29/64      | <b>11,510</b> | 2,100    | 4,500   | 7,500   | 115       |
| 11,800   |            | <b>11,800</b> | 2,200    | 4,500   | 7,500   | 115       |
| 12,000   |            | <b>12,000</b> | 2,200    | 5,000   | 7,700   | 120       |
| 12,200   |            | <b>12,200</b> | 2,300    | 5,000   | 7,700   | 120       |
| 12,500   |            | <b>12,500</b> | 2,300    | 5,000   | 7,700   | 125       |
| 12,700   | 1/2        | <b>12,700</b> | 2,400    | 5,000   | 7,700   | 125       |
| 12,900   |            | <b>12,900</b> | 2,400    | 5,000   | 7,700   | 125       |
| 13,100   | 33/64      | <b>13,100</b> | 2,400    | 5,500   | 8,500   | 130       |
| 13,500   |            | <b>13,500</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,700   |            | <b>13,700</b> | 2,500    | 5,500   | 8,500   | 135       |
| 13,800   |            | <b>13,800</b> | 2,600    | 5,500   | 8,500   | 135       |
| 14,000   |            | <b>14,000</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,100   |            | <b>14,100</b> | 2,600    | 6,000   | 9,600   | 140       |
| 14,400   |            | <b>14,400</b> | 2,700    | 6,000   | 9,600   | 140       |
| 14,500   |            | <b>14,500</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,680   | 37/64      | <b>14,680</b> | 2,700    | 6,000   | 9,600   | 145       |
| 14,700   |            | <b>14,700</b> | 2,700    | 6,000   | 9,600   | 145       |
| 15,000   |            | <b>15,000</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,080   | 19/32      | <b>15,080</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,200   |            | <b>15,200</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,300   |            | <b>15,300</b> | 2,800    | 6,000   | 9,800   | 150       |
| 15,500   |            | <b>15,500</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,600   |            | <b>15,600</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,800   |            | <b>15,800</b> | 2,900    | 6,000   | 9,800   | 155       |
| 15,870   | 5/8        | <b>15,870</b> | 2,900    | 6,000   | 9,800   | 155       |
| 16,270   | 41/64      | <b>16,270</b> | 3,000    | 7,000   | 11,000  | 160       |
| 16,500   |            | <b>16,500</b> | 3,100    | 7,000   | 11,000  | 165       |
| 17,000   |            | <b>17,000</b> | 3,100    | 7,000   | 11,000  | 170       |
| 17,070   | 43/64      | <b>17,070</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,460   | 11/16      | <b>17,460</b> | 3,200    | 7,000   | 11,000  | 170       |
| 17,500   |            | <b>17,500</b> | 3,200    | 7,000   | 11,000  | 175       |
| 17,600   |            | <b>17,600</b> | 3,300    | 7,000   | 11,000  | 175       |
| 17,860   | 45/64      | <b>17,860</b> | 3,300    | 7,000   | 11,000  | 175       |
| 18,000   |            | <b>18,000</b> | 3,300    | 8,000   | 12,600  | 180       |
| 18,260   | 23/32      | <b>18,260</b> | 3,400    | 8,000   | 12,600  | 180       |
| 18,500   |            | <b>18,500</b> | 3,400    | 8,000   | 12,600  | 185       |
| 18,650   | 47/64      | <b>18,650</b> | 3,400    | 8,000   | 12,600  | 185       |
| 19,000   |            | <b>19,000</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,050   | 3/4        | <b>19,050</b> | 3,500    | 8,000   | 12,600  | 190       |
| 19,250   |            | <b>19,250</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,450   | 49/64      | <b>19,450</b> | 3,600    | 8,000   | 12,600  | 190       |
| 19,500   |            | <b>19,500</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,600   |            | <b>19,600</b> | 3,600    | 8,000   | 12,600  | 195       |
| 19,840   | 25/32      | <b>19,840</b> | 3,700    | 8,000   | 12,600  | 195       |
| 20,000   |            | <b>20,000</b> | 3,700    | 9,000   | 13,900  | 200       |
| 20,240   | 51/64      | <b>20,240</b> | 3,700    | 9,000   | 13,900  | 200       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 20,500   |            | <b>20,500</b> | 3,800    | 9,000   | 13,900  | 205       |
| 20,640   | 13/16      | <b>20,640</b> | 3,800    | 9,000   | 13,900  | 205       |
| 21,000   |            | <b>21,000</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,030   | 53/64      | <b>21,030</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,100   |            | <b>21,100</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,430   | 27/32      | <b>21,430</b> | 3,900    | 9,000   | 13,900  | 210       |
| 21,500   |            | <b>21,500</b> | 4,000    | 9,000   | 13,900  | 215       |
| 21,830   | 55/64      | <b>21,830</b> | 4,000    | 9,000   | 13,900  | 215       |
| 22,000   |            | <b>22,000</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,220   | 7/8        | <b>22,220</b> | 4,100    | 10,000  | 15,300  | 220       |
| 22,500   |            | <b>22,500</b> | 4,100    | 10,000  | 15,300  | 225       |
| 22,620   | 57/64      | <b>22,620</b> | 4,200    | 10,000  | 15,300  | 225       |
| 23,000   |            | <b>23,000</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,020   | 29/32      | <b>23,020</b> | 4,200    | 10,000  | 15,300  | 230       |
| 23,420   | 59/64      | <b>23,420</b> | 4,300    | 10,000  | 15,300  | 230       |
| 23,500   |            | <b>23,500</b> | 4,300    | 10,000  | 15,300  | 235       |
| 23,810   | 15/16      | <b>23,810</b> | 4,400    | 10,000  | 15,300  | 235       |
| 24,000   |            | <b>24,000</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,100   |            | <b>24,100</b> | 4,400    | 11,000  | 15,800  | 240       |
| 24,210   | 61/64      | <b>24,210</b> | 4,500    | 11,000  | 15,800  | 240       |
| 24,500   |            | <b>24,500</b> | 4,500    | 11,000  | 15,800  | 245       |
| 24,610   | 31/32      | <b>24,610</b> | 4,500    | 11,000  | 15,800  | 245       |
| 25,000   | 63/64      | <b>25,000</b> | 4,600    | 11,000  | 15,800  | 250       |
| 25,400   | 1          | <b>25,400</b> | 4,700    | 11,000  | 15,800  | 250       |
| 25,500   |            | <b>25,500</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,670   |            | <b>25,670</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,700   |            | <b>25,700</b> | 4,700    | 11,000  | 15,800  | 255       |
| 25,810   |            | <b>25,810</b> | 4,700    | 11,000  | 15,800  | 255       |
| 26,000   |            | <b>26,000</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,190   | 1 1/32     | <b>26,190</b> | 4,800    | 12,000  | 20,000  | 260       |
| 26,500   |            | <b>26,500</b> | 4,900    | 12,000  | 20,000  | 265       |
| 26,590   | 1 3/64     | <b>26,590</b> | 4,900    | 12,000  | 20,000  | 265       |
| 27,000   |            | <b>27,000</b> | 5,000    | 12,000  | 20,000  | 270       |
| 27,500   |            | <b>27,500</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,700   |            | <b>27,700</b> | 5,100    | 12,000  | 20,000  | 275       |
| 27,780   | 1 3/32     | <b>27,780</b> | 5,100    | 12,000  | 20,000  | 275       |
| 28,000   |            | <b>28,000</b> | 5,100    | 13,000  | 20,700  | 280       |
| 28,180   | 1 7/64     | <b>28,180</b> | 5,200    | 13,000  | 20,700  | 280       |
| 28,500   |            | <b>28,500</b> | 5,200    | 13,000  | 20,700  | 285       |
| 28,580   |            | <b>28,580</b> | 5,300    | 13,000  | 20,700  | 285       |
| 29,000   |            | <b>29,000</b> | 5,300    | 13,000  | 20,700  | 290       |
| 29,370   | 1 5/32     | <b>29,370</b> | 5,400    | 13,000  | 20,700  | 290       |
| 29,500   |            | <b>29,500</b> | 5,400    | 13,000  | 20,700  | 295       |
| 29,770   | 1 11/64    | <b>29,770</b> | 5,500    | 13,000  | 20,700  | 295       |
| 30,000   |            | <b>30,000</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,160   | 1 3/16     | <b>30,160</b> | 5,500    | 14,000  | 22,300  | 300       |
| 30,500   |            | <b>30,500</b> | 5,600    | 14,000  | 22,300  | 305       |
| 30,960   | 1 7/32     | <b>30,960</b> | 5,700    | 14,000  | 22,300  | 305       |
| 31,000   |            | <b>31,000</b> | 5,700    | 14,000  | 22,300  | 310       |
| 31,500   |            | <b>31,500</b> | 5,800    | 14,000  | 22,300  | 315       |
| 31,750   | 1 1/4      | <b>31,750</b> | 5,800    | 14,000  | 22,300  | 315       |
| 32,000   |            | <b>32,000</b> | 5,900    | 15,000  | 23,100  | 320       |
| 32,500   |            | <b>32,500</b> | 6,000    | 15,000  | 23,100  | 320       |
| 32,540   | 1 9/32     | <b>32,540</b> | 6,000    | 15,000  | 23,100  | 320       |
| 32,940   | 1 19/64    | <b>32,940</b> | 6,000    | 15,000  | 23,100  | 320       |
| 33,000   |            | <b>33,000</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,340   | 1 5/16     | <b>33,340</b> | 6,100    | 15,000  | 23,100  | 330       |
| 33,500   |            | <b>33,500</b> | 6,100    | 15,000  | 23,100  | 330       |
| 34,000   |            | <b>34,000</b> | 6,200    | 15,000  | 23,100  | 340       |
| 34,130   | 1 11/32    | <b>34,130</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,500   |            | <b>34,500</b> | 6,300    | 15,000  | 23,100  | 340       |
| 34,930   |            | <b>34,930</b> | 6,400    | 15,000  | 23,100  | 340       |
| 35,000   |            | <b>35,000</b> | 6,400    | 15,000  | 23,100  | 350       |
| 35,500   |            | <b>35,500</b> | 6,500    | 15,000  | 23,100  | 350       |
| 35,720   | 1 13/32    | <b>35,720</b> | 6,600    | 15,000  | 23,100  | 350       |
| 36,000   |            | <b>36,000</b> | 6,600    | 16,000  | 23,900  | 360       |
| 36,500   |            | <b>36,500</b> | 6,700    | 16,000  | 23,900  | 360       |
| 36,510   | 1 7/16     | <b>36,510</b> | 6,700    | 16,000  | 23,900  | 360       |
| 37,000   |            | <b>37,000</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,310   | 1 15/32    | <b>37,310</b> | 6,800    | 16,000  | 23,900  | 370       |
| 37,500   |            | <b>37,500</b> | 6,900    | 16,000  | 23,900  | 370       |
| 38,000   |            | <b>38,000</b> | 7,000    | 16,000  | 23,900  | 380       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 38,100   | 1 1/2      | <b>38,100</b> | 7,000    | 16,000  | 23,900  | 380       |
| 38,500   | 1 33/64    | <b>38,500</b> | 7,100    | 16,000  | 23,900  | 380       |
| 39,000   |            | <b>39,000</b> | 7,100    | 16,000  | 23,900  | 390       |
| 39,500   |            | <b>39,500</b> | 7,200    | 16,000  | 23,900  | 390       |
| 40,000   |            | <b>40,000</b> | 7,300    | 16,000  | 23,900  | 400       |

## Sistema di foratura SuperV

### Inserti intercambiabili per SuperV-AP mini



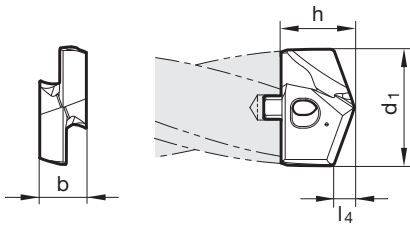
Catalogo n° 77011



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 36

- Assott. del noc.  $\geq \varnothing 11,000$
- affilatura su piani
- 4 fasi di guida
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa
- specialmente per applicazioni con catalogo-Nr. 77007



| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 11,000   |            | <b>11,000</b> | 1,800    | 4,500   | 7,200   | 110       |
| 11,200   |            | <b>11,200</b> | 1,800    | 4,500   | 7,200   | 110       |
| 11,510   | 29/64      | <b>11,510</b> | 1,900    | 4,500   | 7,200   | 110       |
| 11,800   |            | <b>11,800</b> | 1,900    | 4,500   | 7,200   | 110       |
| 12,000   |            | <b>12,000</b> | 1,900    | 5,000   | 7,400   | 120       |
| 12,200   |            | <b>12,200</b> | 2,000    | 5,000   | 7,400   | 120       |
| 12,500   |            | <b>12,500</b> | 2,000    | 5,000   | 7,400   | 120       |
| 12,700   | 1/2        | <b>12,700</b> | 2,100    | 5,000   | 7,400   | 120       |
| 12,900   |            | <b>12,900</b> | 2,100    | 5,000   | 7,400   | 120       |
| 13,100   | 33/64      | <b>13,100</b> | 2,100    | 5,500   | 8,200   | 130       |
| 13,500   |            | <b>13,500</b> | 2,200    | 5,500   | 8,200   | 130       |
| 13,700   |            | <b>13,700</b> | 2,200    | 5,500   | 8,200   | 130       |
| 13,800   |            | <b>13,800</b> | 2,200    | 5,500   | 8,200   | 130       |
| 14,000   |            | <b>14,000</b> | 2,300    | 6,000   | 9,400   | 140       |
| 14,100   |            | <b>14,100</b> | 2,300    | 6,000   | 9,400   | 140       |
| 14,400   |            | <b>14,400</b> | 2,300    | 6,000   | 9,400   | 140       |
| 14,500   |            | <b>14,500</b> | 2,300    | 6,000   | 9,400   | 140       |
| 14,680   | 37/64      | <b>14,680</b> | 2,400    | 6,000   | 9,400   | 140       |
| 14,700   |            | <b>14,700</b> | 2,400    | 6,000   | 9,400   | 140       |
| 15,000   |            | <b>15,000</b> | 2,400    | 6,000   | 9,400   | 140       |
| 15,080   | 19/32      | <b>15,080</b> | 2,400    | 6,000   | 9,400   | 140       |
| 15,200   |            | <b>15,200</b> | 2,400    | 6,000   | 9,400   | 140       |
| 15,300   |            | <b>15,300</b> | 2,500    | 6,000   | 9,400   | 140       |
| 15,500   |            | <b>15,500</b> | 2,500    | 6,000   | 9,400   | 140       |
| 15,600   |            | <b>15,600</b> | 2,500    | 6,000   | 9,400   | 140       |
| 15,800   |            | <b>15,800</b> | 2,500    | 6,000   | 9,400   | 140       |
| 15,870   | 5/8        | <b>15,870</b> | 2,600    | 6,000   | 9,400   | 140       |
| 16,270   | 41/64      | <b>16,270</b> | 2,600    | 7,000   | 10,600  | 160       |
| 16,500   |            | <b>16,500</b> | 2,700    | 7,000   | 10,600  | 160       |
| 17,000   |            | <b>17,000</b> | 2,700    | 7,000   | 10,600  | 160       |
| 17,070   | 43/64      | <b>17,070</b> | 2,700    | 7,000   | 10,600  | 160       |
| 17,460   | 11/16      | <b>17,460</b> | 2,800    | 7,000   | 10,600  | 160       |
| 17,500   |            | <b>17,500</b> | 2,800    | 7,000   | 10,600  | 160       |
| 17,600   |            | <b>17,600</b> | 2,800    | 7,000   | 10,600  | 160       |
| 17,860   | 45/64      | <b>17,860</b> | 2,900    | 7,000   | 10,600  | 160       |
| 18,000   |            | <b>18,000</b> | 2,900    | 8,000   | 12,100  | 180       |
| 18,260   | 23/32      | <b>18,260</b> | 2,900    | 8,000   | 12,100  | 180       |
| 18,500   |            | <b>18,500</b> | 3,000    | 8,000   | 12,100  | 180       |
| 18,650   | 47/64      | <b>18,650</b> | 3,000    | 8,000   | 12,100  | 180       |
| 19,000   |            | <b>19,000</b> | 3,000    | 8,000   | 12,100  | 180       |
| 19,050   | 3/4        | <b>19,050</b> | 3,100    | 8,000   | 12,100  | 180       |
| 19,450   | 49/64      | <b>19,450</b> | 3,100    | 8,000   | 12,100  | 180       |
| 19,500   |            | <b>19,500</b> | 3,100    | 8,000   | 12,100  | 180       |
| 19,600   |            | <b>19,600</b> | 3,100    | 8,000   | 12,100  | 180       |
| 19,840   | 25/32      | <b>19,840</b> | 3,200    | 8,000   | 12,100  | 180       |
| 20,000   |            | <b>20,000</b> | 3,200    | 9,000   | 13,300  | 200       |
| 20,240   | 51/64      | <b>20,240</b> | 3,200    | 9,000   | 13,300  | 200       |
| 20,500   |            | <b>20,500</b> | 3,300    | 9,000   | 13,300  | 200       |

| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 20,640   | 13/16      | <b>20,640</b> | 3,300    | 9,000   | 13,300  | 200       |
| 21,000   |            | <b>21,000</b> | 3,400    | 9,000   | 13,300  | 200       |
| 21,030   | 53/64      | <b>21,030</b> | 3,400    | 9,000   | 13,300  | 200       |
| 21,100   |            | <b>21,100</b> | 3,400    | 9,000   | 13,300  | 200       |
| 21,500   |            | <b>21,500</b> | 3,400    | 9,000   | 13,300  | 200       |
| 22,000   |            | <b>22,000</b> | 3,500    | 10,000  | 14,800  | 220       |
| 22,500   |            | <b>22,500</b> | 3,600    | 10,000  | 14,800  | 220       |
| 23,000   |            | <b>23,000</b> | 3,700    | 10,000  | 14,800  | 220       |
| 23,420   | 59/64      | <b>23,420</b> | 3,700    | 10,000  | 14,800  | 220       |
| 23,810   | 15/16      | <b>23,810</b> | 3,800    | 10,000  | 14,800  | 220       |
| 24,100   |            | <b>24,100</b> | 3,800    | 11,000  | 15,300  | 240       |
| 24,500   |            | <b>24,500</b> | 3,900    | 11,000  | 15,300  | 240       |
| 25,000   | 63/64      | <b>25,000</b> | 4,000    | 11,000  | 15,300  | 240       |
| 25,500   |            | <b>25,500</b> | 4,100    | 11,000  | 15,300  | 240       |
| 25,700   |            | <b>25,700</b> | 4,100    | 11,000  | 15,300  | 240       |
| 26,190   | 1 1/32     | <b>26,190</b> | 4,200    | 12,000  | 19,400  | 260       |
| 26,500   |            | <b>26,500</b> | 4,200    | 12,000  | 19,400  | 260       |
| 27,500   |            | <b>27,500</b> | 4,400    | 12,000  | 19,400  | 260       |
| 27,700   |            | <b>27,700</b> | 4,400    | 12,000  | 19,400  | 260       |
| 28,000   |            | <b>28,000</b> | 4,500    | 13,000  | 20,100  | 280       |
| 28,180   | 1 7/64     | <b>28,180</b> | 4,500    | 13,000  | 20,100  | 280       |
| 28,580   |            | <b>28,580</b> | 4,600    | 13,000  | 20,100  | 280       |
| 29,000   |            | <b>29,000</b> | 4,600    | 13,000  | 20,100  | 280       |
| 29,500   |            | <b>29,500</b> | 4,700    | 13,000  | 20,100  | 280       |
| 30,000   |            | <b>30,000</b> | 4,800    | 14,000  | 21,700  | 300       |
| 30,500   |            | <b>30,500</b> | 4,900    | 14,000  | 21,700  | 300       |
| 30,960   | 1 7/32     | <b>30,960</b> | 4,900    | 14,000  | 21,700  | 300       |
| 31,500   |            | <b>31,500</b> | 5,000    | 14,000  | 21,700  | 300       |
| 31,750   | 1 1/4      | <b>31,750</b> | 5,100    | 14,000  | 21,700  | 300       |
| 32,500   |            | <b>32,500</b> | 5,200    | 15,000  | 22,400  | 320       |
| 32,540   | 1 9/32     | <b>32,540</b> | 5,200    | 15,000  | 22,400  | 320       |
| 33,340   | 1 5/16     | <b>33,340</b> | 5,300    | 15,000  | 22,400  | 320       |
| 33,500   |            | <b>33,500</b> | 5,300    | 15,000  | 22,400  | 320       |
| 34,000   |            | <b>34,000</b> | 5,400    | 15,000  | 22,400  | 320       |
| 34,130   | 1 11/32    | <b>34,130</b> | 5,400    | 15,000  | 22,400  | 320       |
| 34,500   |            | <b>34,500</b> | 5,500    | 15,000  | 22,400  | 320       |
| 34,930   |            | <b>34,930</b> | 5,600    | 15,000  | 22,400  | 320       |
| 35,000   |            | <b>35,000</b> | 5,600    | 15,000  | 22,400  | 320       |
| 35,500   |            | <b>35,500</b> | 5,600    | 15,000  | 22,400  | 320       |
| 36,000   |            | <b>36,000</b> | 5,700    | 16,000  | 23,200  | 360       |
| 36,500   |            | <b>36,500</b> | 5,800    | 16,000  | 23,200  | 360       |
| 36,510   | 1 7/16     | <b>36,510</b> | 5,800    | 16,000  | 23,200  | 360       |
| 37,000   |            | <b>37,000</b> | 5,900    | 16,000  | 23,200  | 360       |
| 37,310   | 1 15/32    | <b>37,310</b> | 5,900    | 16,000  | 23,200  | 360       |
| 37,500   |            | <b>37,500</b> | 6,000    | 16,000  | 23,200  | 360       |
| 38,000   |            | <b>38,000</b> | 6,000    | 16,000  | 23,200  | 360       |
| 38,100   | 1 1/2      | <b>38,100</b> | 6,100    | 16,000  | 23,200  | 360       |
| 38,500   | 1 33/64    | <b>38,500</b> | 6,100    | 16,000  | 23,200  | 360       |
| 39,000   |            | <b>39,000</b> | 6,200    | 16,000  | 23,200  | 360       |
| 39,500   |            | <b>39,500</b> | 6,300    | 16,000  | 23,200  | 360       |
| 40,000   |            | <b>40,000</b> | 6,400    | 16,000  | 23,200  | 360       |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP maxi

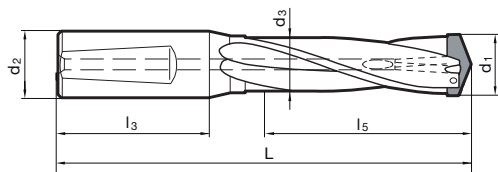


Catalogo n° 76000



Parametri di lav. ind. a pag. 46

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|----------|----------|---------|----------|----------|-----------|
| 16,00-17,00 | <b>17,000</b> | 20,000   | 15,700   | 128,400 | 50,000   | 53,000   | 0.1       |
| 17,01-17,99 | <b>17,990</b> | 20,000   | 16,700   | 128,400 | 50,000   | 53,000   | 0.2       |
| 18,00-19,00 | <b>19,000</b> | 20,000   | 17,700   | 136,700 | 50,000   | 53,000   | 1.1       |
| 19,01-20,00 | <b>20,000</b> | 20,000   | 18,700   | 136,700 | 50,000   | 58,000   | 1.2       |
| 20,01-21,00 | <b>21,000</b> | 25,000   | 19,700   | 151,600 | 56,000   | 58,000   | 2.1       |
| 21,01-22,50 | <b>22,500</b> | 25,000   | 20,700   | 151,600 | 56,000   | 63,000   | 2.2       |
| 22,51-24,00 | <b>24,000</b> | 25,000   | 22,200   | 159,400 | 56,000   | 63,000   | 3.1       |
| 24,01-25,50 | <b>25,500</b> | 25,000   | 23,700   | 168,400 | 56,000   | 68,000   | 3.2       |
| 25,51-27,50 | <b>27,500</b> | 32,000   | 25,200   | 180,000 | 60,000   | 68,000   | 4.1       |
| 27,51-29,50 | <b>29,500</b> | 32,000   | 27,200   | 188,000 | 60,000   | 68,000   | 4.2       |
| 29,51-32,00 | <b>32,000</b> | 32,000   | 29,200   | 195,600 | 60,000   | 75,000   | 5.1       |
| 32,01-34,50 | <b>34,500</b> | 32,000   | 31,700   | 203,600 | 60,000   | 75,000   | 5.2       |
| 34,51-37,50 | <b>37,500</b> | 32,000   | 34,000   | 215,100 | 60,000   | 75,000   | 6.1       |
| 37,51-40,50 | <b>40,500</b> | 32,000   | 37,000   | 228,100 | 60,000   | 120,000  | 6.2       |

## Sistema di foratura SuperV

### Porta utensili SuperV-AP maxi

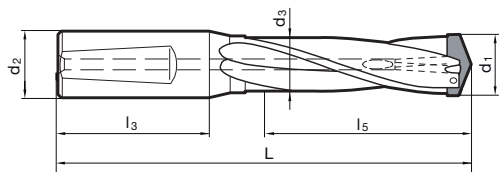


Catalogo n° 76001



Parametri di lav. ind. a pag. 48

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|----------|----------|---------|----------|----------|-----------|
| 16,00-17,00 | <b>17,000</b> | 20,000   | 15,700   | 164,400 | 50,000   | 90,000   | 0.1       |
| 17,01-17,99 | <b>17,990</b> | 20,000   | 16,700   | 164,400 | 50,000   | 90,000   | 0.2       |
| 18,00-19,00 | <b>19,000</b> | 20,000   | 17,700   | 176,700 | 50,000   | 100,000  | 1.1       |
| 19,01-20,00 | <b>20,000</b> | 20,000   | 18,700   | 176,700 | 50,000   | 100,000  | 1.2       |
| 20,01-21,00 | <b>21,000</b> | 25,000   | 19,700   | 195,600 | 56,000   | 110,000  | 2.1       |
| 21,01-22,50 | <b>22,500</b> | 25,000   | 20,700   | 195,600 | 56,000   | 110,000  | 2.2       |
| 22,51-24,00 | <b>24,000</b> | 25,000   | 22,200   | 207,400 | 56,000   | 120,000  | 3.1       |
| 24,01-25,50 | <b>25,500</b> | 25,000   | 23,700   | 220,400 | 56,000   | 130,000  | 3.2       |
| 25,51-27,50 | <b>27,500</b> | 32,000   | 25,200   | 236,000 | 60,000   | 140,000  | 4.1       |
| 27,51-29,50 | <b>29,500</b> | 32,000   | 27,200   | 248,000 | 60,000   | 150,000  | 4.2       |
| 29,51-32,00 | <b>32,000</b> | 32,000   | 29,200   | 259,600 | 60,000   | 160,000  | 5.1       |
| 32,01-34,50 | <b>34,500</b> | 32,000   | 31,700   | 271,600 | 60,000   | 170,000  | 5.2       |
| 34,51-37,50 | <b>37,500</b> | 32,000   | 34,000   | 289,100 | 60,000   | 190,000  | 6.1       |
| 37,51-40,50 | <b>40,500</b> | 32,000   | 37,000   | 308,100 | 60,000   | 200,000  | 6.2       |



## Sistema di foratura SuperV

### Porta utensili SuperV-AP maxi

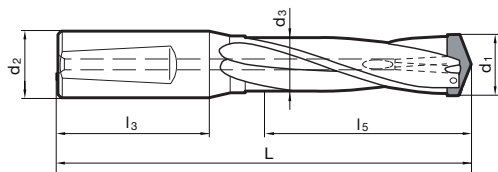


Catalogo n° 76003



Parametri di lav. ind. a pag. 50

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



| d1<br>mm    | Codice        | d2<br>mm | d3<br>mm | L<br>mm | l3<br>mm | l5<br>mm | Grandezza |
|-------------|---------------|----------|----------|---------|----------|----------|-----------|
| 16,00-17,00 | <b>17,000</b> | 20,000   | 15,700   | 194,000 | 50,000   | 126,000  | 0.1       |
| 17,01-17,99 | <b>17,990</b> | 20,000   | 16,700   | 194,000 | 50,000   | 126,000  | 0.2       |
| 18,00-19,00 | <b>19,000</b> | 20,000   | 17,700   | 210,000 | 50,000   | 140,000  | 1.1       |
| 19,01-20,00 | <b>20,000</b> | 20,000   | 18,700   | 210,000 | 50,000   | 140,000  | 1.2       |
| 20,01-21,00 | <b>21,000</b> | 25,000   | 19,700   | 232,200 | 56,000   | 154,000  | 2.1       |
| 21,01-22,50 | <b>22,500</b> | 25,000   | 20,700   | 232,200 | 56,000   | 154,000  | 2.2       |
| 22,51-24,00 | <b>24,000</b> | 25,000   | 22,200   | 247,000 | 56,000   | 168,000  | 3.1       |
| 24,01-25,50 | <b>25,500</b> | 25,000   | 23,700   | 264,000 | 56,000   | 182,000  | 3.2       |
| 25,51-27,50 | <b>27,500</b> | 32,000   | 25,200   | 282,400 | 60,000   | 196,000  | 4.1       |
| 27,51-29,50 | <b>29,500</b> | 32,000   | 27,200   | 298,400 | 60,000   | 210,000  | 4.2       |
| 29,51-32,00 | <b>32,000</b> | 32,000   | 29,200   | 312,400 | 60,000   | 224,000  | 5.1       |
| 32,01-34,50 | <b>34,500</b> | 32,000   | 31,700   | 328,400 | 60,000   | 238,000  | 5.2       |
| 34,51-37,50 | <b>37,500</b> | 32,000   | 34,000   | 350,000 | 60,000   | 266,000  | 6.1       |
| 37,51-40,50 | <b>40,500</b> | 32,000   | 37,000   | 375,000 | 60,000   | 280,000  | 6.2       |

## Sistema di foratura SuperV

### Inseri intercambiabili per SuperV-AP maxi



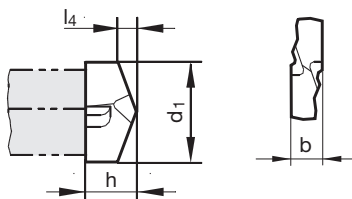
Catalogo n° 76011



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 46-50

- spoglia sul cono tagliente
- tagliente principale forma concava
- vite di serraggio catalogo n° 76020 inclusa



| d1<br>mm | d1<br>inch | Codice        | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|---------------|----------|---------|---------|-----------|
| 16,000   |            | <b>16,000</b> | 3,000    | 4,500   | 8,000   | 0.1       |
| 16,500   |            | <b>16,500</b> | 3,100    | 4,500   | 8,000   | 0.1       |
| 17,000   |            | <b>17,000</b> | 3,100    | 4,500   | 8,000   | 0.1       |
| 17,500   |            | <b>17,500</b> | 3,200    | 4,500   | 8,000   | 0.2       |
| 18,000   |            | <b>18,000</b> | 3,300    | 5,000   | 8,000   | 1.1       |
| 18,500   |            | <b>18,500</b> | 3,400    | 5,000   | 8,000   | 1.1       |
| 19,000   |            | <b>19,000</b> | 3,500    | 5,000   | 8,000   | 1.1       |
| 19,500   |            | <b>19,500</b> | 3,600    | 5,000   | 8,000   | 1.2       |
| 20,000   |            | <b>20,000</b> | 3,700    | 5,000   | 8,000   | 1.2       |
| 20,500   |            | <b>20,500</b> | 3,800    | 5,500   | 8,800   | 2.1       |
| 21,000   |            | <b>21,000</b> | 3,900    | 5,500   | 8,800   | 2.1       |
| 21,500   |            | <b>21,500</b> | 4,000    | 5,500   | 8,800   | 2.2       |
| 22,000   |            | <b>22,000</b> | 4,100    | 5,500   | 8,800   | 2.2       |
| 22,500   |            | <b>22,500</b> | 4,100    | 5,500   | 8,800   | 2.2       |
| 23,000   |            | <b>23,000</b> | 4,200    | 6,300   | 10,000  | 3.1       |
| 23,500   |            | <b>23,500</b> | 4,300    | 6,300   | 10,000  | 3.1       |
| 24,000   |            | <b>24,000</b> | 4,400    | 6,300   | 10,000  | 3.1       |
| 24,500   |            | <b>24,500</b> | 4,500    | 6,300   | 10,000  | 3.2       |
| 25,000   | 63/64      | <b>25,000</b> | 4,600    | 6,300   | 10,000  | 3.2       |
| 25,500   |            | <b>25,500</b> | 4,700    | 6,300   | 10,000  | 3.2       |
| 26,000   |            | <b>26,000</b> | 4,800    | 7,300   | 11,600  | 4.1       |
| 26,500   |            | <b>26,500</b> | 4,900    | 7,300   | 11,600  | 4.1       |
| 27,000   |            | <b>27,000</b> | 5,000    | 7,300   | 11,600  | 4.1       |
| 27,500   |            | <b>27,500</b> | 5,100    | 7,300   | 11,600  | 4.1       |
| 28,000   |            | <b>28,000</b> | 5,100    | 7,300   | 11,600  | 4.2       |
| 28,500   |            | <b>28,500</b> | 5,200    | 7,300   | 11,600  | 4.2       |
| 29,000   |            | <b>29,000</b> | 5,300    | 7,300   | 11,600  | 4.2       |
| 29,500   |            | <b>29,500</b> | 5,400    | 7,300   | 11,600  | 4.2       |
| 30,000   |            | <b>30,000</b> | 5,500    | 8,500   | 13,600  | 5.1       |
| 30,500   |            | <b>30,500</b> | 5,600    | 8,500   | 13,600  | 5.1       |
| 31,000   |            | <b>31,000</b> | 5,700    | 8,500   | 13,600  | 5.1       |
| 31,500   |            | <b>31,500</b> | 5,800    | 8,500   | 13,600  | 5.1       |
| 32,000   |            | <b>32,000</b> | 5,900    | 8,500   | 13,600  | 5.1       |
| 32,500   |            | <b>32,500</b> | 6,000    | 8,500   | 13,600  | 5.2       |
| 33,000   |            | <b>33,000</b> | 6,100    | 8,500   | 13,600  | 5.2       |
| 33,500   |            | <b>33,500</b> | 6,100    | 8,500   | 13,600  | 5.2       |
| 34,000   |            | <b>34,000</b> | 6,200    | 8,500   | 13,600  | 5.2       |
| 34,500   |            | <b>34,500</b> | 6,300    | 8,500   | 13,600  | 5.2       |
| 35,000   |            | <b>35,000</b> | 6,400    | 10,000  | 16,000  | 6.1       |
| 36,000   |            | <b>36,000</b> | 6,600    | 10,000  | 16,000  | 6.1       |
| 37,000   |            | <b>37,000</b> | 6,800    | 10,000  | 16,000  | 6.1       |
| 37,500   |            | <b>37,500</b> | 6,900    | 10,000  | 16,000  | 6.1       |
| 38,000   |            | <b>38,000</b> | 7,000    | 10,000  | 16,000  | 6.2       |
| 39,000   |            | <b>39,000</b> | 7,100    | 10,000  | 16,000  | 6.2       |
| 40,000   |            | <b>40,000</b> | 7,300    | 10,000  | 16,000  | 6.2       |
| 40,500   |            | <b>40,500</b> | 7,400    | 10,000  | 16,000  | 6.2       |

## Sistema di foratura SuperV

### Inseri intercambiabili per SuperV-AP maxi



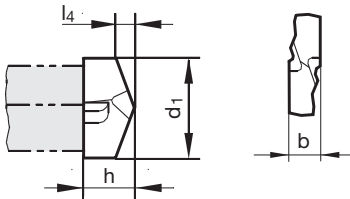
Catalogo n° 56011



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 46-50

- spoglia sul cono tagliente
- tagliente principale forma concava
- massima resistenza all'usura
- vite di serraggio catalogo n° 76020 inclusa



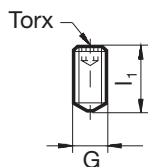
| d1<br>mm | d1<br>inch | Codice | l4<br>mm | b<br>mm | h<br>mm | Grandezza |
|----------|------------|--------|----------|---------|---------|-----------|
| 16,000   |            | 16,000 | 3,000    | 4,500   | 8,000   | 0.1       |
| 16,500   |            | 16,500 | 3,100    | 4,500   | 8,000   | 0.1       |
| 17,000   |            | 17,000 | 3,100    | 4,500   | 8,000   | 0.1       |
| 17,500   |            | 17,500 | 3,200    | 4,500   | 8,000   | 0.2       |
| 18,000   |            | 18,000 | 3,300    | 5,000   | 8,000   | 1.1       |
| 18,500   |            | 18,500 | 3,400    | 5,000   | 8,000   | 1.1       |
| 19,000   |            | 19,000 | 3,500    | 5,000   | 8,000   | 1.1       |
| 19,500   |            | 19,500 | 3,600    | 5,000   | 8,000   | 1.2       |
| 20,000   |            | 20,000 | 3,700    | 5,000   | 8,000   | 1.2       |
| 20,500   |            | 20,500 | 3,800    | 5,500   | 8,800   | 2.1       |
| 21,000   |            | 21,000 | 3,900    | 5,500   | 8,800   | 2.1       |
| 21,500   |            | 21,500 | 4,000    | 5,500   | 8,800   | 2.2       |
| 22,000   |            | 22,000 | 4,100    | 5,500   | 8,800   | 2.2       |
| 22,500   |            | 22,500 | 4,100    | 5,500   | 8,800   | 2.2       |
| 23,000   |            | 23,000 | 4,200    | 6,300   | 10,000  | 3.1       |
| 23,500   |            | 23,500 | 4,300    | 6,300   | 10,000  | 3.1       |
| 24,000   |            | 24,000 | 4,400    | 6,300   | 10,000  | 3.1       |
| 24,500   |            | 24,500 | 4,500    | 6,300   | 10,000  | 3.2       |
| 25,000   | 63/64      | 25,000 | 4,600    | 6,300   | 10,000  | 3.2       |
| 25,500   |            | 25,500 | 4,700    | 6,300   | 10,000  | 3.2       |
| 26,000   |            | 26,000 | 4,800    | 7,300   | 11,600  | 4.1       |
| 26,500   |            | 26,500 | 4,900    | 7,300   | 11,600  | 4.1       |
| 27,000   |            | 27,000 | 5,000    | 7,300   | 11,600  | 4.1       |
| 27,500   |            | 27,500 | 5,100    | 7,300   | 11,600  | 4.1       |
| 28,000   |            | 28,000 | 5,100    | 7,300   | 11,600  | 4.2       |
| 28,500   |            | 28,500 | 5,200    | 7,300   | 11,600  | 4.2       |
| 29,000   |            | 29,000 | 5,300    | 7,300   | 11,600  | 4.2       |
| 29,500   |            | 29,500 | 5,400    | 7,300   | 11,600  | 4.2       |
| 30,000   |            | 30,000 | 5,500    | 8,500   | 13,600  | 5.1       |
| 30,500   |            | 30,500 | 5,600    | 8,500   | 13,600  | 5.1       |
| 31,000   |            | 31,000 | 5,700    | 8,500   | 13,600  | 5.1       |
| 31,500   |            | 31,500 | 5,800    | 8,500   | 13,600  | 5.1       |
| 32,000   |            | 32,000 | 5,900    | 8,500   | 13,600  | 5.1       |
| 32,500   |            | 32,500 | 6,000    | 8,500   | 13,600  | 5.2       |
| 33,000   |            | 33,000 | 6,100    | 8,500   | 13,600  | 5.2       |
| 33,500   |            | 33,500 | 6,100    | 8,500   | 13,600  | 5.2       |
| 34,000   |            | 34,000 | 6,200    | 8,500   | 13,600  | 5.2       |
| 34,500   |            | 34,500 | 6,300    | 8,500   | 13,600  | 5.2       |
| 35,000   |            | 35,000 | 6,400    | 10,000  | 16,000  | 6.1       |
| 36,000   |            | 36,000 | 6,600    | 10,000  | 16,000  | 6.1       |
| 37,000   |            | 37,000 | 6,800    | 10,000  | 16,000  | 6.1       |
| 37,500   |            | 37,500 | 6,900    | 10,000  | 16,000  | 6.1       |
| 38,000   |            | 38,000 | 7,000    | 10,000  | 16,000  | 6.2       |
| 39,000   |            | 39,000 | 7,100    | 10,000  | 16,000  | 6.2       |
| 40,000   |            | 40,000 | 7,300    | 10,000  | 16,000  | 6.2       |
| 40,500   |            | 40,500 | 7,400    | 10,000  | 16,000  | 6.2       |

## Sistema di foratura SuperV

### Viti di serraggio



Catalogo n° 76020



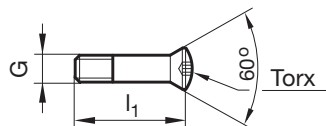
| G          | l1<br>mm | Torx | Codice |
|------------|----------|------|--------|
| M 3X0,35   | 7,000    | T6   | 3,000  |
| M 3X0,35   | 6,000    | T6   | 3,006  |
| M 3,5X0,35 | 8,000    | T7   | 3,500  |
| M 4X0,5    | 9,000    | T8   | 4,000  |
| M 4,5X0,5  | 10,000   | T8   | 4,500  |
| M 5X0,5    | 11,000   | T10  | 5,000  |

## Sistema di foratura SuperV

### Viti di serraggio



Catalogo n° 77020



| G     | l1<br>mm | Torx | Codice |
|-------|----------|------|--------|
| M 2,2 | 9,500    | T7   | 2,200  |
| M 2,2 | 10,500   | T7   | 2,201  |
| M 2,5 | 11,400   | T8   | 2,500  |
| M 3   | 12,100   | T9   | 3,000  |
| M 3   | 13,100   | T9   | 3,001  |
| M 3,5 | 14,250   | T10  | 3,500  |
| M 4   | 16,000   | T15  | 4,000  |
| M 4,5 | 18,000   | T15  | 4,500  |
| M 5   | 19,750   | T20  | 5,000  |
| M 5   | 21,750   | T20  | 5,001  |
| M 5   | 23,400   | T20  | 5,003  |
| M 6   | 27,000   | T25  | 6,000  |
| M 6   | 28,500   | T25  | 6,001  |
| M 6   | 32,500   | T25  | 6,002  |

## Sistema di foratura SuperV

### Chiavi dinamometriche



Catalogo n° 77022

| Tipo | Codice       | Torx | L<br>mm | Mom. torcente<br>Nm |
|------|--------------|------|---------|---------------------|
| A    | <b>2,000</b> | 1/4" | 160,000 | 0,8...2             |
| A    | <b>5,001</b> | 1/4" | 160,000 | 1...5               |
| A    | <b>8,000</b> | 1/4" | 160,000 | 2...8               |

## Sistema di foratura SuperV

### Spine Torx



Catalogo n° 77021

| Torx | L<br>mm | kg    | Codice        |
|------|---------|-------|---------------|
| T6   | 25,000  | 0,040 | <b>6,000</b>  |
| T8   | 25,000  | 0,071 | <b>8,000</b>  |
| T10  | 25,000  | 0,112 | <b>10,000</b> |
| T20  | 25,000  | 0,045 | <b>20,000</b> |

## Sistema di foratura SuperV

### Giravite Torx



Catalogo n° 76021

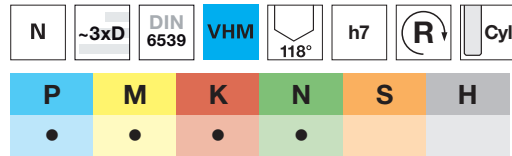
| Torx | Codice        | L<br>mm |
|------|---------------|---------|
| T6   | <b>6,000</b>  | 42,000  |
| T7   | <b>7,001</b>  | 150,000 |
| T8   | <b>8,000</b>  | 48,000  |
| T8   | <b>8,001</b>  | 150,000 |
| T9   | <b>9,001</b>  | 150,000 |
| T10  | <b>10,001</b> | 170,000 |
| T15  | <b>15,000</b> | 54,000  |
| T15  | <b>15,001</b> | 190,000 |
| T20  | <b>20,000</b> | 57,000  |
| T20  | <b>20,001</b> | 205,000 |
| T25  | <b>25,000</b> | 60,000  |
| T25  | <b>25,001</b> | 207,000 |

## Punte in metallo duro

### Punte elicoidali, extra corte

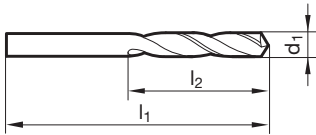


Catalogo n° 71184



Parametri di lav.  
ind. a pag. 52

- Assott. del nocch.  $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale dritta



| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 1,000    |       | 26,000   | 6,000    | 5,100    |       | 62,000   | 26,000   |
| 1,100    |       | 28,000   | 7,000    | 5,200    |       | 62,000   | 26,000   |
| 1,200    |       | 30,000   | 8,000    | 5,300    |       | 62,000   | 26,000   |
| 1,300    |       | 30,000   | 8,000    | 5,400    |       | 66,000   | 28,000   |
| 1,400    |       | 32,000   | 9,000    | 5,500    |       | 66,000   | 28,000   |
| 1,500    |       | 32,000   | 9,000    | 5,600    |       | 66,000   | 28,000   |
| 1,600    |       | 34,000   | 10,000   | 5,700    |       | 66,000   | 28,000   |
| 1,700    |       | 34,000   | 10,000   | 5,800    |       | 66,000   | 28,000   |
| 1,800    |       | 36,000   | 11,000   | 5,900    |       | 66,000   | 28,000   |
| 1,900    |       | 36,000   | 11,000   | 6,000    |       | 66,000   | 28,000   |
| 2,000    |       | 38,000   | 12,000   | 6,100    |       | 70,000   | 31,000   |
| 2,100    |       | 38,000   | 12,000   | 6,200    |       | 70,000   | 31,000   |
| 2,200    |       | 40,000   | 13,000   | 6,300    |       | 70,000   | 31,000   |
| 2,300    |       | 40,000   | 13,000   | 6,350    | 1/4   | 70,000   | 31,000   |
| 2,380    | 3/32  | 43,000   | 14,000   | 6,400    |       | 70,000   | 31,000   |
| 2,400    |       | 43,000   | 14,000   | 6,500    |       | 70,000   | 31,000   |
| 2,500    |       | 43,000   | 14,000   | 6,600    |       | 70,000   | 31,000   |
| 2,600    |       | 43,000   | 14,000   | 6,700    |       | 70,000   | 31,000   |
| 2,700    |       | 46,000   | 16,000   | 6,800    |       | 74,000   | 34,000   |
| 2,780    | 7/64  | 46,000   | 16,000   | 6,900    |       | 74,000   | 34,000   |
| 2,800    |       | 46,000   | 16,000   | 7,000    |       | 74,000   | 34,000   |
| 2,900    |       | 46,000   | 16,000   | 7,100    |       | 74,000   | 34,000   |
| 3,000    |       | 46,000   | 16,000   | 7,140    | 9/32  | 74,000   | 34,000   |
| 3,100    |       | 49,000   | 18,000   | 7,200    |       | 74,000   | 34,000   |
| 3,170    | 1/8   | 49,000   | 18,000   | 7,300    |       | 74,000   | 34,000   |
| 3,200    |       | 49,000   | 18,000   | 7,400    |       | 74,000   | 34,000   |
| 3,300    |       | 49,000   | 18,000   | 7,500    |       | 74,000   | 34,000   |
| 3,400    |       | 52,000   | 20,000   | 7,600    |       | 79,000   | 37,000   |
| 3,500    |       | 52,000   | 20,000   | 7,700    |       | 79,000   | 37,000   |
| 3,570    | 9/64  | 52,000   | 20,000   | 7,800    |       | 79,000   | 37,000   |
| 3,600    |       | 52,000   | 20,000   | 7,900    |       | 79,000   | 37,000   |
| 3,700    |       | 52,000   | 20,000   | 7,940    | 5/16  | 79,000   | 37,000   |
| 3,800    |       | 55,000   | 22,000   | 8,000    |       | 79,000   | 37,000   |
| 3,900    |       | 55,000   | 22,000   | 8,100    |       | 79,000   | 37,000   |
| 3,970    | 5/32  | 55,000   | 22,000   | 8,200    |       | 79,000   | 37,000   |
| 4,000    |       | 55,000   | 22,000   | 8,300    |       | 79,000   | 37,000   |
| 4,100    |       | 55,000   | 22,000   | 8,400    |       | 79,000   | 37,000   |
| 4,200    |       | 55,000   | 22,000   | 8,500    |       | 79,000   | 37,000   |
| 4,300    |       | 58,000   | 24,000   | 8,600    |       | 84,000   | 40,000   |
| 4,370    | 11/64 | 58,000   | 24,000   | 8,700    |       | 84,000   | 40,000   |
| 4,400    |       | 58,000   | 24,000   | 8,730    | 11/32 | 84,000   | 40,000   |
| 4,500    |       | 58,000   | 24,000   | 8,800    |       | 84,000   | 40,000   |
| 4,600    |       | 58,000   | 24,000   | 8,900    |       | 84,000   | 40,000   |
| 4,700    |       | 58,000   | 24,000   | 9,000    |       | 84,000   | 40,000   |
| 4,760    | 3/16  | 62,000   | 26,000   | 9,100    |       | 84,000   | 40,000   |
| 4,800    |       | 62,000   | 26,000   | 9,200    |       | 84,000   | 40,000   |
| 4,900    |       | 62,000   | 26,000   | 9,300    |       | 84,000   | 40,000   |
| 5,000    |       | 62,000   | 26,000   | 9,400    |       | 84,000   | 40,000   |

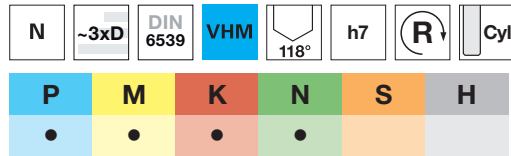
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 9,500    |      | 84,000   | 40,000   | 11,500   |       | 95,000   | 47,000   |
| 9,600    |      | 89,000   | 43,000   | 11,910   | 15/32 | 102,000  | 51,000   |
| 9,700    |      | 89,000   | 43,000   | 12,000   |       | 102,000  | 51,000   |
| 9,800    |      | 89,000   | 43,000   | 13,000   |       | 102,000  | 51,000   |
| 9,900    |      | 89,000   | 43,000   | 15,000   |       | 111,000  | 56,000   |
| 10,000   |      | 89,000   | 43,000   |          |       |          |          |
| 10,100   |      | 89,000   | 43,000   |          |       |          |          |
| 10,200   |      | 89,000   | 43,000   |          |       |          |          |
| 10,300   |      | 89,000   | 43,000   |          |       |          |          |
| 10,500   |      | 89,000   | 43,000   |          |       |          |          |
| 11,000   |      | 95,000   | 47,000   |          |       |          |          |
| 11,110   | 7/16 | 95,000   | 47,000   |          |       |          |          |

## Punte in metallo duro

### Punte elicoidali, extra corte

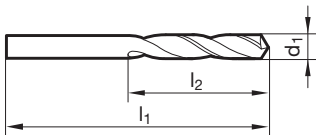


Catalogo n° 51184



Parametri di lav.  
ind. a pag. 52

- Assott. del noc.  $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale dritta
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    | 5,800    |      | 66,000   | 28,000   |
| 1,100    |      | 28,000   | 7,000    | 5,900    |      | 66,000   | 28,000   |
| 1,200    |      | 30,000   | 8,000    | 6,000    |      | 66,000   | 28,000   |
| 1,300    |      | 30,000   | 8,000    | 6,100    |      | 70,000   | 31,000   |
| 1,400    |      | 32,000   | 9,000    | 6,200    |      | 70,000   | 31,000   |
| 1,500    |      | 32,000   | 9,000    | 6,300    |      | 70,000   | 31,000   |
| 1,600    |      | 34,000   | 10,000   | 6,400    |      | 70,000   | 31,000   |
| 1,700    |      | 34,000   | 10,000   | 6,500    |      | 70,000   | 31,000   |
| 1,800    |      | 36,000   | 11,000   | 6,600    |      | 70,000   | 31,000   |
| 1,900    |      | 36,000   | 11,000   | 6,700    |      | 70,000   | 31,000   |
| 2,000    |      | 38,000   | 12,000   | 6,800    |      | 74,000   | 34,000   |
| 2,100    |      | 38,000   | 12,000   | 6,900    |      | 74,000   | 34,000   |
| 2,200    |      | 40,000   | 13,000   | 7,000    |      | 74,000   | 34,000   |
| 2,300    |      | 40,000   | 13,000   | 7,100    |      | 74,000   | 34,000   |
| 2,400    |      | 43,000   | 14,000   | 7,200    |      | 74,000   | 34,000   |
| 2,500    |      | 43,000   | 14,000   | 7,300    |      | 74,000   | 34,000   |
| 2,600    |      | 43,000   | 14,000   | 7,400    |      | 74,000   | 34,000   |
| 2,700    |      | 46,000   | 16,000   | 7,500    |      | 74,000   | 34,000   |
| 2,800    |      | 46,000   | 16,000   | 7,600    |      | 79,000   | 37,000   |
| 2,900    |      | 46,000   | 16,000   | 7,700    |      | 79,000   | 37,000   |
| 3,000    |      | 46,000   | 16,000   | 7,800    |      | 79,000   | 37,000   |
| 3,100    |      | 49,000   | 18,000   | 7,900    |      | 79,000   | 37,000   |
| 3,200    |      | 49,000   | 18,000   | 8,000    |      | 79,000   | 37,000   |
| 3,300    |      | 49,000   | 18,000   | 8,100    |      | 79,000   | 37,000   |
| 3,400    |      | 52,000   | 20,000   | 8,200    |      | 79,000   | 37,000   |
| 3,500    |      | 52,000   | 20,000   | 8,300    |      | 79,000   | 37,000   |
| 3,600    |      | 52,000   | 20,000   | 8,400    |      | 79,000   | 37,000   |
| 3,700    |      | 52,000   | 20,000   | 8,500    |      | 79,000   | 37,000   |
| 3,800    |      | 55,000   | 22,000   | 8,600    |      | 84,000   | 40,000   |
| 3,900    |      | 55,000   | 22,000   | 8,700    |      | 84,000   | 40,000   |
| 4,000    |      | 55,000   | 22,000   | 8,800    |      | 84,000   | 40,000   |
| 4,100    |      | 55,000   | 22,000   | 8,900    |      | 84,000   | 40,000   |
| 4,200    |      | 55,000   | 22,000   | 9,000    |      | 84,000   | 40,000   |
| 4,300    |      | 58,000   | 24,000   | 9,100    |      | 84,000   | 40,000   |
| 4,400    |      | 58,000   | 24,000   | 9,200    |      | 84,000   | 40,000   |
| 4,500    |      | 58,000   | 24,000   | 9,300    |      | 84,000   | 40,000   |
| 4,600    |      | 58,000   | 24,000   | 9,400    |      | 84,000   | 40,000   |
| 4,700    |      | 58,000   | 24,000   | 9,500    |      | 84,000   | 40,000   |
| 4,800    |      | 62,000   | 26,000   | 9,600    |      | 89,000   | 43,000   |
| 4,900    |      | 62,000   | 26,000   | 9,700    |      | 89,000   | 43,000   |
| 5,000    |      | 62,000   | 26,000   | 9,800    |      | 89,000   | 43,000   |
| 5,100    |      | 62,000   | 26,000   | 9,900    |      | 89,000   | 43,000   |
| 5,200    |      | 62,000   | 26,000   | 10,000   |      | 89,000   | 43,000   |
| 5,300    |      | 62,000   | 26,000   | 10,200   |      | 89,000   | 43,000   |
| 5,400    |      | 66,000   | 28,000   | 10,500   |      | 89,000   | 43,000   |
| 5,500    |      | 66,000   | 28,000   | 11,000   |      | 95,000   | 47,000   |
| 5,600    |      | 66,000   | 28,000   | 11,500   |      | 95,000   | 47,000   |
| 5,700    |      | 66,000   | 28,000   | 12,000   |      | 102,000  | 51,000   |

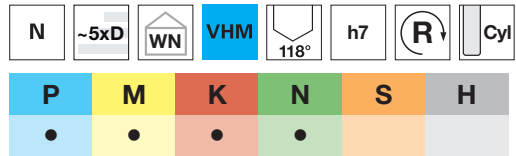


## Punte in metallo duro

### Punte elicoidali, corte

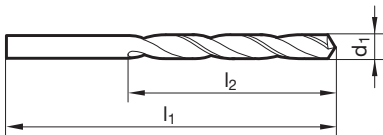


Catalogo n° 71290



Parametri di lav.  
ind. a pag. 52

- Assott. del noc.  $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale dritta



| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 1,000    |       | 34,000   | 12,000   | 5,100    |       | 86,000   | 52,000   |
| 1,100    |       | 36,000   | 14,000   | 5,160    | 13/64 | 86,000   | 52,000   |
| 1,200    |       | 38,000   | 16,000   | 5,200    |       | 86,000   | 52,000   |
| 1,300    |       | 38,000   | 16,000   | 5,300    |       | 86,000   | 52,000   |
| 1,400    |       | 40,000   | 18,000   | 5,400    |       | 93,000   | 57,000   |
| 1,500    |       | 40,000   | 18,000   | 5,500    |       | 93,000   | 57,000   |
| 1,600    |       | 43,000   | 20,000   | 5,560    | 7/32  | 93,000   | 57,000   |
| 1,700    |       | 43,000   | 20,000   | 5,600    |       | 93,000   | 57,000   |
| 1,800    |       | 46,000   | 22,000   | 5,700    |       | 93,000   | 57,000   |
| 1,900    |       | 46,000   | 22,000   | 5,800    |       | 93,000   | 57,000   |
| 2,000    |       | 49,000   | 24,000   | 5,900    |       | 93,000   | 57,000   |
| 2,100    |       | 49,000   | 24,000   | 5,950    | 15/64 | 93,000   | 57,000   |
| 2,200    |       | 53,000   | 27,000   | 6,000    |       | 93,000   | 57,000   |
| 2,300    |       | 53,000   | 27,000   | 6,100    |       | 101,000  | 63,000   |
| 2,380    | 3/32  | 57,000   | 30,000   | 6,200    |       | 101,000  | 63,000   |
| 2,400    |       | 57,000   | 30,000   | 6,300    |       | 101,000  | 63,000   |
| 2,500    |       | 57,000   | 30,000   | 6,350    | 1/4   | 101,000  | 63,000   |
| 2,600    |       | 57,000   | 30,000   | 6,400    |       | 101,000  | 63,000   |
| 2,700    |       | 61,000   | 33,000   | 6,500    |       | 101,000  | 63,000   |
| 2,780    | 7/64  | 61,000   | 33,000   | 6,600    |       | 101,000  | 63,000   |
| 2,800    |       | 61,000   | 33,000   | 6,700    |       | 101,000  | 63,000   |
| 2,900    |       | 61,000   | 33,000   | 6,800    |       | 109,000  | 69,000   |
| 3,000    |       | 61,000   | 33,000   | 6,900    |       | 109,000  | 69,000   |
| 3,100    |       | 65,000   | 36,000   | 7,000    |       | 109,000  | 69,000   |
| 3,170    | 1/8   | 65,000   | 36,000   | 7,100    |       | 109,000  | 69,000   |
| 3,200    |       | 65,000   | 36,000   | 7,140    | 9/32  | 109,000  | 69,000   |
| 3,300    |       | 65,000   | 36,000   | 7,200    |       | 109,000  | 69,000   |
| 3,400    |       | 70,000   | 39,000   | 7,300    |       | 109,000  | 69,000   |
| 3,500    |       | 70,000   | 39,000   | 7,400    |       | 109,000  | 69,000   |
| 3,570    | 9/64  | 70,000   | 39,000   | 7,500    |       | 109,000  | 69,000   |
| 3,600    |       | 70,000   | 39,000   | 7,600    |       | 117,000  | 75,000   |
| 3,700    |       | 70,000   | 39,000   | 7,700    |       | 117,000  | 75,000   |
| 3,800    |       | 75,000   | 43,000   | 7,800    |       | 117,000  | 75,000   |
| 3,900    |       | 75,000   | 43,000   | 7,900    |       | 117,000  | 75,000   |
| 3,970    | 5/32  | 75,000   | 43,000   | 7,940    | 5/16  | 117,000  | 75,000   |
| 4,000    |       | 75,000   | 43,000   | 8,000    |       | 117,000  | 75,000   |
| 4,100    |       | 75,000   | 43,000   | 8,100    |       | 117,000  | 75,000   |
| 4,200    |       | 75,000   | 43,000   | 8,200    |       | 117,000  | 75,000   |
| 4,300    |       | 80,000   | 47,000   | 8,300    |       | 117,000  | 75,000   |
| 4,370    | 11/64 | 80,000   | 47,000   | 8,400    |       | 117,000  | 75,000   |
| 4,400    |       | 80,000   | 47,000   | 8,500    |       | 117,000  | 75,000   |
| 4,500    |       | 80,000   | 47,000   | 8,600    |       | 125,000  | 81,000   |
| 4,600    |       | 80,000   | 47,000   | 8,700    |       | 125,000  | 81,000   |
| 4,700    |       | 80,000   | 47,000   | 8,730    | 11/32 | 125,000  | 81,000   |
| 4,760    | 3/16  | 86,000   | 52,000   | 8,800    |       | 125,000  | 81,000   |
| 4,800    |       | 86,000   | 52,000   | 8,900    |       | 125,000  | 81,000   |
| 4,900    |       | 86,000   | 52,000   | 9,000    |       | 125,000  | 81,000   |
| 5,000    |       | 86,000   | 52,000   | 9,100    |       | 125,000  | 81,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 9,200    |      | 125,000  | 81,000   | 11,000   |       | 142,000  | 94,000   |
| 9,300    |      | 125,000  | 81,000   | 11,110   | 7/16  | 142,000  | 94,000   |
| 9,400    |      | 125,000  | 81,000   | 11,500   |       | 142,000  | 94,000   |
| 9,500    |      | 125,000  | 81,000   | 11,910   | 15/32 | 151,000  | 101,000  |
| 9,600    |      | 133,000  | 87,000   | 12,000   |       | 151,000  | 101,000  |
| 9,700    |      | 133,000  | 87,000   |          |       |          |          |
| 9,800    |      | 133,000  | 87,000   |          |       |          |          |
| 9,900    |      | 133,000  | 87,000   |          |       |          |          |
| 10,000   |      | 133,000  | 87,000   |          |       |          |          |
| 10,200   |      | 133,000  | 87,000   |          |       |          |          |
| 10,300   |      | 133,000  | 87,000   |          |       |          |          |
| 10,500   |      | 133,000  | 87,000   |          |       |          |          |

## Punte in metallo duro

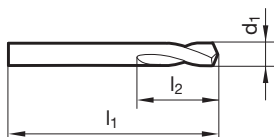
### Punte cilindriche per centri CN



Catalogo n° 71190

|   |    |     |        |     |    |   |    |
|---|----|-----|--------|-----|----|---|----|
| N | WN | VHM | lucido | 90° | h6 | R | HA |
| P | M  | K   | N      | S   | H  |   |    |
| • | •  | •   | •      | •   |    |   |    |

- affilatura su piani
- adatte solo per centrare



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 5,000    | 62,000   | 14,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |
| 12,000   | 102,000  | 30,000   |
| 16,000   | 115,000  | 37,500   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 20,000   | 131,000  | 45,000   |

## Punte in metallo duro

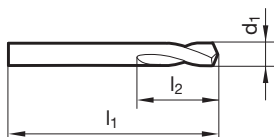
### Punte cilindriche per centri CN



Catalogo n° 71191

|   |    |     |        |      |    |   |    |
|---|----|-----|--------|------|----|---|----|
| N | WN | VHM | lucido | 120° | h6 | R | HA |
| P | M  | K   | N      | S    | H  |   |    |
| • | •  | •   | •      | •    |    |   |    |

- affilatura su piani
- adatte solo per centrare



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 5,000    | 62,000   | 14,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |
| 12,000   | 102,000  | 30,000   |
| 16,000   | 115,000  | 37,500   |

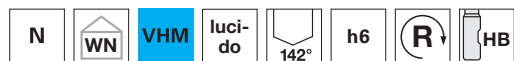
| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 20,000   | 131,000  | 45,000   |

## Punte in metallo duro

### Punte cilindriche per centri CN

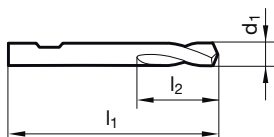


Catalogo n° 71189



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

- affilatura su piani
- adatte solo per centrare
- da gambo Ø 6 mm con dispositivo di bloccaggio



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 4,000    | 55,000   | 12,000   |
| 5,000    | 62,000   | 14,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |
| 12,000   | 102,000  | 30,000   |

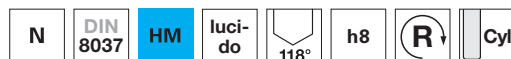
| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 16,000   | 115,000  | 37,500   |
| 20,000   | 131,000  | 45,000   |

## Punte in metallo duro

### Punte speciali, con taglienti in MD



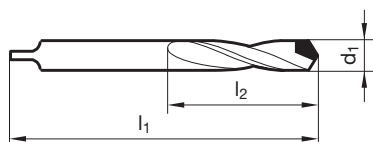
Catalogo n° 71180



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ○        |          | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 52

- Assott. del nocch.  $\geq \varnothing 3,000$
- affilatura su piani
- con riporti in MD



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 3,000    | 50,000   | 20,000   |
| 3,500    | 56,000   | 25,000   |
| 4,000    | 56,000   | 25,000   |
| 4,500    | 63,000   | 28,000   |
| 5,000    | 63,000   | 28,000   |
| 5,500    | 71,000   | 32,000   |
| 6,000    | 71,000   | 32,000   |
| 6,500    | 71,000   | 32,000   |
| 7,000    | 80,000   | 40,000   |
| 7,500    | 80,000   | 40,000   |
| 8,000    | 80,000   | 40,000   |
| 8,500    | 90,000   | 50,000   |
| 9,000    | 90,000   | 50,000   |
| 9,500    | 90,000   | 50,000   |
| 10,000   | 100,000  | 56,000   |
| 10,500   | 100,000  | 56,000   |
| 11,000   | 100,000  | 56,000   |
| 11,500   | 112,000  | 63,000   |

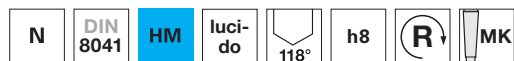
| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 12,000   | 112,000  | 63,000   |
| 13,000   | 112,000  | 63,000   |
| 14,000   | 125,000  | 71,000   |
| 14,500   | 125,000  | 71,000   |
| 15,000   | 125,000  | 71,000   |
| 16,000   | 140,000  | 80,000   |
| 20,000   | 160,000  | 90,000   |

## Punte in metallo duro

### Punte speciali, con taglienti in MD



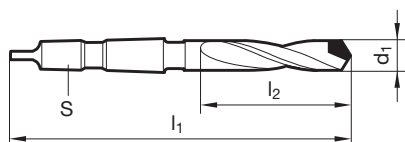
Catalogo n° 71380



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ |   | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 52

- Assott. del nocco.  $\geq \varnothing 11,000$
- affilatura su piani
- con riporti in MD



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 11,000   | MK-1 | 140,000  | 50,000   |
| 12,500   | MK-1 | 146,000  | 56,000   |
| 13,000   | MK-1 | 146,000  | 56,000   |
| 13,500   | MK-2 | 168,000  | 63,000   |
| 14,000   | MK-2 | 168,000  | 63,000   |
| 15,000   | MK-2 | 168,000  | 63,000   |
| 15,500   | MK-2 | 175,000  | 70,000   |
| 16,000   | MK-2 | 175,000  | 70,000   |
| 17,000   | MK-2 | 175,000  | 70,000   |
| 17,500   | MK-2 | 185,000  | 80,000   |
| 18,000   | MK-2 | 185,000  | 80,000   |
| 20,000   | MK-3 | 215,000  | 90,000   |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 21,000   | MK-3 | 215,000  | 90,000   |
| 22,000   | MK-3 | 215,000  | 90,000   |
| 28,000   | MK-4 | 260,000  | 110,000  |
| 30,000   | MK-4 | 275,000  | 125,000  |
| 33,000   | MK-4 | 290,000  | 140,000  |

## Punte a centrare VHM

### Punte a centrare senza piano

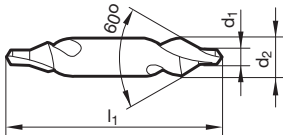


Catalogo n° 71616



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 1,000    | 3,150    | 31,500   |
| 1,250    | 3,150    | 31,500   |
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |
| 6,300    | 16,000   | 71,000   |



## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-AL



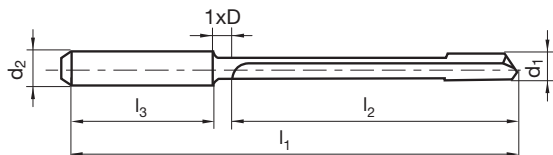
Catalogo n° 55027



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da  $d_1 = 3$  mm e  $d_2 = 6$  mm
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,380    | 4,000    | 100,000  | 70,000   | 28,000   | 2,380  |
| 2,500    | 4,000    | 115,000  | 85,000   | 28,000   | 2,500  |
| 2,780    | 4,000    | 115,000  | 85,000   | 28,000   | 2,780  |
| 3,000    | 6,000    | 145,000  | 105,000  | 36,000   | 3,000  |
| 3,170    | 6,000    | 145,000  | 105,000  | 36,000   | 3,170  |
| 3,500    | 6,000    | 145,000  | 105,000  | 36,000   | 3,500  |
| 3,970    | 6,000    | 160,000  | 120,000  | 36,000   | 3,970  |
| 4,000    | 6,000    | 160,000  | 120,000  | 36,000   | 4,000  |
| 5,000    | 6,000    | 220,000  | 180,000  | 36,000   | 5,000  |
| 5,560    | 6,000    | 220,000  | 180,000  | 36,000   | 5,560  |
| 6,000    | 6,000    | 220,000  | 180,000  | 36,000   | 6,000  |
| 6,350    | 8,000    | 260,000  | 210,000  | 36,000   | 6,350  |
| 7,000    | 8,000    | 260,000  | 210,000  | 36,000   | 7,000  |
| 7,140    | 8,000    | 285,000  | 240,000  | 36,000   | 7,140  |
| 8,000    | 8,000    | 285,000  | 240,000  | 36,000   | 8,000  |
| 9,000    | 10,000   | 350,000  | 300,000  | 40,000   | 9,000  |
| 10,000   | 10,000   | 350,000  | 300,000  | 40,000   | 10,000 |
| 11,000   | 12,000   | 420,000  | 360,000  | 45,000   | 11,000 |
| 12,000   | 12,000   | 420,000  | 360,000  | 45,000   | 12,000 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-AL



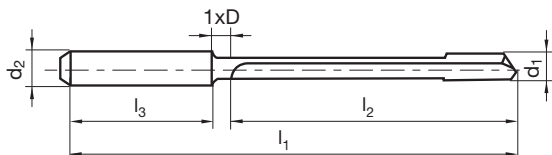
Catalogo n° 55028



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da  $d1 = 3$  mm e  $d2 = 6$  mm
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,380    | 4,000    | 160,000  | 130,000  | 28,000   | 2,380  |
| 2,500    | 4,000    | 185,000  | 155,000  | 28,000   | 2,500  |
| 2,780    | 4,000    | 185,000  | 155,000  | 28,000   | 2,780  |
| 3,000    | 6,000    | 230,000  | 190,000  | 36,000   | 3,000  |
| 3,170    | 6,000    | 230,000  | 190,000  | 36,000   | 3,170  |
| 3,500    | 6,000    | 230,000  | 190,000  | 36,000   | 3,500  |
| 3,970    | 6,000    | 260,000  | 220,000  | 36,000   | 3,970  |
| 4,000    | 6,000    | 260,000  | 220,000  | 36,000   | 4,000  |
| 5,000    | 6,000    | 370,000  | 330,000  | 36,000   | 5,000  |
| 5,560    | 6,000    | 370,000  | 330,000  | 36,000   | 5,560  |
| 6,000    | 6,000    | 370,000  | 330,000  | 36,000   | 6,000  |
| 6,350    | 8,000    | 430,000  | 385,000  | 36,000   | 6,350  |
| 7,000    | 8,000    | 430,000  | 385,000  | 36,000   | 7,000  |
| 7,140    | 8,000    | 485,000  | 440,000  | 36,000   | 7,140  |
| 8,000    | 8,000    | 485,000  | 440,000  | 36,000   | 8,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-AL

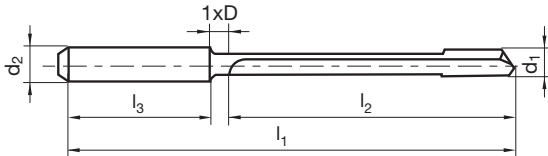


Catalogo n° 55029

|           |      |    |     |            |    |   |    |
|-----------|------|----|-----|------------|----|---|----|
| SuperT-AL | 75xD | WN | VHM | AlTiN nano | h5 | R | HA |
| P         | M    | K  | N   | S          | H  |   |    |
| •         | •    | •  | •   | •          |    |   |    |

Parametri di lav. ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da  $d1 = 3$  mm e  $d2 = 6$  mm
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,380    | 4,000    | 220,000  | 190,000  | 28,000   | 2,380  |
| 2,500    | 4,000    | 255,000  | 220,000  | 28,000   | 2,500  |
| 2,780    | 4,000    | 255,000  | 220,000  | 28,000   | 2,780  |
| 3,000    | 6,000    | 320,000  | 280,000  | 36,000   | 3,000  |
| 3,170    | 6,000    | 320,000  | 280,000  | 36,000   | 3,170  |
| 3,500    | 6,000    | 320,000  | 280,000  | 36,000   | 3,500  |
| 3,970    | 6,000    | 360,000  | 320,000  | 36,000   | 3,970  |
| 4,000    | 6,000    | 360,000  | 320,000  | 36,000   | 4,000  |
| 5,000    | 6,000    | 525,000  | 485,000  | 36,000   | 5,000  |
| 5,560    | 6,000    | 525,000  | 485,000  | 36,000   | 5,560  |
| 6,000    | 6,000    | 525,000  | 485,000  | 36,000   | 6,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-N

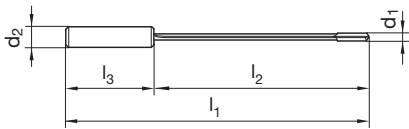


Catalogo n° 75018

|          |      |    |    |     |    |   |    |
|----------|------|----|----|-----|----|---|----|
| SuperT-N | 20xD | WN | HM | TiN | h5 | R | HA |
| P        | M    | K  | N  | S   | H  |   |    |
| •        | •    | •  | •  |     |    |   |    |

Parametri di lav.  
ind. a pag. 56

- con rompitrucolo
- forma tagliente G



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 4,000    | 12,000   | 150,000  | 100,000  | 45,000   | 4,000  |
| 4,200    | 12,000   | 160,000  | 110,000  | 45,000   | 4,200  |
| 4,500    | 12,000   | 170,000  | 120,000  | 45,000   | 4,500  |
| 5,000    | 16,000   | 180,000  | 130,000  | 48,000   | 5,000  |
| 5,500    | 16,000   | 190,000  | 140,000  | 48,000   | 5,500  |
| 6,000    | 16,000   | 210,000  | 160,000  | 48,000   | 6,000  |
| 6,500    | 16,000   | 220,000  | 170,000  | 48,000   | 6,500  |
| 7,000    | 16,000   | 235,000  | 185,000  | 48,000   | 7,000  |
| 8,000    | 16,000   | 260,000  | 210,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 280,000  | 230,000  | 48,000   | 9,000  |
| 10,000   | 20,000   | 320,000  | 260,000  | 50,000   | 10,000 |
| 12,000   | 20,000   | 370,000  | 310,000  | 50,000   | 12,000 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-N

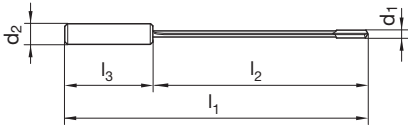


Catalogo n° 75017

|          |      |    |    |     |    |   |    |
|----------|------|----|----|-----|----|---|----|
| SuperT-N | 30xD | WN | HM | TiN | h5 | R | HA |
| P        | M    | K  | N  | S   | H  |   |    |
| •        | •    | •  | •  |     |    |   |    |

Parametri di lav.  
ind. a pag. 56

- con rompitrucolo
- forma tagliente G



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 4,000    | 12,000   | 200,000  | 155,000  | 45,000   | 4,000  |
| 4,200    | 12,000   | 210,000  | 165,000  | 45,000   | 4,200  |
| 4,500    | 12,000   | 220,000  | 175,000  | 45,000   | 4,500  |
| 5,000    | 16,000   | 230,000  | 182,000  | 48,000   | 5,000  |
| 5,500    | 16,000   | 245,000  | 197,000  | 48,000   | 5,500  |
| 6,000    | 16,000   | 260,000  | 212,000  | 48,000   | 6,000  |
| 6,500    | 16,000   | 275,000  | 227,000  | 48,000   | 6,500  |
| 7,000    | 16,000   | 290,000  | 242,000  | 48,000   | 7,000  |
| 8,000    | 16,000   | 320,000  | 272,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 350,000  | 302,000  | 48,000   | 9,000  |
| 10,000   | 20,000   | 400,000  | 350,000  | 50,000   | 10,000 |
| 12,000   | 20,000   | 450,000  | 400,000  | 50,000   | 12,000 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-N

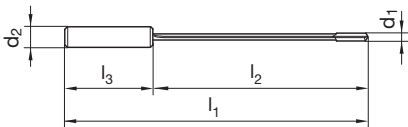


Catalogo n° 75022

|          |      |    |    |     |    |   |    |
|----------|------|----|----|-----|----|---|----|
| SuperT-N | 40xD | WN | HM | TiN | h5 | R | HA |
| P        | M    | K  | N  | S   | H  |   |    |
| •        | •    | •  | •  |     |    |   |    |

Parametri di lav.  
ind. a pag. 56

- con rompitrucolo
- forma tagliente G



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 4,000    | 12,000   | 230,000  | 185,000  | 45,000   | 4,000  |
| 4,200    | 12,000   | 240,000  | 195,000  | 45,000   | 4,200  |
| 4,500    | 12,000   | 250,000  | 205,000  | 45,000   | 4,500  |
| 5,000    | 16,000   | 280,000  | 232,000  | 48,000   | 5,000  |
| 5,500    | 16,000   | 300,000  | 252,000  | 48,000   | 5,500  |
| 6,000    | 16,000   | 320,000  | 272,000  | 48,000   | 6,000  |
| 6,500    | 16,000   | 340,000  | 292,000  | 48,000   | 6,500  |
| 7,000    | 16,000   | 370,000  | 322,000  | 48,000   | 7,000  |
| 8,000    | 16,000   | 420,000  | 372,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 450,000  | 402,000  | 48,000   | 9,000  |
| 10,000   | 20,000   | 510,000  | 460,000  | 50,000   | 10,000 |
| 12,000   | 20,000   | 600,000  | 550,000  | 50,000   | 12,000 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-N



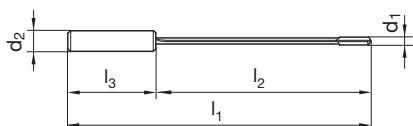
Catalogo n° 75023



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 56

- con rompitrucolo
- forma tagliente G
- profondità di foratura massima per ogni utensile 40xD, per profondità di foratura maggiori utilizzare prima le punte a catalogo-Nr. 75022
- per materiali a truciolo lungo



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 4,950    | 16,000   | 480,000  | 432,000  | 48,000   | 4,950  |
| 5,950    | 16,000   | 560,000  | 512,000  | 48,000   | 5,950  |
| 7,950    | 16,000   | 740,000  | 692,000  | 48,000   | 7,950  |
| 9,950    | 20,000   | 910,000  | 860,000  | 50,000   | 9,950  |
| 11,950   | 20,000   | 1080,000 | 1030,000 | 50,000   | 11,950 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-NX



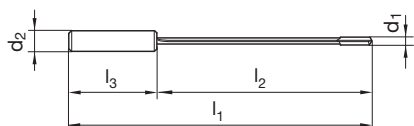
Catalogo n° 55018



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 56

- forma tagliente G
- per acciai legati e altamente legati



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 3,970    | 10,000   | 150,000  | 100,000  | 40,000   | 3,970  |
| 4,000    | 12,000   | 150,000  | 100,000  | 45,000   | 4,000  |
| 5,000    | 16,000   | 180,000  | 130,000  | 48,000   | 5,000  |
| 5,156    | 16,000   | 180,000  | 130,000  | 48,000   | 5,156  |
| 6,000    | 16,000   | 210,000  | 160,000  | 48,000   | 6,000  |
| 6,350    | 16,000   | 220,000  | 170,000  | 48,000   | 6,350  |
| 7,000    | 16,000   | 235,000  | 185,000  | 48,000   | 7,000  |
| 7,938    | 16,000   | 260,000  | 210,000  | 48,000   | 7,938  |
| 8,000    | 16,000   | 260,000  | 210,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 280,000  | 230,000  | 48,000   | 9,000  |
| 9,525    | 16,000   | 290,000  | 240,000  | 48,000   | 9,525  |
| 10,000   | 20,000   | 320,000  | 260,000  | 50,000   | 10,000 |
| 11,000   | 20,000   | 340,000  | 290,000  | 50,000   | 11,000 |
| 11,113   | 20,000   | 340,000  | 290,000  | 50,000   | 11,113 |
| 12,000   | 20,000   | 370,000  | 310,000  | 50,000   | 12,000 |
| 12,700   | 20,000   | 385,000  | 330,000  | 50,000   | 12,700 |

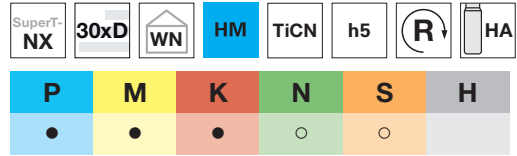


## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-NX

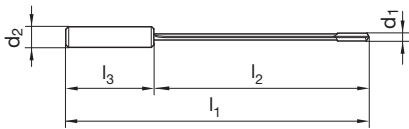


Catalogo n° 55017



- forma tagliente G
- per acciai legati e altamente legati

Parametri di lav.  
ind. a pag. 56



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 3,970    | 10,000   | 200,000  | 155,000  | 40,000   | 3,970  |
| 4,000    | 12,000   | 200,000  | 155,000  | 45,000   | 4,000  |
| 5,000    | 16,000   | 230,000  | 182,000  | 48,000   | 5,000  |
| 5,156    | 16,000   | 230,000  | 182,000  | 48,000   | 5,156  |
| 6,000    | 16,000   | 260,000  | 212,000  | 48,000   | 6,000  |
| 6,350    | 16,000   | 275,000  | 227,000  | 48,000   | 6,350  |
| 7,000    | 16,000   | 290,000  | 242,000  | 48,000   | 7,000  |
| 7,938    | 16,000   | 320,000  | 272,000  | 48,000   | 7,938  |
| 8,000    | 16,000   | 320,000  | 272,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 350,000  | 302,000  | 48,000   | 9,000  |
| 9,525    | 16,000   | 380,000  | 330,000  | 48,000   | 9,525  |
| 10,000   | 20,000   | 400,000  | 350,000  | 50,000   | 10,000 |
| 11,000   | 20,000   | 430,000  | 380,000  | 50,000   | 11,000 |
| 11,113   | 20,000   | 430,000  | 380,000  | 50,000   | 11,113 |
| 12,000   | 20,000   | 450,000  | 400,000  | 50,000   | 12,000 |
| 12,700   | 20,000   | 500,000  | 450,000  | 50,000   | 12,700 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-NX



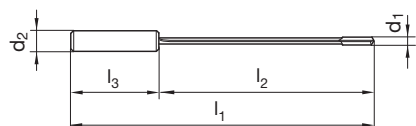
Catalogo n° 55022



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ●        | ●        | ○        | ○        |          |

Parametri di lav.  
ind. a pag. 56

- forma tagliente G
- per acciai legati e altamente legati



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 3,970    | 10,000   | 230,000  | 185,000  | 40,000   | 3,970  |
| 4,000    | 12,000   | 230,000  | 185,000  | 45,000   | 4,000  |
| 5,000    | 16,000   | 280,000  | 232,000  | 48,000   | 5,000  |
| 5,156    | 16,000   | 280,000  | 232,000  | 48,000   | 5,156  |
| 6,000    | 16,000   | 320,000  | 272,000  | 48,000   | 6,000  |
| 6,350    | 16,000   | 340,000  | 292,000  | 48,000   | 6,350  |
| 7,000    | 16,000   | 370,000  | 322,000  | 48,000   | 7,000  |
| 7,938    | 16,000   | 420,000  | 372,000  | 48,000   | 7,938  |
| 8,000    | 16,000   | 420,000  | 372,000  | 48,000   | 8,000  |
| 9,000    | 16,000   | 450,000  | 402,000  | 48,000   | 9,000  |
| 9,525    | 16,000   | 480,000  | 432,000  | 48,000   | 9,525  |
| 10,000   | 20,000   | 510,000  | 460,000  | 50,000   | 10,000 |
| 11,000   | 20,000   | 550,000  | 500,000  | 50,000   | 11,000 |
| 11,113   | 20,000   | 550,000  | 500,000  | 50,000   | 11,113 |
| 12,000   | 20,000   | 600,000  | 550,000  | 50,000   | 12,000 |
| 12,700   | 20,000   | 635,000  | 585,000  | 50,000   | 12,700 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente SuperT-NX



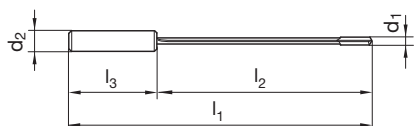
Catalogo n° 55023



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 56

- forma tagliente G
- profondità di foratura massima per ogni utensile 40xD, per profondità di foratura maggiori utilizzare prima le punte a catalogo-Nr. 75022
- per acciai legati e altamente legati



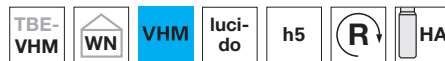
| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 4,950    | 16,000   | 480,000  | 432,000  | 48,000   | 4,950  |
| 5,106    | 16,000   | 480,000  | 432,000  | 48,000   | 5,106  |
| 5,950    | 16,000   | 560,000  | 512,000  | 48,000   | 5,950  |
| 6,300    | 16,000   | 590,000  | 542,000  | 48,000   | 6,300  |
| 6,950    | 16,000   | 650,000  | 602,000  | 48,000   | 6,950  |
| 7,888    | 16,000   | 740,000  | 692,000  | 48,000   | 7,888  |
| 7,950    | 16,000   | 740,000  | 692,000  | 48,000   | 7,950  |
| 8,950    | 16,000   | 820,000  | 772,000  | 48,000   | 8,950  |
| 9,475    | 16,000   | 870,000  | 822,000  | 48,000   | 9,475  |
| 9,950    | 20,000   | 910,000  | 860,000  | 50,000   | 9,950  |
| 10,950   | 20,000   | 995,000  | 945,000  | 50,000   | 10,950 |
| 11,063   | 20,000   | 995,000  | 945,000  | 50,000   | 11,063 |
| 11,950   | 20,000   | 1080,000 | 1030,000 | 50,000   | 11,950 |
| 12,650   | 20,000   | 1140,000 | 1090,000 | 50,000   | 12,650 |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



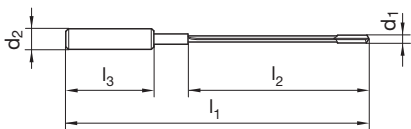
Catalogo n° 75024



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 45 mm
- forma tagliente G
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 1,200    | 4,000    | 90,000   | 45,000   | 28,000   | 1,200  |
| 1,500    | 4,000    | 90,000   | 45,000   | 28,000   | 1,500  |
| 1,600    | 4,000    | 90,000   | 45,000   | 28,000   | 1,600  |
| 2,000    | 4,000    | 90,000   | 45,000   | 28,000   | 2,000  |
| 2,500    | 10,000   | 100,000  | 45,000   | 40,000   | 2,500  |
| 2,700    | 10,000   | 100,000  | 45,000   | 40,000   | 2,700  |
| 3,000    | 10,000   | 100,000  | 45,000   | 40,000   | 3,000  |
| 3,200    | 10,000   | 100,000  | 45,000   | 40,000   | 3,200  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



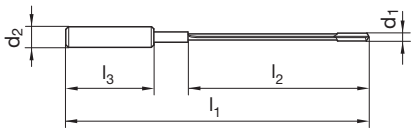
Catalogo n° 55024



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ●        | ●        | ●        | ○        | ○        |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 45 mm
- forma tagliente G
- per acciai legati e altamente legati



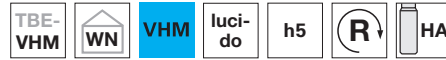
| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,000    | 4,000    | 90,000   | 45,000   | 28,000   | 2,000  |
| 2,500    | 10,000   | 100,000  | 45,000   | 40,000   | 2,500  |
| 2,700    | 10,000   | 100,000  | 45,000   | 40,000   | 2,700  |
| 3,000    | 10,000   | 100,000  | 45,000   | 40,000   | 3,000  |
| 3,200    | 10,000   | 100,000  | 45,000   | 40,000   | 3,200  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



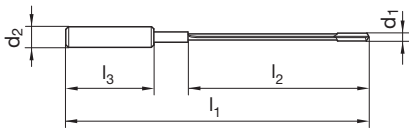
Catalogo n° 75020



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 80 mm
- forma tagliente G
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 1,200    | 4,000    | 125,000  | 80,000   | 28,000   | 1,200  |
| 1,500    | 4,000    | 125,000  | 80,000   | 28,000   | 1,500  |
| 1,600    | 4,000    | 125,000  | 80,000   | 28,000   | 1,600  |
| 2,000    | 4,000    | 125,000  | 80,000   | 28,000   | 2,000  |
| 2,500    | 10,000   | 135,000  | 80,000   | 40,000   | 2,500  |
| 2,700    | 10,000   | 135,000  | 80,000   | 40,000   | 2,700  |
| 3,000    | 10,000   | 135,000  | 80,000   | 40,000   | 3,000  |
| 3,200    | 10,000   | 135,000  | 80,000   | 40,000   | 3,200  |
| 3,500    | 10,000   | 135,000  | 80,000   | 40,000   | 3,500  |
| 4,000    | 10,000   | 135,000  | 80,000   | 40,000   | 4,000  |
| 4,200    | 10,000   | 135,000  | 80,000   | 40,000   | 4,200  |
| 4,500    | 10,000   | 135,000  | 80,000   | 40,000   | 4,500  |
| 5,000    | 10,000   | 135,000  | 80,000   | 40,000   | 5,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



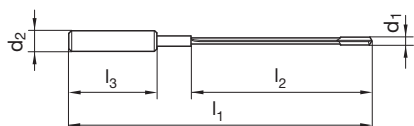
Catalogo n° 55020



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 80 mm
- forma tagliente G
- per acciai legati e altamente legati



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,000    | 4,000    | 125,000  | 80,000   | 28,000   | 2,000  |
| 2,500    | 10,000   | 135,000  | 80,000   | 40,000   | 2,500  |
| 2,700    | 10,000   | 135,000  | 80,000   | 40,000   | 2,700  |
| 3,000    | 10,000   | 135,000  | 80,000   | 40,000   | 3,000  |
| 3,200    | 10,000   | 135,000  | 80,000   | 40,000   | 3,200  |
| 3,500    | 10,000   | 135,000  | 80,000   | 40,000   | 3,500  |
| 4,000    | 10,000   | 135,000  | 80,000   | 40,000   | 4,000  |
| 4,200    | 10,000   | 135,000  | 80,000   | 40,000   | 4,200  |
| 4,500    | 10,000   | 135,000  | 80,000   | 40,000   | 4,500  |
| 5,000    | 10,000   | 135,000  | 80,000   | 40,000   | 5,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



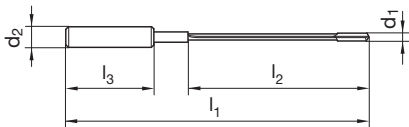
Catalogo n° 75026



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ● | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 120 mm
- forma tagliente G
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 1,500    | 4,000    | 165,000  | 120,000  | 28,000   | 1,500  |
| 1,600    | 4,000    | 165,000  | 120,000  | 28,000   | 1,600  |
| 2,000    | 4,000    | 165,000  | 120,000  | 28,000   | 2,000  |
| 2,500    | 10,000   | 175,000  | 120,000  | 40,000   | 2,500  |
| 2,700    | 10,000   | 175,000  | 120,000  | 40,000   | 2,700  |
| 3,000    | 10,000   | 175,000  | 120,000  | 40,000   | 3,000  |
| 3,200    | 10,000   | 175,000  | 120,000  | 40,000   | 3,200  |
| 3,500    | 10,000   | 175,000  | 120,000  | 40,000   | 3,500  |
| 4,000    | 10,000   | 175,000  | 120,000  | 40,000   | 4,000  |
| 4,200    | 10,000   | 175,000  | 120,000  | 40,000   | 4,200  |
| 4,500    | 10,000   | 175,000  | 120,000  | 40,000   | 4,500  |
| 5,000    | 10,000   | 175,000  | 120,000  | 40,000   | 5,000  |



## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



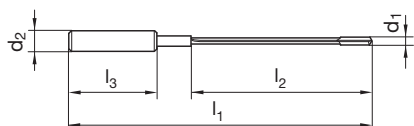
Catalogo n° 55026



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 120 mm
- forma tagliente G
- per acciai legati e altamente legati



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,000    | 4,000    | 165,000  | 120,000  | 28,000   | 2,000  |
| 2,500    | 10,000   | 175,000  | 120,000  | 40,000   | 2,500  |
| 2,700    | 10,000   | 175,000  | 120,000  | 40,000   | 2,700  |
| 3,000    | 10,000   | 175,000  | 120,000  | 40,000   | 3,000  |
| 3,200    | 10,000   | 175,000  | 120,000  | 40,000   | 3,200  |
| 3,500    | 10,000   | 175,000  | 120,000  | 40,000   | 3,500  |
| 4,000    | 10,000   | 175,000  | 120,000  | 40,000   | 4,000  |
| 4,200    | 10,000   | 175,000  | 120,000  | 40,000   | 4,200  |
| 4,500    | 10,000   | 175,000  | 120,000  | 40,000   | 4,500  |
| 5,000    | 10,000   | 175,000  | 120,000  | 40,000   | 5,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



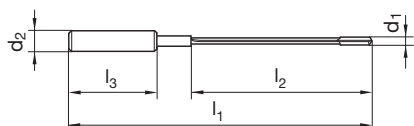
Catalogo n° 75021



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ● | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 160 mm
- forma tagliente G
- uso universale



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 1,500    | 4,000    | 205,000  | 160,000  | 28,000   | 1,500  |
| 1,600    | 4,000    | 205,000  | 160,000  | 28,000   | 1,600  |
| 2,000    | 4,000    | 205,000  | 160,000  | 28,000   | 2,000  |
| 2,500    | 10,000   | 215,000  | 160,000  | 40,000   | 2,500  |
| 2,700    | 10,000   | 215,000  | 160,000  | 40,000   | 2,700  |
| 3,000    | 10,000   | 215,000  | 160,000  | 40,000   | 3,000  |
| 3,200    | 10,000   | 215,000  | 160,000  | 40,000   | 3,200  |
| 3,500    | 10,000   | 215,000  | 160,000  | 40,000   | 3,500  |
| 4,000    | 10,000   | 215,000  | 160,000  | 40,000   | 4,000  |
| 4,200    | 10,000   | 215,000  | 160,000  | 40,000   | 4,200  |
| 4,500    | 10,000   | 215,000  | 160,000  | 40,000   | 4,500  |
| 5,000    | 10,000   | 215,000  | 160,000  | 40,000   | 5,000  |
| 6,000    | 16,000   | 225,000  | 160,000  | 48,000   | 6,000  |
| 8,000    | 16,000   | 225,000  | 160,000  | 48,000   | 8,000  |

## Punte a cannone ad 1 tagliente

### Punte a cannone ad 1 tagliente TBE-VHM



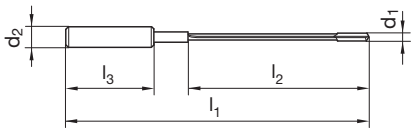
Catalogo n° 55021



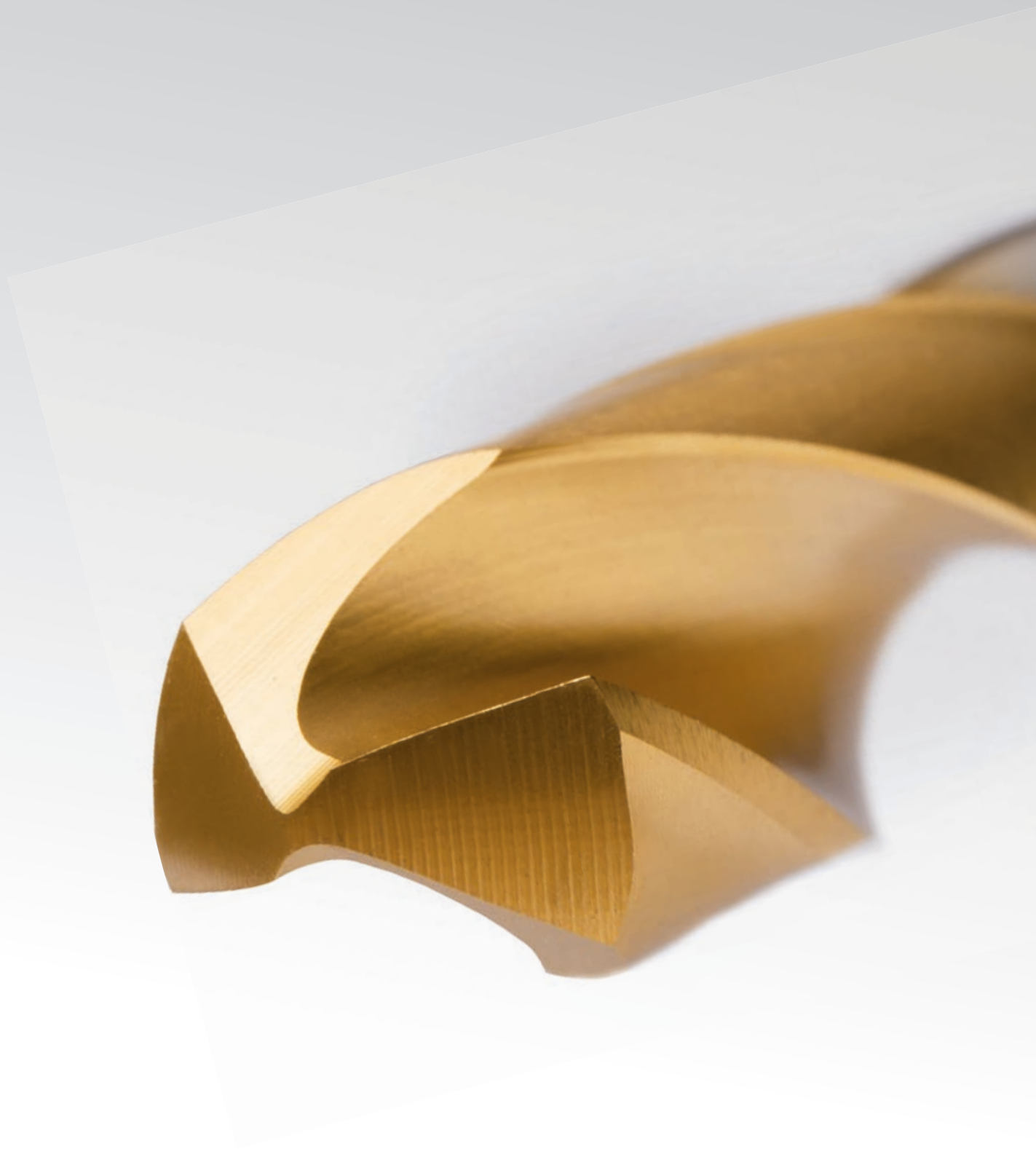
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 56

- lunghezza elica 160 mm
- forma tagliente G
- per acciai legati e altamente legati



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Codice |
|----------|----------|----------|----------|----------|--------|
| 2,000    | 4,000    | 205,000  | 160,000  | 28,000   | 2,000  |
| 2,500    | 10,000   | 215,000  | 160,000  | 40,000   | 2,500  |
| 2,700    | 10,000   | 215,000  | 160,000  | 40,000   | 2,700  |
| 3,000    | 10,000   | 215,000  | 160,000  | 40,000   | 3,000  |
| 3,200    | 10,000   | 215,000  | 160,000  | 40,000   | 3,200  |
| 3,500    | 10,000   | 215,000  | 160,000  | 40,000   | 3,500  |
| 4,000    | 10,000   | 215,000  | 160,000  | 40,000   | 4,000  |
| 4,200    | 10,000   | 215,000  | 160,000  | 40,000   | 4,200  |
| 4,500    | 10,000   | 215,000  | 160,000  | 40,000   | 4,500  |
| 5,000    | 10,000   | 215,000  | 160,000  | 40,000   | 5,000  |
| 6,000    | 16,000   | 225,000  | 160,000  | 48,000   | 6,000  |
| 8,000    | 16,000   | 225,000  | 160,000  | 48,000   | 8,000  |





HSS

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**PUNTE ELICOIDALI**



## CODICI ISO

|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



## LEGENDA DEI PITTOGRAMMI

|                      |            |                   |               |                 |                |                    |          |         |         |          |                   |
|----------------------|------------|-------------------|---------------|-----------------|----------------|--------------------|----------|---------|---------|----------|-------------------|
| MATERIALE TAGLIANTE  | <b>HSS</b> | <b>M42</b>        | <b>HSS-Co</b> | <b>HSS-E-PM</b> | <b>HSS-Co8</b> |                    |          |         |         |          |                   |
| TRATT. DI SUPERFICIE | lucido     | trattati a vapore | TiN - testa   | TiN             | TiAlN nano     | Facetas nitruradas |          |         |         |          |                   |
| TOLLERANZA SUL Ø     | h6         | h8                | -0,004        |                 |                |                    |          |         |         |          |                   |
| PROFONDITÀ DI FORO   | ~3xD       | ~5xD              | ~10xD         | ~15xD           | ~20xD          | ~25xD              | <5xD     | >25xD   |         |          |                   |
| DIREZIONE DI TAGLIO  |            |                   |               |                 |                |                    |          |         |         |          |                   |
|                      | a destra   | a sinistra        |               |                 |                |                    |          |         |         |          |                   |
| FORMA DEL CODOLO     |            |                   |               |                 |                |                    |          |         |         |          |                   |
|                      |            |                   | Conico Morse  |                 |                |                    |          |         |         |          |                   |
| ANGOLI DI AFFILATURA |            |                   |               |                 |                |                    |          |         |         |          |                   |
| NORMA                | DIN 1897   | DIN 338           | DIN 339       | DIN 1869        | DIN 1899       | DIN 345            | DIN 346  | DIN 341 | DIN 344 | DIN 1870 |                   |
|                      | DIN 8374   | DIN 8378          | DIN 8376      | DIN 8379        | DIN 8377       | DIN 333            | DIN 343  | DIN 340 |         |          |                   |
|                      |            |                   |               |                 |                |                    |          |         |         |          | Norma di fabbrica |
| TIPO                 | <b>N</b>   | <b>NX</b>         | V97           | V-PM            | VX             | V72                | <b>H</b> | V66     |         |          |                   |
|                      | V66 Ti     | V70               | V73           | V63             | V73-IK         | N-IK               | V70-IK   | V63-IK  |         |          |                   |

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte elicoidali, extra corte

|  |  |      |          |     |          |                   |               |                |              |     |
|--|--|------|----------|-----|----------|-------------------|---------------|----------------|--------------|-----|
|  |  | N    | destra   | 118 | HSS      | lucido            | DIN 1897      | 0,500 - 32,000 | <b>71110</b> | 190 |
|  |  | N    | sinistra | 118 | HSS      | lucido            | DIN 1897      | 0,500 - 32,000 | <b>71111</b> | 192 |
|  |  | N    | destra   | 118 | HSS      | trattati a vapore | DIN 1897      | 2,000 - 27,000 | <b>71108</b> | 194 |
|  |  | N    | sinistra | 118 | HSS      | trattati a vapore | DIN 1897      | 2,600 - 26,500 | <b>71109</b> | 196 |
|  |  | N    | destra   | 118 | HSS      | TiN               | DIN 1897      | 1,000 - 13,100 | <b>61118</b> | 197 |
|  |  | N    | destra   | 135 | M42      | lucido            | DIN 1897      | 1,000 - 10,000 | <b>71106</b> | 199 |
|  |  | NX   | destra   | 118 | HSS-Co   | lucido            | DIN 1897      | 1,000 - 14,000 | <b>71220</b> | 200 |
|  |  | NX   | destra   | 118 | HSS-Co   | TiN               | DIN 1897      | 1,000 - 14,000 | <b>61220</b> | 202 |
|  |  | V97  | destra   | 130 | HSS-Co   | TiAlN nano        | DIN 1897      | 2,000 - 16,000 | <b>51159</b> | 204 |
|  |  | V-PM | destra   | 130 | HSS-E-PM | TiN               | DIN 1897      | 1,000 - 14,000 | <b>61131</b> | 205 |
|  |  | VX   | destra   | 118 | HSS-Co   | trattati a vapore | DIN 1897      | 1,000 - 10,000 | <b>71112</b> | 206 |
|  |  | VX   | destra   | 118 | HSS-Co   | TiN               | DIN 1897      | 1,000 - 12,500 | <b>61112</b> | 207 |
|  |  | V72  | destra   | 118 | HSS      | lucido            | Norma di fab. | 1,000 - 16,000 | <b>71114</b> | 209 |
|  |  | V72  | sinistra | 118 | HSS      | lucido            | Norma di fab. | 1,000 - 16,000 | <b>71113</b> | 210 |

## Punte elicoidali, corte

|  |  |   |        |     |     |        |         |                |              |     |
|--|--|---|--------|-----|-----|--------|---------|----------------|--------------|-----|
|  |  | N | destra | 118 | HSS | lucido | DIN 338 | 0,200 - 16,000 | <b>71116</b> | 212 |
|--|--|---|--------|-----|-----|--------|---------|----------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte elicoidali, corte

|  |  |        |          |     |        |                   |         |                |              |     |
|--|--|--------|----------|-----|--------|-------------------|---------|----------------|--------------|-----|
|  |  | N      | sinistra | 118 | HSS    | lucido            | DIN 338 | 2,800 - 13,500 | <b>71119</b> | 214 |
|  |  | N      | destra   | 118 | HSS    | trattati a vapore | DIN 338 | 2,000 - 20,000 | <b>71115</b> | 215 |
|  |  | N      | destra   | 118 | HSS    | TiN               | DIN 338 | 1,000 - 16,000 | <b>61116</b> | 218 |
|  |  | N      | destra   | 118 | HSS    | TiN - testa       | DIN 338 | 1,000 - 16,000 | <b>61115</b> | 220 |
|  |  | N      | destra   | 118 | HSS-Co | trattati a vapore | DIN 338 | 1,000 - 15,000 | <b>71149</b> | 222 |
|  |  | N      | destra   | 135 | M42    | lucido            | DIN 338 | 1,000 - 16,000 | <b>71148</b> | 224 |
|  |  | H      | destra   | 118 | HSS    | lucido            | DIN 338 | 1,000 - 12,000 | <b>71117</b> | 226 |
|  |  | NX     | destra   | 118 | HSS-Co | lucido            | DIN 338 | 1,000 - 14,000 | <b>71221</b> | 228 |
|  |  | NX     | destra   | 118 | HSS-Co | TiN               | DIN 338 | 1,000 - 14,000 | <b>61221</b> | 230 |
|  |  | V66    | destra   | 130 | HSS-Co | fasi nitrurate    | DIN 338 | 0,800 - 13,500 | <b>71123</b> | 232 |
|  |  | V66 Ti | destra   | 130 | HSS-Co | lucido            | DIN 338 | 1,000 - 16,000 | <b>71122</b> | 234 |
|  |  | V66 Ti | destra   | 130 | HSS-Co | TiN               | DIN 338 | 1,000 - 13,500 | <b>61223</b> | 236 |
|  |  | V66 Ti | destra   | 130 | HSS-Co | TiAlN nano        | DIN 338 | 2,000 - 13,000 | <b>51122</b> | 238 |
|  |  | V70    | destra   | 130 | HSS    | lucido            | DIN 338 | 1,500 - 15,500 | <b>71124</b> | 239 |
|  |  | V70    | sinistra | 130 | HSS    | lucido            | DIN 338 | 1,500 - 16,000 | <b>71126</b> | 241 |
|  |  | V70    | destra   | 130 | HSS    | TiN               | DIN 338 | 1,500 - 16,000 | <b>61124</b> | 243 |



| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte elicoidali, corte

|  |   |   |   |   |   |      |          |     |          |                |         |                |       |     |
|--|---|---|---|---|---|------|----------|-----|----------|----------------|---------|----------------|-------|-----|
|  | • | • | ○ | ○ | ○ | V70  | destra   | 130 | HSS-Co   | fasi nitrurate | DIN 338 | 1,500 - 13,000 | 71158 | 245 |
|  | • | • | ○ | ○ | ○ | V63  | destra   | 130 | HSS-Co   | TiN            | DIN 338 | 1,500 - 13,000 | 61158 | 247 |
|  | • | ○ | ○ | ○ | ○ | V72  | destra   | 118 | HSS      | lucido         | DIN 338 | 0,550 - 13,000 | 71128 | 248 |
|  | • | ○ | ○ | ○ | ○ | V72  | sinistra | 118 | HSS      | lucido         | DIN 338 | 0,500 - 12,800 | 71129 | 250 |
|  | • | ○ | ○ | ○ | ○ | V97  | destra   | 130 | HSS-Co   | TiAlN nano     | DIN 338 | 1,000 - 13,000 | 51158 | 251 |
|  | ○ | ○ | ○ | ○ | ○ | V-PM | destra   | 130 | HSS-E-PM | TiN            | DIN 338 | 1,000 - 14,000 | 61232 | 253 |

## Serie di punte



|   |   |   |   |   |   |    |        |     |        |        |         |  |       |     |
|---|---|---|---|---|---|----|--------|-----|--------|--------|---------|--|-------|-----|
| • | • | • | • | ○ | ○ | NX | destra | 118 | HSS-Co | lucido | DIN 338 |  | 79012 | 254 |
|---|---|---|---|---|---|----|--------|-----|--------|--------|---------|--|-------|-----|



|   |   |   |   |   |   |   |        |     |     |                   |         |  |       |     |
|---|---|---|---|---|---|---|--------|-----|-----|-------------------|---------|--|-------|-----|
| • | • | • | • | ○ | ○ | N | destra | 118 | HSS | trattati a vapore | DIN 338 |  | 78879 | 254 |
|---|---|---|---|---|---|---|--------|-----|-----|-------------------|---------|--|-------|-----|



|   |   |   |   |   |   |   |        |     |     |             |         |  |       |     |
|---|---|---|---|---|---|---|--------|-----|-----|-------------|---------|--|-------|-----|
| ○ | • | ○ | ○ | ○ | ○ | N | destra | 118 | HSS | TiN - testa | DIN 338 |  | 78880 | 255 |
|---|---|---|---|---|---|---|--------|-----|-----|-------------|---------|--|-------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

## Serie di punte



|  |  |  |  |  |  |  |  |  |  |  |  |               |              |     |
|--|--|--|--|--|--|--|--|--|--|--|--|---------------|--------------|-----|
|  |  |  |  |  |  |  |  |  |  |  |  | Norma di fab. | <b>78877</b> | 256 |
|--|--|--|--|--|--|--|--|--|--|--|--|---------------|--------------|-----|



|  |  |  |  |  |  |  |  |  |  |  |  |               |              |     |
|--|--|--|--|--|--|--|--|--|--|--|--|---------------|--------------|-----|
|  |  |  |  |  |  |  |  |  |  |  |  | Norma di fab. | <b>78878</b> | 256 |
|--|--|--|--|--|--|--|--|--|--|--|--|---------------|--------------|-----|

## Punte con codolo rinforzato



|   |   |   |   |   |   |    |        |     |        |     |               |                |              |     |
|---|---|---|---|---|---|----|--------|-----|--------|-----|---------------|----------------|--------------|-----|
| • | • | • | • | • | • | NX | destra | 118 | HSS-Co | TiN | Norma di fab. | 2,000 - 20,000 | <b>61120</b> | 257 |
|---|---|---|---|---|---|----|--------|-----|--------|-----|---------------|----------------|--------------|-----|



|   |   |   |   |   |   |    |        |     |        |     |               |                |              |     |
|---|---|---|---|---|---|----|--------|-----|--------|-----|---------------|----------------|--------------|-----|
| • | • | • | • | • | • | NX | destra | 118 | HSS-Co | TiN | Norma di fab. | 2,000 - 20,000 | <b>61121</b> | 259 |
|---|---|---|---|---|---|----|--------|-----|--------|-----|---------------|----------------|--------------|-----|



|   |   |   |   |   |   |      |        |     |          |            |               |                |              |     |
|---|---|---|---|---|---|------|--------|-----|----------|------------|---------------|----------------|--------------|-----|
| • | • | • | • | • | • | V-PM | destra | 130 | HSS-E-PM | TiAlN nano | Norma di fab. | 2,000 - 13,000 | <b>51132</b> | 261 |
|---|---|---|---|---|---|------|--------|-----|----------|------------|---------------|----------------|--------------|-----|

## Punte corte, con codolo cil. Ø 16,0 mm



|   |   |   |   |   |   |     |        |     |        |        |               |                 |              |     |
|---|---|---|---|---|---|-----|--------|-----|--------|--------|---------------|-----------------|--------------|-----|
| • | • | • | • | • | • | V72 | destra | 118 | HSS-Co | lucido | Norma di fab. | 16,000 - 30,000 | <b>71168</b> | 262 |
|---|---|---|---|---|---|-----|--------|-----|--------|--------|---------------|-----------------|--------------|-----|

## Punte corte, con codolo cil. Ø 25,4 mm



|   |   |   |   |   |   |     |        |     |        |        |               |                 |              |     |
|---|---|---|---|---|---|-----|--------|-----|--------|--------|---------------|-----------------|--------------|-----|
| • | • | • | • | • | • | V72 | destra | 118 | HSS-Co | lucido | Norma di fab. | 28,000 - 40,000 | <b>71169</b> | 263 |
|---|---|---|---|---|---|-----|--------|-----|--------|--------|---------------|-----------------|--------------|-----|

## Punte per foratura con bussola di guida



|   |   |   |   |   |   |   |        |     |     |                   |         |                |              |     |
|---|---|---|---|---|---|---|--------|-----|-----|-------------------|---------|----------------|--------------|-----|
| • | • | • | • | • | • | N | destra | 118 | HSS | trattati a vapore | DIN 339 | 1,000 - 19,500 | <b>71130</b> | 264 |
|---|---|---|---|---|---|---|--------|-----|-----|-------------------|---------|----------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

## Punte elicoidali, lunghe

|  |  |     |          |     |        |                   |         |                |              |     |
|--|--|-----|----------|-----|--------|-------------------|---------|----------------|--------------|-----|
|  |  | N   | destra   | 118 | HSS    | lucido            | DIN 340 | 0,500 - 16,500 | <b>71136</b> | 265 |
|  |  | N   | destra   | 118 | HSS    | trattati a vapore | DIN 340 | 1,800 - 20,000 | <b>71135</b> | 266 |
|  |  | N   | destra   | 118 | HSS    | TiN               | DIN 340 | 1,000 - 16,000 | <b>61136</b> | 268 |
|  |  | NX  | destra   | 118 | HSS-Co | lucido            | DIN 340 | 1,000 - 14,000 | <b>71222</b> | 270 |
|  |  | NX  | destra   | 118 | HSS-Co | TiN               | DIN 340 | 1,000 - 14,000 | <b>61222</b> | 272 |
|  |  | V66 | destra   | 130 | HSS-Co | lucido            | DIN 340 | 1,000 - 13,000 | <b>71225</b> | 274 |
|  |  | V70 | destra   | 130 | HSS    | lucido            | DIN 340 | 1,500 - 12,000 | <b>71150</b> | 275 |
|  |  | V70 | sinistra | 130 | HSS    | lucido            | DIN 340 | 1,500 - 13,000 | <b>71152</b> | 276 |
|  |  | V70 | destra   | 130 | HSS    | TiN               | DIN 340 | 2,000 - 12,000 | <b>61150</b> | 277 |
|  |  | V73 | destra   | 130 | HSS    | fasi nitrate      | DIN 340 | 1,500 - 12,700 | <b>71154</b> | 278 |
|  |  | V73 | destra   | 130 | HSS-Co | fasi nitrate      | DIN 340 | 1,500 - 13,000 | <b>71156</b> | 280 |

## Punte elicoidali in lunghezze speciali, grandezza 1

|  |  |     |        |     |        |              |          |                |              |     |
|--|--|-----|--------|-----|--------|--------------|----------|----------------|--------------|-----|
|  |  | V63 | destra | 130 | HSS    | fasi nitrate | DIN 1869 | 2,000 - 13,000 | <b>71145</b> | 282 |
|  |  | V63 | destra | 130 | HSS-Co | fasi nitrate | DIN 1869 | 3,000 - 12,700 | <b>71192</b> | 284 |

## Punte elicoidali in lunghezze speciali, grandezza 2

|  |  |     |        |     |     |              |          |                |              |     |
|--|--|-----|--------|-----|-----|--------------|----------|----------------|--------------|-----|
|  |  | V63 | destra | 130 | HSS | fasi nitrate | DIN 1869 | 3,000 - 13,000 | <b>71146</b> | 285 |
|--|--|-----|--------|-----|-----|--------------|----------|----------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte elicoidali in lunghezze speciali, grandezza 2



|   |   |   |   |   |   |     |        |     |        |              |          |                |       |     |
|---|---|---|---|---|---|-----|--------|-----|--------|--------------|----------|----------------|-------|-----|
| • | ○ | • | • | • | • | V63 | destra | 130 | HSS-Co | fasi nitrate | DIN 1869 | 3,000 - 12,000 | 71193 | 286 |
|---|---|---|---|---|---|-----|--------|-----|--------|--------------|----------|----------------|-------|-----|

### Punte elicoidali in lunghezze speciali, grandezza 3



|   |   |   |   |   |   |     |        |     |     |              |          |                |       |     |
|---|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|
| • | • | • | • | • | • | V63 | destra | 130 | HSS | fasi nitrate | DIN 1869 | 3,500 - 13,000 | 71147 | 287 |
|---|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|

### Punte elicoidali, extra lunghe



|   |   |   |   |   |   |     |        |     |     |              |               |                |       |     |
|---|---|---|---|---|---|-----|--------|-----|-----|--------------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | V63 | destra | 130 | HSS | fasi nitrate | Norma di fab. | 6,000 - 12,000 | 71195 | 288 |
|---|---|---|---|---|---|-----|--------|-----|-----|--------------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |     |        |     |     |        |               |                |       |     |
|---|---|---|---|---|---|-----|--------|-----|-----|--------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | V63 | destra | 130 | HSS | lucido | Norma di fab. | 8,000 - 12,000 | 71196 | 289 |
|---|---|---|---|---|---|-----|--------|-----|-----|--------|---------------|----------------|-------|-----|

### Punte con fori di refrigerazione



|   |   |   |   |   |   |        |        |     |     |        |               |                |       |     |
|---|---|---|---|---|---|--------|--------|-----|-----|--------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | V73-IK | destra | 130 | HSS | lucido | Norma di fab. | 3,000 - 13,000 | 71584 | 290 |
|---|---|---|---|---|---|--------|--------|-----|-----|--------|---------------|----------------|-------|-----|

### Micropunte



|   |   |   |   |   |   |   |        |     |          |        |          |               |       |     |
|---|---|---|---|---|---|---|--------|-----|----------|--------|----------|---------------|-------|-----|
| • | • | • | • | • | • | N | destra | 118 | HSS-E-PM | lucido | DIN 1899 | 0,050 - 1,450 | 71187 | 291 |
|---|---|---|---|---|---|---|--------|-----|----------|--------|----------|---------------|-------|-----|

### Punte cilindriche per centri CN



|   |   |   |   |   |   |   |        |    |     |        |               |                |       |     |
|---|---|---|---|---|---|---|--------|----|-----|--------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | N | destra | 90 | HSS | lucido | Norma di fab. | 3,000 - 25,400 | 71175 | 293 |
|---|---|---|---|---|---|---|--------|----|-----|--------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |    |     |     |               |                |       |     |
|---|---|---|---|---|---|---|--------|----|-----|-----|---------------|----------------|-------|-----|
| • | • | • | • | • | • | N | destra | 90 | HSS | TiN | Norma di fab. | 3,000 - 25,000 | 61175 | 294 |
|---|---|---|---|---|---|---|--------|----|-----|-----|---------------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |     |     |        |               |                |       |     |
|---|---|---|---|---|---|---|--------|-----|-----|--------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | N | destra | 120 | HSS | lucido | Norma di fab. | 3,000 - 25,400 | 71176 | 295 |
|---|---|---|---|---|---|---|--------|-----|-----|--------|---------------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte elicoidali, corte

|  |   |   |   |   |   |   |        |     |         |        |               |                 |       |     |
|--|---|---|---|---|---|---|--------|-----|---------|--------|---------------|-----------------|-------|-----|
|  | • | • | ○ | ○ | ○ | N | destra | 130 | HSS-Co8 | lucido | Norma di fab. | 10,000 - 25,500 | 71303 | 296 |
|  | • | • | ○ | ○ | ○ | N | destra | 130 | HSS-Co8 | lucido | Norma di fab. | 12,000 - 30,000 | 71304 | 297 |

### Punte elicoidali

|  |   |   |   |   |   |        |        |     |        |                   |         |                 |       |     |
|--|---|---|---|---|---|--------|--------|-----|--------|-------------------|---------|-----------------|-------|-----|
|  | • | • | • | • | ○ | N      | destra | 118 | HSS    | trattati a vapore | DIN 345 | 3,750 - 68,000  | 71300 | 298 |
|  | • | ○ | • | • | ○ | N      | destra | 118 | HSS-Co | trattati a vapore | DIN 345 | 5,000 - 33,000  | 71416 | 301 |
|  | • | • | • | • | ○ | V70    | destra | 130 | HSS    | lucido            | DIN 345 | 7,940 - 32,000  | 71305 | 302 |
|  | • | • | • | • | ○ | V66 Ti | destra | 130 | HSS-Co | lucido            | DIN 345 | 8,500 - 32,000  | 71312 | 303 |
|  | • | • | • | • | ○ | V66 Ti | destra | 130 | HSS-Co | lucido            | DIN 346 | 11,000 - 29,000 | 71313 | 304 |

### Punte per foratura con bussola di guida

|  |   |   |   |   |   |     |        |     |     |                   |         |                |       |     |
|--|---|---|---|---|---|-----|--------|-----|-----|-------------------|---------|----------------|-------|-----|
|  | • | • | • | • | ○ | N   | destra | 118 | HSS | trattati a vapore | DIN 341 | 6,000 - 45,000 | 71320 | 305 |
|  | • | • | • | • | ○ | V70 | destra | 130 | HSS | lucido            | DIN 341 | 8,000 - 44,000 | 71322 | 306 |

### Punte elicoidali in lunghezze speciali, grandezza 1

|  |   |   |   |   |   |     |        |     |     |              |          |                |       |     |
|--|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|
|  | • | • | • | • | ○ | V63 | destra | 130 | HSS | fasi nitrate | DIN 1870 | 8,000 - 30,000 | 71325 | 307 |
|--|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|

### Punte elicoidali in lunghezze speciali, grandezza 2

|  |   |   |   |   |   |     |        |     |     |              |          |                |       |     |
|--|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|
|  | • | • | • | • | ○ | V63 | destra | 130 | HSS | fasi nitrate | DIN 1870 | 8,000 - 43,000 | 71326 | 308 |
|--|---|---|---|---|---|-----|--------|-----|-----|--------------|----------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte con fori di refrigerazione



|   |   |   |   |  |  |      |        |     |            |                   |               |                 |              |     |
|---|---|---|---|--|--|------|--------|-----|------------|-------------------|---------------|-----------------|--------------|-----|
| • | ○ | • | ○ |  |  | N-IK | destra | 118 | <b>HSS</b> | trattati a vapore | Norma di fab. | 10,000 - 40,000 | <b>71554</b> | 309 |
|---|---|---|---|--|--|------|--------|-----|------------|-------------------|---------------|-----------------|--------------|-----|

### Punte elicoidali lunghe con refrigerazione interna



|   |  |   |   |  |  |        |        |     |               |                   |               |                 |              |     |
|---|--|---|---|--|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|
| • |  | • | • |  |  | V70-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 14,500 - 32,000 | <b>71550</b> | 310 |
|---|--|---|---|--|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|



|   |  |   |   |  |  |        |        |     |               |                   |               |                |              |     |
|---|--|---|---|--|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|
| • |  | • | • |  |  | V70-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 8,000 - 31,500 | <b>71553</b> | 311 |
|---|--|---|---|--|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|

### Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



|   |   |   |   |   |  |        |        |     |               |                   |               |                 |              |     |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|
| • | ○ | • | ○ | ○ |  | V63-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 14,500 - 31,500 | <b>71565</b> | 312 |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|



|   |   |   |   |   |  |        |        |     |               |                   |               |                |              |     |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|
| • | ○ | • | ○ | ○ |  | V63-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 8,000 - 14,000 | <b>71567</b> | 313 |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|



|   |   |   |   |   |  |        |        |     |               |                   |               |                 |              |     |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|
| • | ○ | • | ○ | ○ |  | V63-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 14,500 - 32,000 | <b>71566</b> | 314 |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|-----------------|--------------|-----|



|   |   |   |   |   |  |        |        |     |               |                   |               |                |              |     |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|
| • | ○ | • | ○ | ○ |  | V63-IK | destra | 130 | <b>HSS-Co</b> | trattati a vapore | Norma di fab. | 8,000 - 31,500 | <b>71568</b> | 315 |
|---|---|---|---|---|--|--------|--------|-----|---------------|-------------------|---------------|----------------|--------------|-----|

### Alimentatori per punte con fori di refrigerazione



|  |  |  |  |  |  |  |  |  |  |  |               |  |              |     |
|--|--|--|--|--|--|--|--|--|--|--|---------------|--|--------------|-----|
|  |  |  |  |  |  |  |  |  |  |  | Norma di fab. |  | <b>71560</b> | 316 |
|--|--|--|--|--|--|--|--|--|--|--|---------------|--|--------------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di svasatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-----------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-----------------------|---------------------|------------|-------|-------|-------------|--------|

### Punte a gradino ad eliche indipendenti, cil.

|  |  |   |        |     |     |                   |          |                |              |     |
|--|--|---|--------|-----|-----|-------------------|----------|----------------|--------------|-----|
|  |  | N | destra | 90  | HSS | trattati a vapore | DIN 8374 | 6,000 - 19,000 | <b>71501</b> | 317 |
|  |  | N | destra | 90  | HSS | trattati a vapore | DIN 8378 | 3,400 - 13,500 | <b>71503</b> | 318 |
|  |  | N | destra | 180 | HSS | trattati a vapore | DIN 8376 | 6,000 - 18,000 | <b>71500</b> | 319 |

### Punte a gradino ad eliche indipendenti, CM

|  |  |   |        |     |     |                   |          |                 |              |     |
|--|--|---|--------|-----|-----|-------------------|----------|-----------------|--------------|-----|
|  |  | N | destra | 90  | HSS | trattati a vapore | DIN 8379 | 9,000 - 22,000  | <b>71523</b> | 320 |
|  |  | N | destra | 180 | HSS | trattati a vapore | DIN 8377 | 11,000 - 26,000 | <b>71520</b> | 321 |

| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

### Punte a centrare senza piano

|  |  |  |  |  |  |   |          |   |     |        |         |                |       |     |
|--|--|--|--|--|--|---|----------|---|-----|--------|---------|----------------|-------|-----|
|  |  |  |  |  |  | N | destra   | A | HSS | lucido | DIN 333 | 0,500 - 12,500 | 71600 | 322 |
|  |  |  |  |  |  | N | sinistra | A | HSS | lucido | DIN 333 | 0,500 - 8,000  | 71601 | 323 |
|  |  |  |  |  |  | N | destra   | R | HSS | lucido | DIN 333 | 0,500 - 10,000 | 71602 | 324 |
|  |  |  |  |  |  | N | destra   | R | HSS | TiN    | DIN 333 | 0,800 - 6,300  | 61602 | 325 |
|  |  |  |  |  |  | N | destra   | A | HSS | lucido | DIN 333 | 1,000 - 6,300  | 71605 | 326 |
|  |  |  |  |  |  | N | destra   | B | HSS | lucido | DIN 333 | 1,000 - 6,300  | 71604 | 327 |

### Punte a centrare con piano

|  |  |  |  |  |  |   |        |   |     |        |         |               |       |     |
|--|--|--|--|--|--|---|--------|---|-----|--------|---------|---------------|-------|-----|
|  |  |  |  |  |  | N | destra | A | HSS | lucido | DIN 333 | 1,600 - 6,300 | 71607 | 328 |
|  |  |  |  |  |  | N | destra | R | HSS | lucido | DIN 333 | 1,600 - 8,000 | 71609 | 329 |



| P | M | K | N | S | H | Tipo | Direzione di taglio | Angolo di affilatura ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|------------------------|---------------------|------------|-------|-------|-------------|--------|

### Allargatori cilindrici



|   |  |   |  |  |  |   |        |     |            |                   |         |                |              |     |
|---|--|---|--|--|--|---|--------|-----|------------|-------------------|---------|----------------|--------------|-----|
| • |  | • |  |  |  | N | destra | 120 | <b>HSS</b> | trattati a vapore | DIN 344 | 4,800 - 16,000 | <b>72200</b> | 330 |
|---|--|---|--|--|--|---|--------|-----|------------|-------------------|---------|----------------|--------------|-----|

### Allargatori con attacco cono morse



|   |  |   |  |  |  |   |        |     |            |                   |         |                |              |     |
|---|--|---|--|--|--|---|--------|-----|------------|-------------------|---------|----------------|--------------|-----|
| • |  | • |  |  |  | N | destra | 120 | <b>HSS</b> | trattati a vapore | DIN 343 | 9,000 - 48,600 | <b>72210</b> | 331 |
|---|--|---|--|--|--|---|--------|-----|------------|-------------------|---------|----------------|--------------|-----|

## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**R** a destra  
(tutti gli articoli con questo simbolo sono destri)

**L** a sinistra

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# ≤3×D Prof. di foro

|                |                        |                        |                        |
|----------------|------------------------|------------------------|------------------------|
| Catalogo n°    | 71108                  | 71110                  | 71114                  |
|                | 71109 <small>L</small> | 71111 <small>L</small> | 71113 <small>L</small> |
| Mat. da taglio | <b>HSS</b>             | <b>HSS</b>             | <b>HSS</b>             |
| Superficie     | luc./vap.              | lucida                 | lucida                 |
| DIN/Forma      | 1897                   | 1897                   | a norma                |
| Tipo           | <b>N</b>               | <b>N</b>               | <b>V72</b>             |
| Pagina         | 194/196                | 190/192                | 209/210                |

|            |
|------------|
| 61118      |
| <b>HSS</b> |
| TiN        |
| 1897       |
| <b>N</b>   |
| 197        |

|               |               |               |                |            |
|---------------|---------------|---------------|----------------|------------|
| 71112         | 71168         | 71169         | 71303<br>71304 | 71106      |
| <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co8</b> | <b>M42</b> |
| luc./vap.     | lucida        | lucida        | lucida         | lucida     |
| 1897          | a norma       | a norma       | a norma        | 1897       |
| <b>VX</b>     | <b>V72</b>    | <b>V72</b>    | <b>N</b>       | <b>N</b>   |
| 206           | 262           | 263           | 296/297        | 199        |



| v <sub>c</sub><br>m/min | Codice d'avanzamento |   |          |
|-------------------------|----------------------|---|----------|
| 27                      | F                    | F | F        |
| 22                      | E                    | E | E        |
| 30                      | F                    | F | F        |
| 30                      | E                    | E | E        |
| 25                      | E                    | E | E        |
| 25                      | E                    | E | E        |
| 30                      | F                    | F | F        |
| 16                      | D                    | D |          |
| 30                      | F                    | F | F        |
| 30                      | F                    | F | F        |
| 25                      | F                    | F | F        |
| 20                      | F                    | F | F        |
| 70                      |                      |   | G        |
| 70                      |                      |   | G        |
| 50                      | G                    | G | <b>G</b> |
| 50                      | F                    | F | <b>F</b> |
| 70                      | F                    | F | F        |
| 60                      | E                    | E | <b>E</b> |
| 40                      | E                    | E | <b>E</b> |
| 30                      | D                    | D | <b>D</b> |
| 25                      | D                    | D | D        |
| 15                      | D                    | D | D        |
| 18                      | D                    | D | <b>D</b> |
| 28                      | E                    | E | E        |

| v <sub>c</sub><br>m/min | Codice d'avanz. |
|-------------------------|-----------------|
| 30                      | <b>F</b>        |
| 24                      | <b>E</b>        |
| 33                      | <b>F</b>        |
| 33                      | E               |
| 28                      | <b>E</b>        |
| 28                      | <b>E</b>        |
| 25                      | D               |
| 22                      | D               |
| 33                      | <b>F</b>        |
| 20                      | D               |
| 14                      | D               |
| 18                      | D               |
| 33                      | <b>F</b>        |
| 33                      | F               |
| 28                      | <b>F</b>        |
| 22                      | F               |
| 80                      | F               |
| 65                      | <b>E</b>        |
| 75                      | E               |
| 45                      | <b>E</b>        |
| 33                      | <b>D</b>        |
| 27                      | D               |
| 16                      | <b>D</b>        |
| 15                      | D               |
| 22                      | <b>D</b>        |
| 36                      | <b>E</b>        |

| v <sub>c</sub><br>m/min | Codice d'avanzamento |          |          |          |          |
|-------------------------|----------------------|----------|----------|----------|----------|
| 35                      | E                    |          |          |          | E        |
| 30                      | E                    |          |          |          | E        |
| 40                      | E                    |          |          |          | E        |
| 40                      | <b>E</b>             | <b>E</b> | <b>E</b> |          | E        |
| 40                      | E                    |          |          |          | E        |
| 40                      | E                    |          |          |          | E        |
| 35                      | <b>D</b>             | <b>D</b> | <b>D</b> | <b>D</b> | D        |
| 20                      | <b>D</b>             | D        | D        | <b>D</b> | D        |
| 16                      | <b>C</b>             | C        | C        | <b>C</b> | C        |
| 36                      | F                    |          |          |          | F        |
| 20                      | <b>D</b>             | D        | D        | <b>D</b> | C        |
| 15                      | <b>C</b>             | C        | C        | <b>C</b> | C        |
| 16                      | D                    | D        | D        | <b>D</b> | C        |
| 12                      | C                    | C        | C        | <b>C</b> | C        |
| 15                      | <b>D</b>             | D        | D        | <b>D</b> | C        |
| 12                      | <b>C</b>             | C        | C        | <b>C</b> | C        |
| 15                      | C                    | C        | C        | <b>C</b> | C        |
| 8                       | <b>B</b>             | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 4                       | A                    |          |          | A        | A        |
| 18                      | D                    | D        | D        |          | C        |
| 14                      | C                    | C        | C        | C        | C        |
| 16                      | C                    | C        | C        | C        | C        |
| 35                      | <b>F</b>             |          |          |          | E        |
| 30                      | <b>F</b>             |          |          |          | E        |
| 30                      | F                    |          |          |          | E        |
| 25                      | <b>F</b>             |          |          |          | E        |
| 10                      | C                    |          |          | C        | C        |
| 8                       | A                    | A        | A        | <b>A</b> | A        |
| 10                      | B                    |          |          | <b>B</b> | <b>B</b> |
| 6                       | B                    |          |          | <b>B</b> | <b>B</b> |
| 90                      |                      |          |          |          | G        |
| 90                      |                      |          |          |          | G        |
| 80                      |                      |          |          |          | G        |
| 70                      |                      |          |          |          | F        |
| 70                      |                      |          |          |          | F        |
| 40                      |                      |          |          |          | E        |
| 40                      |                      |          |          |          | E        |
| 35                      | D                    |          |          |          | D        |
| 30                      | <b>D</b>             |          |          |          | D        |
| 20                      | D                    |          |          |          | D        |
| 15                      | D                    |          |          |          | D        |
| 20                      | D                    | D        | D        |          | D        |
| 30                      |                      |          |          |          | D        |

## Parametri di lavoro indicativi per punte

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

| Serie d'avanzamento  |              |       |       |       |       |       |       |       |       |       |                            |
|----------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A            | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | <b>0,50</b>  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | <b>1,00</b>  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | <b>2,00</b>  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | <b>2,50</b>  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | <b>3,15</b>  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | <b>4,00</b>  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | <b>5,00</b>  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | <b>6,30</b>  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | <b>8,00</b>  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | <b>10,00</b> | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | <b>12,50</b> | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | <b>16,00</b> | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | <b>20,00</b> | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | <b>25,00</b> | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | <b>31,50</b> | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | <b>40,00</b> | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |
|                      | <b>50,00</b> | 0,250 | 0,310 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,250 |                            |
|                      | <b>63,00</b> | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 |                            |
| <b>80,00</b>         | 0,400        | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 | 1,600 | 1,600 | 2,000 |       |                            |

| Serie d'avanzamento per 71187 |       |       |       |       |       |       |       |       |       |                            |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Diametro utensile mm          | A     | B     | C     | D     | E     | F     | G     | H     | I     |                            |
| <b>0,10</b>                   | 0,002 | 0,003 | 0,003 | 0,004 | 0,006 | 0,007 | 0,010 | 0,013 | 0,016 | Avanzamenti<br>f (mm/giri) |
| <b>0,16</b>                   | 0,002 | 0,003 | 0,004 | 0,005 | 0,007 | 0,009 | 0,012 | 0,016 | 0,022 |                            |
| <b>0,25</b>                   | 0,003 | 0,004 | 0,005 | 0,007 | 0,009 | 0,011 | 0,014 | 0,019 | 0,024 |                            |
| <b>0,30</b>                   | 0,004 | 0,005 | 0,007 | 0,009 | 0,011 | 0,015 | 0,019 | 0,025 | 0,033 |                            |
| <b>0,50</b>                   | 0,005 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,031 | 0,041 |                            |
| <b>0,63</b>                   | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,034 | 0,044 | 0,057 |                            |
| <b>0,80</b>                   | 0,010 | 0,013 | 0,016 | 0,020 | 0,024 | 0,031 | 0,038 | 0,048 | 0,060 |                            |
| <b>1,00</b>                   | 0,020 | 0,024 | 0,029 | 0,035 | 0,041 | 0,050 | 0,060 | 0,072 | 0,086 |                            |
| <b>1,50</b>                   | 0,030 | 0,035 | 0,040 | 0,046 | 0,052 | 0,060 | 0,069 | 0,080 | 0,092 |                            |

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPB30 (9SMnPB28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre di vetro/C rinforzate                      | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# ≤3×D Prof. di foro

|                |               |               |               |               |               |                 |                 |
|----------------|---------------|---------------|---------------|---------------|---------------|-----------------|-----------------|
| Catalogo n°    | <b>61112</b>  | <b>51159</b>  | <b>61120</b>  | <b>71220</b>  | <b>61220</b>  | <b>61131</b>    | <b>71187</b>    |
| Mat. da taglio | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-E-PM</b> | <b>HSS-E-PM</b> |
| Superficie     | TiN           | TiAlN         | TiN           | lucida        | TiN           | TiN             | lucida          |
| DIN/Forma      | 1897          | 1897          | a norma       | 1897          | 1897          | 1897            | 1899            |
| Tipo           | <b>VX</b>     | <b>V97</b>    | <b>NX</b>     | <b>NX</b>     | <b>NX</b>     | <b>V-PM</b>     | <b>N</b>        |
| Pagina         | 207           | 204           | 257           | 200           | 202           | 205             | 291             |



| v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|
| 38                      | E                  | 42                      | F                  | 45                      | F                  | 35                      | F                  | 45                      | F                  | 40                      | F                  | 21                      | F                  |
| 33                      | D                  | 36                      | E                  | 35                      | E                  | 30                      | E                  | 35                      | E                  | 32                      | E                  | 18                      | E                  |
| 44                      | E                  | 48                      | G                  | 50                      | F                  | 40                      | F                  | 50                      | F                  | 45                      | F                  | 18                      | F                  |
| 38                      | E                  | 42                      | F                  | 40                      | F                  | 30                      | F                  | 40                      | F                  | 40                      | E                  | 16                      | E                  |
| 44                      | E                  | 48                      | F                  | 40                      | F                  | 32                      | F                  | 44                      | F                  | 42                      | F                  | 20                      | E                  |
| 44                      | E                  | 48                      | F                  | 44                      | F                  | 28                      | F                  | 44                      | F                  | 40                      | E                  | 18                      | E                  |
| 38                      | D                  | 42                      | E                  | 40                      | E                  | 20                      | E                  | 40                      | E                  | 28                      | D                  | 14                      | D                  |
| 27                      | D                  | 30                      | E                  | 27                      | D                  | 15                      | D                  | 27                      | D                  | 25                      | D                  | 14                      | D                  |
| 22                      | C                  | 24                      | D                  | 22                      | C                  | 13                      | C                  | 22                      | C                  | 20                      | C                  | 12                      | C                  |
| 44                      | D                  | 48                      | D                  | 44                      | F                  | 30                      | F                  | 44                      | F                  | 40                      | D                  | 18                      | F                  |
| 22                      | D                  | 24                      | E                  | 22                      | D                  | 16                      | D                  | 22                      | D                  | 22                      | D                  | 14                      | D                  |
| 18                      | C                  | 20                      | D                  | 18                      | C                  | 12                      | C                  | 18                      | C                  | 18                      | C                  | 12                      | C                  |
| 22                      | D                  | 24                      | E                  | 22                      | D                  | 15                      | D                  | 22                      | D                  | 20                      | D                  | 14                      | D                  |
| 18                      | C                  | 20                      | D                  | 16                      | C                  | 10                      | C                  | 16                      | C                  | 15                      | C                  | 12                      | C                  |
| 19                      | D                  | 21                      | E                  | 20                      | D                  | 15                      | D                  | 20                      | D                  | 21                      | D                  | 16                      | D                  |
| 14                      | C                  | 16                      | D                  | 15                      | C                  | 10                      | C                  | 15                      | C                  | 16                      | C                  | 14                      | C                  |
| 14                      | C                  | 17                      | D                  | 13                      | C                  | 10                      | C                  | 13                      | C                  | 15                      | C                  | 14                      | C                  |
| 9                       | B                  | 11                      | C                  |                         |                    |                         |                    |                         |                    | 12                      | B                  | 8                       | B                  |
| 4                       | A                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 20                      | D                  | 17                      | D                  | 20                      | D                  | 14                      | D                  | 20                      | D                  | 15                      | D                  | 18                      | D                  |
| 15                      | C                  | 12                      | C                  | 16                      | D                  | 10                      | D                  | 16                      | D                  | 10                      | C                  | 14                      | C                  |
| 18                      | C                  | 14                      | C                  | 18                      | D                  | 12                      | D                  | 18                      | D                  | 12                      | C                  | 16                      | C                  |
| 40                      | F                  | 50                      | G                  | 45                      | F                  | 36                      | F                  | 45                      | F                  | 50                      | F                  | 26                      | F                  |
| 35                      | F                  | 45                      | G                  | 40                      | F                  | 30                      | F                  | 40                      | F                  | 40                      | F                  | 22                      | F                  |
| 33                      | F                  | 36                      | G                  | 40                      | F                  | 30                      | F                  | 40                      | F                  | 44                      | F                  | 18                      | F                  |
| 27                      | F                  | 29                      | G                  | 30                      | F                  | 22                      | F                  | 30                      | F                  | 32                      | F                  | 22                      | F                  |
| 12                      | C                  | 10                      | D                  |                         |                    |                         |                    |                         |                    | 8                       | C                  |                         |                    |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 6                       | B                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 11                      | B                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 7                       | B                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
|                         |                    |                         |                    | 70                      | G                  | 50                      | G                  | 70                      | G                  |                         |                    |                         |                    |
|                         |                    |                         |                    | 70                      | G                  | 50                      | G                  | 70                      | G                  |                         |                    |                         |                    |
|                         |                    |                         |                    | 85                      | G                  | 65                      | G                  | 85                      | G                  |                         |                    | 26                      | G                  |
|                         |                    |                         |                    | 70                      | F                  | 60                      | F                  | 70                      | F                  |                         |                    | 18                      | F                  |
|                         |                    |                         |                    | 80                      | F                  | 60                      | F                  | 80                      | F                  |                         |                    | 75                      | F                  |
|                         |                    |                         |                    | 80                      | F                  | 60                      | F                  | 80                      | F                  |                         |                    |                         |                    |
|                         |                    | 96                      | F                  | 80                      | E                  | 70                      | E                  | 80                      | E                  | 80                      | E                  | 42                      | E                  |
|                         |                    | 84                      | F                  | 77                      | E                  | 45                      | E                  | 77                      | E                  |                         |                    |                         |                    |
|                         |                    | 48                      | F                  | 44                      | E                  | 30                      | E                  | 44                      | E                  | 60                      | E                  | 22                      | E                  |
| 45                      | E                  | 50                      | E                  | 50                      | D                  | 36                      | D                  | 50                      | D                  | 50                      | E                  | 22                      | D                  |
| 40                      | D                  | 45                      | E                  | 40                      | D                  | 30                      | D                  | 40                      | D                  | 45                      | D                  | 18                      | D                  |
| 23                      | D                  | 25                      | E                  | 32                      | D                  | 30                      | D                  | 32                      | D                  | 40                      | D                  | 13                      | D                  |
| 17                      | D                  | 20                      | E                  | 28                      | D                  | 25                      | D                  | 28                      | D                  | 32                      | D                  |                         |                    |
|                         |                    | 24                      | E                  | 25                      | D                  | 20                      | D                  | 25                      | D                  | 25                      | D                  | 16                      | D                  |
|                         |                    | 30                      | E                  | 25                      | D                  | 15                      | D                  | 25                      | D                  |                         |                    | 18                      | D                  |

## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**R** a destra  
(tutti gli articoli con questo simbolo sono destri)

**L** a sinistra

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si                                | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | <input checked="" type="checkbox"/> |
| > 10 % Si  | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# ≤5×D Prof. di foro

|                |                    |           |       |        |                    |        |                    |
|----------------|--------------------|-----------|-------|--------|--------------------|--------|--------------------|
| Catalogo n°    | 71116              | 71115     | 71300 | 71117  | 71124              | 71305  | 71128              |
| Mat. da taglio | 71119 <sup>L</sup> |           |       |        | 71126 <sup>L</sup> |        | 71129 <sup>L</sup> |
| Superficie     | HSS                | HSS       | HSS   | HSS    | HSS                | HSS    | HSS                |
| DIN/Forma      | lucida             | luc./vap. | vap.  | lucida | lucida             | lucida | lucida             |
| Tipo           | 338                | 338       | 345   | 338    | 338                | 345    | 338                |
| Pagina         | N                  | N         | N     | H      | V70                | V70    | V72                |
|                | 212/214            | 215       | 298   | 226    | 239/241            | 302    | 248/250            |

|       |       |
|-------|-------|
| 61116 | 61124 |
| HSS   | HSS   |
| TiN   | TiN   |
| 338   | 338   |
| N     | V70   |
| 218   | 243   |

|           |
|-----------|
| 61115     |
| HSS       |
| testa TiN |
| 338       |
| N         |
| 220       |

|        |
|--------|
| 61223  |
| HSS-Co |
| TiN    |
| 338    |
| V66 Ti |
| 236    |



| v <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |   |   |   |   |
|-------------------------|-------------------------|---|---|---|---|---|
| 27                      | F                       | F | F | F | F | F |
| 22                      | E                       | E | E | E | E | E |
| 30                      | F                       | F | F | F | F | F |
| 30                      | E                       | E | E | E | E | E |
| 25                      | E                       | E | E | E | E | E |
| 25                      | E                       | E | E | E | E | E |
| 30                      | F                       | F | F | F | F | F |
| 16                      | D                       | D | D | D | D | D |
| 30                      | F                       | F | F | G | G | F |
| 30                      | F                       | F | F | F | F | F |
| 25                      | F                       | F | F | F | F | F |
| 25                      | F                       | F | F | F | F | F |
| 80                      |                         |   |   | G | G | G |
| 80                      |                         |   |   | G | G | G |
| 70                      | G                       | G | G | G | G | G |
| 70                      | F                       | F | F | F | F | F |
| 50                      | F                       | F | F | F | F | F |
| 50                      | E                       | E | E | F | F | E |
| 70                      |                         |   |   | F | F | E |
| 40                      | E                       | E | E | F | F | E |
| 30                      | D                       | D | D | D | D | D |
| 25                      | D                       | D | D | D | D | D |
| 15                      | D                       | D | D | D | D | D |
| 18                      | D                       | D | D | D | D | D |
| 28                      | E                       | E | E | E | E | E |

| v <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |
|-------------------------|-------------------------|---|
| 30                      | F                       | F |
| 24                      | E                       | E |
| 33                      | F                       | F |
| 33                      | E                       | E |
| 28                      | E                       | E |
| 28                      | E                       | E |
| 25                      | D                       | D |
| 22                      | D                       | D |
| 33                      | F                       | F |
| 20                      | D                       | D |
| 14                      | D                       | D |
| 18                      | D                       | D |
| 33                      | F                       | G |
| 33                      | F                       | F |
| 28                      | F                       | F |
| 22                      | F                       | F |
| 80                      | F                       | F |
| 65                      | E                       | E |
| 75                      | E                       | E |
| 45                      | E                       | E |
| 33                      | D                       | D |
| 27                      | D                       | D |
| 16                      | D                       | D |
| 15                      | D                       | D |
| 22                      | D                       | D |
| 36                      | E                       | E |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 30                      | F                  |
| 24                      | E                  |
| 33                      | F                  |
| 33                      | E                  |
| 28                      | E                  |
| 28                      | E                  |
| 25                      | D                  |
| 22                      | D                  |
| 33                      | F                  |
| 20                      | D                  |
| 14                      | D                  |
| 18                      | D                  |
| 33                      | F                  |
| 33                      | F                  |
| 28                      | F                  |
| 22                      | F                  |
| 80                      | F                  |
| 65                      | E                  |
| 75                      | E                  |
| 45                      | E                  |
| 33                      | D                  |
| 27                      | D                  |
| 16                      | D                  |
| 15                      | D                  |
| 22                      | D                  |
| 36                      | E                  |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 22                      | C                  |
| 14                      | C                  |
| 9                       | B                  |
| 20                      | D                  |
| 15                      | C                  |
| 18                      | C                  |
| 12                      | C                  |
| 6                       | B                  |
| 11                      | B                  |
| 7                       | B                  |
| 17                      | D                  |

## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |              |       |       |       |       |       |       |       |       |       |                            |
|----------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A            | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | <b>0,50</b>  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | <b>1,00</b>  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | <b>2,00</b>  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | <b>2,50</b>  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | <b>3,15</b>  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | <b>4,00</b>  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | <b>5,00</b>  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | <b>6,30</b>  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | <b>8,00</b>  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | <b>10,00</b> | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | <b>12,50</b> | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | <b>16,00</b> | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | <b>20,00</b> | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | <b>25,00</b> | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | <b>31,50</b> | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | <b>40,00</b> | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



# ≤5×D Prof. di foro

|                |               |               |               |                 |               |               |               |              |               |               |
|----------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|--------------|---------------|---------------|
| Catalogo n°    | <b>71416</b>  | <b>71149</b>  | <b>71158</b>  | <b>71123</b>    | <b>71122</b>  | <b>71312</b>  | <b>71313</b>  | <b>71148</b> | <b>71221</b>  | <b>61221</b>  |
| Mat. da taglio | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b>   | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>HSS-Co</b> | <b>M42</b>   | <b>HSS-Co</b> | <b>HSS-Co</b> |
| Superficie     | vap.          | luc./vap.     | fase nitr.    | luc./fase nitr. | lucida        | lucida        | lucida        | lucida       | lucida        | TiN           |
| DIN/Forma      | 345           | 338           | 338           | 338             | 338           | 345           | 346           | 338          | 338           | 338           |
| Tipo           | <b>N</b>      | <b>N</b>      | <b>V70</b>    | <b>V66</b>      | <b>V66 Ti</b> | <b>V66 Ti</b> | <b>V66 Ti</b> | <b>N</b>     | <b>NX</b>     | <b>NX</b>     |
| Pagina         | 301           | 222           | 245           | 232             | 234           | 303           | 304           | 224          | 228           | 230           |



| $v_c$<br>m/min | Codice d'avanzamento |          |          |          |          |          |          |          | $v_c$<br>m/min | Codice d'avanz. | $v_c$<br>m/min | Codice d'avanz. |          |
|----------------|----------------------|----------|----------|----------|----------|----------|----------|----------|----------------|-----------------|----------------|-----------------|----------|
| 35             | E                    | E        |          |          |          |          |          |          | E              | 35              | F              | 45              | F        |
| 30             | E                    | E        |          |          |          |          |          |          | E              | 30              | E              | 35              | E        |
| 40             | E                    | E        |          |          |          |          |          |          | E              | 40              | F              | 50              | F        |
| 40             | E                    | E        | E        |          |          |          |          |          | E              | 30              | F              | 40              | F        |
| 40             | E                    | E        |          |          |          |          |          |          | E              | 32              | F              | 44              | F        |
| 40             | E                    | E        | E        |          |          |          |          |          | E              | 28              | F              | 44              | F        |
| 35             | <b>D</b>             | <b>D</b> | <b>D</b> |          |          |          |          |          | E              | 20              | E              | 40              | E        |
| 20             | <b>D</b>             | <b>D</b> | <b>D</b> |          |          |          |          |          | D              | 15              | D              | 27              | D        |
| 16             | C                    | C        | C        | C        | C        | C        | C        | C        | C              | 13              | C              | 22              | C        |
| 36             | F                    | F        |          | F        | F        | F        | F        | F        | F              | 30              | F              | 44              | F        |
| 20             | <b>D</b>             | <b>D</b> | D        |          |          |          |          |          | C              | 16              | D              | 22              | D        |
| 15             | C                    | C        | C        | C        | C        | C        | C        | C        | C              | 12              | C              | 18              | C        |
| 16             | <b>D</b>             | <b>D</b> | D        |          |          |          |          |          | C              | 15              | D              | 22              | D        |
| 12             | C                    | C        | C        | C        | C        | C        | C        | C        | C              | 10              | C              | 16              | C        |
| 15             | <b>D</b>             | <b>D</b> | D        |          |          |          |          |          | C              | 15              | D              | 20              | D        |
| 12             | C                    | <b>C</b> | C        | C        | C        | C        | C        | C        | C              | 10              | C              | 15              | C        |
| 15             | C                    | C        | C        | C        | C        | C        | C        | C        | C              | 10              | C              | 13              | C        |
| 8              | <b>B</b>             | <b>B</b> |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> |                |                 |                |                 |          |
| 4              |                      |          |          |          |          |          |          | <b>A</b> |                |                 |                |                 |          |
| 18             | D                    | D        | <b>D</b> | D        | D        | D        | D        | C        |                | 14              | <b>D</b>       | 20              | <b>D</b> |
| 14             | C                    | C        |          | <b>C</b> | <b>C</b> | <b>C</b> | <b>C</b> |          |                | 10              | <b>D</b>       | 16              | <b>D</b> |
| 16             | C                    | C        | C        | <b>C</b> | <b>C</b> | <b>C</b> | <b>C</b> | C        |                | 12              | <b>D</b>       | 18              | <b>D</b> |
| 35             | F                    | F        | F        |          |          |          |          | E        |                | 36              | <b>F</b>       | 45              | <b>F</b> |
| 30             | <b>F</b>             | <b>F</b> | <b>F</b> |          |          |          |          | E        |                | 30              | <b>F</b>       | 40              | <b>F</b> |
| 30             | F                    | F        | F        |          |          |          |          | E        |                | 30              | <b>F</b>       | 40              | <b>F</b> |
| 28             | <b>F</b>             | <b>F</b> | <b>F</b> |          |          |          |          | E        |                | 22              | <b>F</b>       | 30              | <b>F</b> |
| 10             | C                    | C        | C        | C        | C        | C        | C        | <b>C</b> |                |                 |                |                 |          |
| 8              |                      |          |          | A        | A        | A        | A        | <b>A</b> |                |                 |                |                 |          |
| 10             |                      |          |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> | B        |                |                 |                |                 |          |
| 6              |                      |          |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> | B        |                |                 |                |                 |          |
| 90             |                      |          |          |          |          |          |          | G        |                | 50              | <b>G</b>       | 70              | G        |
| 90             |                      |          |          |          |          |          |          | G        |                | 50              | <b>G</b>       | 70              | G        |
| 80             |                      |          | G        |          |          |          |          | G        |                | 65              | <b>G</b>       | 85              | G        |
| 70             |                      |          | F        |          |          |          |          | F        |                | 60              | <b>F</b>       | 70              | F        |
| 70             |                      |          |          |          |          |          |          | F        |                | 60              | <b>F</b>       | 70              | F        |
| 40             | E                    | <b>E</b> | E        |          |          |          |          | E        |                | 25              | <b>E</b>       | 80              | <b>E</b> |
| 60             |                      |          |          |          |          |          |          | E        |                | 70              | <b>E</b>       | 77              | <b>E</b> |
| 40             | E                    | E        | E        |          |          |          |          | E        |                | 30              | <b>E</b>       | 44              | <b>E</b> |
| 35             | D                    | <b>D</b> |          |          |          |          |          | D        |                | 36              | <b>D</b>       | 50              | <b>D</b> |
| 33             | D                    | <b>D</b> |          |          |          |          |          | D        |                | 30              | <b>D</b>       | 40              | <b>D</b> |
| 20             | D                    | D        | D        |          |          |          |          | D        |                | 30              | <b>D</b>       | 32              | <b>D</b> |
| 15             | D                    | D        | D        |          |          |          |          | D        |                | 25              | <b>D</b>       | 28              | <b>D</b> |
| 20             | D                    | D        | D        |          |          |          |          | D        |                | 20              | <b>D</b>       | 25              | <b>D</b> |
|                |                      |          |          |          |          |          |          |          |                | 15              | <b>D</b>       | 27              | <b>D</b> |

## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |



## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

**R** a destra  
(tutti gli articoli con questo simbolo sono destri)

**L** a sinistra

### Impiego del refrigerante:

Olio da taglio, attivo

Emulsione

senza lubrificante

solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# ≤10×D Prof. di foro

|                |        |           |       |       |                |        |            |         |       |       |        |            |                |
|----------------|--------|-----------|-------|-------|----------------|--------|------------|---------|-------|-------|--------|------------|----------------|
| Catalogo n°    | 71136  | 71130     | 71135 | 71320 | 71150<br>71152 | 71322  | 71154      | 71584   | 61136 | 61150 | 71225  | 71156      | 71550<br>71553 |
| Mat. da taglio | HSS    | HSS       | HSS   | HSS   | HSS            | HSS    | HSS        | HSS     | HSS   | HSS   | HSS-Co |            | HSS-Co         |
| Superficie     | lucida | luc./vap. |       | vap.  | lucida         | lucida | fase nitr. | lucida  | TiN   | TiN   | lucida | fase nitr. | vap.           |
| DIN/Forma      | 340    | 339       | 340   | 341   | 340            | 341    | 340        | a norma | 340   | 340   | 340    | 340        | a norma        |
| Tipo           | N      | N         | N     | N     | V70            | V70    | V73        | V73-IK  | N     | V70   | V66    | V73        | V70-IK         |
| Pagina         | 265    | 264       | 266   | 305   | 275/276        | 306    | 278        | 290     | 268   | 277   | 274    | 280        | 310/311        |



| v <sub>c</sub><br>m/min | Codice d'avanzamento |   |   |   |   |   |   | v <sub>c</sub><br>m/min | Codice d'avanz. | v <sub>c</sub><br>m/min | Codice d'avanz. |   |    | v <sub>c</sub><br>m/min | Codice d'avanz. |  | v <sub>c</sub><br>m/min | Codice d'avanz. |
|-------------------------|----------------------|---|---|---|---|---|---|-------------------------|-----------------|-------------------------|-----------------|---|----|-------------------------|-----------------|--|-------------------------|-----------------|
| 24                      | F                    | F | F | F | F | F | F | 26                      | F               | 28                      | F               | F |    | 26                      | F               |  |                         |                 |
| 20                      | E                    | E | E | E | E | E | E | 22                      | E               | 22                      | E               | E |    | 22                      | E               |  |                         |                 |
| 27                      | F                    | F | F | F | F | F | F | 30                      | F               | 30                      | F               | F |    | 30                      | F               |  |                         |                 |
| 27                      | E                    | E | E | E | E | E | E | 30                      | E               | 30                      | E               | E | 24 | E                       |                 |  |                         |                 |
| 22                      | E                    | E | E | E | E | E | E | 24                      | E               | 25                      | E               | E |    | 24                      | E               |  |                         |                 |
| 22                      | E                    | E | E | E | E | E | E | 24                      | E               | 25                      | E               | E | 24 | E                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 22                      | D               | 22                      | D               | D | 16 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 20                      | D               | 18                      | D               | D | 16 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 14                      | C               |                         |                 |   | 14 | C                       |                 |  |                         |                 |
| 27                      | F                    | F | F | F | F | F | F | 30                      | F               | 30                      | F               | F |    | 30                      | F               |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 17                      | D               | 14                      | D               | D | 14 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 12                      | C               |                         |                 |   | 10 | C                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 14                      | D               | 12                      | D               | D | 12 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 10                      | C               |                         |                 |   | 8  | C                       |                 |  |                         |                 |
| 14                      | D                    | D | D | D | D | D | D | 15                      | D               | 16                      | D               | D | 16 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 10                      | C               | 10                      | C               | C | 8  | C                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 10                      | C               |                         |                 |   | 8  | C                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 7                       | B               |                         |                 |   | 6  | B                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
| 12                      |                      |   |   | D |   |   |   |                         |                 |                         |                 |   | 12 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   | 8  | C                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   | 10 | C                       |                 |  |                         |                 |
| 27                      | F                    | F | F | F | G | G | F | 30                      | F               | 30                      | F               | F | 30 | F                       |                 |  |                         |                 |
| 27                      | F                    | F | F | F | F | F | F | 30                      | F               | 30                      | F               | F | 24 | F                       |                 |  |                         |                 |
| 22                      | F                    | F | F | F | F | F | F | 24                      | F               | 24                      | F               | F | 24 | F                       |                 |  |                         |                 |
| 18                      | F                    | F | F | F | F | F | F | 20                      | F               | 20                      | F               | F | 20 | F                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 7                       | C               |                         |                 |   | 6  | C                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
| 70                      |                      |   |   | G | G |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
| 70                      |                      |   |   | G | G |   |   | 80                      | F               |                         |                 |   |    |                         |                 |  |                         |                 |
| 45                      | G                    | G | G | G | G | G | G | 50                      | G               | 50                      | G               | G | 60 | G                       |                 |  |                         |                 |
| 45                      | F                    | F | F | F | F | F | F | 50                      | F               | 50                      | F               | F | 50 | F                       |                 |  |                         |                 |
| 63                      | F                    | F | F | F | F | F | F |                         |                 | 70                      | F               |   | 60 | E                       |                 |  |                         |                 |
| 54                      | E                    | E | E | E | F | F | F | 60                      | E               | 60                      | E               | E | 30 | E                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   |                         |                 |                         |                 |   |    |                         |                 |  |                         |                 |
| 36                      | E                    | E | E | E | F | F | F | 40                      | E               | 40                      | E               | E | 38 | E                       |                 |  |                         |                 |
| 28                      | D                    | D | D | D |   |   |   |                         |                 | 30                      | D               |   |    |                         |                 |  |                         |                 |
| 22                      | D                    | D | D | D |   |   |   | 24                      | D               | 25                      | D               |   |    |                         |                 |  |                         |                 |
| 22                      | D                    | D | D | D | D | D | D | 24                      | D               | 14                      | D               | D | 24 | D                       |                 |  |                         |                 |
|                         |                      |   |   |   |   |   |   | 22                      | D               | 12                      | D               | D | 13 | D                       |                 |  |                         |                 |
| 14                      | D                    | D | D | D | D | D | D |                         |                 | 18                      | D               | D | 16 | D                       |                 |  |                         |                 |
| 22                      | E                    | E | E | E |   |   |   | 24                      | E               | 32                      | E               |   | 26 | D                       |                 |  |                         |                 |

## Parametri di lavoro indicativi per punte

| Serie d'avanzamento  |       |       |       |       |       |       |       |       |       |       |                            |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Lettera d'identi.    | A     | B     | C     | D     | E     | F     | G     | H     | I     |       |                            |
| Diametro utensile mm | 0,50  | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | Avanzamenti<br>f (mm/giri) |
|                      | 1,00  | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |                            |
|                      | 2,00  | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |                            |
|                      | 2,50  | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |                            |
|                      | 3,15  | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |                            |
|                      | 4,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |                            |
|                      | 5,00  | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |                            |
|                      | 6,30  | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |                            |
|                      | 8,00  | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |                            |
|                      | 10,00 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |                            |
|                      | 12,50 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |                            |
|                      | 16,00 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |                            |
|                      | 20,00 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |                            |
|                      | 25,00 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |                            |
|                      | 31,50 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |                            |
|                      | 40,00 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |                            |

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

### Impiego del refrigerante:

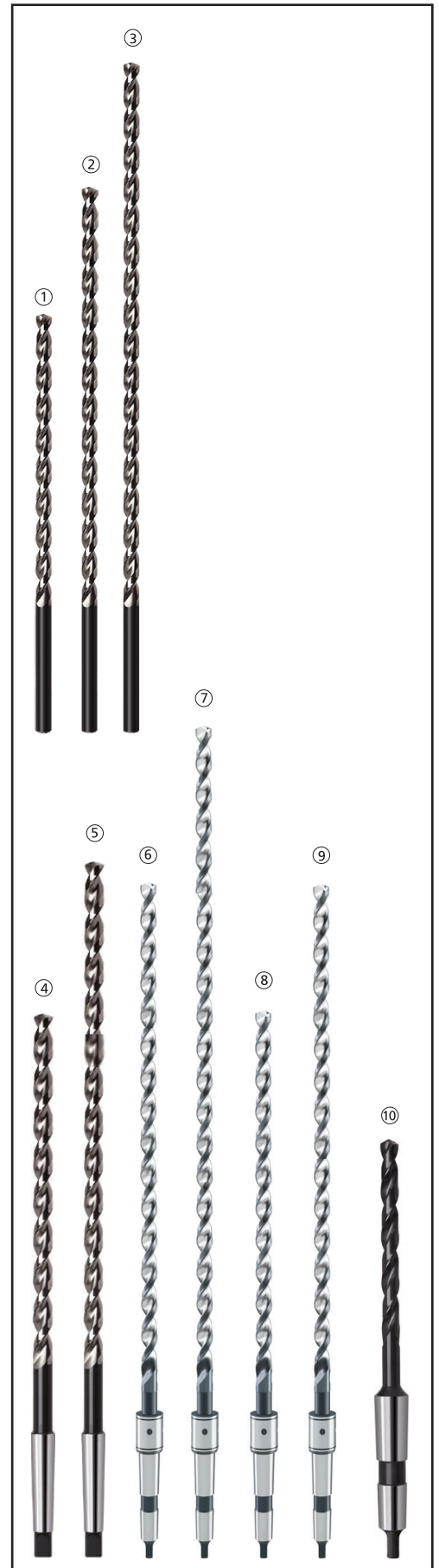
- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input checked="" type="checkbox"/> |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input checked="" type="checkbox"/> |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

# ≥10×D Prof. di foro

|                |  |  |  |  |  |                    |
|----------------|--|--|--|--|--|--------------------|
| Catalogo n°    | 71145 <sup>①</sup><br>71146 <sup>②</sup><br>71147 <sup>③</sup> | 71195 <sup>①</sup><br>71196 <sup>②</sup> | 71325 <sup>④</sup><br>71326 <sup>⑤</sup> | 71192 <sup>①</sup><br>71193 <sup>②</sup> | 71565 <sup>⑥</sup><br>71566 <sup>⑦</sup><br>71567 <sup>⑧</sup><br>71568 <sup>⑨</sup> | 71554 <sup>⑩</sup> |
| Mat. da taglio | <b>HSS</b>   | <b>HSS</b>                               | <b>HSS</b>                               | <b>HSS-Co</b>                            | <b>HSS-Co</b>  | <b>HSS</b>         |
| Superficie     | luc./f. nitr.  | fase nitr.                               | f. nitr./vap.                            | fase nitr.                               | vap.   | vap.               |
| DIN/Forma      | 1869   | a norma                                  | 1870                                     | 1869                                     | a norma  | a norma            |
| Tipo           | <b>V63</b>   | <b>V63</b>                               | <b>V63</b>                               | <b>V63</b>                               | <b>V63-IK</b>  | <b>N-IK</b>        |
| Pagina         | 282/285/287  | 288/289                                  | 307/308                                  | 284/286                                  | 312/314/313/315  | 309                |

| v <sub>c</sub><br>m/min | Codice<br>d'avanzamento |   |   | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. | v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|-------------------------|---|---|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|
| 22                      | E                       | E | E | 30                      | D                  | 30                      | E                  | 26                      | F                  |
| 18                      | D                       | D | D | 25                      | D                  | 25                      | D                  | 22                      | E                  |
| 22                      | E                       | E | E | 33                      | D                  | 30                      | E                  | 30                      | F                  |
| 18                      | D                       | D | D | 30                      | D                  | 25                      | D                  | 30                      | E                  |
| 22                      | D                       | D | D | 33                      | D                  | 30                      | D                  | 24                      | E                  |
| 18                      | D                       | D | D | 33                      | D                  | 25                      | D                  | 24                      | E                  |
|                         |                         |   |   | 20                      | C                  | 18                      | C                  | 22                      | D                  |
|                         |                         |   |   | 14                      | C                  | 16                      | C                  | 20                      | D                  |
|                         |                         |   |   | 10                      | B                  | 12                      | B                  | 14                      | C                  |
| 22                      | E                       | E | E | 29                      | D                  | 30                      | E                  | 30                      | F                  |
|                         |                         |   |   | 14                      | C                  | 14                      | C                  | 17                      | D                  |
|                         |                         |   |   | 10                      | B                  | 12                      | B                  | 12                      | C                  |
|                         |                         |   |   | 10                      | C                  | 12                      | C                  | 14                      | D                  |
|                         |                         |   |   | 8                       | B                  | 8                       | B                  | 10                      | C                  |
| 12                      | C                       | C | C | 11                      | C                  | 16                      | C                  | 15                      | D                  |
| 6                       | B                       | B | B | 8                       | B                  | 8                       | B                  | 10                      | C                  |
|                         |                         |   |   | 8                       | B                  | 8                       | B                  | 10                      | C                  |
|                         |                         |   |   | 5                       | A                  | 6                       | A                  | 7                       | B                  |
|                         |                         |   |   | 3                       | A                  | 3                       | A                  |                         |                    |
|                         |                         |   |   | 10                      | C                  | 12                      | C                  |                         |                    |
|                         |                         |   |   | 8                       | B                  | 8                       | B                  |                         |                    |
|                         |                         |   |   | 10                      | B                  | 12                      | B                  |                         |                    |
| 22                      | E                       | E | E | 30                      | E                  | 30                      | E                  | 30                      | F                  |
| 18                      | E                       | E | E | 20                      | E                  | 25                      | E                  | 30                      | F                  |
| 20                      | E                       | E | E | 16                      | E                  | 28                      | E                  | 24                      | F                  |
| 14                      | E                       | E | E | 16                      | E                  | 20                      | E                  | 20                      | F                  |
|                         |                         |   |   | 5                       | B                  | 6                       | B                  | 7                       | C                  |
|                         |                         |   |   |                         |                    |                         |                    |                         |                    |
|                         |                         |   |   |                         |                    |                         |                    |                         |                    |
|                         |                         |   |   |                         |                    |                         |                    |                         |                    |
|                         |                         |   |   | 6                       | A                  | 6                       | A                  |                         |                    |
|                         |                         |   |   | 6                       | A                  | 8                       | B                  |                         |                    |
|                         |                         |   |   | 5                       | A                  | 6                       | B                  |                         |                    |
|                         |                         |   |   |                         |                    |                         |                    |                         |                    |
| 45                      | F                       | F | F | 50                      | F                  | 63                      | F                  | 50                      | G                  |
| 36                      | E                       | E | E | 40                      | E                  | 50                      | E                  | 50                      | F                  |
| 55                      | E                       | E | E |                         |                    |                         |                    |                         |                    |
| 22                      | D                       | D | D | 30                      | D                  | 30                      | D                  | 60                      | E                  |
|                         |                         |   |   | 45                      | D                  |                         |                    |                         |                    |
| 28                      | D                       | D | D | 30                      | D                  | 40                      | D                  | 40                      | E                  |
| 22                      | C                       | C | C | 25                      | D                  |                         |                    |                         |                    |
| 20                      | C                       | C | C | 20                      | D                  | 28                      | D                  | 24                      | D                  |
| 18                      | C                       | C | C | 16                      | C                  | 25                      | D                  | 24                      | D                  |
|                         |                         |   |   | 10                      | C                  | 20                      | D                  | 22                      | D                  |
| 12                      | C                       | C | C | 14                      | C                  |                         |                    |                         |                    |
| 18                      | D                       | D | D | 20                      | C                  | 25                      | D                  | 24                      | E                  |

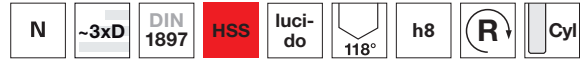


## Punte cilindriche

### Punte elicoidali, extra corte



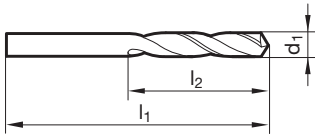
Catalogo n° 71110



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 0,500    |      | 20,000   | 3,000    | 3,300    |       | 49,000   | 18,000   |
| 0,600    |      | 21,000   | 3,500    | 3,400    |       | 52,000   | 20,000   |
| 0,700    |      | 23,000   | 4,500    | 3,500    |       | 52,000   | 20,000   |
| 0,750    |      | 23,000   | 4,500    | 3,600    |       | 52,000   | 20,000   |
| 0,800    |      | 24,000   | 5,000    | 3,700    |       | 52,000   | 20,000   |
| 0,900    |      | 25,000   | 5,500    | 3,750    |       | 52,000   | 20,000   |
| 1,000    |      | 26,000   | 6,000    | 3,800    |       | 55,000   | 22,000   |
| 1,050    |      | 26,000   | 6,000    | 3,900    |       | 55,000   | 22,000   |
| 1,100    |      | 28,000   | 7,000    | 4,000    |       | 55,000   | 22,000   |
| 1,150    |      | 28,000   | 7,000    | 4,100    |       | 55,000   | 22,000   |
| 1,200    |      | 30,000   | 8,000    | 4,200    |       | 55,000   | 22,000   |
| 1,250    |      | 30,000   | 8,000    | 4,250    |       | 55,000   | 22,000   |
| 1,300    |      | 30,000   | 8,000    | 4,300    |       | 58,000   | 24,000   |
| 1,350    |      | 32,000   | 9,000    | 4,400    |       | 58,000   | 24,000   |
| 1,400    |      | 32,000   | 9,000    | 4,500    |       | 58,000   | 24,000   |
| 1,450    |      | 32,000   | 9,000    | 4,600    |       | 58,000   | 24,000   |
| 1,500    |      | 32,000   | 9,000    | 4,700    |       | 58,000   | 24,000   |
| 1,550    |      | 34,000   | 10,000   | 4,800    |       | 62,000   | 26,000   |
| 1,600    |      | 34,000   | 10,000   | 4,900    |       | 62,000   | 26,000   |
| 1,650    |      | 34,000   | 10,000   | 5,000    |       | 62,000   | 26,000   |
| 1,700    |      | 34,000   | 10,000   | 5,100    |       | 62,000   | 26,000   |
| 1,750    |      | 36,000   | 11,000   | 5,150    |       | 62,000   | 26,000   |
| 1,800    |      | 36,000   | 11,000   | 5,200    |       | 62,000   | 26,000   |
| 1,900    |      | 36,000   | 11,000   | 5,250    |       | 62,000   | 26,000   |
| 1,950    |      | 38,000   | 12,000   | 5,300    |       | 62,000   | 26,000   |
| 2,000    |      | 38,000   | 12,000   | 5,400    |       | 66,000   | 28,000   |
| 2,050    |      | 38,000   | 12,000   | 5,500    |       | 66,000   | 28,000   |
| 2,100    |      | 38,000   | 12,000   | 5,600    |       | 66,000   | 28,000   |
| 2,150    |      | 40,000   | 13,000   | 5,700    |       | 66,000   | 28,000   |
| 2,200    |      | 40,000   | 13,000   | 5,750    |       | 66,000   | 28,000   |
| 2,250    |      | 40,000   | 13,000   | 5,800    |       | 66,000   | 28,000   |
| 2,300    |      | 40,000   | 13,000   | 5,900    |       | 66,000   | 28,000   |
| 2,400    |      | 43,000   | 14,000   | 6,000    |       | 66,000   | 28,000   |
| 2,450    |      | 43,000   | 14,000   | 6,100    |       | 70,000   | 31,000   |
| 2,500    |      | 43,000   | 14,000   | 6,200    |       | 70,000   | 31,000   |
| 2,550    |      | 43,000   | 14,000   | 6,250    |       | 70,000   | 31,000   |
| 2,600    |      | 43,000   | 14,000   | 6,300    |       | 70,000   | 31,000   |
| 2,650    |      | 43,000   | 14,000   | 6,400    |       | 70,000   | 31,000   |
| 2,700    |      | 46,000   | 16,000   | 6,500    |       | 70,000   | 31,000   |
| 2,750    |      | 46,000   | 16,000   | 6,600    |       | 70,000   | 31,000   |
| 2,800    |      | 46,000   | 16,000   | 6,700    |       | 70,000   | 31,000   |
| 2,850    |      | 46,000   | 16,000   | 6,750    | 17/64 | 74,000   | 34,000   |
| 2,900    |      | 46,000   | 16,000   | 6,800    |       | 74,000   | 34,000   |
| 2,950    |      | 46,000   | 16,000   | 6,900    |       | 74,000   | 34,000   |
| 3,000    |      | 46,000   | 16,000   | 7,000    |       | 74,000   | 34,000   |
| 3,100    |      | 49,000   | 18,000   | 7,100    |       | 74,000   | 34,000   |
| 3,200    |      | 49,000   | 18,000   | 7,200    |       | 74,000   | 34,000   |
| 3,250    |      | 49,000   | 18,000   | 7,250    |       | 74,000   | 34,000   |



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 7,300    |      | 74,000   | 34,000   | 12,000   |       | 102,000  | 51,000   |
| 7,400    |      | 74,000   | 34,000   | 12,500   |       | 102,000  | 51,000   |
| 7,500    |      | 74,000   | 34,000   | 12,750   |       | 102,000  | 51,000   |
| 7,600    |      | 79,000   | 37,000   | 13,000   |       | 102,000  | 51,000   |
| 7,700    |      | 79,000   | 37,000   | 13,500   |       | 107,000  | 54,000   |
| 7,750    |      | 79,000   | 37,000   | 14,000   |       | 107,000  | 54,000   |
| 7,800    |      | 79,000   | 37,000   | 14,500   |       | 111,000  | 56,000   |
| 7,900    |      | 79,000   | 37,000   | 15,000   |       | 111,000  | 56,000   |
| 8,000    |      | 79,000   | 37,000   | 15,500   |       | 115,000  | 58,000   |
| 8,100    |      | 79,000   | 37,000   | 16,000   |       | 115,000  | 58,000   |
| 8,200    |      | 79,000   | 37,000   | 16,500   |       | 119,000  | 60,000   |
| 8,250    |      | 79,000   | 37,000   | 17,000   |       | 119,000  | 60,000   |
| 8,300    |      | 79,000   | 37,000   | 17,500   |       | 123,000  | 62,000   |
| 8,400    |      | 79,000   | 37,000   | 18,000   |       | 123,000  | 62,000   |
| 8,500    |      | 79,000   | 37,000   | 18,500   |       | 127,000  | 64,000   |
| 8,600    |      | 84,000   | 40,000   | 19,000   |       | 127,000  | 64,000   |
| 8,700    |      | 84,000   | 40,000   | 19,500   |       | 131,000  | 66,000   |
| 8,750    |      | 84,000   | 40,000   | 20,000   |       | 131,000  | 66,000   |
| 8,800    |      | 84,000   | 40,000   | 20,500   |       | 136,000  | 68,000   |
| 8,900    |      | 84,000   | 40,000   | 21,000   |       | 136,000  | 68,000   |
| 9,000    |      | 84,000   | 40,000   | 21,500   |       | 141,000  | 70,000   |
| 9,100    |      | 84,000   | 40,000   | 22,000   |       | 141,000  | 70,000   |
| 9,200    |      | 84,000   | 40,000   | 22,500   |       | 146,000  | 72,000   |
| 9,250    |      | 84,000   | 40,000   | 23,000   |       | 146,000  | 72,000   |
| 9,300    |      | 84,000   | 40,000   | 24,000   |       | 151,000  | 75,000   |
| 9,400    |      | 84,000   | 40,000   | 25,000   | 63/64 | 151,000  | 75,000   |
| 9,500    |      | 84,000   | 40,000   | 26,000   |       | 156,000  | 78,000   |
| 9,600    |      | 89,000   | 43,000   | 28,000   |       | 162,000  | 81,000   |
| 9,700    |      | 89,000   | 43,000   | 29,000   |       | 168,000  | 84,000   |
| 9,750    |      | 89,000   | 43,000   | 30,000   |       | 168,000  | 84,000   |
| 9,800    |      | 89,000   | 43,000   | 31,000   |       | 174,000  | 87,000   |
| 9,900    |      | 89,000   | 43,000   | 32,000   |       | 180,000  | 90,000   |
| 10,000   |      | 89,000   | 43,000   |          |       |          |          |
| 10,100   |      | 89,000   | 43,000   |          |       |          |          |
| 10,200   |      | 89,000   | 43,000   |          |       |          |          |
| 10,250   |      | 89,000   | 43,000   |          |       |          |          |
| 10,300   |      | 89,000   | 43,000   |          |       |          |          |
| 10,400   |      | 89,000   | 43,000   |          |       |          |          |
| 10,500   |      | 89,000   | 43,000   |          |       |          |          |
| 10,750   |      | 95,000   | 47,000   |          |       |          |          |
| 11,000   |      | 95,000   | 47,000   |          |       |          |          |
| 11,500   |      | 95,000   | 47,000   |          |       |          |          |

## Punte cilindriche

### Punte elicoidali, extra corte



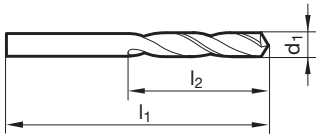
Catalogo n° 71111



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 14,300$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 0,500    |      | 20,000   | 3,000    | 3,000    |      | 46,000   | 16,000   |
| 0,550    |      | 21,000   | 3,500    | 3,100    |      | 49,000   | 18,000   |
| 0,600    |      | 21,000   | 3,500    | 3,150    |      | 49,000   | 18,000   |
| 0,650    |      | 22,000   | 4,000    | 3,200    |      | 49,000   | 18,000   |
| 0,700    |      | 23,000   | 4,500    | 3,300    |      | 49,000   | 18,000   |
| 0,750    |      | 23,000   | 4,500    | 3,450    |      | 52,000   | 20,000   |
| 0,800    |      | 24,000   | 5,000    | 3,500    |      | 52,000   | 20,000   |
| 0,850    |      | 24,000   | 5,000    | 3,550    |      | 52,000   | 20,000   |
| 0,900    |      | 25,000   | 5,500    | 3,600    |      | 52,000   | 20,000   |
| 0,950    |      | 25,000   | 5,500    | 3,650    |      | 52,000   | 20,000   |
| 1,000    |      | 26,000   | 6,000    | 3,700    |      | 52,000   | 20,000   |
| 1,050    |      | 26,000   | 6,000    | 3,750    |      | 52,000   | 20,000   |
| 1,100    |      | 28,000   | 7,000    | 3,800    |      | 55,000   | 22,000   |
| 1,150    |      | 28,000   | 7,000    | 3,850    |      | 55,000   | 22,000   |
| 1,200    |      | 30,000   | 8,000    | 3,900    |      | 55,000   | 22,000   |
| 1,250    |      | 30,000   | 8,000    | 3,950    |      | 55,000   | 22,000   |
| 1,300    |      | 30,000   | 8,000    | 4,000    |      | 55,000   | 22,000   |
| 1,350    |      | 32,000   | 9,000    | 4,100    |      | 55,000   | 22,000   |
| 1,400    |      | 32,000   | 9,000    | 4,200    |      | 55,000   | 22,000   |
| 1,450    |      | 32,000   | 9,000    | 4,300    |      | 58,000   | 24,000   |
| 1,500    |      | 32,000   | 9,000    | 4,500    |      | 58,000   | 24,000   |
| 1,550    |      | 34,000   | 10,000   | 4,600    |      | 58,000   | 24,000   |
| 1,600    |      | 34,000   | 10,000   | 4,700    |      | 58,000   | 24,000   |
| 1,650    |      | 34,000   | 10,000   | 4,750    |      | 58,000   | 24,000   |
| 1,700    |      | 34,000   | 10,000   | 4,800    |      | 62,000   | 26,000   |
| 1,750    |      | 36,000   | 11,000   | 5,000    |      | 62,000   | 26,000   |
| 1,800    |      | 36,000   | 11,000   | 5,100    |      | 62,000   | 26,000   |
| 1,850    |      | 36,000   | 11,000   | 5,200    |      | 62,000   | 26,000   |
| 1,900    |      | 36,000   | 11,000   | 5,300    |      | 62,000   | 26,000   |
| 2,000    |      | 38,000   | 12,000   | 5,400    |      | 66,000   | 28,000   |
| 2,050    |      | 38,000   | 12,000   | 5,500    |      | 66,000   | 28,000   |
| 2,100    |      | 38,000   | 12,000   | 5,600    |      | 66,000   | 28,000   |
| 2,150    |      | 40,000   | 13,000   | 5,700    |      | 66,000   | 28,000   |
| 2,200    |      | 40,000   | 13,000   | 5,750    |      | 66,000   | 28,000   |
| 2,250    |      | 40,000   | 13,000   | 5,800    |      | 66,000   | 28,000   |
| 2,300    |      | 40,000   | 13,000   | 5,900    |      | 66,000   | 28,000   |
| 2,350    |      | 40,000   | 13,000   | 6,200    |      | 70,000   | 31,000   |
| 2,400    |      | 43,000   | 14,000   | 6,250    |      | 70,000   | 31,000   |
| 2,450    |      | 43,000   | 14,000   | 6,300    |      | 70,000   | 31,000   |
| 2,500    |      | 43,000   | 14,000   | 6,500    |      | 70,000   | 31,000   |
| 2,550    |      | 43,000   | 14,000   | 6,600    |      | 70,000   | 31,000   |
| 2,600    |      | 43,000   | 14,000   | 6,700    |      | 70,000   | 31,000   |
| 2,650    |      | 43,000   | 14,000   | 6,800    |      | 74,000   | 34,000   |
| 2,700    |      | 46,000   | 16,000   | 6,900    |      | 74,000   | 34,000   |
| 2,800    |      | 46,000   | 16,000   | 7,000    |      | 74,000   | 34,000   |
| 2,850    |      | 46,000   | 16,000   | 7,100    |      | 74,000   | 34,000   |
| 2,900    |      | 46,000   | 16,000   | 7,300    |      | 74,000   | 34,000   |
| 2,950    |      | 46,000   | 16,000   | 7,400    |      | 74,000   | 34,000   |

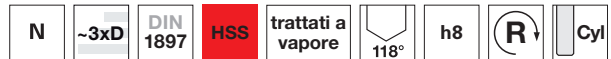
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 7,500    |      | 74,000   | 34,000   | 12,100   |       | 102,000  | 51,000   |
| 7,600    |      | 79,000   | 37,000   | 12,300   | 31/64 | 102,000  | 51,000   |
| 7,700    |      | 79,000   | 37,000   | 12,400   |       | 102,000  | 51,000   |
| 7,750    |      | 79,000   | 37,000   | 12,750   |       | 102,000  | 51,000   |
| 7,800    |      | 79,000   | 37,000   | 12,900   |       | 102,000  | 51,000   |
| 7,900    |      | 79,000   | 37,000   | 13,000   |       | 102,000  | 51,000   |
| 8,000    |      | 79,000   | 37,000   | 13,100   | 33/64 | 102,000  | 51,000   |
| 8,100    |      | 79,000   | 37,000   | 13,200   |       | 102,000  | 51,000   |
| 8,200    |      | 79,000   | 37,000   | 13,250   |       | 107,000  | 54,000   |
| 8,250    |      | 79,000   | 37,000   | 13,300   |       | 107,000  | 54,000   |
| 8,300    |      | 79,000   | 37,000   | 13,600   |       | 107,000  | 54,000   |
| 8,400    |      | 79,000   | 37,000   | 13,750   |       | 107,000  | 54,000   |
| 8,500    |      | 79,000   | 37,000   | 13,800   |       | 107,000  | 54,000   |
| 8,600    |      | 84,000   | 40,000   | 13,900   |       | 107,000  | 54,000   |
| 8,700    |      | 84,000   | 40,000   | 14,300   |       | 111,000  | 56,000   |
| 8,750    |      | 84,000   | 40,000   | 14,400   |       | 111,000  | 56,000   |
| 8,800    |      | 84,000   | 40,000   | 14,800   |       | 111,000  | 56,000   |
| 8,900    |      | 84,000   | 40,000   | 14,900   |       | 111,000  | 56,000   |
| 9,000    |      | 84,000   | 40,000   | 15,000   |       | 111,000  | 56,000   |
| 9,100    |      | 84,000   | 40,000   | 15,300   |       | 115,000  | 58,000   |
| 9,200    |      | 84,000   | 40,000   | 15,400   |       | 115,000  | 58,000   |
| 9,250    |      | 84,000   | 40,000   | 15,750   |       | 115,000  | 58,000   |
| 9,400    |      | 84,000   | 40,000   | 15,800   |       | 115,000  | 58,000   |
| 9,500    |      | 84,000   | 40,000   | 15,900   |       | 115,000  | 58,000   |
| 9,600    |      | 89,000   | 43,000   | 16,000   |       | 115,000  | 58,000   |
| 9,700    |      | 89,000   | 43,000   | 16,250   |       | 119,000  | 60,000   |
| 9,750    |      | 89,000   | 43,000   | 16,300   |       | 119,000  | 60,000   |
| 9,800    |      | 89,000   | 43,000   | 16,900   |       | 119,000  | 60,000   |
| 9,900    |      | 89,000   | 43,000   | 17,250   |       | 123,000  | 62,000   |
| 10,000   |      | 89,000   | 43,000   | 17,400   |       | 123,000  | 62,000   |
| 10,200   |      | 89,000   | 43,000   | 17,600   |       | 123,000  | 62,000   |
| 10,300   |      | 89,000   | 43,000   | 18,600   |       | 127,000  | 64,000   |
| 10,500   |      | 89,000   | 43,000   | 18,750   |       | 127,000  | 64,000   |
| 10,700   |      | 95,000   | 47,000   | 18,800   |       | 127,000  | 64,000   |
| 10,800   |      | 95,000   | 47,000   | 19,000   |       | 127,000  | 64,000   |
| 11,000   |      | 95,000   | 47,000   | 21,500   |       | 141,000  | 70,000   |
| 11,100   |      | 95,000   | 47,000   | 29,000   |       | 168,000  | 84,000   |
| 11,300   |      | 95,000   | 47,000   | 30,000   |       | 168,000  | 84,000   |
| 11,600   |      | 95,000   | 47,000   | 32,000   |       | 180,000  | 90,000   |
| 11,750   |      | 95,000   | 47,000   |          |       |          |          |
| 11,900   |      | 102,000  | 51,000   |          |       |          |          |
| 12,000   |      | 102,000  | 51,000   |          |       |          |          |

## Punte cilindriche

### Punte elicoidali, extra corte



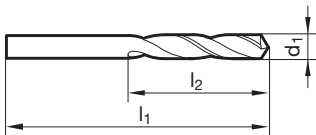
Catalogo n° 71108



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano
- lucida  $< 2,36$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 2,000    |      | 38,000   | 12,000   | 6,400    |      | 70,000   | 31,000   |
| 2,100    |      | 38,000   | 12,000   | 6,500    |      | 70,000   | 31,000   |
| 2,200    |      | 40,000   | 13,000   | 6,600    |      | 70,000   | 31,000   |
| 2,300    |      | 40,000   | 13,000   | 6,700    |      | 70,000   | 31,000   |
| 2,400    |      | 43,000   | 14,000   | 6,800    |      | 74,000   | 34,000   |
| 2,500    |      | 43,000   | 14,000   | 6,900    |      | 74,000   | 34,000   |
| 2,550    |      | 43,000   | 14,000   | 7,000    |      | 74,000   | 34,000   |
| 2,600    |      | 43,000   | 14,000   | 7,100    |      | 74,000   | 34,000   |
| 2,700    |      | 46,000   | 16,000   | 7,200    |      | 74,000   | 34,000   |
| 2,800    |      | 46,000   | 16,000   | 7,300    |      | 74,000   | 34,000   |
| 2,900    |      | 46,000   | 16,000   | 7,400    |      | 74,000   | 34,000   |
| 2,950    |      | 46,000   | 16,000   | 7,500    |      | 74,000   | 34,000   |
| 3,000    |      | 46,000   | 16,000   | 7,600    |      | 79,000   | 37,000   |
| 3,100    |      | 49,000   | 18,000   | 7,700    |      | 79,000   | 37,000   |
| 3,200    |      | 49,000   | 18,000   | 7,800    |      | 79,000   | 37,000   |
| 3,250    |      | 49,000   | 18,000   | 7,900    |      | 79,000   | 37,000   |
| 3,300    |      | 49,000   | 18,000   | 8,000    |      | 79,000   | 37,000   |
| 3,400    |      | 52,000   | 20,000   | 8,100    |      | 79,000   | 37,000   |
| 3,500    |      | 52,000   | 20,000   | 8,200    |      | 79,000   | 37,000   |
| 3,600    |      | 52,000   | 20,000   | 8,300    |      | 79,000   | 37,000   |
| 3,700    |      | 52,000   | 20,000   | 8,400    |      | 79,000   | 37,000   |
| 3,800    |      | 55,000   | 22,000   | 8,500    |      | 79,000   | 37,000   |
| 3,900    |      | 55,000   | 22,000   | 8,600    |      | 84,000   | 40,000   |
| 4,000    |      | 55,000   | 22,000   | 8,700    |      | 84,000   | 40,000   |
| 4,100    |      | 55,000   | 22,000   | 8,750    |      | 84,000   | 40,000   |
| 4,200    |      | 55,000   | 22,000   | 8,800    |      | 84,000   | 40,000   |
| 4,300    |      | 58,000   | 24,000   | 8,900    |      | 84,000   | 40,000   |
| 4,400    |      | 58,000   | 24,000   | 9,000    |      | 84,000   | 40,000   |
| 4,500    |      | 58,000   | 24,000   | 9,100    |      | 84,000   | 40,000   |
| 4,600    |      | 58,000   | 24,000   | 9,200    |      | 84,000   | 40,000   |
| 4,700    |      | 58,000   | 24,000   | 9,300    |      | 84,000   | 40,000   |
| 4,800    |      | 62,000   | 26,000   | 9,400    |      | 84,000   | 40,000   |
| 4,900    |      | 62,000   | 26,000   | 9,500    |      | 84,000   | 40,000   |
| 5,000    |      | 62,000   | 26,000   | 9,600    |      | 89,000   | 43,000   |
| 5,100    |      | 62,000   | 26,000   | 9,700    |      | 89,000   | 43,000   |
| 5,200    |      | 62,000   | 26,000   | 9,800    |      | 89,000   | 43,000   |
| 5,250    |      | 62,000   | 26,000   | 9,900    |      | 89,000   | 43,000   |
| 5,300    |      | 62,000   | 26,000   | 10,000   |      | 89,000   | 43,000   |
| 5,400    |      | 66,000   | 28,000   | 10,100   |      | 89,000   | 43,000   |
| 5,500    |      | 66,000   | 28,000   | 10,200   |      | 89,000   | 43,000   |
| 5,600    |      | 66,000   | 28,000   | 10,500   |      | 89,000   | 43,000   |
| 5,700    |      | 66,000   | 28,000   | 11,000   |      | 95,000   | 47,000   |
| 5,800    |      | 66,000   | 28,000   | 11,500   |      | 95,000   | 47,000   |
| 5,900    |      | 66,000   | 28,000   | 12,000   |      | 102,000  | 51,000   |
| 6,000    |      | 66,000   | 28,000   | 12,500   |      | 102,000  | 51,000   |
| 6,100    |      | 70,000   | 31,000   | 13,000   |      | 102,000  | 51,000   |
| 6,200    |      | 70,000   | 31,000   | 13,500   |      | 107,000  | 54,000   |
| 6,300    |      | 70,000   | 31,000   | 14,000   |      | 107,000  | 54,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |       | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|-------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch  | mm        | mm        |
| <b>14,500</b> |      | 111,000   | 56,000    | <b>20,000</b> |       | 131,000   | 66,000    |
| <b>15,000</b> |      | 111,000   | 56,000    | <b>20,500</b> |       | 136,000   | 68,000    |
| <b>16,000</b> |      | 115,000   | 58,000    | <b>25,000</b> | 63/64 | 151,000   | 75,000    |
| <b>17,000</b> |      | 119,000   | 60,000    | <b>27,000</b> |       | 162,000   | 81,000    |
| <b>18,000</b> |      | 123,000   | 62,000    |               |       |           |           |
| <b>19,500</b> |      | 131,000   | 66,000    |               |       |           |           |

## Punte cilindriche

### Punte elicoidali, extra corte



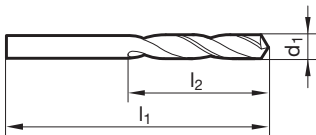
Catalogo n° 71109



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- per torni automatici/revolver
- lucida < 6,00 mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 2,600    |      | 43,000   | 14,000   |
| 2,750    |      | 46,000   | 16,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,100    |      | 49,000   | 18,000   |
| 3,200    |      | 49,000   | 18,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,400    |      | 52,000   | 20,000   |
| 3,500    |      | 52,000   | 20,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,100    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,250    |      | 55,000   | 22,000   |
| 4,300    |      | 58,000   | 24,000   |
| 4,400    |      | 58,000   | 24,000   |
| 4,500    |      | 58,000   | 24,000   |
| 4,900    |      | 62,000   | 26,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,200    |      | 62,000   | 26,000   |
| 5,300    |      | 62,000   | 26,000   |
| 5,400    |      | 66,000   | 28,000   |
| 5,500    |      | 66,000   | 28,000   |
| 5,600    |      | 66,000   | 28,000   |
| 5,700    |      | 66,000   | 28,000   |
| 6,000    |      | 66,000   | 28,000   |
| 6,200    |      | 70,000   | 31,000   |
| 6,400    |      | 70,000   | 31,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,900    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,200    |      | 74,000   | 34,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 7,500    |      | 74,000   | 34,000   |
| 7,800    |      | 79,000   | 37,000   |
| 7,900    |      | 79,000   | 37,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,100    |      | 79,000   | 37,000   |
| 8,300    |      | 79,000   | 37,000   |
| 8,700    |      | 84,000   | 40,000   |
| 8,800    |      | 84,000   | 40,000   |
| 8,900    |      | 84,000   | 40,000   |
| 9,100    |      | 84,000   | 40,000   |
| 9,300    |      | 84,000   | 40,000   |
| 9,400    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 9,700    |      | 89,000   | 43,000   |
| 10,200   |      | 89,000   | 43,000   |
| 10,750   |      | 95,000   | 47,000   |
| 11,000   |      | 95,000   | 47,000   |
| 11,500   |      | 95,000   | 47,000   |
| 12,500   |      | 102,000  | 51,000   |
| 13,250   |      | 107,000  | 54,000   |
| 14,500   |      | 111,000  | 56,000   |
| 15,500   |      | 115,000  | 58,000   |
| 15,750   |      | 115,000  | 58,000   |
| 16,000   |      | 115,000  | 58,000   |
| 17,000   |      | 119,000  | 60,000   |
| 17,500   |      | 123,000  | 62,000   |
| 21,000   |      | 136,000  | 68,000   |
| 22,000   |      | 141,000  | 70,000   |
| 24,000   |      | 151,000  | 75,000   |
| 26,500   |      | 156,000  | 78,000   |

## Punte cilindriche

### Punte elicoidali, extra corte



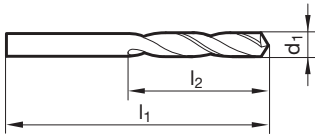
Catalogo n° 61118



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano
- maggiore protezione contro l'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    |
| 1,100    |      | 28,000   | 7,000    |
| 1,200    |      | 30,000   | 8,000    |
| 1,300    |      | 30,000   | 8,000    |
| 1,400    |      | 32,000   | 9,000    |
| 1,500    |      | 32,000   | 9,000    |
| 1,600    |      | 34,000   | 10,000   |
| 1,700    |      | 34,000   | 10,000   |
| 1,800    |      | 36,000   | 11,000   |
| 1,900    |      | 36,000   | 11,000   |
| 2,000    |      | 38,000   | 12,000   |
| 2,100    |      | 38,000   | 12,000   |
| 2,200    |      | 40,000   | 13,000   |
| 2,300    |      | 40,000   | 13,000   |
| 2,400    |      | 43,000   | 14,000   |
| 2,500    |      | 43,000   | 14,000   |
| 2,600    |      | 43,000   | 14,000   |
| 2,700    |      | 46,000   | 16,000   |
| 2,800    |      | 46,000   | 16,000   |
| 2,900    |      | 46,000   | 16,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,100    |      | 49,000   | 18,000   |
| 3,200    |      | 49,000   | 18,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,400    |      | 52,000   | 20,000   |
| 3,500    |      | 52,000   | 20,000   |
| 3,600    |      | 52,000   | 20,000   |
| 3,700    |      | 52,000   | 20,000   |
| 3,800    |      | 55,000   | 22,000   |
| 3,900    |      | 55,000   | 22,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,100    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,300    |      | 58,000   | 24,000   |
| 4,400    |      | 58,000   | 24,000   |
| 4,500    |      | 58,000   | 24,000   |
| 4,600    |      | 58,000   | 24,000   |
| 4,700    |      | 58,000   | 24,000   |
| 4,800    |      | 62,000   | 26,000   |
| 4,900    |      | 62,000   | 26,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,100    |      | 62,000   | 26,000   |
| 5,200    |      | 62,000   | 26,000   |
| 5,300    |      | 62,000   | 26,000   |
| 5,400    |      | 66,000   | 28,000   |
| 5,500    |      | 66,000   | 28,000   |
| 5,600    |      | 66,000   | 28,000   |
| 5,700    |      | 66,000   | 28,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 66,000   | 28,000   |
| 5,900    |      | 66,000   | 28,000   |
| 6,000    |      | 66,000   | 28,000   |
| 6,100    |      | 70,000   | 31,000   |
| 6,200    |      | 70,000   | 31,000   |
| 6,300    |      | 70,000   | 31,000   |
| 6,400    |      | 70,000   | 31,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,600    |      | 70,000   | 31,000   |
| 6,700    |      | 70,000   | 31,000   |
| 6,800    |      | 74,000   | 34,000   |
| 6,900    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,100    |      | 74,000   | 34,000   |
| 7,200    |      | 74,000   | 34,000   |
| 7,300    |      | 74,000   | 34,000   |
| 7,400    |      | 74,000   | 34,000   |
| 7,500    |      | 74,000   | 34,000   |
| 7,600    |      | 79,000   | 37,000   |
| 7,700    |      | 79,000   | 37,000   |
| 7,800    |      | 79,000   | 37,000   |
| 7,900    |      | 79,000   | 37,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,100    |      | 79,000   | 37,000   |
| 8,200    |      | 79,000   | 37,000   |
| 8,300    |      | 79,000   | 37,000   |
| 8,400    |      | 79,000   | 37,000   |
| 8,500    |      | 79,000   | 37,000   |
| 8,600    |      | 84,000   | 40,000   |
| 8,700    |      | 84,000   | 40,000   |
| 8,800    |      | 84,000   | 40,000   |
| 8,900    |      | 84,000   | 40,000   |
| 9,000    |      | 84,000   | 40,000   |
| 9,100    |      | 84,000   | 40,000   |
| 9,200    |      | 84,000   | 40,000   |
| 9,300    |      | 84,000   | 40,000   |
| 9,400    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 9,600    |      | 89,000   | 43,000   |
| 9,700    |      | 89,000   | 43,000   |
| 9,800    |      | 89,000   | 43,000   |
| 9,900    |      | 89,000   | 43,000   |
| 10,000   |      | 89,000   | 43,000   |
| 10,100   |      | 89,000   | 43,000   |
| 10,200   |      | 89,000   | 43,000   |
| 10,300   |      | 89,000   | 43,000   |
| 10,400   |      | 89,000   | 43,000   |
| 10,500   |      | 89,000   | 43,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |       | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|-------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch  | mm        | mm        |
| <b>10,600</b> |      | 89,000    | 43,000    | <b>13,000</b> |       | 102,000   | 51,000    |
| <b>10,800</b> |      | 95,000    | 47,000    | <b>13,100</b> | 33/64 | 102,000   | 51,000    |
| <b>11,000</b> |      | 95,000    | 47,000    |               |       |           |           |
| <b>11,500</b> |      | 95,000    | 47,000    |               |       |           |           |
| <b>12,000</b> |      | 102,000   | 51,000    |               |       |           |           |
| <b>12,500</b> |      | 102,000   | 51,000    |               |       |           |           |



## Punte cilindriche

### Punte elicoidali, extra corte



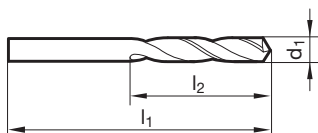
Catalogo n° 71106



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | ○ |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- con alta perc. di CoMo
- specialmente per resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    |
| 1,500    |      | 32,000   | 9,000    |
| 2,000    |      | 38,000   | 12,000   |
| 2,500    |      | 43,000   | 14,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,500    |      | 52,000   | 20,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,500    |      | 58,000   | 24,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,500    |      | 66,000   | 28,000   |

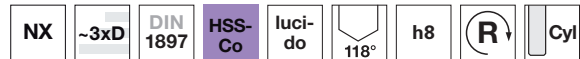
| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 6,000    |      | 66,000   | 28,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,800    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,500    |      | 74,000   | 34,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,500    |      | 79,000   | 37,000   |
| 9,000    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 10,000   |      | 89,000   | 43,000   |

## Punte cilindriche

### Punte elicoidali, extra corte



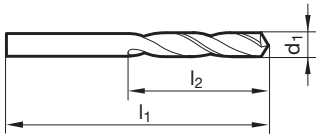
Catalogo n° 71220



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 178

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    |
| 1,100    |      | 28,000   | 7,000    |
| 1,200    |      | 30,000   | 8,000    |
| 1,300    |      | 30,000   | 8,000    |
| 1,400    |      | 32,000   | 9,000    |
| 1,500    |      | 32,000   | 9,000    |
| 1,600    |      | 34,000   | 10,000   |
| 1,700    |      | 34,000   | 10,000   |
| 1,800    |      | 36,000   | 11,000   |
| 1,900    |      | 36,000   | 11,000   |
| 2,000    |      | 38,000   | 12,000   |
| 2,100    |      | 38,000   | 12,000   |
| 2,200    |      | 40,000   | 13,000   |
| 2,300    |      | 40,000   | 13,000   |
| 2,400    |      | 43,000   | 14,000   |
| 2,500    |      | 43,000   | 14,000   |
| 2,600    |      | 43,000   | 14,000   |
| 2,700    |      | 46,000   | 16,000   |
| 2,800    |      | 46,000   | 16,000   |
| 2,900    |      | 46,000   | 16,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,100    |      | 49,000   | 18,000   |
| 3,200    |      | 49,000   | 18,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,400    |      | 52,000   | 20,000   |
| 3,500    |      | 52,000   | 20,000   |
| 3,600    |      | 52,000   | 20,000   |
| 3,700    |      | 52,000   | 20,000   |
| 3,800    |      | 55,000   | 22,000   |
| 3,900    |      | 55,000   | 22,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,100    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,300    |      | 58,000   | 24,000   |
| 4,400    |      | 58,000   | 24,000   |
| 4,500    |      | 58,000   | 24,000   |
| 4,600    |      | 58,000   | 24,000   |
| 4,700    |      | 58,000   | 24,000   |
| 4,800    |      | 62,000   | 26,000   |
| 4,900    |      | 62,000   | 26,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,100    |      | 62,000   | 26,000   |
| 5,200    |      | 62,000   | 26,000   |
| 5,300    |      | 62,000   | 26,000   |
| 5,400    |      | 66,000   | 28,000   |
| 5,500    |      | 66,000   | 28,000   |
| 5,600    |      | 66,000   | 28,000   |
| 5,700    |      | 66,000   | 28,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 66,000   | 28,000   |
| 5,900    |      | 66,000   | 28,000   |
| 6,000    |      | 66,000   | 28,000   |
| 6,100    |      | 70,000   | 31,000   |
| 6,200    |      | 70,000   | 31,000   |
| 6,300    |      | 70,000   | 31,000   |
| 6,400    |      | 70,000   | 31,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,600    |      | 70,000   | 31,000   |
| 6,700    |      | 70,000   | 31,000   |
| 6,800    |      | 74,000   | 34,000   |
| 6,900    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,100    |      | 74,000   | 34,000   |
| 7,200    |      | 74,000   | 34,000   |
| 7,300    |      | 74,000   | 34,000   |
| 7,400    |      | 74,000   | 34,000   |
| 7,500    |      | 74,000   | 34,000   |
| 7,600    |      | 79,000   | 37,000   |
| 7,700    |      | 79,000   | 37,000   |
| 7,800    |      | 79,000   | 37,000   |
| 7,900    |      | 79,000   | 37,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,100    |      | 79,000   | 37,000   |
| 8,200    |      | 79,000   | 37,000   |
| 8,300    |      | 79,000   | 37,000   |
| 8,400    |      | 79,000   | 37,000   |
| 8,500    |      | 79,000   | 37,000   |
| 8,600    |      | 84,000   | 40,000   |
| 8,700    |      | 84,000   | 40,000   |
| 8,800    |      | 84,000   | 40,000   |
| 8,900    |      | 84,000   | 40,000   |
| 9,000    |      | 84,000   | 40,000   |
| 9,100    |      | 84,000   | 40,000   |
| 9,200    |      | 84,000   | 40,000   |
| 9,300    |      | 84,000   | 40,000   |
| 9,400    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 9,600    |      | 89,000   | 43,000   |
| 9,700    |      | 89,000   | 43,000   |
| 9,800    |      | 89,000   | 43,000   |
| 9,900    |      | 89,000   | 43,000   |
| 10,000   |      | 89,000   | 43,000   |
| 10,100   |      | 89,000   | 43,000   |
| 10,200   |      | 89,000   | 43,000   |
| 10,300   |      | 89,000   | 43,000   |
| 10,400   |      | 89,000   | 43,000   |
| 10,500   |      | 89,000   | 43,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 95,000    | 47,000    | <b>14,000</b> |      | 107,000   | 54,000    |
| <b>11,500</b> |      | 95,000    | 47,000    |               |      |           |           |
| <b>12,000</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>12,500</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>13,000</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>13,500</b> |      | 107,000   | 54,000    |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, extra corte



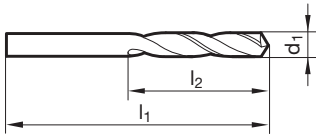
Catalogo n° 61220



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 178

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale
- maggiore protezione contro l'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    |
| 1,100    |      | 28,000   | 7,000    |
| 1,200    |      | 30,000   | 8,000    |
| 1,300    |      | 30,000   | 8,000    |
| 1,400    |      | 32,000   | 9,000    |
| 1,500    |      | 32,000   | 9,000    |
| 1,600    |      | 34,000   | 10,000   |
| 1,700    |      | 34,000   | 10,000   |
| 1,800    |      | 36,000   | 11,000   |
| 1,900    |      | 36,000   | 11,000   |
| 2,000    |      | 38,000   | 12,000   |
| 2,100    |      | 38,000   | 12,000   |
| 2,200    |      | 40,000   | 13,000   |
| 2,300    |      | 40,000   | 13,000   |
| 2,400    |      | 43,000   | 14,000   |
| 2,500    |      | 43,000   | 14,000   |
| 2,600    |      | 43,000   | 14,000   |
| 2,700    |      | 46,000   | 16,000   |
| 2,800    |      | 46,000   | 16,000   |
| 2,900    |      | 46,000   | 16,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,100    |      | 49,000   | 18,000   |
| 3,200    |      | 49,000   | 18,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,400    |      | 52,000   | 20,000   |
| 3,500    |      | 52,000   | 20,000   |
| 3,600    |      | 52,000   | 20,000   |
| 3,700    |      | 52,000   | 20,000   |
| 3,800    |      | 55,000   | 22,000   |
| 3,900    |      | 55,000   | 22,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,100    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,300    |      | 58,000   | 24,000   |
| 4,400    |      | 58,000   | 24,000   |
| 4,500    |      | 58,000   | 24,000   |
| 4,600    |      | 58,000   | 24,000   |
| 4,700    |      | 58,000   | 24,000   |
| 4,800    |      | 62,000   | 26,000   |
| 4,900    |      | 62,000   | 26,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,100    |      | 62,000   | 26,000   |
| 5,200    |      | 62,000   | 26,000   |
| 5,300    |      | 62,000   | 26,000   |
| 5,400    |      | 66,000   | 28,000   |
| 5,500    |      | 66,000   | 28,000   |
| 5,600    |      | 66,000   | 28,000   |
| 5,700    |      | 66,000   | 28,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 66,000   | 28,000   |
| 5,900    |      | 66,000   | 28,000   |
| 6,000    |      | 66,000   | 28,000   |
| 6,100    |      | 70,000   | 31,000   |
| 6,200    |      | 70,000   | 31,000   |
| 6,300    |      | 70,000   | 31,000   |
| 6,400    |      | 70,000   | 31,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,600    |      | 70,000   | 31,000   |
| 6,700    |      | 70,000   | 31,000   |
| 6,800    |      | 74,000   | 34,000   |
| 6,900    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,100    |      | 74,000   | 34,000   |
| 7,200    |      | 74,000   | 34,000   |
| 7,300    |      | 74,000   | 34,000   |
| 7,400    |      | 74,000   | 34,000   |
| 7,500    |      | 74,000   | 34,000   |
| 7,600    |      | 79,000   | 37,000   |
| 7,700    |      | 79,000   | 37,000   |
| 7,800    |      | 79,000   | 37,000   |
| 7,900    |      | 79,000   | 37,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,100    |      | 79,000   | 37,000   |
| 8,200    |      | 79,000   | 37,000   |
| 8,300    |      | 79,000   | 37,000   |
| 8,400    |      | 79,000   | 37,000   |
| 8,500    |      | 79,000   | 37,000   |
| 8,600    |      | 84,000   | 40,000   |
| 8,700    |      | 84,000   | 40,000   |
| 8,800    |      | 84,000   | 40,000   |
| 8,900    |      | 84,000   | 40,000   |
| 9,000    |      | 84,000   | 40,000   |
| 9,100    |      | 84,000   | 40,000   |
| 9,200    |      | 84,000   | 40,000   |
| 9,300    |      | 84,000   | 40,000   |
| 9,400    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 9,600    |      | 89,000   | 43,000   |
| 9,700    |      | 89,000   | 43,000   |
| 9,800    |      | 89,000   | 43,000   |
| 9,900    |      | 89,000   | 43,000   |
| 10,000   |      | 89,000   | 43,000   |
| 10,100   |      | 89,000   | 43,000   |
| 10,200   |      | 89,000   | 43,000   |
| 10,300   |      | 89,000   | 43,000   |
| 10,400   |      | 89,000   | 43,000   |
| 10,500   |      | 89,000   | 43,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 95,000    | 47,000    | <b>14,000</b> |      | 107,000   | 54,000    |
| <b>11,500</b> |      | 95,000    | 47,000    |               |      |           |           |
| <b>12,000</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>12,500</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>13,000</b> |      | 102,000   | 51,000    |               |      |           |           |
| <b>13,500</b> |      | 107,000   | 54,000    |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, extra corte



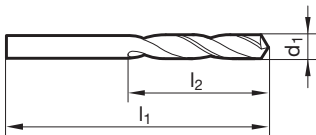
Catalogo n° 51159



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 178

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 2,000    |      | 38,000   | 12,000   | 6,900    |       | 74,000   | 34,000   |
| 2,100    |      | 38,000   | 12,000   | 7,000    |       | 74,000   | 34,000   |
| 2,200    |      | 40,000   | 13,000   | 7,100    |       | 74,000   | 34,000   |
| 2,300    |      | 40,000   | 13,000   | 7,300    |       | 74,000   | 34,000   |
| 2,400    |      | 43,000   | 14,000   | 7,400    |       | 74,000   | 34,000   |
| 2,500    |      | 43,000   | 14,000   | 7,500    |       | 74,000   | 34,000   |
| 2,600    |      | 43,000   | 14,000   | 7,600    |       | 79,000   | 37,000   |
| 2,700    |      | 46,000   | 16,000   | 7,700    |       | 79,000   | 37,000   |
| 2,800    |      | 46,000   | 16,000   | 7,800    |       | 79,000   | 37,000   |
| 2,900    |      | 46,000   | 16,000   | 7,900    |       | 79,000   | 37,000   |
| 3,000    |      | 46,000   | 16,000   | 8,000    |       | 79,000   | 37,000   |
| 3,100    |      | 49,000   | 18,000   | 8,100    |       | 79,000   | 37,000   |
| 3,200    |      | 49,000   | 18,000   | 8,200    |       | 79,000   | 37,000   |
| 3,300    |      | 49,000   | 18,000   | 8,300    |       | 79,000   | 37,000   |
| 3,400    |      | 52,000   | 20,000   | 8,400    |       | 79,000   | 37,000   |
| 3,500    |      | 52,000   | 20,000   | 8,500    |       | 79,000   | 37,000   |
| 3,600    |      | 52,000   | 20,000   | 8,600    |       | 84,000   | 40,000   |
| 3,700    |      | 52,000   | 20,000   | 8,700    |       | 84,000   | 40,000   |
| 3,800    |      | 55,000   | 22,000   | 8,800    |       | 84,000   | 40,000   |
| 3,900    |      | 55,000   | 22,000   | 8,900    |       | 84,000   | 40,000   |
| 4,000    |      | 55,000   | 22,000   | 9,000    |       | 84,000   | 40,000   |
| 4,100    |      | 55,000   | 22,000   | 9,100    |       | 84,000   | 40,000   |
| 4,200    |      | 55,000   | 22,000   | 9,200    |       | 84,000   | 40,000   |
| 4,300    |      | 58,000   | 24,000   | 9,300    |       | 84,000   | 40,000   |
| 4,400    |      | 58,000   | 24,000   | 9,500    |       | 84,000   | 40,000   |
| 4,500    |      | 58,000   | 24,000   | 9,600    |       | 89,000   | 43,000   |
| 4,600    |      | 58,000   | 24,000   | 9,700    |       | 89,000   | 43,000   |
| 4,700    |      | 58,000   | 24,000   | 9,800    |       | 89,000   | 43,000   |
| 4,800    |      | 62,000   | 26,000   | 9,900    |       | 89,000   | 43,000   |
| 4,900    |      | 62,000   | 26,000   | 10,000   |       | 89,000   | 43,000   |
| 5,000    |      | 62,000   | 26,000   | 10,200   |       | 89,000   | 43,000   |
| 5,100    |      | 62,000   | 26,000   | 10,500   |       | 89,000   | 43,000   |
| 5,200    |      | 62,000   | 26,000   | 10,800   |       | 95,000   | 47,000   |
| 5,300    |      | 62,000   | 26,000   | 11,000   |       | 95,000   | 47,000   |
| 5,400    |      | 66,000   | 28,000   | 11,500   |       | 95,000   | 47,000   |
| 5,500    |      | 66,000   | 28,000   | 11,800   |       | 95,000   | 47,000   |
| 5,600    |      | 66,000   | 28,000   | 12,000   |       | 102,000  | 51,000   |
| 5,700    |      | 66,000   | 28,000   | 12,300   | 31/64 | 102,000  | 51,000   |
| 5,800    |      | 66,000   | 28,000   | 12,500   |       | 102,000  | 51,000   |
| 5,900    |      | 66,000   | 28,000   | 13,000   |       | 102,000  | 51,000   |
| 6,000    |      | 66,000   | 28,000   | 13,500   |       | 107,000  | 54,000   |
| 6,100    |      | 70,000   | 31,000   | 14,000   |       | 107,000  | 54,000   |
| 6,200    |      | 70,000   | 31,000   | 14,500   |       | 111,000  | 56,000   |
| 6,300    |      | 70,000   | 31,000   | 15,000   |       | 111,000  | 56,000   |
| 6,400    |      | 70,000   | 31,000   | 15,500   |       | 115,000  | 58,000   |
| 6,500    |      | 70,000   | 31,000   | 16,000   |       | 115,000  | 58,000   |
| 6,700    |      | 70,000   | 31,000   |          |       |          |          |
| 6,800    |      | 74,000   | 34,000   |          |       |          |          |

## Punte cilindriche

### Punte elicoidali, extra corte



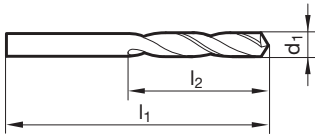
Catalogo n° 61131



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 178

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- specialmente per resistenza all'usura
- stabilità elevata



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    |
| 1,100    |      | 28,000   | 7,000    |
| 1,200    |      | 30,000   | 8,000    |
| 1,300    |      | 30,000   | 8,000    |
| 1,400    |      | 32,000   | 9,000    |
| 1,500    |      | 32,000   | 9,000    |
| 1,600    |      | 34,000   | 10,000   |
| 1,700    |      | 34,000   | 10,000   |
| 1,800    |      | 36,000   | 11,000   |
| 1,900    |      | 36,000   | 11,000   |
| 2,000    |      | 38,000   | 12,000   |
| 2,100    |      | 38,000   | 12,000   |
| 2,200    |      | 40,000   | 13,000   |
| 2,300    |      | 40,000   | 13,000   |
| 2,400    |      | 43,000   | 14,000   |
| 2,500    |      | 43,000   | 14,000   |
| 2,600    |      | 43,000   | 14,000   |
| 2,700    |      | 46,000   | 16,000   |
| 2,800    |      | 46,000   | 16,000   |
| 2,900    |      | 46,000   | 16,000   |
| 3,000    |      | 46,000   | 16,000   |
| 3,100    |      | 49,000   | 18,000   |
| 3,200    |      | 49,000   | 18,000   |
| 3,300    |      | 49,000   | 18,000   |
| 3,400    |      | 52,000   | 20,000   |
| 3,500    |      | 52,000   | 20,000   |
| 3,600    |      | 52,000   | 20,000   |
| 3,700    |      | 52,000   | 20,000   |
| 3,800    |      | 55,000   | 22,000   |
| 3,900    |      | 55,000   | 22,000   |
| 4,000    |      | 55,000   | 22,000   |
| 4,100    |      | 55,000   | 22,000   |
| 4,200    |      | 55,000   | 22,000   |
| 4,300    |      | 58,000   | 24,000   |
| 4,400    |      | 58,000   | 24,000   |
| 4,500    |      | 58,000   | 24,000   |
| 4,600    |      | 58,000   | 24,000   |
| 4,700    |      | 58,000   | 24,000   |
| 4,800    |      | 62,000   | 26,000   |
| 4,900    |      | 62,000   | 26,000   |
| 5,000    |      | 62,000   | 26,000   |
| 5,100    |      | 62,000   | 26,000   |
| 5,200    |      | 62,000   | 26,000   |
| 5,300    |      | 62,000   | 26,000   |
| 5,400    |      | 66,000   | 28,000   |
| 5,500    |      | 66,000   | 28,000   |
| 5,600    |      | 66,000   | 28,000   |
| 5,700    |      | 66,000   | 28,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 66,000   | 28,000   |
| 5,900    |      | 66,000   | 28,000   |
| 6,000    |      | 66,000   | 28,000   |
| 6,100    |      | 70,000   | 31,000   |
| 6,200    |      | 70,000   | 31,000   |
| 6,300    |      | 70,000   | 31,000   |
| 6,400    |      | 70,000   | 31,000   |
| 6,500    |      | 70,000   | 31,000   |
| 6,600    |      | 70,000   | 31,000   |
| 6,700    |      | 70,000   | 31,000   |
| 6,800    |      | 74,000   | 34,000   |
| 6,900    |      | 74,000   | 34,000   |
| 7,000    |      | 74,000   | 34,000   |
| 7,100    |      | 74,000   | 34,000   |
| 7,200    |      | 74,000   | 34,000   |
| 7,300    |      | 74,000   | 34,000   |
| 7,400    |      | 74,000   | 34,000   |
| 7,500    |      | 74,000   | 34,000   |
| 7,600    |      | 79,000   | 37,000   |
| 7,700    |      | 79,000   | 37,000   |
| 7,800    |      | 79,000   | 37,000   |
| 7,900    |      | 79,000   | 37,000   |
| 8,000    |      | 79,000   | 37,000   |
| 8,100    |      | 79,000   | 37,000   |
| 8,200    |      | 79,000   | 37,000   |
| 8,300    |      | 79,000   | 37,000   |
| 8,400    |      | 79,000   | 37,000   |
| 8,500    |      | 79,000   | 37,000   |
| 8,800    |      | 84,000   | 40,000   |
| 9,000    |      | 84,000   | 40,000   |
| 9,300    |      | 84,000   | 40,000   |
| 9,500    |      | 84,000   | 40,000   |
| 9,800    |      | 89,000   | 43,000   |
| 10,000   |      | 89,000   | 43,000   |
| 10,200   |      | 89,000   | 43,000   |
| 10,500   |      | 89,000   | 43,000   |
| 11,000   |      | 95,000   | 47,000   |
| 11,500   |      | 95,000   | 47,000   |
| 12,000   |      | 102,000  | 51,000   |
| 12,500   |      | 102,000  | 51,000   |
| 13,000   |      | 102,000  | 51,000   |
| 13,500   |      | 107,000  | 54,000   |
| 14,000   |      | 107,000  | 54,000   |

## Punte cilindriche

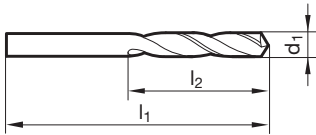
### Punte elicoidali, extra corte



Catalogo n° 71112

|    |      |          |        |                   |      |                                   |   |     |
|----|------|----------|--------|-------------------|------|-----------------------------------|---|-----|
| vx | ~3xD | DIN 1897 | HSS-Co | trattati a vapore | 118° | h8                                | R | Cyl |
| P  | M    | K        | N      | S                 | H    | Parametri di lav. ind. a pag. 176 |   |     |
| ●  | ●    | ●        | ○      | ○                 |      |                                   |   |     |

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida  $< 2,36$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,000    |      | 26,000   | 6,000    | 4,400    |       | 58,000   | 24,000   |
| 1,100    |      | 28,000   | 7,000    | 4,500    |       | 58,000   | 24,000   |
| 1,150    |      | 28,000   | 7,000    | 4,600    |       | 58,000   | 24,000   |
| 1,200    |      | 30,000   | 8,000    | 4,700    |       | 58,000   | 24,000   |
| 1,250    |      | 30,000   | 8,000    | 4,750    |       | 58,000   | 24,000   |
| 1,300    |      | 30,000   | 8,000    | 4,800    |       | 62,000   | 26,000   |
| 1,400    |      | 32,000   | 9,000    | 4,900    |       | 62,000   | 26,000   |
| 1,500    |      | 32,000   | 9,000    | 5,000    |       | 62,000   | 26,000   |
| 1,550    |      | 34,000   | 10,000   | 5,100    |       | 62,000   | 26,000   |
| 1,600    |      | 34,000   | 10,000   | 5,200    |       | 62,000   | 26,000   |
| 1,650    |      | 34,000   | 10,000   | 5,300    |       | 62,000   | 26,000   |
| 1,700    |      | 34,000   | 10,000   | 5,400    |       | 66,000   | 28,000   |
| 1,750    |      | 36,000   | 11,000   | 5,500    |       | 66,000   | 28,000   |
| 1,800    |      | 36,000   | 11,000   | 5,600    |       | 66,000   | 28,000   |
| 1,900    |      | 36,000   | 11,000   | 5,700    |       | 66,000   | 28,000   |
| 2,000    |      | 38,000   | 12,000   | 5,800    |       | 66,000   | 28,000   |
| 2,050    |      | 38,000   | 12,000   | 5,900    |       | 66,000   | 28,000   |
| 2,100    |      | 38,000   | 12,000   | 6,000    |       | 66,000   | 28,000   |
| 2,200    |      | 40,000   | 13,000   | 6,100    |       | 70,000   | 31,000   |
| 2,250    |      | 40,000   | 13,000   | 6,200    |       | 70,000   | 31,000   |
| 2,300    |      | 40,000   | 13,000   | 6,300    |       | 70,000   | 31,000   |
| 2,350    |      | 40,000   | 13,000   | 6,400    |       | 70,000   | 31,000   |
| 2,400    |      | 43,000   | 14,000   | 6,500    |       | 70,000   | 31,000   |
| 2,450    |      | 43,000   | 14,000   | 6,600    |       | 70,000   | 31,000   |
| 2,500    |      | 43,000   | 14,000   | 6,750    | 17/64 | 74,000   | 34,000   |
| 2,600    |      | 43,000   | 14,000   | 6,800    |       | 74,000   | 34,000   |
| 2,650    |      | 43,000   | 14,000   | 6,900    |       | 74,000   | 34,000   |
| 2,700    |      | 46,000   | 16,000   | 7,000    |       | 74,000   | 34,000   |
| 2,750    |      | 46,000   | 16,000   | 7,100    |       | 74,000   | 34,000   |
| 2,800    |      | 46,000   | 16,000   | 7,200    |       | 74,000   | 34,000   |
| 2,900    |      | 46,000   | 16,000   | 7,250    |       | 74,000   | 34,000   |
| 2,950    |      | 46,000   | 16,000   | 7,300    |       | 74,000   | 34,000   |
| 3,000    |      | 46,000   | 16,000   | 7,500    |       | 74,000   | 34,000   |
| 3,100    |      | 49,000   | 18,000   | 7,600    |       | 79,000   | 37,000   |
| 3,200    |      | 49,000   | 18,000   | 7,800    |       | 79,000   | 37,000   |
| 3,300    |      | 49,000   | 18,000   | 8,000    |       | 79,000   | 37,000   |
| 3,400    |      | 52,000   | 20,000   | 8,100    |       | 79,000   | 37,000   |
| 3,500    |      | 52,000   | 20,000   | 8,200    |       | 79,000   | 37,000   |
| 3,600    |      | 52,000   | 20,000   | 8,400    |       | 79,000   | 37,000   |
| 3,700    |      | 52,000   | 20,000   | 8,500    |       | 79,000   | 37,000   |
| 3,750    |      | 52,000   | 20,000   | 8,700    |       | 84,000   | 40,000   |
| 3,800    |      | 55,000   | 22,000   | 8,900    |       | 84,000   | 40,000   |
| 3,900    |      | 55,000   | 22,000   | 9,000    |       | 84,000   | 40,000   |
| 4,000    |      | 55,000   | 22,000   | 9,250    |       | 84,000   | 40,000   |
| 4,100    |      | 55,000   | 22,000   | 9,300    |       | 84,000   | 40,000   |
| 4,200    |      | 55,000   | 22,000   | 9,700    |       | 89,000   | 43,000   |
| 4,250    |      | 55,000   | 22,000   | 9,800    |       | 89,000   | 43,000   |
| 4,300    |      | 58,000   | 24,000   | 10,000   |       | 89,000   | 43,000   |



## Punte cilindriche

### Punte elicoidali, extra corte



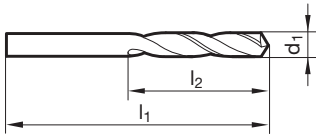
Catalogo n° 61112



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 178

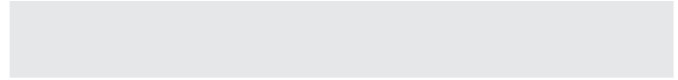
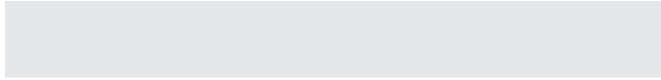
- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 26,000   | 6,000    | 5,800    |      | 66,000   | 28,000   |
| 1,100    |      | 28,000   | 7,000    | 5,900    |      | 66,000   | 28,000   |
| 1,200    |      | 30,000   | 8,000    | 6,000    |      | 66,000   | 28,000   |
| 1,300    |      | 30,000   | 8,000    | 6,100    |      | 70,000   | 31,000   |
| 1,400    |      | 32,000   | 9,000    | 6,200    |      | 70,000   | 31,000   |
| 1,500    |      | 32,000   | 9,000    | 6,300    |      | 70,000   | 31,000   |
| 1,600    |      | 34,000   | 10,000   | 6,400    |      | 70,000   | 31,000   |
| 1,700    |      | 34,000   | 10,000   | 6,500    |      | 70,000   | 31,000   |
| 1,800    |      | 36,000   | 11,000   | 6,600    |      | 70,000   | 31,000   |
| 1,900    |      | 36,000   | 11,000   | 6,700    |      | 70,000   | 31,000   |
| 2,000    |      | 38,000   | 12,000   | 6,800    |      | 74,000   | 34,000   |
| 2,100    |      | 38,000   | 12,000   | 6,900    |      | 74,000   | 34,000   |
| 2,200    |      | 40,000   | 13,000   | 7,000    |      | 74,000   | 34,000   |
| 2,300    |      | 40,000   | 13,000   | 7,100    |      | 74,000   | 34,000   |
| 2,400    |      | 43,000   | 14,000   | 7,200    |      | 74,000   | 34,000   |
| 2,500    |      | 43,000   | 14,000   | 7,300    |      | 74,000   | 34,000   |
| 2,600    |      | 43,000   | 14,000   | 7,400    |      | 74,000   | 34,000   |
| 2,700    |      | 46,000   | 16,000   | 7,500    |      | 74,000   | 34,000   |
| 2,800    |      | 46,000   | 16,000   | 7,600    |      | 79,000   | 37,000   |
| 2,900    |      | 46,000   | 16,000   | 7,700    |      | 79,000   | 37,000   |
| 3,000    |      | 46,000   | 16,000   | 7,800    |      | 79,000   | 37,000   |
| 3,100    |      | 49,000   | 18,000   | 7,900    |      | 79,000   | 37,000   |
| 3,200    |      | 49,000   | 18,000   | 8,000    |      | 79,000   | 37,000   |
| 3,300    |      | 49,000   | 18,000   | 8,100    |      | 79,000   | 37,000   |
| 3,400    |      | 52,000   | 20,000   | 8,200    |      | 79,000   | 37,000   |
| 3,500    |      | 52,000   | 20,000   | 8,300    |      | 79,000   | 37,000   |
| 3,600    |      | 52,000   | 20,000   | 8,400    |      | 79,000   | 37,000   |
| 3,700    |      | 52,000   | 20,000   | 8,500    |      | 79,000   | 37,000   |
| 3,800    |      | 55,000   | 22,000   | 8,600    |      | 84,000   | 40,000   |
| 3,900    |      | 55,000   | 22,000   | 8,700    |      | 84,000   | 40,000   |
| 4,000    |      | 55,000   | 22,000   | 8,800    |      | 84,000   | 40,000   |
| 4,100    |      | 55,000   | 22,000   | 9,000    |      | 84,000   | 40,000   |
| 4,200    |      | 55,000   | 22,000   | 9,100    |      | 84,000   | 40,000   |
| 4,300    |      | 58,000   | 24,000   | 9,200    |      | 84,000   | 40,000   |
| 4,400    |      | 58,000   | 24,000   | 9,300    |      | 84,000   | 40,000   |
| 4,500    |      | 58,000   | 24,000   | 9,400    |      | 84,000   | 40,000   |
| 4,600    |      | 58,000   | 24,000   | 9,500    |      | 84,000   | 40,000   |
| 4,700    |      | 58,000   | 24,000   | 9,600    |      | 89,000   | 43,000   |
| 4,800    |      | 62,000   | 26,000   | 9,700    |      | 89,000   | 43,000   |
| 4,900    |      | 62,000   | 26,000   | 9,800    |      | 89,000   | 43,000   |
| 5,000    |      | 62,000   | 26,000   | 9,900    |      | 89,000   | 43,000   |
| 5,100    |      | 62,000   | 26,000   | 10,000   |      | 89,000   | 43,000   |
| 5,200    |      | 62,000   | 26,000   | 10,100   |      | 89,000   | 43,000   |
| 5,300    |      | 62,000   | 26,000   | 10,200   |      | 89,000   | 43,000   |
| 5,400    |      | 66,000   | 28,000   | 10,500   |      | 89,000   | 43,000   |
| 5,500    |      | 66,000   | 28,000   | 11,000   |      | 95,000   | 47,000   |
| 5,600    |      | 66,000   | 28,000   | 11,500   |      | 95,000   | 47,000   |
| 5,700    |      | 66,000   | 28,000   | 12,000   |      | 102,000  | 51,000   |

| d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|
| 12,300   | 31/64 | 102,000  | 51,000   |
| 12,500   |       | 102,000  | 51,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
|          |      |          |          |



## Punte cilindriche

### Punte elicoidali, extra corte



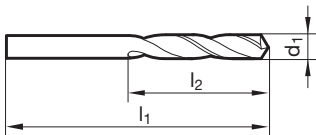
Catalogo n° 71114



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- senza assottigliamento dell'apice della punta
- spoglia sul cono tagliente
- ideali per torni



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 28,000   | 8,000    |
| 1,050    |      | 28,000   | 8,000    |
| 1,100    |      | 30,000   | 9,000    |
| 1,150    |      | 30,000   | 9,000    |
| 1,250    |      | 32,000   | 10,000   |
| 1,300    |      | 32,000   | 10,000   |
| 1,450    |      | 35,000   | 12,000   |
| 1,650    |      | 37,000   | 13,000   |
| 1,700    |      | 37,000   | 13,000   |
| 1,750    |      | 39,000   | 14,000   |
| 1,800    |      | 39,000   | 14,000   |
| 1,850    |      | 39,000   | 14,000   |
| 1,900    |      | 39,000   | 14,000   |
| 1,950    |      | 42,000   | 16,000   |
| 2,000    |      | 42,000   | 16,000   |
| 2,050    |      | 42,000   | 16,000   |
| 2,150    |      | 44,000   | 17,000   |
| 2,200    |      | 44,000   | 17,000   |
| 2,300    |      | 44,000   | 17,000   |
| 2,350    |      | 44,000   | 17,000   |
| 2,400    |      | 47,000   | 18,000   |
| 2,450    |      | 47,000   | 18,000   |
| 2,500    |      | 47,000   | 18,000   |
| 2,550    |      | 47,000   | 18,000   |
| 2,600    |      | 47,000   | 18,000   |
| 2,700    |      | 51,000   | 21,000   |
| 2,750    |      | 51,000   | 21,000   |
| 2,800    |      | 51,000   | 21,000   |
| 2,900    |      | 51,000   | 21,000   |
| 2,950    |      | 51,000   | 21,000   |
| 3,100    |      | 54,000   | 23,000   |
| 3,150    |      | 54,000   | 23,000   |
| 3,200    |      | 54,000   | 23,000   |
| 3,250    |      | 54,000   | 23,000   |
| 3,300    |      | 54,000   | 23,000   |
| 3,350    |      | 54,000   | 23,000   |
| 3,400    |      | 58,000   | 26,000   |
| 3,550    |      | 58,000   | 26,000   |
| 3,600    |      | 58,000   | 26,000   |
| 3,650    |      | 58,000   | 26,000   |
| 3,700    |      | 58,000   | 26,000   |
| 3,750    |      | 58,000   | 26,000   |
| 3,800    |      | 62,000   | 29,000   |
| 3,850    |      | 62,000   | 29,000   |
| 3,900    |      | 62,000   | 29,000   |
| 3,950    |      | 62,000   | 29,000   |
| 4,000    |      | 62,000   | 29,000   |
| 4,050    |      | 62,000   | 29,000   |

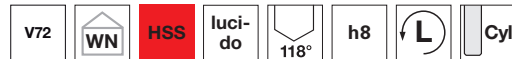
| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 4,100    |      | 62,000   | 29,000   |
| 4,150    |      | 62,000   | 29,000   |
| 4,350    |      | 65,000   | 31,000   |
| 4,400    |      | 65,000   | 31,000   |
| 4,450    |      | 65,000   | 31,000   |
| 4,500    |      | 65,000   | 31,000   |
| 4,600    |      | 65,000   | 31,000   |
| 4,650    |      | 65,000   | 31,000   |
| 4,700    |      | 65,000   | 31,000   |
| 4,800    |      | 70,000   | 34,000   |
| 4,850    |      | 70,000   | 34,000   |
| 4,900    |      | 70,000   | 34,000   |
| 4,950    |      | 70,000   | 34,000   |
| 5,400    |      | 74,000   | 36,000   |
| 5,500    |      | 74,000   | 36,000   |
| 5,600    |      | 74,000   | 36,000   |
| 5,700    |      | 74,000   | 36,000   |
| 5,800    |      | 74,000   | 36,000   |
| 5,900    |      | 74,000   | 36,000   |
| 6,000    |      | 74,000   | 36,000   |
| 6,200    |      | 79,000   | 40,000   |
| 6,300    |      | 79,000   | 40,000   |
| 6,600    |      | 79,000   | 40,000   |
| 6,700    |      | 79,000   | 40,000   |
| 6,900    |      | 84,000   | 44,000   |
| 7,000    |      | 84,000   | 44,000   |
| 7,100    |      | 84,000   | 44,000   |
| 8,000    |      | 90,000   | 48,000   |
| 8,500    |      | 90,000   | 48,000   |
| 9,000    |      | 96,000   | 52,000   |
| 9,100    |      | 96,000   | 52,000   |
| 9,500    |      | 96,000   | 52,000   |
| 10,000   |      | 102,000  | 56,000   |
| 11,500   |      | 109,000  | 61,000   |
| 13,000   |      | 117,000  | 66,000   |
| 14,000   |      | 122,000  | 70,000   |
| 14,500   |      | 128,000  | 73,000   |
| 15,000   |      | 128,000  | 73,000   |
| 15,500   |      | 132,000  | 75,000   |
| 16,000   |      | 132,000  | 75,000   |

## Punte cilindriche

### Punte elicoidali, extra corte



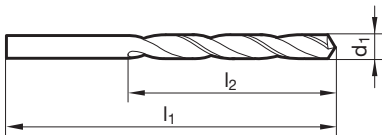
Catalogo n° 71113



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 176

- senza assottigliamento dell'apice della punta
- spoglia sul cono tagliente
- ideali per torni



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,000    |      | 28,000   | 8,000    | 5,300    |       | 70,000   | 34,000   |
| 1,100    |      | 30,000   | 9,000    | 5,500    |       | 74,000   | 36,000   |
| 1,250    |      | 32,000   | 10,000   | 5,600    |       | 74,000   | 36,000   |
| 1,300    |      | 32,000   | 10,000   | 5,700    |       | 74,000   | 36,000   |
| 1,350    |      | 35,000   | 12,000   | 5,800    |       | 74,000   | 36,000   |
| 1,400    |      | 35,000   | 12,000   | 5,900    |       | 74,000   | 36,000   |
| 1,600    |      | 37,000   | 13,000   | 6,200    |       | 79,000   | 40,000   |
| 1,650    |      | 37,000   | 13,000   | 6,300    |       | 79,000   | 40,000   |
| 1,700    |      | 37,000   | 13,000   | 6,500    |       | 79,000   | 40,000   |
| 1,750    |      | 39,000   | 14,000   | 6,700    |       | 79,000   | 40,000   |
| 1,800    |      | 39,000   | 14,000   | 6,900    |       | 84,000   | 44,000   |
| 1,900    |      | 39,000   | 14,000   | 7,100    |       | 84,000   | 44,000   |
| 1,950    |      | 42,000   | 16,000   | 7,200    |       | 84,000   | 44,000   |
| 2,000    |      | 42,000   | 16,000   | 7,300    |       | 84,000   | 44,000   |
| 2,050    |      | 42,000   | 16,000   | 7,400    |       | 84,000   | 44,000   |
| 2,100    |      | 42,000   | 16,000   | 7,500    |       | 84,000   | 44,000   |
| 2,150    |      | 44,000   | 17,000   | 7,600    |       | 90,000   | 48,000   |
| 2,200    |      | 44,000   | 17,000   | 7,700    |       | 90,000   | 48,000   |
| 2,300    |      | 44,000   | 17,000   | 7,800    |       | 90,000   | 48,000   |
| 2,350    |      | 44,000   | 17,000   | 7,900    |       | 90,000   | 48,000   |
| 2,400    |      | 47,000   | 18,000   | 8,000    |       | 90,000   | 48,000   |
| 2,550    |      | 47,000   | 18,000   | 8,300    |       | 90,000   | 48,000   |
| 2,600    |      | 47,000   | 18,000   | 8,500    |       | 90,000   | 48,000   |
| 2,650    |      | 47,000   | 18,000   | 8,600    |       | 96,000   | 52,000   |
| 2,700    |      | 51,000   | 21,000   | 8,700    |       | 96,000   | 52,000   |
| 2,800    |      | 51,000   | 21,000   | 8,800    |       | 96,000   | 52,000   |
| 2,850    |      | 51,000   | 21,000   | 8,900    |       | 96,000   | 52,000   |
| 2,900    |      | 51,000   | 21,000   | 9,100    |       | 96,000   | 52,000   |
| 3,100    |      | 54,000   | 23,000   | 9,200    |       | 96,000   | 52,000   |
| 3,200    |      | 54,000   | 23,000   | 9,300    |       | 96,000   | 52,000   |
| 3,300    |      | 54,000   | 23,000   | 9,500    |       | 96,000   | 52,000   |
| 3,400    |      | 58,000   | 26,000   | 9,600    |       | 102,000  | 56,000   |
| 3,500    |      | 58,000   | 26,000   | 9,700    |       | 102,000  | 56,000   |
| 3,550    |      | 58,000   | 26,000   | 9,800    |       | 102,000  | 56,000   |
| 3,600    |      | 58,000   | 26,000   | 9,900    |       | 102,000  | 56,000   |
| 3,700    |      | 58,000   | 26,000   | 10,400   |       | 102,000  | 56,000   |
| 3,900    |      | 62,000   | 29,000   | 10,500   |       | 102,000  | 56,000   |
| 3,950    |      | 62,000   | 29,000   | 10,800   |       | 109,000  | 61,000   |
| 4,100    |      | 62,000   | 29,000   | 10,900   |       | 109,000  | 61,000   |
| 4,200    |      | 62,000   | 29,000   | 11,200   |       | 109,000  | 61,000   |
| 4,250    |      | 62,000   | 29,000   | 11,300   |       | 109,000  | 61,000   |
| 4,300    |      | 65,000   | 31,000   | 11,400   |       | 109,000  | 61,000   |
| 4,400    |      | 65,000   | 31,000   | 11,500   |       | 109,000  | 61,000   |
| 4,600    |      | 65,000   | 31,000   | 11,800   |       | 109,000  | 61,000   |
| 4,700    |      | 65,000   | 31,000   | 12,200   |       | 117,000  | 66,000   |
| 4,900    |      | 70,000   | 34,000   | 12,250   |       | 117,000  | 66,000   |
| 4,950    |      | 70,000   | 34,000   | 12,300   | 31/64 | 117,000  | 66,000   |
| 5,200    |      | 70,000   | 34,000   | 12,600   |       | 117,000  | 66,000   |

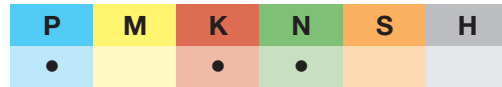
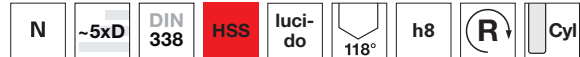
| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> | <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|------------------------|-------------|------------------------|------------------------|
| <b>13,500</b>          |             | 122,000                | 70,000                 |                        |             |                        |                        |
| <b>14,500</b>          |             | 128,000                | 73,000                 |                        |             |                        |                        |
| <b>14,750</b>          |             | 128,000                | 73,000                 |                        |             |                        |                        |
| <b>15,000</b>          |             | 128,000                | 73,000                 |                        |             |                        |                        |
| <b>15,500</b>          |             | 132,000                | 75,000                 |                        |             |                        |                        |
| <b>16,000</b>          |             | 132,000                | 75,000                 |                        |             |                        |                        |

## Punte cilindriche

### Punte elicoidali, corte

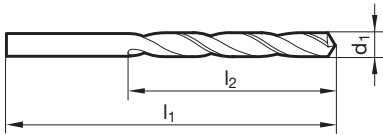


Catalogo n° 71116



Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 0,200    |      | 19,000   | 2,500    | 1,320    |      | 38,000   | 16,000   |
| 0,250    |      | 19,000   | 3,000    | 1,340    |      | 40,000   | 18,000   |
| 0,290    |      | 19,000   | 3,000    | 1,360    |      | 40,000   | 18,000   |
| 0,300    |      | 19,000   | 3,000    | 1,380    |      | 40,000   | 18,000   |
| 0,330    |      | 19,000   | 4,000    | 1,400    |      | 40,000   | 18,000   |
| 0,340    |      | 19,000   | 4,000    | 1,430    |      | 40,000   | 18,000   |
| 0,350    |      | 19,000   | 4,000    | 1,450    |      | 40,000   | 18,000   |
| 0,390    |      | 20,000   | 5,000    | 1,500    |      | 40,000   | 18,000   |
| 0,400    |      | 20,000   | 5,000    | 1,560    |      | 43,000   | 20,000   |
| 0,450    |      | 20,000   | 5,000    | 1,570    |      | 43,000   | 20,000   |
| 0,500    |      | 22,000   | 6,000    | 1,600    |      | 43,000   | 20,000   |
| 0,540    |      | 24,000   | 7,000    | 1,610    |      | 43,000   | 20,000   |
| 0,550    |      | 24,000   | 7,000    | 1,620    |      | 43,000   | 20,000   |
| 0,580    |      | 24,000   | 7,000    | 1,650    |      | 43,000   | 20,000   |
| 0,600    |      | 24,000   | 7,000    | 1,660    |      | 43,000   | 20,000   |
| 0,630    |      | 26,000   | 8,000    | 1,670    |      | 43,000   | 20,000   |
| 0,660    |      | 26,000   | 8,000    | 1,680    |      | 43,000   | 20,000   |
| 0,680    |      | 28,000   | 9,000    | 1,700    |      | 43,000   | 20,000   |
| 0,700    |      | 28,000   | 9,000    | 1,710    |      | 46,000   | 22,000   |
| 0,740    |      | 28,000   | 9,000    | 1,730    |      | 46,000   | 22,000   |
| 0,760    |      | 30,000   | 10,000   | 1,750    |      | 46,000   | 22,000   |
| 0,770    |      | 30,000   | 10,000   | 1,800    |      | 46,000   | 22,000   |
| 0,780    |      | 30,000   | 10,000   | 1,810    |      | 46,000   | 22,000   |
| 0,800    |      | 30,000   | 10,000   | 1,850    |      | 46,000   | 22,000   |
| 0,850    |      | 30,000   | 10,000   | 1,870    |      | 46,000   | 22,000   |
| 0,860    |      | 32,000   | 11,000   | 1,900    |      | 46,000   | 22,000   |
| 0,870    |      | 32,000   | 11,000   | 1,950    |      | 49,000   | 24,000   |
| 0,880    |      | 32,000   | 11,000   | 1,990    |      | 49,000   | 24,000   |
| 0,900    |      | 32,000   | 11,000   | 2,000    |      | 49,000   | 24,000   |
| 0,940    |      | 32,000   | 11,000   | 2,050    |      | 49,000   | 24,000   |
| 0,950    |      | 32,000   | 11,000   | 2,100    |      | 49,000   | 24,000   |
| 0,960    |      | 34,000   | 12,000   | 2,200    |      | 53,000   | 27,000   |
| 1,000    |      | 34,000   | 12,000   | 2,300    |      | 53,000   | 27,000   |
| 1,050    |      | 34,000   | 12,000   | 2,400    |      | 57,000   | 30,000   |
| 1,060    |      | 34,000   | 12,000   | 2,500    |      | 57,000   | 30,000   |
| 1,080    |      | 36,000   | 14,000   | 2,600    |      | 57,000   | 30,000   |
| 1,100    |      | 36,000   | 14,000   | 2,700    |      | 61,000   | 33,000   |
| 1,110    |      | 36,000   | 14,000   | 2,800    |      | 61,000   | 33,000   |
| 1,120    |      | 36,000   | 14,000   | 2,900    |      | 61,000   | 33,000   |
| 1,130    |      | 36,000   | 14,000   | 3,000    |      | 61,000   | 33,000   |
| 1,150    |      | 36,000   | 14,000   | 3,100    |      | 65,000   | 36,000   |
| 1,160    |      | 36,000   | 14,000   | 3,200    |      | 65,000   | 36,000   |
| 1,170    |      | 36,000   | 14,000   | 3,300    |      | 65,000   | 36,000   |
| 1,190    | 3/64 | 38,000   | 16,000   | 3,400    |      | 70,000   | 39,000   |
| 1,200    |      | 38,000   | 16,000   | 3,500    |      | 70,000   | 39,000   |
| 1,230    |      | 38,000   | 16,000   | 3,600    |      | 70,000   | 39,000   |
| 1,250    |      | 38,000   | 16,000   | 3,700    |      | 70,000   | 39,000   |
| 1,300    |      | 38,000   | 16,000   | 3,800    |      | 75,000   | 43,000   |

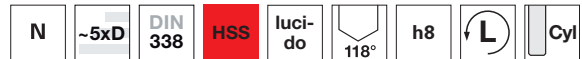
| d1    |      | l1      | l2     | d1     |      | l1      | l2      |
|-------|------|---------|--------|--------|------|---------|---------|
| mm    | inch | mm      | mm     | mm     | inch | mm      | mm      |
| 3,900 |      | 75,000  | 43,000 | 8,000  |      | 117,000 | 75,000  |
| 4,000 |      | 75,000  | 43,000 | 8,100  |      | 117,000 | 75,000  |
| 4,100 |      | 75,000  | 43,000 | 8,200  |      | 117,000 | 75,000  |
| 4,200 |      | 75,000  | 43,000 | 8,300  |      | 117,000 | 75,000  |
| 4,300 |      | 80,000  | 47,000 | 8,400  |      | 117,000 | 75,000  |
| 4,400 |      | 80,000  | 47,000 | 8,500  |      | 117,000 | 75,000  |
| 4,500 |      | 80,000  | 47,000 | 8,600  |      | 125,000 | 81,000  |
| 4,600 |      | 80,000  | 47,000 | 8,800  |      | 125,000 | 81,000  |
| 4,700 |      | 80,000  | 47,000 | 9,000  |      | 125,000 | 81,000  |
| 4,800 |      | 86,000  | 52,000 | 9,100  |      | 125,000 | 81,000  |
| 4,900 |      | 86,000  | 52,000 | 9,200  |      | 125,000 | 81,000  |
| 5,000 |      | 86,000  | 52,000 | 9,300  |      | 125,000 | 81,000  |
| 5,100 |      | 86,000  | 52,000 | 9,400  |      | 125,000 | 81,000  |
| 5,200 |      | 86,000  | 52,000 | 9,500  |      | 125,000 | 81,000  |
| 5,300 |      | 86,000  | 52,000 | 9,600  |      | 133,000 | 87,000  |
| 5,400 |      | 93,000  | 57,000 | 9,700  |      | 133,000 | 87,000  |
| 5,500 |      | 93,000  | 57,000 | 9,900  |      | 133,000 | 87,000  |
| 5,600 |      | 93,000  | 57,000 | 10,000 |      | 133,000 | 87,000  |
| 5,700 |      | 93,000  | 57,000 | 10,200 |      | 133,000 | 87,000  |
| 5,800 |      | 93,000  | 57,000 | 10,300 |      | 133,000 | 87,000  |
| 5,900 |      | 93,000  | 57,000 | 10,500 |      | 133,000 | 87,000  |
| 6,000 |      | 93,000  | 57,000 | 10,700 |      | 142,000 | 94,000  |
| 6,100 |      | 101,000 | 63,000 | 10,900 |      | 142,000 | 94,000  |
| 6,200 |      | 101,000 | 63,000 | 11,000 |      | 142,000 | 94,000  |
| 6,250 |      | 101,000 | 63,000 | 11,500 |      | 142,000 | 94,000  |
| 6,300 |      | 101,000 | 63,000 | 11,900 |      | 151,000 | 101,000 |
| 6,500 |      | 101,000 | 63,000 | 12,000 |      | 151,000 | 101,000 |
| 6,600 |      | 101,000 | 63,000 | 12,200 |      | 151,000 | 101,000 |
| 6,700 |      | 101,000 | 63,000 | 12,500 |      | 151,000 | 101,000 |
| 6,800 |      | 109,000 | 69,000 | 13,000 |      | 151,000 | 101,000 |
| 6,900 |      | 109,000 | 69,000 | 14,000 |      | 160,000 | 108,000 |
| 7,000 |      | 109,000 | 69,000 | 14,500 |      | 169,000 | 114,000 |
| 7,100 |      | 109,000 | 69,000 | 15,000 |      | 169,000 | 114,000 |
| 7,500 |      | 109,000 | 69,000 | 15,500 |      | 178,000 | 120,000 |
| 7,700 |      | 117,000 | 75,000 | 16,000 |      | 178,000 | 120,000 |
| 7,800 |      | 117,000 | 75,000 |        |      |         |         |

## Punte cilindriche

### Punte elicoidali, corte



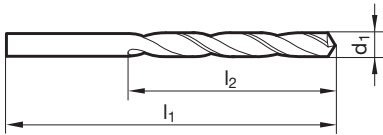
Catalogo n° 71119



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 14,010$
- spoglia sul cono tagliente



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 2,800    |      | 61,000   | 33,000   |
| 2,900    |      | 61,000   | 33,000   |
| 3,600    |      | 70,000   | 39,000   |
| 4,300    |      | 80,000   | 47,000   |
| 4,600    |      | 80,000   | 47,000   |
| 5,200    |      | 86,000   | 52,000   |
| 5,400    |      | 93,000   | 57,000   |
| 5,600    |      | 93,000   | 57,000   |
| 6,000    |      | 93,000   | 57,000   |
| 7,000    |      | 109,000  | 69,000   |
| 7,250    |      | 109,000  | 69,000   |
| 7,300    |      | 109,000  | 69,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 7,800    |      | 117,000  | 75,000   |
| 8,000    |      | 117,000  | 75,000   |
| 8,800    |      | 125,000  | 81,000   |
| 9,000    |      | 125,000  | 81,000   |
| 9,500    |      | 125,000  | 81,000   |
| 13,500   |      | 160,000  | 108,000  |



## Punte cilindriche

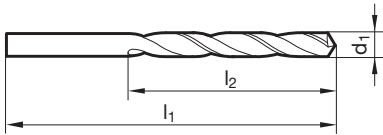
## Punte elicoidali, corte



Catalogo n° 71115

|   |      |         |     |                   |      |                                   |   |     |
|---|------|---------|-----|-------------------|------|-----------------------------------|---|-----|
| N | ~5xD | DIN 338 | HSS | trattati a vapore | 118° | h8                                | R | Cyl |
| P | M    | K       | N   | S                 | H    | Parametri di lav. ind. a pag. 180 |   |     |
| • |      | •       | •   |                   |      |                                   |   |     |

- Assott. del noc.  $\geq \varnothing 2,180$
- spoglia sul cono tagliente
- lucida  $< 2,36$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 2,000    |      | 49,000   | 24,000   | 3,550    |       | 70,000   | 39,000   |
| 2,050    |      | 49,000   | 24,000   | 3,570    | 9/64  | 70,000   | 39,000   |
| 2,060    |      | 49,000   | 24,000   | 3,600    |       | 70,000   | 39,000   |
| 2,080    |      | 49,000   | 24,000   | 3,650    |       | 70,000   | 39,000   |
| 2,100    |      | 49,000   | 24,000   | 3,660    |       | 70,000   | 39,000   |
| 2,150    |      | 53,000   | 27,000   | 3,700    |       | 70,000   | 39,000   |
| 2,180    |      | 53,000   | 27,000   | 3,730    |       | 70,000   | 39,000   |
| 2,200    |      | 53,000   | 27,000   | 3,750    |       | 70,000   | 39,000   |
| 2,250    |      | 53,000   | 27,000   | 3,800    |       | 75,000   | 43,000   |
| 2,260    |      | 53,000   | 27,000   | 3,850    |       | 75,000   | 43,000   |
| 2,300    |      | 53,000   | 27,000   | 3,860    |       | 75,000   | 43,000   |
| 2,350    |      | 53,000   | 27,000   | 3,900    |       | 75,000   | 43,000   |
| 2,370    |      | 57,000   | 30,000   | 3,910    |       | 75,000   | 43,000   |
| 2,380    | 3/32 | 57,000   | 30,000   | 3,950    |       | 75,000   | 43,000   |
| 2,400    |      | 57,000   | 30,000   | 3,970    | 5/32  | 75,000   | 43,000   |
| 2,440    |      | 57,000   | 30,000   | 3,990    |       | 75,000   | 43,000   |
| 2,450    |      | 57,000   | 30,000   | 4,000    |       | 75,000   | 43,000   |
| 2,490    |      | 57,000   | 30,000   | 4,040    |       | 75,000   | 43,000   |
| 2,500    |      | 57,000   | 30,000   | 4,050    |       | 75,000   | 43,000   |
| 2,530    |      | 57,000   | 30,000   | 4,090    |       | 75,000   | 43,000   |
| 2,550    |      | 57,000   | 30,000   | 4,100    |       | 75,000   | 43,000   |
| 2,580    |      | 57,000   | 30,000   | 4,150    |       | 75,000   | 43,000   |
| 2,600    |      | 57,000   | 30,000   | 4,200    |       | 75,000   | 43,000   |
| 2,640    |      | 57,000   | 30,000   | 4,220    |       | 75,000   | 43,000   |
| 2,650    |      | 57,000   | 30,000   | 4,250    |       | 75,000   | 43,000   |
| 2,700    |      | 61,000   | 33,000   | 4,300    |       | 80,000   | 47,000   |
| 2,710    |      | 61,000   | 33,000   | 4,350    |       | 80,000   | 47,000   |
| 2,750    |      | 61,000   | 33,000   | 4,370    | 11/64 | 80,000   | 47,000   |
| 2,780    | 7/64 | 61,000   | 33,000   | 4,390    |       | 80,000   | 47,000   |
| 2,790    |      | 61,000   | 33,000   | 4,400    |       | 80,000   | 47,000   |
| 2,800    |      | 61,000   | 33,000   | 4,500    |       | 80,000   | 47,000   |
| 2,820    |      | 61,000   | 33,000   | 4,550    |       | 80,000   | 47,000   |
| 2,850    |      | 61,000   | 33,000   | 4,570    |       | 80,000   | 47,000   |
| 2,900    |      | 61,000   | 33,000   | 4,600    |       | 80,000   | 47,000   |
| 2,950    |      | 61,000   | 33,000   | 4,650    |       | 80,000   | 47,000   |
| 3,000    |      | 61,000   | 33,000   | 4,700    |       | 80,000   | 47,000   |
| 3,050    |      | 65,000   | 36,000   | 4,750    |       | 80,000   | 47,000   |
| 3,100    |      | 65,000   | 36,000   | 4,760    | 3/16  | 86,000   | 52,000   |
| 3,150    |      | 65,000   | 36,000   | 4,800    |       | 86,000   | 52,000   |
| 3,170    | 1/8  | 65,000   | 36,000   | 4,850    |       | 86,000   | 52,000   |
| 3,200    |      | 65,000   | 36,000   | 4,900    |       | 86,000   | 52,000   |
| 3,250    |      | 65,000   | 36,000   | 4,950    |       | 86,000   | 52,000   |
| 3,260    |      | 65,000   | 36,000   | 5,000    |       | 86,000   | 52,000   |
| 3,300    |      | 65,000   | 36,000   | 5,050    |       | 86,000   | 52,000   |
| 3,350    |      | 65,000   | 36,000   | 5,100    |       | 86,000   | 52,000   |
| 3,400    |      | 70,000   | 39,000   | 5,110    |       | 86,000   | 52,000   |
| 3,450    |      | 70,000   | 39,000   | 5,160    | 13/64 | 86,000   | 52,000   |
| 3,500    |      | 70,000   | 39,000   | 5,180    |       | 86,000   | 52,000   |

| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 5,200    |       | 86,000   | 52,000   | 9,130    | 23/64 | 125,000  | 81,000   |
| 5,250    |       | 86,000   | 52,000   | 9,150    |       | 125,000  | 81,000   |
| 5,300    |       | 86,000   | 52,000   | 9,200    |       | 125,000  | 81,000   |
| 5,350    |       | 93,000   | 57,000   | 9,250    |       | 125,000  | 81,000   |
| 5,400    |       | 93,000   | 57,000   | 9,300    |       | 125,000  | 81,000   |
| 5,410    |       | 93,000   | 57,000   | 9,350    |       | 125,000  | 81,000   |
| 5,500    |       | 93,000   | 57,000   | 9,400    |       | 125,000  | 81,000   |
| 5,550    |       | 93,000   | 57,000   | 9,500    |       | 125,000  | 81,000   |
| 5,560    | 7/32  | 93,000   | 57,000   | 9,520    | 3/8   | 133,000  | 87,000   |
| 5,600    |       | 93,000   | 57,000   | 9,600    |       | 133,000  | 87,000   |
| 5,610    |       | 93,000   | 57,000   | 9,650    |       | 133,000  | 87,000   |
| 5,650    |       | 93,000   | 57,000   | 9,700    |       | 133,000  | 87,000   |
| 5,700    |       | 93,000   | 57,000   | 9,750    |       | 133,000  | 87,000   |
| 5,750    |       | 93,000   | 57,000   | 9,800    |       | 133,000  | 87,000   |
| 5,800    |       | 93,000   | 57,000   | 9,900    |       | 133,000  | 87,000   |
| 5,850    |       | 93,000   | 57,000   | 10,000   |       | 133,000  | 87,000   |
| 5,900    |       | 93,000   | 57,000   | 10,100   |       | 133,000  | 87,000   |
| 6,000    |       | 93,000   | 57,000   | 10,200   |       | 133,000  | 87,000   |
| 6,050    |       | 101,000  | 63,000   | 10,250   |       | 133,000  | 87,000   |
| 6,100    |       | 101,000  | 63,000   | 10,300   |       | 133,000  | 87,000   |
| 6,200    |       | 101,000  | 63,000   | 10,320   | 13/32 | 133,000  | 87,000   |
| 6,250    |       | 101,000  | 63,000   | 10,400   |       | 133,000  | 87,000   |
| 6,300    |       | 101,000  | 63,000   | 10,500   |       | 133,000  | 87,000   |
| 6,350    | 1/4   | 101,000  | 63,000   | 10,600   |       | 133,000  | 87,000   |
| 6,400    |       | 101,000  | 63,000   | 10,700   |       | 142,000  | 94,000   |
| 6,450    |       | 101,000  | 63,000   | 10,750   |       | 142,000  | 94,000   |
| 6,500    |       | 101,000  | 63,000   | 10,800   |       | 142,000  | 94,000   |
| 6,600    |       | 101,000  | 63,000   | 10,900   |       | 142,000  | 94,000   |
| 6,650    |       | 101,000  | 63,000   | 11,000   |       | 142,000  | 94,000   |
| 6,700    |       | 101,000  | 63,000   | 11,100   |       | 142,000  | 94,000   |
| 6,750    | 17/64 | 109,000  | 69,000   | 11,200   |       | 142,000  | 94,000   |
| 6,800    |       | 109,000  | 69,000   | 11,250   |       | 142,000  | 94,000   |
| 6,850    |       | 109,000  | 69,000   | 11,300   |       | 142,000  | 94,000   |
| 6,900    |       | 109,000  | 69,000   | 11,400   |       | 142,000  | 94,000   |
| 7,000    |       | 109,000  | 69,000   | 11,500   |       | 142,000  | 94,000   |
| 7,050    |       | 109,000  | 69,000   | 11,600   |       | 142,000  | 94,000   |
| 7,100    |       | 109,000  | 69,000   | 11,700   |       | 142,000  | 94,000   |
| 7,140    | 9/32  | 109,000  | 69,000   | 11,750   |       | 142,000  | 94,000   |
| 7,200    |       | 109,000  | 69,000   | 11,800   |       | 142,000  | 94,000   |
| 7,250    |       | 109,000  | 69,000   | 11,900   |       | 151,000  | 101,000  |
| 7,300    |       | 109,000  | 69,000   | 11,910   | 15/32 | 151,000  | 101,000  |
| 7,400    |       | 109,000  | 69,000   | 12,000   |       | 151,000  | 101,000  |
| 7,500    |       | 109,000  | 69,000   | 12,100   |       | 151,000  | 101,000  |
| 7,540    | 19/64 | 117,000  | 75,000   | 12,200   |       | 151,000  | 101,000  |
| 7,600    |       | 117,000  | 75,000   | 12,250   |       | 151,000  | 101,000  |
| 7,650    |       | 117,000  | 75,000   | 12,300   | 31/64 | 151,000  | 101,000  |
| 7,700    |       | 117,000  | 75,000   | 12,400   |       | 151,000  | 101,000  |
| 7,750    |       | 117,000  | 75,000   | 12,500   |       | 151,000  | 101,000  |
| 7,800    |       | 117,000  | 75,000   | 12,600   |       | 151,000  | 101,000  |
| 7,850    |       | 117,000  | 75,000   | 12,700   | 1/2   | 151,000  | 101,000  |
| 7,900    |       | 117,000  | 75,000   | 12,750   |       | 151,000  | 101,000  |
| 7,940    | 5/16  | 117,000  | 75,000   | 12,800   |       | 151,000  | 101,000  |
| 8,000    |       | 117,000  | 75,000   | 12,900   |       | 151,000  | 101,000  |
| 8,050    |       | 117,000  | 75,000   | 13,000   |       | 151,000  | 101,000  |
| 8,100    |       | 117,000  | 75,000   | 13,100   | 33/64 | 151,000  | 101,000  |
| 8,150    |       | 117,000  | 75,000   | 13,200   |       | 151,000  | 101,000  |
| 8,200    |       | 117,000  | 75,000   | 13,250   |       | 160,000  | 108,000  |
| 8,250    |       | 117,000  | 75,000   | 13,300   |       | 160,000  | 108,000  |
| 8,300    |       | 117,000  | 75,000   | 13,400   |       | 160,000  | 108,000  |
| 8,400    |       | 117,000  | 75,000   | 13,500   |       | 160,000  | 108,000  |
| 8,500    |       | 117,000  | 75,000   | 13,600   |       | 160,000  | 108,000  |
| 8,550    |       | 125,000  | 81,000   | 13,700   |       | 160,000  | 108,000  |
| 8,600    |       | 125,000  | 81,000   | 13,750   |       | 160,000  | 108,000  |
| 8,650    |       | 125,000  | 81,000   | 13,800   |       | 160,000  | 108,000  |
| 8,700    |       | 125,000  | 81,000   | 13,900   |       | 160,000  | 108,000  |
| 8,730    | 11/32 | 125,000  | 81,000   | 14,000   |       | 160,000  | 108,000  |
| 8,750    |       | 125,000  | 81,000   | 14,100   |       | 169,000  | 114,000  |
| 8,800    |       | 125,000  | 81,000   | 14,200   |       | 169,000  | 114,000  |
| 8,900    |       | 125,000  | 81,000   | 14,250   |       | 169,000  | 114,000  |
| 9,000    |       | 125,000  | 81,000   | 14,300   |       | 169,000  | 114,000  |
| 9,050    |       | 125,000  | 81,000   | 14,400   |       | 169,000  | 114,000  |
| 9,100    |       | 125,000  | 81,000   | 14,500   |       | 169,000  | 114,000  |

| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 14,700   |      | 169,000  | 114,000  | 16,200   |      | 184,000  | 125,000  |
| 14,750   |      | 169,000  | 114,000  | 16,250   |      | 184,000  | 125,000  |
| 14,800   |      | 169,000  | 114,000  | 16,500   |      | 184,000  | 125,000  |
| 14,900   |      | 169,000  | 114,000  | 16,700   |      | 184,000  | 125,000  |
| 15,000   |      | 169,000  | 114,000  | 17,000   |      | 184,000  | 125,000  |
| 15,100   |      | 178,000  | 120,000  | 17,250   |      | 191,000  | 130,000  |
| 15,200   |      | 178,000  | 120,000  | 17,500   |      | 191,000  | 130,000  |
| 15,250   |      | 178,000  | 120,000  | 17,750   |      | 191,000  | 130,000  |
| 15,300   |      | 178,000  | 120,000  | 18,000   |      | 191,000  | 130,000  |
| 15,400   |      | 178,000  | 120,000  | 18,250   |      | 198,000  | 135,000  |
| 15,500   |      | 178,000  | 120,000  | 18,500   |      | 198,000  | 135,000  |
| 15,600   |      | 178,000  | 120,000  | 18,750   |      | 198,000  | 135,000  |
| 15,700   |      | 178,000  | 120,000  | 19,000   |      | 198,000  | 135,000  |
| 15,750   |      | 178,000  | 120,000  | 19,050   | 3/4  | 205,000  | 140,000  |
| 15,800   |      | 178,000  | 120,000  | 19,500   |      | 205,000  | 140,000  |
| 15,900   |      | 178,000  | 120,000  | 19,750   |      | 205,000  | 140,000  |
| 16,000   |      | 178,000  | 120,000  | 20,000   |      | 205,000  | 140,000  |
| 16,100   |      | 184,000  | 125,000  |          |      |          |          |

## Punte cilindriche

### Punte elicoidali, corte



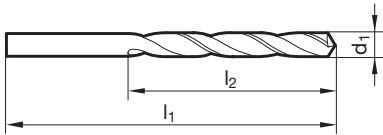
Catalogo n° 61116



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,700    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,800    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 5,900    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,400    |      | 40,000   | 18,000   | 6,100    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,300    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,500    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,700    |      | 101,000  | 63,000   |
| 2,100    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 6,900    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,100    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,400    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,900    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,800    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,100    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,500    |      | 117,000  | 75,000   |
| 3,900    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,250    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 9,800    |      | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,200   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 10,800   |      | 142,000  | 94,000   |
| 5,600    |      | 93,000   | 57,000   | 11,000   |      | 142,000  | 94,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,500</b> |      | 142,000   | 94,000    | <b>13,500</b> |      | 160,000   | 108,000   |
| <b>11,800</b> |      | 142,000   | 94,000    | <b>14,000</b> |      | 160,000   | 108,000   |
| <b>12,000</b> |      | 151,000   | 101,000   | <b>14,500</b> |      | 169,000   | 114,000   |
| <b>12,500</b> |      | 151,000   | 101,000   | <b>15,000</b> |      | 169,000   | 114,000   |
| <b>12,700</b> | 1/2  | 151,000   | 101,000   | <b>15,500</b> |      | 178,000   | 120,000   |
| <b>13,000</b> |      | 151,000   | 101,000   | <b>16,000</b> |      | 178,000   | 120,000   |

## Punte cilindriche

### Punte elicoidali, corte



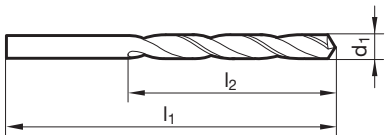
Catalogo n° 61115



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |      | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 9,800    |      | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,100   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 10,200   |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 10,300   |      | 133,000  | 87,000   |
| 5,600    |      | 93,000   | 57,000   | 10,400   |      | 133,000  | 87,000   |
| 5,700    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>10,600</b> |      | 133,000   | 87,000    | <b>12,500</b> |      | 151,000   | 101,000   |
| <b>10,700</b> |      | 142,000   | 94,000    | <b>12,600</b> |      | 151,000   | 101,000   |
| <b>10,800</b> |      | 142,000   | 94,000    | <b>12,800</b> |      | 151,000   | 101,000   |
| <b>10,900</b> |      | 142,000   | 94,000    | <b>12,900</b> |      | 151,000   | 101,000   |
| <b>11,000</b> |      | 142,000   | 94,000    | <b>13,000</b> |      | 151,000   | 101,000   |
| <b>11,100</b> |      | 142,000   | 94,000    | <b>13,200</b> |      | 151,000   | 101,000   |
| <b>11,200</b> |      | 142,000   | 94,000    | <b>13,300</b> |      | 160,000   | 108,000   |
| <b>11,300</b> |      | 142,000   | 94,000    | <b>13,400</b> |      | 160,000   | 108,000   |
| <b>11,400</b> |      | 142,000   | 94,000    | <b>13,500</b> |      | 160,000   | 108,000   |
| <b>11,500</b> |      | 142,000   | 94,000    | <b>13,600</b> |      | 160,000   | 108,000   |
| <b>11,600</b> |      | 142,000   | 94,000    | <b>13,700</b> |      | 160,000   | 108,000   |
| <b>11,700</b> |      | 142,000   | 94,000    | <b>13,800</b> |      | 160,000   | 108,000   |
| <b>11,800</b> |      | 142,000   | 94,000    | <b>13,900</b> |      | 160,000   | 108,000   |
| <b>11,900</b> |      | 151,000   | 101,000   | <b>14,000</b> |      | 160,000   | 108,000   |
| <b>12,000</b> |      | 151,000   | 101,000   | <b>14,500</b> |      | 169,000   | 114,000   |
| <b>12,100</b> |      | 151,000   | 101,000   | <b>15,000</b> |      | 169,000   | 114,000   |
| <b>12,200</b> |      | 151,000   | 101,000   | <b>15,500</b> |      | 178,000   | 120,000   |
| <b>12,400</b> |      | 151,000   | 101,000   | <b>16,000</b> |      | 178,000   | 120,000   |

## Punte cilindriche

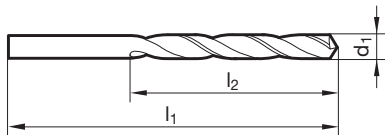
## Punte elicoidali, corte



Catalogo n° 71149

|   |      |         |        |                   |      |                                   |   |     |
|---|------|---------|--------|-------------------|------|-----------------------------------|---|-----|
| N | ~5xD | DIN 338 | HSS-Co | trattati a vapore | 118° | h8                                | R | Cyl |
| P | M    | K       | N      | S                 | H    | Parametri di lav. ind. a pag. 182 |   |     |
| ● | ●    | ●       | ○      |                   |      |                                   |   |     |

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida  $< 2,36$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |      | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,200    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,600    |      | 125,000  | 81,000   |
| 3,800    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,100    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,600    |      | 133,000  | 87,000   |
| 4,800    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 9,800    |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,200   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,500   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 11,000   |      | 142,000  | 94,000   |
| 5,500    |      | 93,000   | 57,000   | 11,500   |      | 142,000  | 94,000   |
| 5,600    |      | 93,000   | 57,000   | 12,000   |      | 151,000  | 101,000  |
| 5,700    |      | 93,000   | 57,000   | 12,500   |      | 151,000  | 101,000  |



| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
| <b>12,700</b>          | 1/2         | 151,000                | 101,000                |
| <b>13,000</b>          |             | 151,000                | 101,000                |
| <b>13,500</b>          |             | 160,000                | 108,000                |
| <b>14,000</b>          |             | 160,000                | 108,000                |
| <b>15,000</b>          |             | 169,000                | 114,000                |

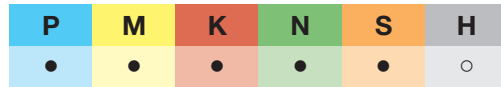
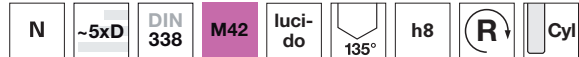
| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
|------------------------|-------------|------------------------|------------------------|

## Punte cilindriche

### Punte elicoidali, corte

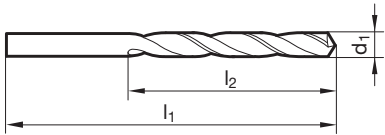


Catalogo n° 71148



Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- con alta perc. di CoMo
- specialmente per resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   |
| 1,100    |      | 36,000   | 14,000   |
| 1,200    |      | 38,000   | 16,000   |
| 1,300    |      | 38,000   | 16,000   |
| 1,400    |      | 40,000   | 18,000   |
| 1,500    |      | 40,000   | 18,000   |
| 1,600    |      | 43,000   | 20,000   |
| 1,700    |      | 43,000   | 20,000   |
| 1,800    |      | 46,000   | 22,000   |
| 1,900    |      | 46,000   | 22,000   |
| 2,000    |      | 49,000   | 24,000   |
| 2,100    |      | 49,000   | 24,000   |
| 2,200    |      | 53,000   | 27,000   |
| 2,300    |      | 53,000   | 27,000   |
| 2,400    |      | 57,000   | 30,000   |
| 2,500    |      | 57,000   | 30,000   |
| 2,600    |      | 57,000   | 30,000   |
| 2,700    |      | 61,000   | 33,000   |
| 2,800    |      | 61,000   | 33,000   |
| 2,900    |      | 61,000   | 33,000   |
| 3,000    |      | 61,000   | 33,000   |
| 3,100    |      | 65,000   | 36,000   |
| 3,200    |      | 65,000   | 36,000   |
| 3,300    |      | 65,000   | 36,000   |
| 3,400    |      | 70,000   | 39,000   |
| 3,500    |      | 70,000   | 39,000   |
| 3,600    |      | 70,000   | 39,000   |
| 3,700    |      | 70,000   | 39,000   |
| 3,800    |      | 75,000   | 43,000   |
| 3,900    |      | 75,000   | 43,000   |
| 4,000    |      | 75,000   | 43,000   |
| 4,100    |      | 75,000   | 43,000   |
| 4,200    |      | 75,000   | 43,000   |
| 4,300    |      | 80,000   | 47,000   |
| 4,400    |      | 80,000   | 47,000   |
| 4,500    |      | 80,000   | 47,000   |
| 4,600    |      | 80,000   | 47,000   |
| 4,700    |      | 80,000   | 47,000   |
| 4,800    |      | 86,000   | 52,000   |
| 4,900    |      | 86,000   | 52,000   |
| 5,000    |      | 86,000   | 52,000   |
| 5,100    |      | 86,000   | 52,000   |
| 5,200    |      | 86,000   | 52,000   |
| 5,300    |      | 86,000   | 52,000   |
| 5,400    |      | 93,000   | 57,000   |
| 5,500    |      | 93,000   | 57,000   |
| 5,600    |      | 93,000   | 57,000   |
| 5,700    |      | 93,000   | 57,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 93,000   | 57,000   |
| 5,900    |      | 93,000   | 57,000   |
| 6,000    |      | 93,000   | 57,000   |
| 6,100    |      | 101,000  | 63,000   |
| 6,200    |      | 101,000  | 63,000   |
| 6,300    |      | 101,000  | 63,000   |
| 6,400    |      | 101,000  | 63,000   |
| 6,500    |      | 101,000  | 63,000   |
| 6,600    |      | 101,000  | 63,000   |
| 6,700    |      | 101,000  | 63,000   |
| 6,800    |      | 109,000  | 69,000   |
| 6,900    |      | 109,000  | 69,000   |
| 7,000    |      | 109,000  | 69,000   |
| 7,100    |      | 109,000  | 69,000   |
| 7,200    |      | 109,000  | 69,000   |
| 7,300    |      | 109,000  | 69,000   |
| 7,400    |      | 109,000  | 69,000   |
| 7,500    |      | 109,000  | 69,000   |
| 7,600    |      | 117,000  | 75,000   |
| 7,700    |      | 117,000  | 75,000   |
| 7,800    |      | 117,000  | 75,000   |
| 8,000    |      | 117,000  | 75,000   |
| 8,100    |      | 117,000  | 75,000   |
| 8,200    |      | 117,000  | 75,000   |
| 8,300    |      | 117,000  | 75,000   |
| 8,400    |      | 117,000  | 75,000   |
| 8,500    |      | 117,000  | 75,000   |
| 8,600    |      | 125,000  | 81,000   |
| 8,700    |      | 125,000  | 81,000   |
| 8,800    |      | 125,000  | 81,000   |
| 8,900    |      | 125,000  | 81,000   |
| 9,000    |      | 125,000  | 81,000   |
| 9,100    |      | 125,000  | 81,000   |
| 9,200    |      | 125,000  | 81,000   |
| 9,300    |      | 125,000  | 81,000   |
| 9,400    |      | 125,000  | 81,000   |
| 9,500    |      | 125,000  | 81,000   |
| 9,600    |      | 133,000  | 87,000   |
| 9,700    |      | 133,000  | 87,000   |
| 9,800    |      | 133,000  | 87,000   |
| 9,900    |      | 133,000  | 87,000   |
| 10,000   |      | 133,000  | 87,000   |
| 10,200   |      | 133,000  | 87,000   |
| 10,500   |      | 133,000  | 87,000   |
| 11,000   |      | 142,000  | 94,000   |
| 11,500   |      | 142,000  | 94,000   |
| 12,000   |      | 151,000  | 101,000  |
| 12,500   |      | 151,000  | 101,000  |

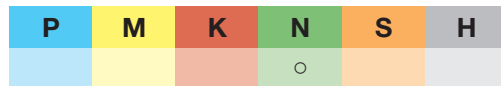
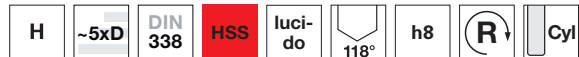
| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>12,700</b> | 1/2  | 151,000   | 101,000   | <b>15,500</b> |      | 178,000   | 120,000   |
| <b>13,000</b> |      | 151,000   | 101,000   | <b>16,000</b> |      | 178,000   | 120,000   |
| <b>13,500</b> |      | 160,000   | 108,000   |               |      |           |           |
| <b>14,000</b> |      | 160,000   | 108,000   |               |      |           |           |
| <b>14,500</b> |      | 169,000   | 114,000   |               |      |           |           |
| <b>15,000</b> |      | 169,000   | 114,000   |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, corte

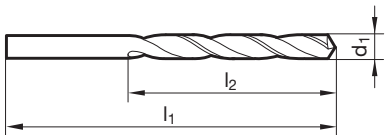


Catalogo n° 71117



Parametri di lav.  
ind. a pag. 180

- spoglia sul cono tagliente
- per materiali duri e friabili



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,000    |      | 86,000   | 52,000   |
| 1,050    |      | 34,000   | 12,000   | 5,100    |      | 86,000   | 52,000   |
| 1,100    |      | 36,000   | 14,000   | 5,200    |      | 86,000   | 52,000   |
| 1,150    |      | 36,000   | 14,000   | 5,300    |      | 86,000   | 52,000   |
| 1,200    |      | 38,000   | 16,000   | 5,400    |      | 93,000   | 57,000   |
| 1,250    |      | 38,000   | 16,000   | 5,500    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 5,600    |      | 93,000   | 57,000   |
| 1,350    |      | 40,000   | 18,000   | 5,700    |      | 93,000   | 57,000   |
| 1,400    |      | 40,000   | 18,000   | 5,800    |      | 93,000   | 57,000   |
| 1,450    |      | 40,000   | 18,000   | 5,900    |      | 93,000   | 57,000   |
| 1,500    |      | 40,000   | 18,000   | 6,000    |      | 93,000   | 57,000   |
| 1,550    |      | 43,000   | 20,000   | 6,100    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,200    |      | 101,000  | 63,000   |
| 1,650    |      | 43,000   | 20,000   | 6,250    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,300    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,500    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,700    |      | 101,000  | 63,000   |
| 2,100    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 6,900    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,100    |      | 109,000  | 69,000   |
| 2,550    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,400    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,900    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,750    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 7,800    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,000    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,100    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,400    |      | 117,000  | 75,000   |
| 3,850    |      | 75,000   | 43,000   | 8,500    |      | 117,000  | 75,000   |
| 3,900    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,000    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,750    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,500    |      | 125,000  | 81,000   |
| 4,900    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |

| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
| <b>9,700</b>           |             | 133,000                | 87,000                 |
| <b>9,900</b>           |             | 133,000                | 87,000                 |
| <b>10,000</b>          |             | 133,000                | 87,000                 |
| <b>11,500</b>          |             | 142,000                | 94,000                 |
| <b>12,000</b>          |             | 151,000                | 101,000                |

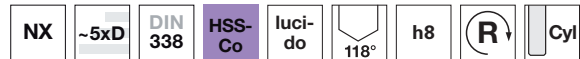
| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
|------------------------|-------------|------------------------|------------------------|

## Punte cilindriche

## Punte elicoidali, corte



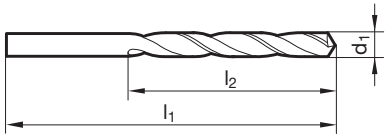
Catalogo n° 71221



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |      | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 9,800    |      | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,100   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 10,200   |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 10,300   |      | 133,000  | 87,000   |
| 5,600    |      | 93,000   | 57,000   | 10,400   |      | 133,000  | 87,000   |
| 5,700    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 142,000   | 94,000    | <b>14,000</b> |      | 160,000   | 108,000   |
| <b>11,500</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>12,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>12,500</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>13,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>13,500</b> |      | 160,000   | 108,000   |               |      |           |           |

## Punte cilindriche

## Punte elicoidali, corte



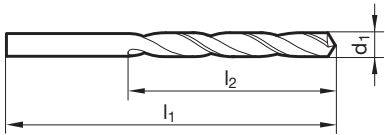
Catalogo n° 61221



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   |
| 1,100    |      | 36,000   | 14,000   |
| 1,200    |      | 38,000   | 16,000   |
| 1,300    |      | 38,000   | 16,000   |
| 1,400    |      | 40,000   | 18,000   |
| 1,500    |      | 40,000   | 18,000   |
| 1,600    |      | 43,000   | 20,000   |
| 1,700    |      | 43,000   | 20,000   |
| 1,800    |      | 46,000   | 22,000   |
| 1,900    |      | 46,000   | 22,000   |
| 2,000    |      | 49,000   | 24,000   |
| 2,100    |      | 49,000   | 24,000   |
| 2,200    |      | 53,000   | 27,000   |
| 2,300    |      | 53,000   | 27,000   |
| 2,400    |      | 57,000   | 30,000   |
| 2,500    |      | 57,000   | 30,000   |
| 2,600    |      | 57,000   | 30,000   |
| 2,700    |      | 61,000   | 33,000   |
| 2,800    |      | 61,000   | 33,000   |
| 2,900    |      | 61,000   | 33,000   |
| 3,000    |      | 61,000   | 33,000   |
| 3,100    |      | 65,000   | 36,000   |
| 3,200    |      | 65,000   | 36,000   |
| 3,300    |      | 65,000   | 36,000   |
| 3,400    |      | 70,000   | 39,000   |
| 3,500    |      | 70,000   | 39,000   |
| 3,600    |      | 70,000   | 39,000   |
| 3,700    |      | 70,000   | 39,000   |
| 3,800    |      | 75,000   | 43,000   |
| 3,900    |      | 75,000   | 43,000   |
| 4,000    |      | 75,000   | 43,000   |
| 4,100    |      | 75,000   | 43,000   |
| 4,200    |      | 75,000   | 43,000   |
| 4,300    |      | 80,000   | 47,000   |
| 4,400    |      | 80,000   | 47,000   |
| 4,500    |      | 80,000   | 47,000   |
| 4,600    |      | 80,000   | 47,000   |
| 4,700    |      | 80,000   | 47,000   |
| 4,800    |      | 86,000   | 52,000   |
| 4,900    |      | 86,000   | 52,000   |
| 5,000    |      | 86,000   | 52,000   |
| 5,100    |      | 86,000   | 52,000   |
| 5,200    |      | 86,000   | 52,000   |
| 5,300    |      | 86,000   | 52,000   |
| 5,400    |      | 93,000   | 57,000   |
| 5,500    |      | 93,000   | 57,000   |
| 5,600    |      | 93,000   | 57,000   |
| 5,700    |      | 93,000   | 57,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 93,000   | 57,000   |
| 5,900    |      | 93,000   | 57,000   |
| 6,000    |      | 93,000   | 57,000   |
| 6,100    |      | 101,000  | 63,000   |
| 6,200    |      | 101,000  | 63,000   |
| 6,300    |      | 101,000  | 63,000   |
| 6,400    |      | 101,000  | 63,000   |
| 6,500    |      | 101,000  | 63,000   |
| 6,600    |      | 101,000  | 63,000   |
| 6,700    |      | 101,000  | 63,000   |
| 6,800    |      | 109,000  | 69,000   |
| 6,900    |      | 109,000  | 69,000   |
| 7,000    |      | 109,000  | 69,000   |
| 7,100    |      | 109,000  | 69,000   |
| 7,200    |      | 109,000  | 69,000   |
| 7,300    |      | 109,000  | 69,000   |
| 7,400    |      | 109,000  | 69,000   |
| 7,500    |      | 109,000  | 69,000   |
| 7,600    |      | 117,000  | 75,000   |
| 7,700    |      | 117,000  | 75,000   |
| 7,800    |      | 117,000  | 75,000   |
| 7,900    |      | 117,000  | 75,000   |
| 8,000    |      | 117,000  | 75,000   |
| 8,100    |      | 117,000  | 75,000   |
| 8,200    |      | 117,000  | 75,000   |
| 8,300    |      | 117,000  | 75,000   |
| 8,400    |      | 117,000  | 75,000   |
| 8,500    |      | 117,000  | 75,000   |
| 8,600    |      | 125,000  | 81,000   |
| 8,700    |      | 125,000  | 81,000   |
| 8,800    |      | 125,000  | 81,000   |
| 8,900    |      | 125,000  | 81,000   |
| 9,000    |      | 125,000  | 81,000   |
| 9,100    |      | 125,000  | 81,000   |
| 9,200    |      | 125,000  | 81,000   |
| 9,300    |      | 125,000  | 81,000   |
| 9,400    |      | 125,000  | 81,000   |
| 9,500    |      | 125,000  | 81,000   |
| 9,600    |      | 133,000  | 87,000   |
| 9,700    |      | 133,000  | 87,000   |
| 9,800    |      | 133,000  | 87,000   |
| 9,900    |      | 133,000  | 87,000   |
| 10,000   |      | 133,000  | 87,000   |
| 10,100   |      | 133,000  | 87,000   |
| 10,200   |      | 133,000  | 87,000   |
| 10,300   |      | 133,000  | 87,000   |
| 10,400   |      | 133,000  | 87,000   |
| 10,500   |      | 133,000  | 87,000   |



| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 142,000   | 94,000    | <b>14,000</b> |      | 160,000   | 108,000   |
| <b>11,500</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>12,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>12,500</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>13,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>13,500</b> |      | 160,000   | 108,000   |               |      |           |           |

## Punte cilindriche

## Punte elicoidali, corte



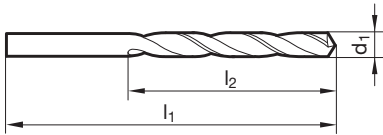
Catalogo n° 71123



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida  $< 2,0$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 0,800    |      | 30,000   | 10,000   | 4,400    |      | 80,000   | 47,000   |
| 0,850    |      | 30,000   | 10,000   | 4,500    |      | 80,000   | 47,000   |
| 0,900    |      | 32,000   | 11,000   | 4,600    |      | 80,000   | 47,000   |
| 1,000    |      | 34,000   | 12,000   | 4,700    |      | 80,000   | 47,000   |
| 1,050    |      | 34,000   | 12,000   | 4,800    |      | 86,000   | 52,000   |
| 1,100    |      | 36,000   | 14,000   | 4,900    |      | 86,000   | 52,000   |
| 1,200    |      | 38,000   | 16,000   | 5,000    |      | 86,000   | 52,000   |
| 1,300    |      | 38,000   | 16,000   | 5,100    |      | 86,000   | 52,000   |
| 1,350    |      | 40,000   | 18,000   | 5,200    |      | 86,000   | 52,000   |
| 1,400    |      | 40,000   | 18,000   | 5,300    |      | 86,000   | 52,000   |
| 1,450    |      | 40,000   | 18,000   | 5,400    |      | 93,000   | 57,000   |
| 1,500    |      | 40,000   | 18,000   | 5,500    |      | 93,000   | 57,000   |
| 1,550    |      | 43,000   | 20,000   | 5,600    |      | 93,000   | 57,000   |
| 1,600    |      | 43,000   | 20,000   | 5,700    |      | 93,000   | 57,000   |
| 1,700    |      | 43,000   | 20,000   | 5,800    |      | 93,000   | 57,000   |
| 1,800    |      | 46,000   | 22,000   | 5,900    |      | 93,000   | 57,000   |
| 1,900    |      | 46,000   | 22,000   | 6,000    |      | 93,000   | 57,000   |
| 1,950    |      | 49,000   | 24,000   | 6,100    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,200    |      | 101,000  | 63,000   |
| 2,050    |      | 49,000   | 24,000   | 6,300    |      | 101,000  | 63,000   |
| 2,100    |      | 49,000   | 24,000   | 6,400    |      | 101,000  | 63,000   |
| 2,200    |      | 53,000   | 27,000   | 6,500    |      | 101,000  | 63,000   |
| 2,300    |      | 53,000   | 27,000   | 6,600    |      | 101,000  | 63,000   |
| 2,400    |      | 57,000   | 30,000   | 6,700    |      | 101,000  | 63,000   |
| 2,450    |      | 57,000   | 30,000   | 6,800    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 6,900    |      | 109,000  | 69,000   |
| 2,550    |      | 57,000   | 30,000   | 7,000    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,100    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,200    |      | 109,000  | 69,000   |
| 2,750    |      | 61,000   | 33,000   | 7,300    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,400    |      | 109,000  | 69,000   |
| 2,850    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,900    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,950    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |

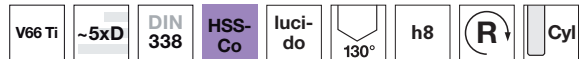
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 9,200    |      | 125,000  | 81,000   | 12,100   |      | 151,000  | 101,000  |
| 9,300    |      | 125,000  | 81,000   | 12,200   |      | 151,000  | 101,000  |
| 9,400    |      | 125,000  | 81,000   | 12,400   |      | 151,000  | 101,000  |
| 9,500    |      | 125,000  | 81,000   | 12,500   |      | 151,000  | 101,000  |
| 9,600    |      | 133,000  | 87,000   | 12,600   |      | 151,000  | 101,000  |
| 9,700    |      | 133,000  | 87,000   | 12,800   |      | 151,000  | 101,000  |
| 9,800    |      | 133,000  | 87,000   | 13,000   |      | 151,000  | 101,000  |
| 9,900    |      | 133,000  | 87,000   | 13,500   |      | 160,000  | 108,000  |
| 10,000   |      | 133,000  | 87,000   |          |      |          |          |
| 10,200   |      | 133,000  | 87,000   |          |      |          |          |
| 10,500   |      | 133,000  | 87,000   |          |      |          |          |
| 10,800   |      | 142,000  | 94,000   |          |      |          |          |
| 11,000   |      | 142,000  | 94,000   |          |      |          |          |
| 11,500   |      | 142,000  | 94,000   |          |      |          |          |
| 11,700   |      | 142,000  | 94,000   |          |      |          |          |
| 11,800   |      | 142,000  | 94,000   |          |      |          |          |
| 11,900   |      | 151,000  | 101,000  |          |      |          |          |
| 12,000   |      | 151,000  | 101,000  |          |      |          |          |

## Punte cilindriche

## Punte elicoidali, corte



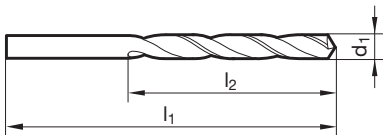
Catalogo n° 71122



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● |   |   | ● |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 4,600$
- spoglia sul cono tagliente



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |       | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |       | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |       | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |       | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |       | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |       | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |       | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |       | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |       | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |       | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,750    | 17/64 | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,800    |       | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 6,900    |       | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,000    |       | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,100    |       | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,200    |       | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |       | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |       | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |       | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,800    |       | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,900    |       | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 8,000    |       | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,100    |       | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,200    |       | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,300    |       | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,400    |       | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,500    |       | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,600    |       | 125,000  | 81,000   |
| 3,800    |      | 75,000   | 43,000   | 8,700    |       | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,800    |       | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,900    |       | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,000    |       | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,100    |       | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,300    |       | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,400    |       | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,500    |       | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,600    |       | 133,000  | 87,000   |
| 4,700    |      | 80,000   | 47,000   | 9,700    |       | 133,000  | 87,000   |
| 4,800    |      | 86,000   | 52,000   | 9,800    |       | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 10,000   |       | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 10,200   |       | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 10,500   |       | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 11,000   |       | 142,000  | 94,000   |
| 5,300    |      | 86,000   | 52,000   | 11,500   |       | 142,000  | 94,000   |
| 5,400    |      | 93,000   | 57,000   | 12,000   |       | 151,000  | 101,000  |
| 5,500    |      | 93,000   | 57,000   | 12,500   |       | 151,000  | 101,000  |
| 5,600    |      | 93,000   | 57,000   | 13,000   |       | 151,000  | 101,000  |
| 5,700    |      | 93,000   | 57,000   | 13,500   |       | 160,000  | 108,000  |

| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
| <b>14,000</b>          |             | 160,000                | 108,000                |
| <b>14,500</b>          |             | 169,000                | 114,000                |
| <b>15,000</b>          |             | 169,000                | 114,000                |
| <b>16,000</b>          |             | 178,000                | 120,000                |

| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|
|------------------------|-------------|------------------------|------------------------|

## Punte cilindriche

### Punte elicoidali, corte



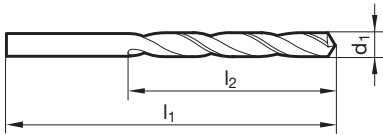
Catalogo n° 61223



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,000    |      | 86,000   | 52,000   |
| 1,050    |      | 34,000   | 12,000   | 5,100    |      | 86,000   | 52,000   |
| 1,100    |      | 36,000   | 14,000   | 5,200    |      | 86,000   | 52,000   |
| 1,150    |      | 36,000   | 14,000   | 5,300    |      | 86,000   | 52,000   |
| 1,200    |      | 38,000   | 16,000   | 5,400    |      | 93,000   | 57,000   |
| 1,250    |      | 38,000   | 16,000   | 5,500    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 5,600    |      | 93,000   | 57,000   |
| 1,350    |      | 40,000   | 18,000   | 5,700    |      | 93,000   | 57,000   |
| 1,400    |      | 40,000   | 18,000   | 5,800    |      | 93,000   | 57,000   |
| 1,500    |      | 40,000   | 18,000   | 5,900    |      | 93,000   | 57,000   |
| 1,550    |      | 43,000   | 20,000   | 6,000    |      | 93,000   | 57,000   |
| 1,600    |      | 43,000   | 20,000   | 6,100    |      | 101,000  | 63,000   |
| 1,650    |      | 43,000   | 20,000   | 6,200    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,300    |      | 101,000  | 63,000   |
| 1,750    |      | 46,000   | 22,000   | 6,400    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,500    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,950    |      | 49,000   | 24,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,300    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>9,800</b>  |      | 133,000   | 87,000    | <b>11,500</b> |      | 142,000   | 94,000    |
| <b>9,900</b>  |      | 133,000   | 87,000    | <b>12,000</b> |      | 151,000   | 101,000   |
| <b>10,000</b> |      | 133,000   | 87,000    | <b>12,500</b> |      | 151,000   | 101,000   |
| <b>10,200</b> |      | 133,000   | 87,000    | <b>13,000</b> |      | 151,000   | 101,000   |
| <b>10,500</b> |      | 133,000   | 87,000    | <b>13,500</b> |      | 160,000   | 108,000   |
| <b>11,000</b> |      | 142,000   | 94,000    |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, corte



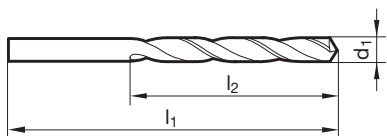
Catalogo n° 51122



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 2,000    |      | 49,000   | 24,000   |
| 2,500    |      | 57,000   | 30,000   |
| 3,000    |      | 61,000   | 33,000   |
| 3,500    |      | 70,000   | 39,000   |
| 4,000    |      | 75,000   | 43,000   |
| 4,200    |      | 75,000   | 43,000   |
| 4,500    |      | 80,000   | 47,000   |
| 5,000    |      | 86,000   | 52,000   |
| 5,500    |      | 93,000   | 57,000   |
| 6,000    |      | 93,000   | 57,000   |
| 6,500    |      | 101,000  | 63,000   |
| 6,800    |      | 109,000  | 69,000   |
| 7,000    |      | 109,000  | 69,000   |
| 7,500    |      | 109,000  | 69,000   |
| 8,000    |      | 117,000  | 75,000   |
| 8,500    |      | 117,000  | 75,000   |
| 9,000    |      | 125,000  | 81,000   |
| 9,500    |      | 125,000  | 81,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 10,000   |      | 133,000  | 87,000   |
| 10,200   |      | 133,000  | 87,000   |
| 10,500   |      | 133,000  | 87,000   |
| 11,000   |      | 142,000  | 94,000   |
| 11,500   |      | 142,000  | 94,000   |
| 12,000   |      | 151,000  | 101,000  |
| 12,500   |      | 151,000  | 101,000  |
| 13,000   |      | 151,000  | 101,000  |

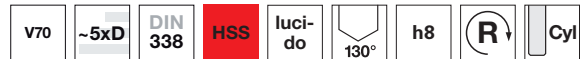


## Punte cilindriche

### Punte elicoidali, corte



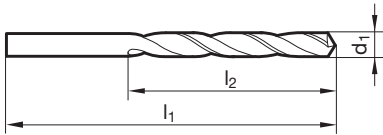
Catalogo n° 71124



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ● |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,500    |      | 40,000   | 18,000   | 3,910    |       | 75,000   | 43,000   |
| 1,570    |      | 43,000   | 20,000   | 3,970    | 5/32  | 75,000   | 43,000   |
| 1,600    |      | 43,000   | 20,000   | 3,990    |       | 75,000   | 43,000   |
| 1,700    |      | 43,000   | 20,000   | 4,000    |       | 75,000   | 43,000   |
| 1,750    |      | 46,000   | 22,000   | 4,090    |       | 75,000   | 43,000   |
| 1,780    |      | 46,000   | 22,000   | 4,100    |       | 75,000   | 43,000   |
| 1,800    |      | 46,000   | 22,000   | 4,200    |       | 75,000   | 43,000   |
| 1,850    |      | 46,000   | 22,000   | 4,220    |       | 75,000   | 43,000   |
| 1,900    |      | 46,000   | 22,000   | 4,300    |       | 80,000   | 47,000   |
| 1,930    |      | 49,000   | 24,000   | 4,390    |       | 80,000   | 47,000   |
| 1,980    | 5/64 | 49,000   | 24,000   | 4,400    |       | 80,000   | 47,000   |
| 1,990    |      | 49,000   | 24,000   | 4,500    |       | 80,000   | 47,000   |
| 2,000    |      | 49,000   | 24,000   | 4,570    |       | 80,000   | 47,000   |
| 2,050    |      | 49,000   | 24,000   | 4,600    |       | 80,000   | 47,000   |
| 2,080    |      | 49,000   | 24,000   | 4,700    |       | 80,000   | 47,000   |
| 2,100    |      | 49,000   | 24,000   | 4,800    |       | 86,000   | 52,000   |
| 2,180    |      | 53,000   | 27,000   | 4,850    |       | 86,000   | 52,000   |
| 2,200    |      | 53,000   | 27,000   | 4,900    |       | 86,000   | 52,000   |
| 2,260    |      | 53,000   | 27,000   | 4,980    |       | 86,000   | 52,000   |
| 2,300    |      | 53,000   | 27,000   | 5,000    |       | 86,000   | 52,000   |
| 2,370    |      | 57,000   | 30,000   | 5,100    |       | 86,000   | 52,000   |
| 2,400    |      | 57,000   | 30,000   | 5,110    |       | 86,000   | 52,000   |
| 2,490    |      | 57,000   | 30,000   | 5,180    |       | 86,000   | 52,000   |
| 2,500    |      | 57,000   | 30,000   | 5,200    |       | 86,000   | 52,000   |
| 2,580    |      | 57,000   | 30,000   | 5,220    |       | 86,000   | 52,000   |
| 2,600    |      | 57,000   | 30,000   | 5,300    |       | 86,000   | 52,000   |
| 2,700    |      | 61,000   | 33,000   | 5,310    |       | 93,000   | 57,000   |
| 2,710    |      | 61,000   | 33,000   | 5,400    |       | 93,000   | 57,000   |
| 2,780    | 7/64 | 61,000   | 33,000   | 5,410    |       | 93,000   | 57,000   |
| 2,790    |      | 61,000   | 33,000   | 5,500    |       | 93,000   | 57,000   |
| 2,800    |      | 61,000   | 33,000   | 5,560    | 7/32  | 93,000   | 57,000   |
| 2,870    |      | 61,000   | 33,000   | 5,600    |       | 93,000   | 57,000   |
| 2,900    |      | 61,000   | 33,000   | 5,610    |       | 93,000   | 57,000   |
| 2,950    |      | 61,000   | 33,000   | 5,700    |       | 93,000   | 57,000   |
| 3,000    |      | 61,000   | 33,000   | 5,790    |       | 93,000   | 57,000   |
| 3,100    |      | 65,000   | 36,000   | 5,800    |       | 93,000   | 57,000   |
| 3,200    |      | 65,000   | 36,000   | 5,900    |       | 93,000   | 57,000   |
| 3,260    |      | 65,000   | 36,000   | 5,940    |       | 93,000   | 57,000   |
| 3,300    |      | 65,000   | 36,000   | 5,950    | 15/64 | 93,000   | 57,000   |
| 3,400    |      | 70,000   | 39,000   | 6,000    |       | 93,000   | 57,000   |
| 3,450    |      | 70,000   | 39,000   | 6,050    |       | 101,000  | 63,000   |
| 3,500    |      | 70,000   | 39,000   | 6,100    |       | 101,000  | 63,000   |
| 3,600    |      | 70,000   | 39,000   | 6,200    |       | 101,000  | 63,000   |
| 3,700    |      | 70,000   | 39,000   | 6,300    |       | 101,000  | 63,000   |
| 3,730    |      | 70,000   | 39,000   | 6,350    | 1/4   | 101,000  | 63,000   |
| 3,800    |      | 75,000   | 43,000   | 6,400    |       | 101,000  | 63,000   |
| 3,860    |      | 75,000   | 43,000   | 6,500    |       | 101,000  | 63,000   |
| 3,900    |      | 75,000   | 43,000   | 6,530    |       | 101,000  | 63,000   |

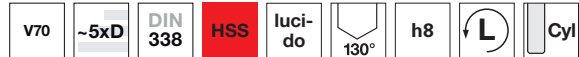
| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 6,600    |       | 101,000  | 63,000   | 9,520    | 3/8   | 133,000  | 87,000   |
| 6,630    |       | 101,000  | 63,000   | 9,530    |       | 133,000  | 87,000   |
| 6,700    |       | 101,000  | 63,000   | 9,580    |       | 133,000  | 87,000   |
| 6,750    | 17/64 | 109,000  | 69,000   | 9,600    |       | 133,000  | 87,000   |
| 6,760    |       | 109,000  | 69,000   | 9,700    |       | 133,000  | 87,000   |
| 6,800    |       | 109,000  | 69,000   | 9,800    |       | 133,000  | 87,000   |
| 6,900    |       | 109,000  | 69,000   | 9,900    |       | 133,000  | 87,000   |
| 6,910    |       | 109,000  | 69,000   | 9,920    | 25/64 | 133,000  | 87,000   |
| 7,000    |       | 109,000  | 69,000   | 10,000   |       | 133,000  | 87,000   |
| 7,040    |       | 109,000  | 69,000   | 10,080   |       | 133,000  | 87,000   |
| 7,100    |       | 109,000  | 69,000   | 10,100   |       | 133,000  | 87,000   |
| 7,140    | 9/32  | 109,000  | 69,000   | 10,200   |       | 133,000  | 87,000   |
| 7,200    |       | 109,000  | 69,000   | 10,260   |       | 133,000  | 87,000   |
| 7,300    |       | 109,000  | 69,000   | 10,300   |       | 133,000  | 87,000   |
| 7,370    |       | 109,000  | 69,000   | 10,400   |       | 133,000  | 87,000   |
| 7,400    |       | 109,000  | 69,000   | 10,490   |       | 133,000  | 87,000   |
| 7,490    |       | 109,000  | 69,000   | 10,500   |       | 133,000  | 87,000   |
| 7,500    |       | 109,000  | 69,000   | 10,600   |       | 133,000  | 87,000   |
| 7,540    | 19/64 | 117,000  | 75,000   | 10,720   | 27/64 | 142,000  | 94,000   |
| 7,600    |       | 117,000  | 75,000   | 10,900   |       | 142,000  | 94,000   |
| 7,670    |       | 117,000  | 75,000   | 11,000   |       | 142,000  | 94,000   |
| 7,700    |       | 117,000  | 75,000   | 11,100   |       | 142,000  | 94,000   |
| 7,750    |       | 117,000  | 75,000   | 11,110   | 7/16  | 142,000  | 94,000   |
| 7,800    |       | 117,000  | 75,000   | 11,200   |       | 142,000  | 94,000   |
| 7,940    | 5/16  | 117,000  | 75,000   | 11,300   |       | 142,000  | 94,000   |
| 8,000    |       | 117,000  | 75,000   | 11,400   |       | 142,000  | 94,000   |
| 8,030    |       | 117,000  | 75,000   | 11,500   |       | 142,000  | 94,000   |
| 8,100    |       | 117,000  | 75,000   | 11,510   | 29/64 | 142,000  | 94,000   |
| 8,200    |       | 117,000  | 75,000   | 11,600   |       | 142,000  | 94,000   |
| 8,300    |       | 117,000  | 75,000   | 11,800   |       | 142,000  | 94,000   |
| 8,330    | 21/64 | 117,000  | 75,000   | 11,900   |       | 151,000  | 101,000  |
| 8,400    |       | 117,000  | 75,000   | 11,910   | 15/32 | 151,000  | 101,000  |
| 8,430    |       | 117,000  | 75,000   | 12,000   |       | 151,000  | 101,000  |
| 8,500    |       | 117,000  | 75,000   | 12,500   |       | 151,000  | 101,000  |
| 8,600    |       | 125,000  | 81,000   | 12,700   | 1/2   | 151,000  | 101,000  |
| 8,610    |       | 125,000  | 81,000   | 13,000   |       | 151,000  | 101,000  |
| 8,700    |       | 125,000  | 81,000   | 14,000   |       | 160,000  | 108,000  |
| 8,800    |       | 125,000  | 81,000   | 14,500   |       | 169,000  | 114,000  |
| 8,840    |       | 125,000  | 81,000   | 15,000   |       | 169,000  | 114,000  |
| 8,900    |       | 125,000  | 81,000   | 15,500   |       | 178,000  | 120,000  |
| 9,000    |       | 125,000  | 81,000   |          |       |          |          |
| 9,090    |       | 125,000  | 81,000   |          |       |          |          |
| 9,100    |       | 125,000  | 81,000   |          |       |          |          |
| 9,130    | 23/64 | 125,000  | 81,000   |          |       |          |          |
| 9,200    |       | 125,000  | 81,000   |          |       |          |          |
| 9,300    |       | 125,000  | 81,000   |          |       |          |          |
| 9,350    |       | 125,000  | 81,000   |          |       |          |          |
| 9,500    |       | 125,000  | 81,000   |          |       |          |          |

## Punte cilindriche

### Punte elicoidali, corte



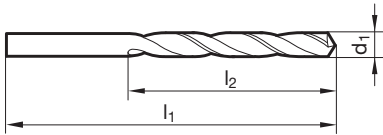
Catalogo n° 71126



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ● |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,500    |      | 40,000   | 18,000   | 6,800    |      | 109,000  | 69,000   |
| 1,600    |      | 43,000   | 20,000   | 6,900    |      | 109,000  | 69,000   |
| 1,700    |      | 43,000   | 20,000   | 7,000    |      | 109,000  | 69,000   |
| 1,750    |      | 46,000   | 22,000   | 7,100    |      | 109,000  | 69,000   |
| 1,800    |      | 46,000   | 22,000   | 7,200    |      | 109,000  | 69,000   |
| 1,900    |      | 46,000   | 22,000   | 7,300    |      | 109,000  | 69,000   |
| 2,000    |      | 49,000   | 24,000   | 7,400    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 7,500    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,600    |      | 117,000  | 75,000   |
| 2,300    |      | 53,000   | 27,000   | 7,700    |      | 117,000  | 75,000   |
| 2,400    |      | 57,000   | 30,000   | 7,800    |      | 117,000  | 75,000   |
| 2,500    |      | 57,000   | 30,000   | 8,000    |      | 117,000  | 75,000   |
| 2,600    |      | 57,000   | 30,000   | 8,100    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 8,200    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 8,300    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 8,400    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,500    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,600    |      | 125,000  | 81,000   |
| 3,500    |      | 70,000   | 39,000   | 8,700    |      | 125,000  | 81,000   |
| 3,600    |      | 70,000   | 39,000   | 8,800    |      | 125,000  | 81,000   |
| 3,700    |      | 70,000   | 39,000   | 8,900    |      | 125,000  | 81,000   |
| 3,800    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 9,100    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 9,200    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,300    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,400    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,600    |      | 133,000  | 87,000   |
| 4,600    |      | 80,000   | 47,000   | 9,700    |      | 133,000  | 87,000   |
| 4,700    |      | 80,000   | 47,000   | 9,800    |      | 133,000  | 87,000   |
| 4,800    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 10,100   |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,200   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,300   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 10,400   |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |
| 5,600    |      | 93,000   | 57,000   | 10,600   |      | 133,000  | 87,000   |
| 5,700    |      | 93,000   | 57,000   | 10,700   |      | 142,000  | 94,000   |
| 5,800    |      | 93,000   | 57,000   | 10,800   |      | 142,000  | 94,000   |
| 5,900    |      | 93,000   | 57,000   | 10,900   |      | 142,000  | 94,000   |
| 6,000    |      | 93,000   | 57,000   | 11,000   |      | 142,000  | 94,000   |
| 6,100    |      | 101,000  | 63,000   | 11,100   |      | 142,000  | 94,000   |
| 6,200    |      | 101,000  | 63,000   | 11,300   |      | 142,000  | 94,000   |
| 6,300    |      | 101,000  | 63,000   | 11,400   |      | 142,000  | 94,000   |
| 6,500    |      | 101,000  | 63,000   | 11,500   |      | 142,000  | 94,000   |
| 6,600    |      | 101,000  | 63,000   | 11,600   |      | 142,000  | 94,000   |
| 6,700    |      | 101,000  | 63,000   | 11,700   |      | 142,000  | 94,000   |

| <b>d1</b>     |       | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|-------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch  | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,800</b> |       | 142,000   | 94,000    | <b>14,000</b> |      | 160,000   | 108,000   |
| <b>11,900</b> |       | 151,000   | 101,000   | <b>14,500</b> |      | 169,000   | 114,000   |
| <b>12,000</b> |       | 151,000   | 101,000   | <b>15,000</b> |      | 169,000   | 114,000   |
| <b>12,300</b> | 31/64 | 151,000   | 101,000   | <b>16,000</b> |      | 178,000   | 120,000   |
| <b>12,500</b> |       | 151,000   | 101,000   |               |      |           |           |
| <b>13,000</b> |       | 151,000   | 101,000   |               |      |           |           |

## Punte cilindriche

## Punte elicoidali, corte



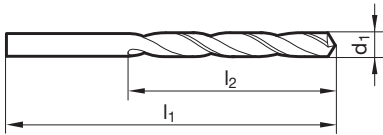
Catalogo n° 61124



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- maggiore protezione contro l'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,500    |      | 40,000   | 18,000   | 5,700    |       | 93,000   | 57,000   |
| 1,600    |      | 43,000   | 20,000   | 5,800    |       | 93,000   | 57,000   |
| 1,700    |      | 43,000   | 20,000   | 6,000    |       | 93,000   | 57,000   |
| 1,800    |      | 46,000   | 22,000   | 6,100    |       | 101,000  | 63,000   |
| 1,850    |      | 46,000   | 22,000   | 6,200    |       | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,250    |       | 101,000  | 63,000   |
| 1,980    | 5/64 | 49,000   | 24,000   | 6,300    |       | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,400    |       | 101,000  | 63,000   |
| 2,100    |      | 49,000   | 24,000   | 6,500    |       | 101,000  | 63,000   |
| 2,180    |      | 53,000   | 27,000   | 6,600    |       | 101,000  | 63,000   |
| 2,200    |      | 53,000   | 27,000   | 6,700    |       | 101,000  | 63,000   |
| 2,300    |      | 53,000   | 27,000   | 6,750    | 17/64 | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 6,800    |       | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 6,900    |       | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,000    |       | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,100    |       | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,200    |       | 109,000  | 69,000   |
| 2,900    |      | 61,000   | 33,000   | 7,300    |       | 109,000  | 69,000   |
| 3,000    |      | 61,000   | 33,000   | 7,400    |       | 109,000  | 69,000   |
| 3,100    |      | 65,000   | 36,000   | 7,500    |       | 109,000  | 69,000   |
| 3,200    |      | 65,000   | 36,000   | 7,600    |       | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 7,700    |       | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 7,800    |       | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 7,900    |       | 117,000  | 75,000   |
| 3,570    | 9/64 | 70,000   | 39,000   | 8,000    |       | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,030    |       | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,100    |       | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,200    |       | 117,000  | 75,000   |
| 3,860    |      | 75,000   | 43,000   | 8,300    |       | 117,000  | 75,000   |
| 3,900    |      | 75,000   | 43,000   | 8,400    |       | 117,000  | 75,000   |
| 3,990    |      | 75,000   | 43,000   | 8,500    |       | 117,000  | 75,000   |
| 4,000    |      | 75,000   | 43,000   | 8,600    |       | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 8,700    |       | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 8,800    |       | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 8,840    |       | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 8,900    |       | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,000    |       | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,100    |       | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,200    |       | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,300    |       | 125,000  | 81,000   |
| 4,900    |      | 86,000   | 52,000   | 9,400    |       | 125,000  | 81,000   |
| 5,000    |      | 86,000   | 52,000   | 9,500    |       | 125,000  | 81,000   |
| 5,100    |      | 86,000   | 52,000   | 9,600    |       | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 9,700    |       | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 9,800    |       | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 9,900    |       | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 9,920    | 25/64 | 133,000  | 87,000   |
| 5,600    |      | 93,000   | 57,000   | 10,000   |       | 133,000  | 87,000   |

| <b>d1</b>     |       | <b>l1</b> | <b>l2</b> | <b>d1</b>     |       | <b>l1</b> | <b>l2</b> |
|---------------|-------|-----------|-----------|---------------|-------|-----------|-----------|
| <b>mm</b>     | inch  | mm        | mm        | <b>mm</b>     | inch  | mm        | mm        |
| <b>10,100</b> |       | 133,000   | 87,000    | <b>12,300</b> | 31/64 | 151,000   | 101,000   |
| <b>10,200</b> |       | 133,000   | 87,000    | <b>12,500</b> |       | 151,000   | 101,000   |
| <b>10,500</b> |       | 133,000   | 87,000    | <b>12,700</b> | 1/2   | 151,000   | 101,000   |
| <b>10,600</b> |       | 133,000   | 87,000    | <b>13,000</b> |       | 151,000   | 101,000   |
| <b>10,720</b> | 27/64 | 142,000   | 94,000    | <b>13,500</b> |       | 160,000   | 108,000   |
| <b>10,800</b> |       | 142,000   | 94,000    | <b>14,000</b> |       | 160,000   | 108,000   |
| <b>10,900</b> |       | 142,000   | 94,000    | <b>14,500</b> |       | 169,000   | 114,000   |
| <b>11,000</b> |       | 142,000   | 94,000    | <b>15,000</b> |       | 169,000   | 114,000   |
| <b>11,100</b> |       | 142,000   | 94,000    | <b>15,500</b> |       | 178,000   | 120,000   |
| <b>11,200</b> |       | 142,000   | 94,000    | <b>16,000</b> |       | 178,000   | 120,000   |
| <b>11,300</b> |       | 142,000   | 94,000    |               |       |           |           |
| <b>11,400</b> |       | 142,000   | 94,000    |               |       |           |           |
| <b>11,500</b> |       | 142,000   | 94,000    |               |       |           |           |
| <b>11,600</b> |       | 142,000   | 94,000    |               |       |           |           |
| <b>11,800</b> |       | 142,000   | 94,000    |               |       |           |           |
| <b>11,900</b> |       | 151,000   | 101,000   |               |       |           |           |
| <b>11,910</b> | 15/32 | 151,000   | 101,000   |               |       |           |           |
| <b>12,000</b> |       | 151,000   | 101,000   |               |       |           |           |

## Punte cilindriche

## Punte elicoidali, corte



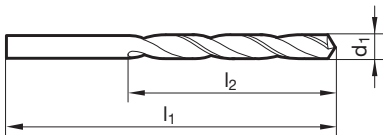
Catalogo n° 71158



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- lucida  $< 2,36$  mm



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,500    |      | 40,000   | 18,000   | 6,100    |      | 101,000  | 63,000   |
| 1,590    | 1/16 | 43,000   | 20,000   | 6,200    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,300    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,350    | 1/4  | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,400    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,500    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,600    |      | 101,000  | 63,000   |
| 2,100    |      | 49,000   | 24,000   | 6,700    |      | 101,000  | 63,000   |
| 2,200    |      | 53,000   | 27,000   | 6,800    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 6,900    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,000    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,100    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,140    | 9/32 | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,200    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,300    |      | 109,000  | 69,000   |
| 2,900    |      | 61,000   | 33,000   | 7,400    |      | 109,000  | 69,000   |
| 3,000    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 3,100    |      | 65,000   | 36,000   | 7,600    |      | 117,000  | 75,000   |
| 3,170    | 1/8  | 65,000   | 36,000   | 7,700    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 7,800    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 7,940    | 5/16 | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,000    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,100    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,300    |      | 117,000  | 75,000   |
| 3,900    |      | 75,000   | 43,000   | 8,400    |      | 117,000  | 75,000   |
| 4,000    |      | 75,000   | 43,000   | 8,500    |      | 117,000  | 75,000   |
| 4,100    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 8,800    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 8,900    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,000    |      | 125,000  | 81,000   |
| 4,600    |      | 80,000   | 47,000   | 9,100    |      | 125,000  | 81,000   |
| 4,700    |      | 80,000   | 47,000   | 9,200    |      | 125,000  | 81,000   |
| 4,800    |      | 86,000   | 52,000   | 9,300    |      | 125,000  | 81,000   |
| 4,900    |      | 86,000   | 52,000   | 9,400    |      | 125,000  | 81,000   |
| 5,000    |      | 86,000   | 52,000   | 9,500    |      | 125,000  | 81,000   |
| 5,100    |      | 86,000   | 52,000   | 9,520    | 3/8  | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 9,600    |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 9,700    |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 9,800    |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 9,900    |      | 133,000  | 87,000   |
| 5,600    |      | 93,000   | 57,000   | 10,000   |      | 133,000  | 87,000   |
| 5,700    |      | 93,000   | 57,000   | 10,200   |      | 133,000  | 87,000   |
| 5,800    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |
| 5,900    |      | 93,000   | 57,000   | 10,800   |      | 142,000  | 94,000   |
| 6,000    |      | 93,000   | 57,000   | 11,000   |      | 142,000  | 94,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,110</b> | 7/16 | 142,000   | 94,000    | <b>12,700</b> | 1/2  | 151,000   | 101,000   |
| <b>11,200</b> |      | 142,000   | 94,000    | <b>13,000</b> |      | 151,000   | 101,000   |
| <b>11,500</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>11,800</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>12,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>12,500</b> |      | 151,000   | 101,000   |               |      |           |           |



## Punte cilindriche

## Punte elicoidali, corte



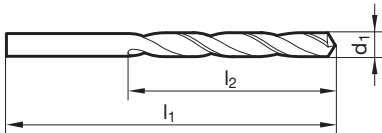
Catalogo n° 61158



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- specifiche per prof. di foro oltre 3xD



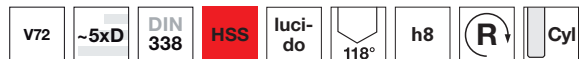
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,600    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 8,700    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,200    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,600    |      | 133,000  | 87,000   |
| 4,500    |      | 80,000   | 47,000   | 9,800    |      | 133,000  | 87,000   |
| 4,600    |      | 80,000   | 47,000   | 10,000   |      | 133,000  | 87,000   |
| 4,700    |      | 80,000   | 47,000   | 10,200   |      | 133,000  | 87,000   |
| 4,800    |      | 86,000   | 52,000   | 10,500   |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 11,000   |      | 142,000  | 94,000   |
| 5,000    |      | 86,000   | 52,000   | 11,500   |      | 142,000  | 94,000   |
| 5,100    |      | 86,000   | 52,000   | 11,800   |      | 142,000  | 94,000   |
| 5,200    |      | 86,000   | 52,000   | 12,000   |      | 151,000  | 101,000  |
| 5,300    |      | 86,000   | 52,000   | 12,500   |      | 151,000  | 101,000  |
| 5,400    |      | 93,000   | 57,000   | 13,000   |      | 151,000  | 101,000  |
| 5,500    |      | 93,000   | 57,000   |          |      |          |          |
| 5,600    |      | 93,000   | 57,000   |          |      |          |          |
| 5,700    |      | 93,000   | 57,000   |          |      |          |          |
| 5,800    |      | 93,000   | 57,000   |          |      |          |          |
| 5,900    |      | 93,000   | 57,000   |          |      |          |          |
| 6,000    |      | 93,000   | 57,000   |          |      |          |          |
| 6,100    |      | 101,000  | 63,000   |          |      |          |          |
| 6,200    |      | 101,000  | 63,000   |          |      |          |          |

## Punte cilindriche

### Punte elicoidali, corte



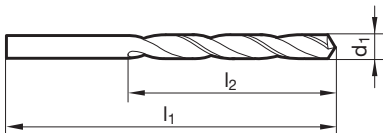
Catalogo n° 71128



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ● |   |   |

Parametri di lav.  
ind. a pag. 180

- spoglia sul cono tagliente
- ideali per torni



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 0,550    |      | 24,000   | 7,000    | 3,450    |      | 70,000   | 39,000   |
| 0,600    |      | 24,000   | 7,000    | 3,500    |      | 70,000   | 39,000   |
| 0,650    |      | 26,000   | 8,000    | 3,550    |      | 70,000   | 39,000   |
| 0,750    |      | 28,000   | 9,000    | 3,600    |      | 70,000   | 39,000   |
| 0,800    |      | 30,000   | 10,000   | 3,700    |      | 70,000   | 39,000   |
| 0,850    |      | 30,000   | 10,000   | 3,750    |      | 70,000   | 39,000   |
| 0,900    |      | 32,000   | 11,000   | 3,800    |      | 75,000   | 43,000   |
| 0,950    |      | 32,000   | 11,000   | 3,850    |      | 75,000   | 43,000   |
| 1,000    |      | 34,000   | 12,000   | 3,900    |      | 75,000   | 43,000   |
| 1,050    |      | 34,000   | 12,000   | 4,000    |      | 75,000   | 43,000   |
| 1,100    |      | 36,000   | 14,000   | 4,100    |      | 75,000   | 43,000   |
| 1,200    |      | 38,000   | 16,000   | 4,150    |      | 75,000   | 43,000   |
| 1,250    |      | 38,000   | 16,000   | 4,200    |      | 75,000   | 43,000   |
| 1,300    |      | 38,000   | 16,000   | 4,300    |      | 80,000   | 47,000   |
| 1,400    |      | 40,000   | 18,000   | 4,350    |      | 80,000   | 47,000   |
| 1,450    |      | 40,000   | 18,000   | 4,400    |      | 80,000   | 47,000   |
| 1,500    |      | 40,000   | 18,000   | 4,450    |      | 80,000   | 47,000   |
| 1,550    |      | 43,000   | 20,000   | 4,500    |      | 80,000   | 47,000   |
| 1,600    |      | 43,000   | 20,000   | 4,550    |      | 80,000   | 47,000   |
| 1,700    |      | 43,000   | 20,000   | 4,600    |      | 80,000   | 47,000   |
| 1,750    |      | 46,000   | 22,000   | 4,700    |      | 80,000   | 47,000   |
| 1,800    |      | 46,000   | 22,000   | 4,800    |      | 86,000   | 52,000   |
| 1,850    |      | 46,000   | 22,000   | 4,850    |      | 86,000   | 52,000   |
| 1,900    |      | 46,000   | 22,000   | 4,900    |      | 86,000   | 52,000   |
| 1,950    |      | 49,000   | 24,000   | 4,950    |      | 86,000   | 52,000   |
| 2,000    |      | 49,000   | 24,000   | 5,000    |      | 86,000   | 52,000   |
| 2,100    |      | 49,000   | 24,000   | 5,100    |      | 86,000   | 52,000   |
| 2,150    |      | 53,000   | 27,000   | 5,200    |      | 86,000   | 52,000   |
| 2,200    |      | 53,000   | 27,000   | 5,300    |      | 86,000   | 52,000   |
| 2,250    |      | 53,000   | 27,000   | 5,400    |      | 93,000   | 57,000   |
| 2,300    |      | 53,000   | 27,000   | 5,500    |      | 93,000   | 57,000   |
| 2,400    |      | 57,000   | 30,000   | 5,600    |      | 93,000   | 57,000   |
| 2,450    |      | 57,000   | 30,000   | 5,700    |      | 93,000   | 57,000   |
| 2,500    |      | 57,000   | 30,000   | 5,800    |      | 93,000   | 57,000   |
| 2,550    |      | 57,000   | 30,000   | 5,900    |      | 93,000   | 57,000   |
| 2,600    |      | 57,000   | 30,000   | 6,000    |      | 93,000   | 57,000   |
| 2,700    |      | 61,000   | 33,000   | 6,100    |      | 101,000  | 63,000   |
| 2,800    |      | 61,000   | 33,000   | 6,200    |      | 101,000  | 63,000   |
| 2,850    |      | 61,000   | 33,000   | 6,300    |      | 101,000  | 63,000   |
| 2,900    |      | 61,000   | 33,000   | 6,400    |      | 101,000  | 63,000   |
| 2,950    |      | 61,000   | 33,000   | 6,500    |      | 101,000  | 63,000   |
| 3,000    |      | 61,000   | 33,000   | 6,600    |      | 101,000  | 63,000   |
| 3,100    |      | 65,000   | 36,000   | 6,700    |      | 101,000  | 63,000   |
| 3,150    |      | 65,000   | 36,000   | 6,800    |      | 109,000  | 69,000   |
| 3,250    |      | 65,000   | 36,000   | 6,900    |      | 109,000  | 69,000   |
| 3,300    |      | 65,000   | 36,000   | 7,000    |      | 109,000  | 69,000   |
| 3,350    |      | 65,000   | 36,000   | 7,100    |      | 109,000  | 69,000   |
| 3,400    |      | 70,000   | 39,000   | 7,200    |      | 109,000  | 69,000   |

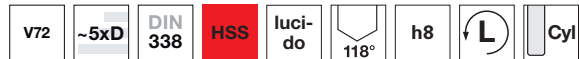
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 7,300    |      | 109,000  | 69,000   | 9,800    |      | 133,000  | 87,000   |
| 7,400    |      | 109,000  | 69,000   | 10,000   |      | 133,000  | 87,000   |
| 7,500    |      | 109,000  | 69,000   | 10,200   |      | 133,000  | 87,000   |
| 7,600    |      | 117,000  | 75,000   | 10,500   |      | 133,000  | 87,000   |
| 7,700    |      | 117,000  | 75,000   | 11,000   |      | 142,000  | 94,000   |
| 7,800    |      | 117,000  | 75,000   | 11,500   |      | 142,000  | 94,000   |
| 7,900    |      | 117,000  | 75,000   | 12,000   |      | 151,000  | 101,000  |
| 8,000    |      | 117,000  | 75,000   | 12,500   |      | 151,000  | 101,000  |
| 8,500    |      | 117,000  | 75,000   | 13,000   |      | 151,000  | 101,000  |
| 8,600    |      | 125,000  | 81,000   |          |      |          |          |
| 9,000    |      | 125,000  | 81,000   |          |      |          |          |
| 9,500    |      | 125,000  | 81,000   |          |      |          |          |

## Punte cilindriche

## Punte elicoidali, corte



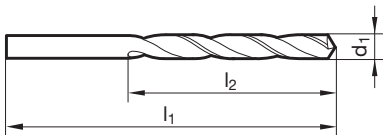
Catalogo n° 71129



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ● |   |   |

Parametri di lav.  
ind. a pag. 180

- spoglia sul cono tagliente
- ideali per torni



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 0,500    |      | 22,000   | 6,000    | 6,600    |       | 101,000  | 63,000   |
| 0,550    |      | 24,000   | 7,000    | 6,700    |       | 101,000  | 63,000   |
| 0,600    |      | 24,000   | 7,000    | 6,800    |       | 109,000  | 69,000   |
| 0,650    |      | 26,000   | 8,000    | 7,000    |       | 109,000  | 69,000   |
| 0,700    |      | 28,000   | 9,000    | 7,100    |       | 109,000  | 69,000   |
| 0,750    |      | 28,000   | 9,000    | 7,400    |       | 109,000  | 69,000   |
| 0,900    |      | 32,000   | 11,000   | 7,500    |       | 109,000  | 69,000   |
| 1,000    |      | 34,000   | 12,000   | 8,000    |       | 117,000  | 75,000   |
| 1,250    |      | 38,000   | 16,000   | 8,100    |       | 117,000  | 75,000   |
| 1,550    |      | 43,000   | 20,000   | 8,200    |       | 117,000  | 75,000   |
| 1,650    |      | 43,000   | 20,000   | 8,300    |       | 117,000  | 75,000   |
| 2,150    |      | 53,000   | 27,000   | 8,700    |       | 125,000  | 81,000   |
| 2,200    |      | 53,000   | 27,000   | 8,800    |       | 125,000  | 81,000   |
| 2,300    |      | 53,000   | 27,000   | 8,900    |       | 125,000  | 81,000   |
| 2,500    |      | 57,000   | 30,000   | 9,000    |       | 125,000  | 81,000   |
| 2,650    |      | 57,000   | 30,000   | 9,500    |       | 125,000  | 81,000   |
| 2,700    |      | 61,000   | 33,000   | 9,600    |       | 133,000  | 87,000   |
| 2,850    |      | 61,000   | 33,000   | 9,800    |       | 133,000  | 87,000   |
| 2,950    |      | 61,000   | 33,000   | 9,900    |       | 133,000  | 87,000   |
| 3,000    |      | 61,000   | 33,000   | 10,000   |       | 133,000  | 87,000   |
| 3,100    |      | 65,000   | 36,000   | 10,600   |       | 133,000  | 87,000   |
| 3,300    |      | 65,000   | 36,000   | 10,700   |       | 142,000  | 94,000   |
| 3,550    |      | 70,000   | 39,000   | 10,800   |       | 142,000  | 94,000   |
| 3,600    |      | 70,000   | 39,000   | 10,900   |       | 142,000  | 94,000   |
| 3,950    |      | 75,000   | 43,000   | 11,000   |       | 142,000  | 94,000   |
| 4,000    |      | 75,000   | 43,000   | 11,100   |       | 142,000  | 94,000   |
| 4,250    |      | 75,000   | 43,000   | 11,200   |       | 142,000  | 94,000   |
| 4,500    |      | 80,000   | 47,000   | 11,500   |       | 142,000  | 94,000   |
| 4,550    |      | 80,000   | 47,000   | 11,700   |       | 142,000  | 94,000   |
| 4,600    |      | 80,000   | 47,000   | 11,800   |       | 142,000  | 94,000   |
| 4,650    |      | 80,000   | 47,000   | 12,000   |       | 151,000  | 101,000  |
| 4,700    |      | 80,000   | 47,000   | 12,100   |       | 151,000  | 101,000  |
| 4,800    |      | 86,000   | 52,000   | 12,200   |       | 151,000  | 101,000  |
| 5,000    |      | 86,000   | 52,000   | 12,300   | 31/64 | 151,000  | 101,000  |
| 5,700    |      | 93,000   | 57,000   | 12,400   |       | 151,000  | 101,000  |
| 5,800    |      | 93,000   | 57,000   | 12,500   |       | 151,000  | 101,000  |
| 5,900    |      | 93,000   | 57,000   | 12,600   |       | 151,000  | 101,000  |
| 6,100    |      | 101,000  | 63,000   | 12,700   | 1/2   | 151,000  | 101,000  |
| 6,200    |      | 101,000  | 63,000   | 12,800   |       | 151,000  | 101,000  |
| 6,300    |      | 101,000  | 63,000   |          |       |          |          |
| 6,400    |      | 101,000  | 63,000   |          |       |          |          |
| 6,500    |      | 101,000  | 63,000   |          |       |          |          |

## Punte cilindriche

## Punte elicoidali, corte



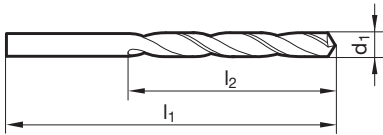
Catalogo n° 51158



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- specifiche per prof. di foro oltre 3xD



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |      | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,500    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,600    |      | 117,000  | 75,000   |
| 2,700    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 2,800    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,900    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 8,000    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,200    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,300    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,600    |      | 125,000  | 81,000   |
| 3,600    |      | 70,000   | 39,000   | 8,700    |      | 125,000  | 81,000   |
| 3,700    |      | 70,000   | 39,000   | 8,800    |      | 125,000  | 81,000   |
| 3,800    |      | 75,000   | 43,000   | 8,900    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 9,100    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,200    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,300    |      | 125,000  | 81,000   |
| 4,300    |      | 80,000   | 47,000   | 9,400    |      | 125,000  | 81,000   |
| 4,400    |      | 80,000   | 47,000   | 9,500    |      | 125,000  | 81,000   |
| 4,500    |      | 80,000   | 47,000   | 9,600    |      | 133,000  | 87,000   |
| 4,600    |      | 80,000   | 47,000   | 9,700    |      | 133,000  | 87,000   |
| 4,700    |      | 80,000   | 47,000   | 9,800    |      | 133,000  | 87,000   |
| 4,800    |      | 86,000   | 52,000   | 9,900    |      | 133,000  | 87,000   |
| 4,900    |      | 86,000   | 52,000   | 10,000   |      | 133,000  | 87,000   |
| 5,000    |      | 86,000   | 52,000   | 10,100   |      | 133,000  | 87,000   |
| 5,100    |      | 86,000   | 52,000   | 10,200   |      | 133,000  | 87,000   |
| 5,200    |      | 86,000   | 52,000   | 10,300   |      | 133,000  | 87,000   |
| 5,300    |      | 86,000   | 52,000   | 10,400   |      | 133,000  | 87,000   |
| 5,400    |      | 93,000   | 57,000   | 10,500   |      | 133,000  | 87,000   |
| 5,500    |      | 93,000   | 57,000   | 10,700   |      | 142,000  | 94,000   |
| 5,600    |      | 93,000   | 57,000   | 10,800   |      | 142,000  | 94,000   |
| 5,700    |      | 93,000   | 57,000   | 11,000   |      | 142,000  | 94,000   |

| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,200</b> |      | 142,000   | 94,000    | <b>13,000</b> |      | 151,000   | 101,000   |
| <b>11,500</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>11,700</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>11,800</b> |      | 142,000   | 94,000    |               |      |           |           |
| <b>12,000</b> |      | 151,000   | 101,000   |               |      |           |           |
| <b>12,500</b> |      | 151,000   | 101,000   |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, corte



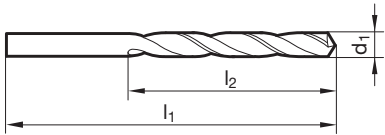
Catalogo n° 61232



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 184

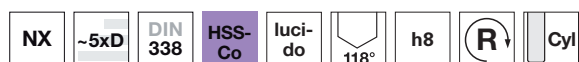
- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata
- specialmente per resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 34,000   | 12,000   | 5,800    |      | 93,000   | 57,000   |
| 1,100    |      | 36,000   | 14,000   | 5,900    |      | 93,000   | 57,000   |
| 1,200    |      | 38,000   | 16,000   | 6,000    |      | 93,000   | 57,000   |
| 1,300    |      | 38,000   | 16,000   | 6,100    |      | 101,000  | 63,000   |
| 1,400    |      | 40,000   | 18,000   | 6,200    |      | 101,000  | 63,000   |
| 1,500    |      | 40,000   | 18,000   | 6,300    |      | 101,000  | 63,000   |
| 1,600    |      | 43,000   | 20,000   | 6,400    |      | 101,000  | 63,000   |
| 1,700    |      | 43,000   | 20,000   | 6,500    |      | 101,000  | 63,000   |
| 1,800    |      | 46,000   | 22,000   | 6,600    |      | 101,000  | 63,000   |
| 1,900    |      | 46,000   | 22,000   | 6,700    |      | 101,000  | 63,000   |
| 2,000    |      | 49,000   | 24,000   | 6,800    |      | 109,000  | 69,000   |
| 2,100    |      | 49,000   | 24,000   | 6,900    |      | 109,000  | 69,000   |
| 2,200    |      | 53,000   | 27,000   | 7,000    |      | 109,000  | 69,000   |
| 2,300    |      | 53,000   | 27,000   | 7,100    |      | 109,000  | 69,000   |
| 2,400    |      | 57,000   | 30,000   | 7,200    |      | 109,000  | 69,000   |
| 2,500    |      | 57,000   | 30,000   | 7,300    |      | 109,000  | 69,000   |
| 2,600    |      | 57,000   | 30,000   | 7,400    |      | 109,000  | 69,000   |
| 2,700    |      | 61,000   | 33,000   | 7,500    |      | 109,000  | 69,000   |
| 2,800    |      | 61,000   | 33,000   | 7,600    |      | 117,000  | 75,000   |
| 2,900    |      | 61,000   | 33,000   | 7,700    |      | 117,000  | 75,000   |
| 3,000    |      | 61,000   | 33,000   | 7,800    |      | 117,000  | 75,000   |
| 3,100    |      | 65,000   | 36,000   | 7,900    |      | 117,000  | 75,000   |
| 3,200    |      | 65,000   | 36,000   | 8,000    |      | 117,000  | 75,000   |
| 3,300    |      | 65,000   | 36,000   | 8,100    |      | 117,000  | 75,000   |
| 3,400    |      | 70,000   | 39,000   | 8,200    |      | 117,000  | 75,000   |
| 3,500    |      | 70,000   | 39,000   | 8,300    |      | 117,000  | 75,000   |
| 3,600    |      | 70,000   | 39,000   | 8,400    |      | 117,000  | 75,000   |
| 3,700    |      | 70,000   | 39,000   | 8,500    |      | 117,000  | 75,000   |
| 3,800    |      | 75,000   | 43,000   | 8,800    |      | 125,000  | 81,000   |
| 3,900    |      | 75,000   | 43,000   | 9,000    |      | 125,000  | 81,000   |
| 4,000    |      | 75,000   | 43,000   | 9,300    |      | 125,000  | 81,000   |
| 4,100    |      | 75,000   | 43,000   | 9,500    |      | 125,000  | 81,000   |
| 4,200    |      | 75,000   | 43,000   | 9,800    |      | 133,000  | 87,000   |
| 4,300    |      | 80,000   | 47,000   | 10,000   |      | 133,000  | 87,000   |
| 4,400    |      | 80,000   | 47,000   | 10,200   |      | 133,000  | 87,000   |
| 4,500    |      | 80,000   | 47,000   | 10,500   |      | 133,000  | 87,000   |
| 4,600    |      | 80,000   | 47,000   | 11,000   |      | 142,000  | 94,000   |
| 4,700    |      | 80,000   | 47,000   | 11,500   |      | 142,000  | 94,000   |
| 4,800    |      | 86,000   | 52,000   | 12,000   |      | 151,000  | 101,000  |
| 4,900    |      | 86,000   | 52,000   | 12,500   |      | 151,000  | 101,000  |
| 5,000    |      | 86,000   | 52,000   | 13,000   |      | 151,000  | 101,000  |
| 5,100    |      | 86,000   | 52,000   | 13,500   |      | 160,000  | 108,000  |
| 5,200    |      | 86,000   | 52,000   | 14,000   |      | 160,000  | 108,000  |
| 5,300    |      | 86,000   | 52,000   |          |      |          |          |
| 5,400    |      | 93,000   | 57,000   |          |      |          |          |
| 5,500    |      | 93,000   | 57,000   |          |      |          |          |
| 5,600    |      | 93,000   | 57,000   |          |      |          |          |
| 5,700    |      | 93,000   | 57,000   |          |      |          |          |

## Punte cilindriche

### Serie di punte



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

- in scatole di plastica
- costituito da catalogo-Nr. 71221
- affilatura su piani

Catalogo n° 79012

| Codice | d1<br>mm | in progr.<br>mm | Pezzi per set |
|--------|----------|-----------------|---------------|
| 7,014  | 1,0-13,0 | 0,5             | 25            |
| 7,018  | 1,0-10,5 | 0,5             | 24            |

## Punte cilindriche

### Serie di punte



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

- in scatole di plastica
- costituito da catalogo-Nr. 71115
- spoglia sul cono tagliente
- lucida < 2,36 mm

Catalogo n° 78879

| Codice | d1<br>mm | in progr.<br>mm | Pezzi per set |
|--------|----------|-----------------|---------------|
| 0,011  | 1,0-5,0  | 0,1             | 41            |
| 0,012  | 5,1-10,0 | 0,1             | 50            |
| 0,013  | 1,0-10,0 | 0,5             | 19            |
| 0,014  | 1,0-13,0 | 0,5             | 25            |
| 0,015  | 1,0-5,9  | 0,1             | 50            |
| 0,016  | 6,0-10,0 | 0,1             | 41            |
| 0,018  | 1,0-10,5 | 0,5             | 24            |



## Punte cilindriche

### Serie di punte



|   |      |         |     |             |      |    |   |     |
|---|------|---------|-----|-------------|------|----|---|-----|
| N | ~5xD | DIN 338 | HSS | TiN - testa | 118° | h8 | R | Cyl |
| P | M    | K       | N   | S           | H    |    |   |     |
| ○ |      | ●       | ○   |             |      |    |   |     |

- in scatole di plastica
- costituito da catalogo-Nr. 61115
- spoglia sul cono tagliente

Catalogo n° 78880

| Codice | d1<br>mm | in progr.<br>mm | Pezzi per set |
|--------|----------|-----------------|---------------|
| 6,013  | 1,0-10,0 | 0,5             | 19            |
| 6,014  | 1,0-13,0 | 0,5             | 25            |

## Punte cilindriche

### Serie di punte



- livello di bachelite

Catalogo n° 78877

| Codice | d1<br>mm |
|--------|----------|
| 0,111  | 1,0-5,0  |
| 0,112  | 5,1-10,0 |
| 0,113  | 1,0-10,0 |
| 0,114  | 1,0-13,0 |

## Punte cilindriche

### Serie di punte



- cassetta di plastica

Catalogo n° 78878

| Codice | d1<br>mm | in progr.<br>mm | Pezzi per set |
|--------|----------|-----------------|---------------|
| 0,213  | 1,0-10,0 | 0,5             | 19            |
| 0,214  | 1,0-13,0 | 0,5             | 25            |
| 0,215  | 1,0-5,9  | 0,1             | 50            |
| 0,216  | 6,0-10,0 | 0,1             | 41            |

## Punte cilindriche

### Punte con codolo rinforzato



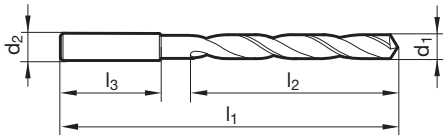
Catalogo n° 61120



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 178

- Assott. del noc.  $\geq \varnothing 2,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale
- Con codolo ridotto



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 2,000    | 3,000    | 44,000   | 12,000   | 28,000   |
| 2,100    | 3,000    | 44,000   | 12,000   | 28,000   |
| 2,200    | 3,000    | 45,000   | 13,000   | 28,000   |
| 2,300    | 3,000    | 45,000   | 13,000   | 28,000   |
| 2,400    | 3,000    | 46,000   | 14,000   | 28,000   |
| 2,500    | 3,000    | 46,000   | 14,000   | 28,000   |
| 2,600    | 3,000    | 46,000   | 14,000   | 28,000   |
| 2,700    | 3,000    | 48,000   | 16,000   | 28,000   |
| 2,800    | 3,000    | 48,000   | 16,000   | 28,000   |
| 2,900    | 3,000    | 48,000   | 16,000   | 28,000   |
| 3,000    | 3,000    | 48,000   | 16,000   | 28,000   |
| 3,100    | 4,000    | 50,000   | 18,000   | 28,000   |
| 3,200    | 4,000    | 50,000   | 18,000   | 28,000   |
| 3,300    | 4,000    | 50,000   | 18,000   | 28,000   |
| 3,400    | 4,000    | 52,000   | 20,000   | 28,000   |
| 3,500    | 4,000    | 52,000   | 20,000   | 28,000   |
| 3,600    | 4,000    | 52,000   | 20,000   | 28,000   |
| 3,700    | 4,000    | 52,000   | 20,000   | 28,000   |
| 3,800    | 4,000    | 54,000   | 22,000   | 28,000   |
| 3,900    | 4,000    | 54,000   | 22,000   | 28,000   |
| 4,000    | 4,000    | 54,000   | 22,000   | 28,000   |
| 4,100    | 6,000    | 66,000   | 22,000   | 36,000   |
| 4,200    | 6,000    | 66,000   | 22,000   | 36,000   |
| 4,300    | 6,000    | 68,000   | 24,000   | 36,000   |
| 4,400    | 6,000    | 68,000   | 24,000   | 36,000   |
| 4,500    | 6,000    | 68,000   | 24,000   | 36,000   |
| 4,600    | 6,000    | 68,000   | 24,000   | 36,000   |
| 4,700    | 6,000    | 68,000   | 24,000   | 36,000   |
| 4,800    | 6,000    | 70,000   | 26,000   | 36,000   |
| 4,900    | 6,000    | 70,000   | 26,000   | 36,000   |
| 5,000    | 6,000    | 70,000   | 26,000   | 36,000   |
| 5,100    | 6,000    | 70,000   | 26,000   | 36,000   |
| 5,200    | 6,000    | 70,000   | 26,000   | 36,000   |
| 5,300    | 6,000    | 70,000   | 26,000   | 36,000   |
| 5,400    | 6,000    | 72,000   | 28,000   | 36,000   |
| 5,500    | 6,000    | 72,000   | 28,000   | 36,000   |
| 5,600    | 6,000    | 72,000   | 28,000   | 36,000   |
| 5,700    | 6,000    | 72,000   | 28,000   | 36,000   |
| 5,800    | 6,000    | 72,000   | 28,000   | 36,000   |
| 5,900    | 6,000    | 72,000   | 28,000   | 36,000   |
| 6,000    | 6,000    | 72,000   | 28,000   | 36,000   |
| 6,100    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,200    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,300    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,400    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,500    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,600    | 8,000    | 75,000   | 31,000   | 36,000   |
| 6,700    | 8,000    | 75,000   | 31,000   | 36,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 6,800    | 8,000    | 78,000   | 34,000   | 36,000   |
| 6,900    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,000    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,100    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,200    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,300    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,400    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,500    | 8,000    | 78,000   | 34,000   | 36,000   |
| 7,600    | 8,000    | 81,000   | 37,000   | 36,000   |
| 7,700    | 8,000    | 81,000   | 37,000   | 36,000   |
| 7,800    | 8,000    | 81,000   | 37,000   | 36,000   |
| 7,900    | 8,000    | 81,000   | 37,000   | 36,000   |
| 8,000    | 8,000    | 81,000   | 37,000   | 36,000   |
| 8,100    | 10,000   | 87,000   | 37,000   | 40,000   |
| 8,200    | 10,000   | 87,000   | 37,000   | 40,000   |
| 8,300    | 10,000   | 87,000   | 37,000   | 40,000   |
| 8,400    | 10,000   | 87,000   | 37,000   | 40,000   |
| 8,500    | 10,000   | 87,000   | 37,000   | 40,000   |
| 8,600    | 10,000   | 91,000   | 40,000   | 40,000   |
| 8,700    | 10,000   | 91,000   | 40,000   | 40,000   |
| 8,800    | 10,000   | 91,000   | 40,000   | 40,000   |
| 8,900    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,000    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,100    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,200    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,300    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,400    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,500    | 10,000   | 91,000   | 40,000   | 40,000   |
| 9,600    | 10,000   | 93,000   | 43,000   | 40,000   |
| 9,700    | 10,000   | 93,000   | 43,000   | 40,000   |
| 9,800    | 10,000   | 93,000   | 43,000   | 40,000   |
| 9,900    | 10,000   | 93,000   | 43,000   | 40,000   |
| 10,000   | 10,000   | 93,000   | 43,000   | 40,000   |
| 10,100   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,200   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,300   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,400   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,500   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,600   | 12,000   | 100,000  | 43,000   | 45,000   |
| 10,700   | 12,000   | 104,000  | 47,000   | 45,000   |
| 10,800   | 12,000   | 104,000  | 47,000   | 45,000   |
| 10,900   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,000   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,100   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,200   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,300   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,400   | 12,000   | 104,000  | 47,000   | 45,000   |
| 11,500   | 12,000   | 104,000  | 47,000   | 45,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 11,600   | 12,000   | 104,000  | 47,000   | 45,000   | 14,500   | 16,000   | 116,000  | 56,000   | 48,000   |
| 11,700   | 12,000   | 104,000  | 47,000   | 45,000   | 15,000   | 16,000   | 116,000  | 56,000   | 48,000   |
| 11,800   | 12,000   | 104,000  | 47,000   | 45,000   | 15,500   | 16,000   | 118,000  | 58,000   | 48,000   |
| 11,900   | 12,000   | 108,000  | 51,000   | 45,000   | 16,000   | 16,000   | 118,000  | 58,000   | 48,000   |
| 12,000   | 12,000   | 108,000  | 51,000   | 45,000   | 16,500   | 20,000   | 126,000  | 60,000   | 50,000   |
| 12,100   | 16,000   | 111,000  | 51,000   | 48,000   | 17,000   | 20,000   | 126,000  | 60,000   | 50,000   |
| 12,200   | 16,000   | 111,000  | 51,000   | 48,000   | 17,500   | 20,000   | 128,000  | 62,000   | 50,000   |
| 12,300   | 16,000   | 111,000  | 51,000   | 48,000   | 18,000   | 20,000   | 128,000  | 62,000   | 50,000   |
| 12,400   | 16,000   | 111,000  | 51,000   | 48,000   | 18,500   | 20,000   | 130,000  | 64,000   | 50,000   |
| 12,500   | 16,000   | 111,000  | 51,000   | 48,000   | 19,000   | 20,000   | 130,000  | 64,000   | 50,000   |
| 12,600   | 16,000   | 111,000  | 51,000   | 48,000   | 19,500   | 20,000   | 132,000  | 66,000   | 50,000   |
| 12,700   | 16,000   | 111,000  | 51,000   | 48,000   | 20,000   | 20,000   | 132,000  | 66,000   | 50,000   |
| 12,800   | 16,000   | 111,000  | 51,000   | 48,000   |          |          |          |          |          |
| 12,900   | 16,000   | 111,000  | 51,000   | 48,000   |          |          |          |          |          |
| 13,000   | 16,000   | 111,000  | 51,000   | 48,000   |          |          |          |          |          |
| 13,100   | 16,000   | 111,000  | 51,000   | 48,000   |          |          |          |          |          |
| 13,500   | 16,000   | 114,000  | 54,000   | 48,000   |          |          |          |          |          |
| 14,000   | 16,000   | 114,000  | 54,000   | 48,000   |          |          |          |          |          |

## Punte cilindriche

### Punte con codolo rinforzato



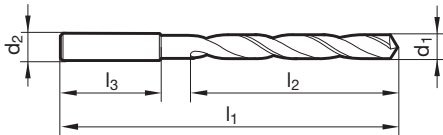
Catalogo n° 61121



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 2,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale
- Con codolo ridotto



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 2,000    | 3,000    | 56,000   | 24,000   | 28,000   | 6,800    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,100    | 3,000    | 56,000   | 24,000   | 28,000   | 6,900    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,200    | 3,000    | 59,000   | 27,000   | 28,000   | 7,000    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,300    | 3,000    | 59,000   | 27,000   | 28,000   | 7,100    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,400    | 3,000    | 62,000   | 30,000   | 28,000   | 7,200    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,500    | 3,000    | 62,000   | 30,000   | 28,000   | 7,300    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,600    | 3,000    | 62,000   | 30,000   | 28,000   | 7,400    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,700    | 3,000    | 65,000   | 33,000   | 28,000   | 7,500    | 8,000    | 113,000  | 69,000   | 36,000   |
| 2,800    | 3,000    | 65,000   | 33,000   | 28,000   | 7,600    | 8,000    | 119,000  | 75,000   | 36,000   |
| 2,900    | 3,000    | 65,000   | 33,000   | 28,000   | 7,700    | 8,000    | 119,000  | 75,000   | 36,000   |
| 3,000    | 3,000    | 65,000   | 33,000   | 28,000   | 7,800    | 8,000    | 119,000  | 75,000   | 36,000   |
| 3,100    | 4,000    | 68,000   | 36,000   | 28,000   | 7,900    | 8,000    | 119,000  | 75,000   | 36,000   |
| 3,200    | 4,000    | 68,000   | 36,000   | 28,000   | 8,000    | 8,000    | 119,000  | 75,000   | 36,000   |
| 3,300    | 4,000    | 68,000   | 36,000   | 28,000   | 8,100    | 10,000   | 125,000  | 75,000   | 40,000   |
| 3,400    | 4,000    | 71,000   | 39,000   | 28,000   | 8,200    | 10,000   | 125,000  | 75,000   | 40,000   |
| 3,500    | 4,000    | 71,000   | 39,000   | 28,000   | 8,300    | 10,000   | 125,000  | 75,000   | 40,000   |
| 3,600    | 4,000    | 71,000   | 39,000   | 28,000   | 8,400    | 10,000   | 125,000  | 75,000   | 40,000   |
| 3,700    | 4,000    | 71,000   | 39,000   | 28,000   | 8,500    | 10,000   | 125,000  | 75,000   | 40,000   |
| 3,800    | 4,000    | 75,000   | 43,000   | 28,000   | 8,600    | 10,000   | 131,000  | 81,000   | 40,000   |
| 3,900    | 4,000    | 75,000   | 43,000   | 28,000   | 8,700    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,000    | 4,000    | 75,000   | 43,000   | 28,000   | 8,800    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,100    | 6,000    | 87,000   | 43,000   | 36,000   | 8,900    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,200    | 6,000    | 87,000   | 43,000   | 36,000   | 9,000    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,300    | 6,000    | 91,000   | 47,000   | 36,000   | 9,100    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,400    | 6,000    | 91,000   | 47,000   | 36,000   | 9,200    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,500    | 6,000    | 91,000   | 47,000   | 36,000   | 9,300    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,600    | 6,000    | 91,000   | 47,000   | 36,000   | 9,400    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,700    | 6,000    | 91,000   | 47,000   | 36,000   | 9,500    | 10,000   | 131,000  | 81,000   | 40,000   |
| 4,800    | 6,000    | 96,000   | 52,000   | 36,000   | 9,600    | 10,000   | 137,000  | 87,000   | 40,000   |
| 4,900    | 6,000    | 96,000   | 52,000   | 36,000   | 9,700    | 10,000   | 137,000  | 87,000   | 40,000   |
| 5,000    | 6,000    | 96,000   | 52,000   | 36,000   | 9,800    | 10,000   | 137,000  | 87,000   | 40,000   |
| 5,100    | 6,000    | 96,000   | 52,000   | 36,000   | 10,000   | 10,000   | 137,000  | 87,000   | 40,000   |
| 5,200    | 6,000    | 96,000   | 52,000   | 36,000   | 10,100   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,300    | 6,000    | 96,000   | 52,000   | 36,000   | 10,200   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,400    | 6,000    | 101,000  | 57,000   | 36,000   | 10,300   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,500    | 6,000    | 101,000  | 57,000   | 36,000   | 10,400   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,600    | 6,000    | 101,000  | 57,000   | 36,000   | 10,500   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,700    | 6,000    | 101,000  | 57,000   | 36,000   | 10,600   | 12,000   | 144,000  | 87,000   | 45,000   |
| 5,800    | 6,000    | 101,000  | 57,000   | 36,000   | 10,700   | 12,000   | 151,000  | 94,000   | 45,000   |
| 5,900    | 6,000    | 101,000  | 57,000   | 36,000   | 10,800   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,000    | 6,000    | 101,000  | 57,000   | 36,000   | 10,900   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,100    | 8,000    | 107,000  | 63,000   | 36,000   | 11,000   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,200    | 8,000    | 107,000  | 63,000   | 36,000   | 11,100   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,300    | 8,000    | 107,000  | 63,000   | 36,000   | 11,200   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,400    | 8,000    | 107,000  | 63,000   | 36,000   | 11,300   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,500    | 8,000    | 107,000  | 63,000   | 36,000   | 11,400   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,600    | 8,000    | 107,000  | 63,000   | 36,000   | 11,500   | 12,000   | 151,000  | 94,000   | 45,000   |
| 6,700    | 8,000    | 107,000  | 63,000   | 36,000   | 11,600   | 12,000   | 151,000  | 94,000   | 45,000   |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 11,700   | 12,000   | 151,000  | 94,000   | 45,000   | 15,000   | 16,000   | 169,000  | 109,000  | 48,000   |
| 11,800   | 12,000   | 151,000  | 94,000   | 45,000   | 15,500   | 16,000   | 172,000  | 112,000  | 48,000   |
| 11,900   | 12,000   | 158,000  | 101,000  | 45,000   | 16,000   | 16,000   | 172,000  | 112,000  | 48,000   |
| 12,000   | 12,000   | 158,000  | 101,000  | 45,000   | 16,500   | 20,000   | 181,000  | 115,000  | 50,000   |
| 12,100   | 16,000   | 161,000  | 101,000  | 48,000   | 17,000   | 20,000   | 181,000  | 115,000  | 50,000   |
| 12,200   | 16,000   | 161,000  | 101,000  | 48,000   | 17,500   | 20,000   | 184,000  | 118,000  | 50,000   |
| 12,300   | 16,000   | 161,000  | 101,000  | 48,000   | 18,000   | 20,000   | 184,000  | 118,000  | 50,000   |
| 12,400   | 16,000   | 161,000  | 101,000  | 48,000   | 18,500   | 20,000   | 188,000  | 122,000  | 50,000   |
| 12,500   | 16,000   | 161,000  | 101,000  | 48,000   | 19,000   | 20,000   | 188,000  | 122,000  | 50,000   |
| 12,600   | 16,000   | 161,000  | 101,000  | 48,000   | 19,500   | 20,000   | 191,000  | 125,000  | 50,000   |
| 12,700   | 16,000   | 161,000  | 101,000  | 48,000   | 20,000   | 20,000   | 191,000  | 125,000  | 50,000   |
| 12,800   | 16,000   | 161,000  | 101,000  | 48,000   |          |          |          |          |          |
| 12,900   | 16,000   | 161,000  | 101,000  | 48,000   |          |          |          |          |          |
| 13,000   | 16,000   | 161,000  | 101,000  | 48,000   |          |          |          |          |          |
| 13,100   | 16,000   | 161,000  | 101,000  | 48,000   |          |          |          |          |          |
| 13,500   | 16,000   | 166,000  | 106,000  | 48,000   |          |          |          |          |          |
| 14,000   | 16,000   | 166,000  | 106,000  | 48,000   |          |          |          |          |          |
| 14,500   | 16,000   | 169,000  | 109,000  | 48,000   |          |          |          |          |          |

## Punte cilindriche

### Punte con codolo rinforzato



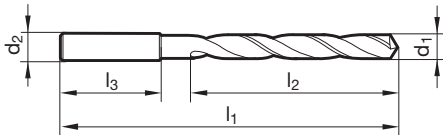
Catalogo n° 51132



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   | ○ |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del nocco.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- stabilità elevata
- specialmente per resistenza all'usura
- Con codolo ridotto



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 2,000    | 3,000    | 56,000   | 24,000   | 28,000   |
| 2,200    | 3,000    | 59,000   | 27,000   | 28,000   |
| 2,500    | 3,000    | 62,000   | 30,000   | 28,000   |
| 3,000    | 3,000    | 65,000   | 33,000   | 28,000   |
| 3,200    | 4,000    | 68,000   | 36,000   | 28,000   |
| 3,300    | 4,000    | 68,000   | 36,000   | 28,000   |
| 3,400    | 4,000    | 71,000   | 39,000   | 28,000   |
| 3,500    | 4,000    | 71,000   | 39,000   | 28,000   |
| 3,700    | 4,000    | 71,000   | 39,000   | 28,000   |
| 3,800    | 4,000    | 75,000   | 43,000   | 28,000   |
| 4,000    | 4,000    | 75,000   | 43,000   | 28,000   |
| 4,200    | 6,000    | 87,000   | 43,000   | 36,000   |
| 4,300    | 6,000    | 91,000   | 47,000   | 36,000   |
| 4,500    | 6,000    | 91,000   | 47,000   | 36,000   |
| 4,600    | 6,000    | 91,000   | 47,000   | 36,000   |
| 4,800    | 6,000    | 96,000   | 52,000   | 36,000   |
| 5,000    | 6,000    | 96,000   | 52,000   | 36,000   |
| 5,100    | 6,000    | 96,000   | 52,000   | 36,000   |
| 5,500    | 6,000    | 101,000  | 57,000   | 36,000   |
| 5,700    | 6,000    | 101,000  | 57,000   | 36,000   |
| 5,800    | 6,000    | 101,000  | 57,000   | 36,000   |
| 6,000    | 6,000    | 101,000  | 57,000   | 36,000   |
| 6,500    | 8,000    | 107,000  | 63,000   | 36,000   |
| 6,800    | 8,000    | 113,000  | 69,000   | 36,000   |

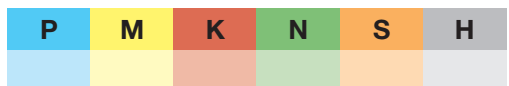
| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 6,900    | 8,000    | 113,000  | 69,000   | 36,000   |
| 7,000    | 8,000    | 113,000  | 69,000   | 36,000   |
| 7,400    | 8,000    | 113,000  | 69,000   | 36,000   |
| 7,500    | 8,000    | 113,000  | 69,000   | 36,000   |
| 7,800    | 8,000    | 119,000  | 75,000   | 36,000   |
| 8,000    | 8,000    | 119,000  | 75,000   | 36,000   |
| 8,500    | 10,000   | 125,000  | 75,000   | 40,000   |
| 8,600    | 10,000   | 131,000  | 81,000   | 40,000   |
| 8,800    | 10,000   | 131,000  | 81,000   | 40,000   |
| 9,000    | 10,000   | 131,000  | 81,000   | 40,000   |
| 9,300    | 10,000   | 131,000  | 81,000   | 40,000   |
| 9,500    | 10,000   | 131,000  | 81,000   | 40,000   |
| 10,000   | 10,000   | 137,000  | 87,000   | 40,000   |
| 10,200   | 12,000   | 144,000  | 87,000   | 45,000   |
| 10,300   | 12,000   | 144,000  | 87,000   | 45,000   |
| 10,500   | 12,000   | 144,000  | 87,000   | 45,000   |
| 11,000   | 12,000   | 151,000  | 94,000   | 45,000   |
| 11,200   | 12,000   | 151,000  | 94,000   | 45,000   |
| 11,500   | 12,000   | 151,000  | 94,000   | 45,000   |
| 12,000   | 12,000   | 158,000  | 101,000  | 45,000   |
| 12,100   | 14,000   | 161,000  | 101,000  | 45,000   |
| 12,500   | 14,000   | 161,000  | 101,000  | 45,000   |
| 13,000   | 14,000   | 161,000  | 101,000  | 45,000   |

## Punte cilindriche

### Punte corte, con codolo cil. Ø 16,0 mm

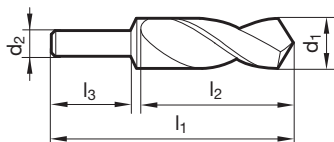


Catalogo n° 71168



Parametri di lav.  
ind. a pag. 176

- per modifiche, come, p. es.: correzione del diametro, rettifica gradino, rettifica sagoma
- senza punto di divisione, senza tagli



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 16,000   | 130,000  | 88,000   |
| 16,500   | 130,000  | 88,000   |
| 17,000   | 130,000  | 88,000   |
| 17,500   | 130,000  | 88,000   |
| 18,000   | 130,000  | 88,000   |
| 19,000   | 130,000  | 88,000   |
| 20,000   | 130,000  | 88,000   |
| 20,500   | 130,000  | 88,000   |
| 21,000   | 130,000  | 88,000   |
| 21,500   | 130,000  | 88,000   |
| 22,000   | 130,000  | 88,000   |
| 23,000   | 130,000  | 88,000   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 24,000   | 130,000  | 88,000   |
| 24,500   | 130,000  | 88,000   |
| 25,000   | 130,000  | 88,000   |
| 25,500   | 140,000  | 98,000   |
| 26,000   | 140,000  | 98,000   |
| 27,000   | 140,000  | 98,000   |
| 28,000   | 140,000  | 98,000   |
| 30,000   | 140,000  | 98,000   |

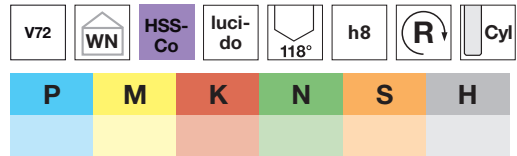


## Punte cilindriche

### Punte corte, con codolo cil. Ø 25,4 mm

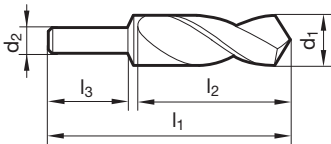


Catalogo n° 71169



Parametri di lav.  
ind. a pag. 176

- con codolo unificato
- per modifiche, come, p. es.: correzione del diametro, rettifica gradino, rettifica sagoma
- senza punto di divisione, senza tagli



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 28,000   | 140,000  | 93,000   |
| 30,000   | 140,000  | 93,000   |
| 32,000   | 140,000  | 93,000   |
| 36,000   | 140,000  | 93,000   |
| 40,000   | 140,000  | 93,000   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |

## Punte cilindriche

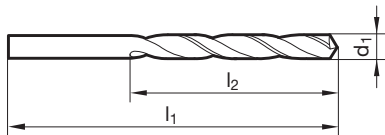
### Punte per foratura con bussola di guida



Catalogo n° 71130

|   |       |         |     |                   |      |                                   |   |     |
|---|-------|---------|-----|-------------------|------|-----------------------------------|---|-----|
| N | -10xD | DIN 339 | HSS | trattati a vapore | 118° | h8                                | R | Cyl |
| P | M     | K       | N   | S                 | H    | Parametri di lav. ind. a pag. 186 |   |     |
| • |       | •       | •   |                   |      |                                   |   |     |

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per forare con bussola di guida
- da  $\varnothing 3$  mm con supporto secondo DIN 1809
- lucida  $< 2,36$  mm



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 1,000    | 48,000   | 26,000   |
| 1,150    | 50,000   | 28,000   |
| 1,200    | 52,000   | 30,000   |
| 1,350    | 55,000   | 33,000   |
| 1,500    | 55,000   | 33,000   |
| 1,850    | 62,000   | 38,000   |
| 2,000    | 66,000   | 41,000   |
| 2,300    | 70,000   | 44,000   |
| 2,500    | 74,000   | 47,000   |
| 2,600    | 74,000   | 47,000   |
| 2,800    | 79,000   | 51,000   |
| 2,850    | 79,000   | 51,000   |
| 2,900    | 79,000   | 51,000   |
| 3,100    | 84,000   | 55,000   |
| 3,200    | 84,000   | 55,000   |
| 3,400    | 91,000   | 60,000   |
| 3,800    | 96,000   | 64,000   |
| 3,900    | 96,000   | 64,000   |
| 4,000    | 96,000   | 64,000   |
| 4,100    | 96,000   | 64,000   |
| 4,300    | 102,000  | 69,000   |
| 4,400    | 102,000  | 69,000   |
| 4,500    | 102,000  | 69,000   |
| 4,600    | 102,000  | 69,000   |
| 4,700    | 102,000  | 69,000   |
| 4,800    | 108,000  | 74,000   |
| 4,900    | 108,000  | 74,000   |
| 5,000    | 108,000  | 74,000   |
| 5,100    | 108,000  | 74,000   |
| 5,400    | 116,000  | 80,000   |
| 5,600    | 116,000  | 80,000   |
| 5,700    | 116,000  | 80,000   |
| 5,800    | 116,000  | 80,000   |
| 5,900    | 116,000  | 80,000   |
| 6,000    | 116,000  | 80,000   |
| 6,100    | 124,000  | 86,000   |
| 6,200    | 124,000  | 86,000   |
| 6,400    | 124,000  | 86,000   |
| 6,500    | 124,000  | 86,000   |
| 6,600    | 124,000  | 86,000   |
| 6,800    | 133,000  | 93,000   |
| 7,000    | 133,000  | 93,000   |
| 7,100    | 133,000  | 93,000   |
| 7,200    | 133,000  | 93,000   |
| 7,300    | 133,000  | 93,000   |
| 7,400    | 133,000  | 93,000   |
| 7,500    | 133,000  | 93,000   |
| 7,600    | 142,000  | 100,000  |

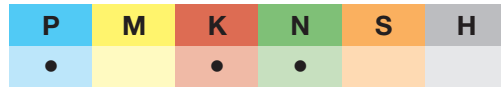
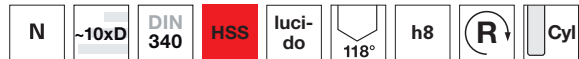
| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 7,700    | 142,000  | 100,000  |
| 7,800    | 142,000  | 100,000  |
| 7,900    | 142,000  | 100,000  |
| 8,000    | 142,000  | 100,000  |
| 8,100    | 142,000  | 100,000  |
| 8,200    | 142,000  | 100,000  |
| 8,300    | 142,000  | 100,000  |
| 8,500    | 142,000  | 100,000  |
| 8,700    | 151,000  | 107,000  |
| 8,800    | 151,000  | 107,000  |
| 9,000    | 151,000  | 107,000  |
| 9,100    | 151,000  | 107,000  |
| 9,200    | 151,000  | 107,000  |
| 9,300    | 151,000  | 107,000  |
| 9,400    | 151,000  | 107,000  |
| 9,500    | 151,000  | 107,000  |
| 9,600    | 162,000  | 116,000  |
| 9,900    | 162,000  | 116,000  |
| 10,000   | 162,000  | 116,000  |
| 10,200   | 162,000  | 116,000  |
| 10,500   | 162,000  | 116,000  |
| 11,000   | 173,000  | 125,000  |
| 11,200   | 173,000  | 125,000  |
| 11,800   | 173,000  | 125,000  |
| 12,000   | 184,000  | 134,000  |
| 12,200   | 184,000  | 134,000  |
| 12,500   | 184,000  | 134,000  |
| 13,000   | 184,000  | 134,000  |
| 13,500   | 194,000  | 142,000  |
| 14,000   | 194,000  | 142,000  |
| 14,500   | 202,000  | 147,000  |
| 15,000   | 202,000  | 147,000  |
| 16,000   | 211,000  | 153,000  |
| 17,000   | 218,000  | 159,000  |
| 17,500   | 226,000  | 165,000  |
| 18,000   | 226,000  | 165,000  |
| 18,500   | 234,000  | 171,000  |
| 19,000   | 234,000  | 171,000  |
| 19,200   | 242,000  | 177,000  |
| 19,500   | 242,000  | 177,000  |

## Punte cilindriche

### Punte elicoidali, lunghe

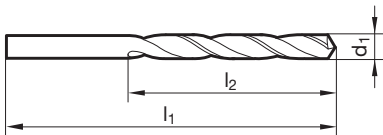


Catalogo n° 71136



Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 0,500    |      | 32,000   | 12,000   | 5,400    |      | 139,000  | 91,000   |
| 0,600    |      | 35,000   | 15,000   | 5,500    |      | 139,000  | 91,000   |
| 0,700    |      | 42,000   | 21,000   | 5,600    |      | 139,000  | 91,000   |
| 0,800    |      | 46,000   | 25,000   | 5,700    |      | 139,000  | 91,000   |
| 0,900    |      | 51,000   | 29,000   | 5,800    |      | 139,000  | 91,000   |
| 1,000    |      | 56,000   | 33,000   | 5,900    |      | 139,000  | 91,000   |
| 1,050    |      | 56,000   | 33,000   | 6,000    |      | 139,000  | 91,000   |
| 1,100    |      | 60,000   | 37,000   | 6,200    |      | 148,000  | 97,000   |
| 1,200    |      | 65,000   | 41,000   | 6,300    |      | 148,000  | 97,000   |
| 1,250    |      | 65,000   | 41,000   | 6,400    |      | 148,000  | 97,000   |
| 1,300    |      | 65,000   | 41,000   | 6,500    |      | 148,000  | 97,000   |
| 1,500    |      | 70,000   | 45,000   | 6,600    |      | 148,000  | 97,000   |
| 1,550    |      | 76,000   | 50,000   | 6,700    |      | 148,000  | 97,000   |
| 1,600    |      | 76,000   | 50,000   | 6,800    |      | 156,000  | 102,000  |
| 1,650    |      | 76,000   | 50,000   | 6,900    |      | 156,000  | 102,000  |
| 1,800    |      | 80,000   | 53,000   | 7,000    |      | 156,000  | 102,000  |
| 1,850    |      | 80,000   | 53,000   | 7,100    |      | 156,000  | 102,000  |
| 1,900    |      | 80,000   | 53,000   | 7,500    |      | 156,000  | 102,000  |
| 1,950    |      | 85,000   | 56,000   | 7,600    |      | 165,000  | 109,000  |
| 2,000    |      | 85,000   | 56,000   | 8,000    |      | 165,000  | 109,000  |
| 2,400    |      | 95,000   | 62,000   | 8,100    |      | 165,000  | 109,000  |
| 2,500    |      | 95,000   | 62,000   | 8,200    |      | 165,000  | 109,000  |
| 2,600    |      | 95,000   | 62,000   | 8,500    |      | 165,000  | 109,000  |
| 2,700    |      | 100,000  | 66,000   | 8,700    |      | 175,000  | 115,000  |
| 2,900    |      | 100,000  | 66,000   | 8,800    |      | 175,000  | 115,000  |
| 3,000    |      | 100,000  | 66,000   | 8,900    |      | 175,000  | 115,000  |
| 3,200    |      | 106,000  | 69,000   | 9,000    |      | 175,000  | 115,000  |
| 3,300    |      | 106,000  | 69,000   | 9,100    |      | 175,000  | 115,000  |
| 3,400    |      | 112,000  | 73,000   | 9,200    |      | 175,000  | 115,000  |
| 3,500    |      | 112,000  | 73,000   | 9,300    |      | 175,000  | 115,000  |
| 3,600    |      | 112,000  | 73,000   | 9,500    |      | 175,000  | 115,000  |
| 3,700    |      | 112,000  | 73,000   | 9,600    |      | 184,000  | 121,000  |
| 3,800    |      | 119,000  | 78,000   | 9,700    |      | 184,000  | 121,000  |
| 3,900    |      | 119,000  | 78,000   | 9,900    |      | 184,000  | 121,000  |
| 4,000    |      | 119,000  | 78,000   | 10,000   |      | 184,000  | 121,000  |
| 4,100    |      | 119,000  | 78,000   | 10,200   |      | 184,000  | 121,000  |
| 4,200    |      | 119,000  | 78,000   | 10,500   |      | 184,000  | 121,000  |
| 4,300    |      | 126,000  | 82,000   | 11,000   |      | 195,000  | 128,000  |
| 4,400    |      | 126,000  | 82,000   | 11,500   |      | 195,000  | 128,000  |
| 4,500    |      | 126,000  | 82,000   | 12,000   |      | 205,000  | 134,000  |
| 4,600    |      | 126,000  | 82,000   | 12,500   |      | 205,000  | 134,000  |
| 4,700    |      | 126,000  | 82,000   | 13,000   |      | 205,000  | 134,000  |
| 4,800    |      | 132,000  | 87,000   | 13,500   |      | 214,000  | 140,000  |
| 4,900    |      | 132,000  | 87,000   | 14,500   |      | 220,000  | 144,000  |
| 5,000    |      | 132,000  | 87,000   | 15,000   |      | 220,000  | 144,000  |
| 5,100    |      | 132,000  | 87,000   | 15,500   |      | 227,000  | 149,000  |
| 5,200    |      | 132,000  | 87,000   | 16,000   |      | 227,000  | 149,000  |
| 5,300    |      | 132,000  | 87,000   | 16,500   |      | 235,000  | 154,000  |

## Punte cilindriche

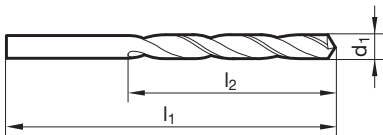
### Punte elicoidali, lunghe



Catalogo n° 71135

|   |       |         |     |                   |      |                                   |   |     |
|---|-------|---------|-----|-------------------|------|-----------------------------------|---|-----|
| N | -10xD | DIN 340 | HSS | trattati a vapore | 118° | h8                                | R | Cyl |
| P | M     | K       | N   | S                 | H    | Parametri di lav. ind. a pag. 186 |   |     |
| • |       | •       | •   |                   |      |                                   |   |     |

- Assott. del noc.  $\geq \varnothing 1,800$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida
- lucida  $< 2,36$  mm



| d1    |      | l1      | l2     | d1     |      | l1      | l2      |
|-------|------|---------|--------|--------|------|---------|---------|
| mm    | inch | mm      | mm     | mm     | inch | mm      | mm      |
| 1,800 |      | 80,000  | 53,000 | 6,250  |      | 148,000 | 97,000  |
| 2,000 |      | 85,000  | 56,000 | 6,300  |      | 148,000 | 97,000  |
| 2,050 |      | 85,000  | 56,000 | 6,400  |      | 148,000 | 97,000  |
| 2,100 |      | 85,000  | 56,000 | 6,500  |      | 148,000 | 97,000  |
| 2,300 |      | 90,000  | 59,000 | 6,600  |      | 148,000 | 97,000  |
| 2,400 |      | 95,000  | 62,000 | 6,700  |      | 148,000 | 97,000  |
| 2,500 |      | 95,000  | 62,000 | 6,800  |      | 156,000 | 102,000 |
| 2,600 |      | 95,000  | 62,000 | 6,900  |      | 156,000 | 102,000 |
| 2,800 |      | 100,000 | 66,000 | 7,000  |      | 156,000 | 102,000 |
| 3,000 |      | 100,000 | 66,000 | 7,100  |      | 156,000 | 102,000 |
| 3,050 |      | 106,000 | 69,000 | 7,200  |      | 156,000 | 102,000 |
| 3,100 |      | 106,000 | 69,000 | 7,250  |      | 156,000 | 102,000 |
| 3,200 |      | 106,000 | 69,000 | 7,300  |      | 156,000 | 102,000 |
| 3,250 |      | 106,000 | 69,000 | 7,400  |      | 156,000 | 102,000 |
| 3,300 |      | 106,000 | 69,000 | 7,500  |      | 156,000 | 102,000 |
| 3,400 |      | 112,000 | 73,000 | 7,600  |      | 165,000 | 109,000 |
| 3,500 |      | 112,000 | 73,000 | 7,700  |      | 165,000 | 109,000 |
| 3,550 |      | 112,000 | 73,000 | 7,800  |      | 165,000 | 109,000 |
| 3,600 |      | 112,000 | 73,000 | 7,900  |      | 165,000 | 109,000 |
| 3,700 |      | 112,000 | 73,000 | 8,000  |      | 165,000 | 109,000 |
| 3,800 |      | 119,000 | 78,000 | 8,100  |      | 165,000 | 109,000 |
| 3,850 |      | 119,000 | 78,000 | 8,200  |      | 165,000 | 109,000 |
| 3,900 |      | 119,000 | 78,000 | 8,300  |      | 165,000 | 109,000 |
| 4,000 |      | 119,000 | 78,000 | 8,400  |      | 165,000 | 109,000 |
| 4,100 |      | 119,000 | 78,000 | 8,500  |      | 165,000 | 109,000 |
| 4,200 |      | 119,000 | 78,000 | 8,600  |      | 175,000 | 115,000 |
| 4,250 |      | 119,000 | 78,000 | 8,700  |      | 175,000 | 115,000 |
| 4,300 |      | 126,000 | 82,000 | 8,750  |      | 175,000 | 115,000 |
| 4,500 |      | 126,000 | 82,000 | 8,800  |      | 175,000 | 115,000 |
| 4,600 |      | 126,000 | 82,000 | 8,900  |      | 175,000 | 115,000 |
| 4,650 |      | 126,000 | 82,000 | 9,000  |      | 175,000 | 115,000 |
| 4,750 |      | 126,000 | 82,000 | 9,100  |      | 175,000 | 115,000 |
| 4,800 |      | 132,000 | 87,000 | 9,200  |      | 175,000 | 115,000 |
| 4,850 |      | 132,000 | 87,000 | 9,300  |      | 175,000 | 115,000 |
| 4,900 |      | 132,000 | 87,000 | 9,400  |      | 175,000 | 115,000 |
| 5,000 |      | 132,000 | 87,000 | 9,500  |      | 175,000 | 115,000 |
| 5,100 |      | 132,000 | 87,000 | 9,600  |      | 184,000 | 121,000 |
| 5,200 |      | 132,000 | 87,000 | 9,700  |      | 184,000 | 121,000 |
| 5,300 |      | 132,000 | 87,000 | 9,800  |      | 184,000 | 121,000 |
| 5,400 |      | 139,000 | 91,000 | 9,900  |      | 184,000 | 121,000 |
| 5,500 |      | 139,000 | 91,000 | 10,000 |      | 184,000 | 121,000 |
| 5,600 |      | 139,000 | 91,000 | 10,100 |      | 184,000 | 121,000 |
| 5,700 |      | 139,000 | 91,000 | 10,200 |      | 184,000 | 121,000 |
| 5,800 |      | 139,000 | 91,000 | 10,250 |      | 184,000 | 121,000 |
| 5,900 |      | 139,000 | 91,000 | 10,300 |      | 184,000 | 121,000 |
| 6,000 |      | 139,000 | 91,000 | 10,400 |      | 184,000 | 121,000 |
| 6,100 |      | 148,000 | 97,000 | 10,500 |      | 184,000 | 121,000 |
| 6,200 |      | 148,000 | 97,000 | 10,600 |      | 184,000 | 121,000 |

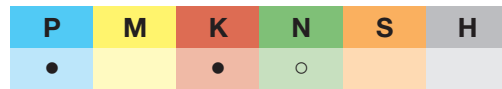
| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 10,700   |      | 195,000  | 128,000  | 15,000   |      | 220,000  | 144,000  |
| 10,800   |      | 195,000  | 128,000  | 15,500   |      | 227,000  | 149,000  |
| 10,900   |      | 195,000  | 128,000  | 16,000   |      | 227,000  | 149,000  |
| 11,000   |      | 195,000  | 128,000  | 17,000   |      | 235,000  | 154,000  |
| 11,500   |      | 195,000  | 128,000  | 18,000   |      | 241,000  | 158,000  |
| 11,750   |      | 195,000  | 128,000  | 20,000   |      | 254,000  | 166,000  |
| 12,000   |      | 205,000  | 134,000  |          |      |          |          |
| 12,500   |      | 205,000  | 134,000  |          |      |          |          |
| 13,000   |      | 205,000  | 134,000  |          |      |          |          |
| 13,500   |      | 214,000  | 140,000  |          |      |          |          |
| 14,000   |      | 214,000  | 140,000  |          |      |          |          |
| 14,500   |      | 220,000  | 144,000  |          |      |          |          |

## Punte cilindriche

### Punte elicoidali, lunghe

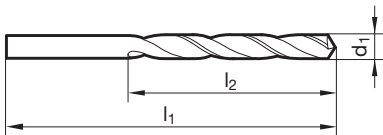


Catalogo n° 61136



Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 56,000   | 33,000   |
| 1,100    |      | 60,000   | 37,000   |
| 1,200    |      | 65,000   | 41,000   |
| 1,300    |      | 65,000   | 41,000   |
| 1,400    |      | 70,000   | 45,000   |
| 1,500    |      | 70,000   | 45,000   |
| 1,600    |      | 76,000   | 50,000   |
| 1,700    |      | 76,000   | 50,000   |
| 1,800    |      | 80,000   | 53,000   |
| 1,900    |      | 80,000   | 53,000   |
| 2,000    |      | 85,000   | 56,000   |
| 2,100    |      | 85,000   | 56,000   |
| 2,200    |      | 90,000   | 59,000   |
| 2,300    |      | 90,000   | 59,000   |
| 2,400    |      | 95,000   | 62,000   |
| 2,500    |      | 95,000   | 62,000   |
| 2,600    |      | 95,000   | 62,000   |
| 2,700    |      | 100,000  | 66,000   |
| 2,800    |      | 100,000  | 66,000   |
| 2,900    |      | 100,000  | 66,000   |
| 3,000    |      | 100,000  | 66,000   |
| 3,100    |      | 106,000  | 69,000   |
| 3,200    |      | 106,000  | 69,000   |
| 3,300    |      | 106,000  | 69,000   |
| 3,400    |      | 112,000  | 73,000   |
| 3,500    |      | 112,000  | 73,000   |
| 3,600    |      | 112,000  | 73,000   |
| 3,700    |      | 112,000  | 73,000   |
| 3,800    |      | 119,000  | 78,000   |
| 3,900    |      | 119,000  | 78,000   |
| 4,000    |      | 119,000  | 78,000   |
| 4,100    |      | 119,000  | 78,000   |
| 4,200    |      | 119,000  | 78,000   |
| 4,300    |      | 126,000  | 82,000   |
| 4,400    |      | 126,000  | 82,000   |
| 4,500    |      | 126,000  | 82,000   |
| 4,600    |      | 126,000  | 82,000   |
| 4,700    |      | 126,000  | 82,000   |
| 4,800    |      | 132,000  | 87,000   |
| 4,900    |      | 132,000  | 87,000   |
| 5,000    |      | 132,000  | 87,000   |
| 5,100    |      | 132,000  | 87,000   |
| 5,200    |      | 132,000  | 87,000   |
| 5,300    |      | 132,000  | 87,000   |
| 5,400    |      | 139,000  | 91,000   |
| 5,500    |      | 139,000  | 91,000   |
| 5,600    |      | 139,000  | 91,000   |
| 5,700    |      | 139,000  | 91,000   |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,800    |      | 139,000  | 91,000   |
| 5,900    |      | 139,000  | 91,000   |
| 6,000    |      | 139,000  | 91,000   |
| 6,100    |      | 148,000  | 97,000   |
| 6,200    |      | 148,000  | 97,000   |
| 6,300    |      | 148,000  | 97,000   |
| 6,400    |      | 148,000  | 97,000   |
| 6,500    |      | 148,000  | 97,000   |
| 6,600    |      | 148,000  | 97,000   |
| 6,700    |      | 148,000  | 97,000   |
| 6,800    |      | 156,000  | 102,000  |
| 6,900    |      | 156,000  | 102,000  |
| 7,000    |      | 156,000  | 102,000  |
| 7,100    |      | 156,000  | 102,000  |
| 7,200    |      | 156,000  | 102,000  |
| 7,300    |      | 156,000  | 102,000  |
| 7,400    |      | 156,000  | 102,000  |
| 7,500    |      | 156,000  | 102,000  |
| 7,600    |      | 165,000  | 109,000  |
| 7,700    |      | 165,000  | 109,000  |
| 7,800    |      | 165,000  | 109,000  |
| 7,900    |      | 165,000  | 109,000  |
| 8,000    |      | 165,000  | 109,000  |
| 8,100    |      | 165,000  | 109,000  |
| 8,200    |      | 165,000  | 109,000  |
| 8,300    |      | 165,000  | 109,000  |
| 8,400    |      | 165,000  | 109,000  |
| 8,500    |      | 165,000  | 109,000  |
| 8,600    |      | 175,000  | 115,000  |
| 8,700    |      | 175,000  | 115,000  |
| 8,800    |      | 175,000  | 115,000  |
| 8,900    |      | 175,000  | 115,000  |
| 9,000    |      | 175,000  | 115,000  |
| 9,100    |      | 175,000  | 115,000  |
| 9,200    |      | 175,000  | 115,000  |
| 9,300    |      | 175,000  | 115,000  |
| 9,400    |      | 175,000  | 115,000  |
| 9,500    |      | 175,000  | 115,000  |
| 9,600    |      | 184,000  | 121,000  |
| 9,700    |      | 184,000  | 121,000  |
| 9,800    |      | 184,000  | 121,000  |
| 9,900    |      | 184,000  | 121,000  |
| 10,000   |      | 184,000  | 121,000  |
| 10,200   |      | 184,000  | 121,000  |
| 10,500   |      | 184,000  | 121,000  |
| 10,800   |      | 195,000  | 128,000  |
| 11,000   |      | 195,000  | 128,000  |
| 11,500   |      | 195,000  | 128,000  |

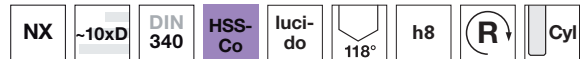
| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>12,000</b> |      | 205,000   | 134,000   | <b>15,000</b> |      | 220,000   | 144,000   |
| <b>12,500</b> |      | 205,000   | 134,000   | <b>15,500</b> |      | 227,000   | 149,000   |
| <b>13,000</b> |      | 205,000   | 134,000   | <b>16,000</b> |      | 227,000   | 149,000   |
| <b>13,500</b> |      | 214,000   | 140,000   |               |      |           |           |
| <b>14,000</b> |      | 214,000   | 140,000   |               |      |           |           |
| <b>14,500</b> |      | 220,000   | 144,000   |               |      |           |           |

## Punte cilindriche

## Punte elicoidali, lunghe



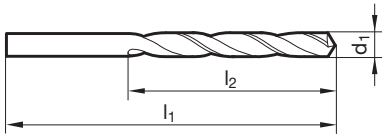
Catalogo n° 71222



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 56,000   | 33,000   | 5,800    |      | 139,000  | 91,000   |
| 1,100    |      | 60,000   | 37,000   | 5,900    |      | 139,000  | 91,000   |
| 1,200    |      | 65,000   | 41,000   | 6,000    |      | 139,000  | 91,000   |
| 1,300    |      | 65,000   | 41,000   | 6,100    |      | 148,000  | 97,000   |
| 1,400    |      | 70,000   | 45,000   | 6,200    |      | 148,000  | 97,000   |
| 1,500    |      | 70,000   | 45,000   | 6,300    |      | 148,000  | 97,000   |
| 1,600    |      | 76,000   | 50,000   | 6,400    |      | 148,000  | 97,000   |
| 1,700    |      | 76,000   | 50,000   | 6,500    |      | 148,000  | 97,000   |
| 1,800    |      | 80,000   | 53,000   | 6,600    |      | 148,000  | 97,000   |
| 1,900    |      | 80,000   | 53,000   | 6,700    |      | 148,000  | 97,000   |
| 2,000    |      | 85,000   | 56,000   | 6,800    |      | 156,000  | 102,000  |
| 2,100    |      | 85,000   | 56,000   | 6,900    |      | 156,000  | 102,000  |
| 2,200    |      | 90,000   | 59,000   | 7,000    |      | 156,000  | 102,000  |
| 2,300    |      | 90,000   | 59,000   | 7,100    |      | 156,000  | 102,000  |
| 2,400    |      | 95,000   | 62,000   | 7,200    |      | 156,000  | 102,000  |
| 2,500    |      | 95,000   | 62,000   | 7,300    |      | 156,000  | 102,000  |
| 2,600    |      | 95,000   | 62,000   | 7,400    |      | 156,000  | 102,000  |
| 2,700    |      | 100,000  | 66,000   | 7,500    |      | 156,000  | 102,000  |
| 2,800    |      | 100,000  | 66,000   | 7,600    |      | 165,000  | 109,000  |
| 2,900    |      | 100,000  | 66,000   | 7,700    |      | 165,000  | 109,000  |
| 3,000    |      | 100,000  | 66,000   | 7,800    |      | 165,000  | 109,000  |
| 3,100    |      | 106,000  | 69,000   | 7,900    |      | 165,000  | 109,000  |
| 3,200    |      | 106,000  | 69,000   | 8,000    |      | 165,000  | 109,000  |
| 3,300    |      | 106,000  | 69,000   | 8,100    |      | 165,000  | 109,000  |
| 3,400    |      | 112,000  | 73,000   | 8,200    |      | 165,000  | 109,000  |
| 3,500    |      | 112,000  | 73,000   | 8,300    |      | 165,000  | 109,000  |
| 3,600    |      | 112,000  | 73,000   | 8,400    |      | 165,000  | 109,000  |
| 3,700    |      | 112,000  | 73,000   | 8,500    |      | 165,000  | 109,000  |
| 3,800    |      | 119,000  | 78,000   | 8,600    |      | 175,000  | 115,000  |
| 3,900    |      | 119,000  | 78,000   | 8,700    |      | 175,000  | 115,000  |
| 4,000    |      | 119,000  | 78,000   | 8,800    |      | 175,000  | 115,000  |
| 4,100    |      | 119,000  | 78,000   | 8,900    |      | 175,000  | 115,000  |
| 4,200    |      | 119,000  | 78,000   | 9,000    |      | 175,000  | 115,000  |
| 4,300    |      | 126,000  | 82,000   | 9,100    |      | 175,000  | 115,000  |
| 4,400    |      | 126,000  | 82,000   | 9,200    |      | 175,000  | 115,000  |
| 4,500    |      | 126,000  | 82,000   | 9,300    |      | 175,000  | 115,000  |
| 4,600    |      | 126,000  | 82,000   | 9,400    |      | 175,000  | 115,000  |
| 4,700    |      | 126,000  | 82,000   | 9,500    |      | 175,000  | 115,000  |
| 4,800    |      | 132,000  | 87,000   | 9,600    |      | 184,000  | 121,000  |
| 4,900    |      | 132,000  | 87,000   | 9,700    |      | 184,000  | 121,000  |
| 5,000    |      | 132,000  | 87,000   | 9,800    |      | 184,000  | 121,000  |
| 5,100    |      | 132,000  | 87,000   | 9,900    |      | 184,000  | 121,000  |
| 5,200    |      | 132,000  | 87,000   | 10,000   |      | 184,000  | 121,000  |
| 5,300    |      | 132,000  | 87,000   | 10,100   |      | 184,000  | 121,000  |
| 5,400    |      | 139,000  | 91,000   | 10,200   |      | 184,000  | 121,000  |
| 5,500    |      | 139,000  | 91,000   | 10,300   |      | 184,000  | 121,000  |
| 5,600    |      | 139,000  | 91,000   | 10,400   |      | 184,000  | 121,000  |
| 5,700    |      | 139,000  | 91,000   | 10,500   |      | 184,000  | 121,000  |



| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 195,000   | 128,000   | <b>14,000</b> |      | 214,000   | 140,000   |
| <b>11,500</b> |      | 195,000   | 128,000   |               |      |           |           |
| <b>12,000</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>12,500</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>13,000</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>13,500</b> |      | 214,000   | 140,000   |               |      |           |           |

## Punte cilindriche

## Punte elicoidali, lunghe



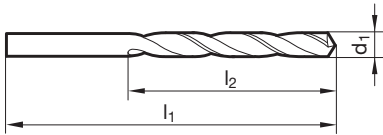
Catalogo n° 61222



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 184

- Assott. del noc.  $\geq \varnothing 1,000$
- affilatura su piani
- è necess. un limitato momento torcente
- è necess. una limitata forza di avanz.
- massima resistenza all'usura
- uso universale



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,000    |      | 56,000   | 33,000   | 5,800    |      | 139,000  | 91,000   |
| 1,100    |      | 60,000   | 37,000   | 5,900    |      | 139,000  | 91,000   |
| 1,200    |      | 65,000   | 41,000   | 6,000    |      | 139,000  | 91,000   |
| 1,300    |      | 65,000   | 41,000   | 6,100    |      | 148,000  | 97,000   |
| 1,400    |      | 70,000   | 45,000   | 6,200    |      | 148,000  | 97,000   |
| 1,500    |      | 70,000   | 45,000   | 6,300    |      | 148,000  | 97,000   |
| 1,600    |      | 76,000   | 50,000   | 6,400    |      | 148,000  | 97,000   |
| 1,700    |      | 76,000   | 50,000   | 6,500    |      | 148,000  | 97,000   |
| 1,800    |      | 80,000   | 53,000   | 6,600    |      | 148,000  | 97,000   |
| 1,900    |      | 80,000   | 53,000   | 6,700    |      | 148,000  | 97,000   |
| 2,000    |      | 85,000   | 56,000   | 6,800    |      | 156,000  | 102,000  |
| 2,100    |      | 85,000   | 56,000   | 6,900    |      | 156,000  | 102,000  |
| 2,200    |      | 90,000   | 59,000   | 7,000    |      | 156,000  | 102,000  |
| 2,300    |      | 90,000   | 59,000   | 7,100    |      | 156,000  | 102,000  |
| 2,400    |      | 95,000   | 62,000   | 7,200    |      | 156,000  | 102,000  |
| 2,500    |      | 95,000   | 62,000   | 7,300    |      | 156,000  | 102,000  |
| 2,600    |      | 95,000   | 62,000   | 7,400    |      | 156,000  | 102,000  |
| 2,700    |      | 100,000  | 66,000   | 7,500    |      | 156,000  | 102,000  |
| 2,800    |      | 100,000  | 66,000   | 7,600    |      | 165,000  | 109,000  |
| 2,900    |      | 100,000  | 66,000   | 7,700    |      | 165,000  | 109,000  |
| 3,000    |      | 100,000  | 66,000   | 7,800    |      | 165,000  | 109,000  |
| 3,100    |      | 106,000  | 69,000   | 7,900    |      | 165,000  | 109,000  |
| 3,200    |      | 106,000  | 69,000   | 8,000    |      | 165,000  | 109,000  |
| 3,300    |      | 106,000  | 69,000   | 8,100    |      | 165,000  | 109,000  |
| 3,400    |      | 112,000  | 73,000   | 8,200    |      | 165,000  | 109,000  |
| 3,500    |      | 112,000  | 73,000   | 8,300    |      | 165,000  | 109,000  |
| 3,600    |      | 112,000  | 73,000   | 8,400    |      | 165,000  | 109,000  |
| 3,700    |      | 112,000  | 73,000   | 8,500    |      | 165,000  | 109,000  |
| 3,800    |      | 119,000  | 78,000   | 8,600    |      | 175,000  | 115,000  |
| 3,900    |      | 119,000  | 78,000   | 8,700    |      | 175,000  | 115,000  |
| 4,000    |      | 119,000  | 78,000   | 8,800    |      | 175,000  | 115,000  |
| 4,100    |      | 119,000  | 78,000   | 8,900    |      | 175,000  | 115,000  |
| 4,200    |      | 119,000  | 78,000   | 9,000    |      | 175,000  | 115,000  |
| 4,300    |      | 126,000  | 82,000   | 9,100    |      | 175,000  | 115,000  |
| 4,400    |      | 126,000  | 82,000   | 9,200    |      | 175,000  | 115,000  |
| 4,500    |      | 126,000  | 82,000   | 9,300    |      | 175,000  | 115,000  |
| 4,600    |      | 126,000  | 82,000   | 9,400    |      | 175,000  | 115,000  |
| 4,700    |      | 126,000  | 82,000   | 9,500    |      | 175,000  | 115,000  |
| 4,800    |      | 132,000  | 87,000   | 9,600    |      | 184,000  | 121,000  |
| 4,900    |      | 132,000  | 87,000   | 9,700    |      | 184,000  | 121,000  |
| 5,000    |      | 132,000  | 87,000   | 9,800    |      | 184,000  | 121,000  |
| 5,100    |      | 132,000  | 87,000   | 9,900    |      | 184,000  | 121,000  |
| 5,200    |      | 132,000  | 87,000   | 10,000   |      | 184,000  | 121,000  |
| 5,300    |      | 132,000  | 87,000   | 10,100   |      | 184,000  | 121,000  |
| 5,400    |      | 139,000  | 91,000   | 10,200   |      | 184,000  | 121,000  |
| 5,500    |      | 139,000  | 91,000   | 10,300   |      | 184,000  | 121,000  |
| 5,600    |      | 139,000  | 91,000   | 10,400   |      | 184,000  | 121,000  |
| 5,700    |      | 139,000  | 91,000   | 10,500   |      | 184,000  | 121,000  |

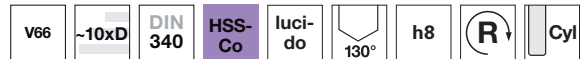
| <b>d1</b>     |      | <b>l1</b> | <b>l2</b> | <b>d1</b>     |      | <b>l1</b> | <b>l2</b> |
|---------------|------|-----------|-----------|---------------|------|-----------|-----------|
| <b>mm</b>     | inch | mm        | mm        | <b>mm</b>     | inch | mm        | mm        |
| <b>11,000</b> |      | 195,000   | 128,000   | <b>14,000</b> |      | 214,000   | 140,000   |
| <b>11,500</b> |      | 195,000   | 128,000   |               |      |           |           |
| <b>12,000</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>12,500</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>13,000</b> |      | 205,000   | 134,000   |               |      |           |           |
| <b>13,500</b> |      | 214,000   | 140,000   |               |      |           |           |

## Punte cilindriche

### Punte elicoidali, lunghe



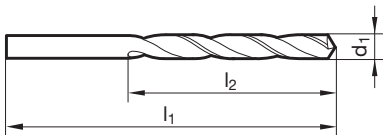
Catalogo n° 71225



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • | • |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura
- preferibile per Titanio e leghe di Titanio
- con riserva per Hastelloy, Inconel, Nimonic



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,000    |      | 56,000   | 33,000   |
| 1,100    |      | 60,000   | 37,000   |
| 1,200    |      | 65,000   | 41,000   |
| 1,300    |      | 65,000   | 41,000   |
| 1,400    |      | 70,000   | 45,000   |
| 1,500    |      | 70,000   | 45,000   |
| 1,600    |      | 76,000   | 50,000   |
| 1,700    |      | 76,000   | 50,000   |
| 1,800    |      | 80,000   | 53,000   |
| 2,000    |      | 85,000   | 56,000   |
| 2,200    |      | 90,000   | 59,000   |
| 2,300    |      | 90,000   | 59,000   |
| 2,500    |      | 95,000   | 62,000   |
| 2,600    |      | 95,000   | 62,000   |
| 2,700    |      | 100,000  | 66,000   |
| 3,000    |      | 100,000  | 66,000   |
| 3,100    |      | 106,000  | 69,000   |
| 3,200    |      | 106,000  | 69,000   |
| 3,300    |      | 106,000  | 69,000   |
| 3,400    |      | 112,000  | 73,000   |
| 3,500    |      | 112,000  | 73,000   |
| 3,600    |      | 112,000  | 73,000   |
| 3,700    |      | 112,000  | 73,000   |
| 3,800    |      | 119,000  | 78,000   |
| 3,900    |      | 119,000  | 78,000   |
| 4,000    |      | 119,000  | 78,000   |
| 4,100    |      | 119,000  | 78,000   |
| 4,200    |      | 119,000  | 78,000   |
| 4,300    |      | 126,000  | 82,000   |
| 4,400    |      | 126,000  | 82,000   |
| 4,500    |      | 126,000  | 82,000   |
| 4,600    |      | 126,000  | 82,000   |
| 4,700    |      | 126,000  | 82,000   |
| 4,800    |      | 132,000  | 87,000   |
| 5,000    |      | 132,000  | 87,000   |
| 5,200    |      | 132,000  | 87,000   |
| 5,300    |      | 132,000  | 87,000   |
| 5,400    |      | 139,000  | 91,000   |
| 5,500    |      | 139,000  | 91,000   |
| 5,600    |      | 139,000  | 91,000   |
| 5,700    |      | 139,000  | 91,000   |
| 5,800    |      | 139,000  | 91,000   |

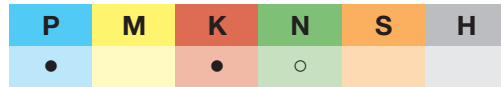
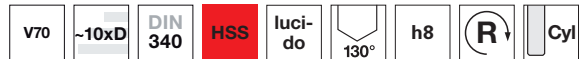
| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 6,000    |      | 139,000  | 91,000   |
| 6,100    |      | 148,000  | 97,000   |
| 6,200    |      | 148,000  | 97,000   |
| 6,300    |      | 148,000  | 97,000   |
| 6,400    |      | 148,000  | 97,000   |
| 6,500    |      | 148,000  | 97,000   |
| 6,600    |      | 148,000  | 97,000   |
| 6,700    |      | 148,000  | 97,000   |
| 6,800    |      | 156,000  | 102,000  |
| 6,900    |      | 156,000  | 102,000  |
| 7,000    |      | 156,000  | 102,000  |
| 7,100    |      | 156,000  | 102,000  |
| 7,200    |      | 156,000  | 102,000  |
| 7,300    |      | 156,000  | 102,000  |
| 7,400    |      | 156,000  | 102,000  |
| 7,500    |      | 156,000  | 102,000  |
| 7,600    |      | 165,000  | 109,000  |
| 7,800    |      | 165,000  | 109,000  |
| 7,900    |      | 165,000  | 109,000  |
| 8,000    |      | 165,000  | 109,000  |
| 8,100    |      | 165,000  | 109,000  |
| 8,200    |      | 165,000  | 109,000  |
| 8,300    |      | 165,000  | 109,000  |
| 8,500    |      | 165,000  | 109,000  |
| 9,000    |      | 175,000  | 115,000  |
| 9,500    |      | 175,000  | 115,000  |
| 10,000   |      | 184,000  | 121,000  |
| 10,200   |      | 184,000  | 121,000  |
| 10,500   |      | 184,000  | 121,000  |
| 11,000   |      | 195,000  | 128,000  |
| 12,000   |      | 205,000  | 134,000  |
| 13,000   |      | 205,000  | 134,000  |

## Punte cilindriche

### Punte elicoidali, lunghe

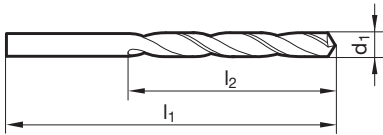


Catalogo n° 71150



Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 1,500    |      | 70,000   | 45,000   | 6,100    |      | 148,000  | 97,000   |
| 1,600    |      | 76,000   | 50,000   | 6,200    |      | 148,000  | 97,000   |
| 1,700    |      | 76,000   | 50,000   | 6,300    |      | 148,000  | 97,000   |
| 1,750    |      | 80,000   | 53,000   | 6,400    |      | 148,000  | 97,000   |
| 1,800    |      | 80,000   | 53,000   | 6,500    |      | 148,000  | 97,000   |
| 1,900    |      | 80,000   | 53,000   | 6,600    |      | 148,000  | 97,000   |
| 2,000    |      | 85,000   | 56,000   | 6,700    |      | 148,000  | 97,000   |
| 2,050    |      | 85,000   | 56,000   | 6,800    |      | 156,000  | 102,000  |
| 2,100    |      | 85,000   | 56,000   | 6,900    |      | 156,000  | 102,000  |
| 2,200    |      | 90,000   | 59,000   | 7,000    |      | 156,000  | 102,000  |
| 2,300    |      | 90,000   | 59,000   | 7,100    |      | 156,000  | 102,000  |
| 2,400    |      | 95,000   | 62,000   | 7,200    |      | 156,000  | 102,000  |
| 2,500    |      | 95,000   | 62,000   | 7,300    |      | 156,000  | 102,000  |
| 2,600    |      | 95,000   | 62,000   | 7,400    |      | 156,000  | 102,000  |
| 2,700    |      | 100,000  | 66,000   | 7,500    |      | 156,000  | 102,000  |
| 2,800    |      | 100,000  | 66,000   | 7,600    |      | 165,000  | 109,000  |
| 2,900    |      | 100,000  | 66,000   | 7,700    |      | 165,000  | 109,000  |
| 3,000    |      | 100,000  | 66,000   | 7,800    |      | 165,000  | 109,000  |
| 3,100    |      | 106,000  | 69,000   | 7,900    |      | 165,000  | 109,000  |
| 3,200    |      | 106,000  | 69,000   | 8,000    |      | 165,000  | 109,000  |
| 3,300    |      | 106,000  | 69,000   | 8,100    |      | 165,000  | 109,000  |
| 3,400    |      | 112,000  | 73,000   | 8,200    |      | 165,000  | 109,000  |
| 3,500    |      | 112,000  | 73,000   | 8,300    |      | 165,000  | 109,000  |
| 3,600    |      | 112,000  | 73,000   | 8,400    |      | 165,000  | 109,000  |
| 3,700    |      | 112,000  | 73,000   | 8,500    |      | 165,000  | 109,000  |
| 3,800    |      | 119,000  | 78,000   | 8,600    |      | 175,000  | 115,000  |
| 3,900    |      | 119,000  | 78,000   | 8,700    |      | 175,000  | 115,000  |
| 4,000    |      | 119,000  | 78,000   | 8,800    |      | 175,000  | 115,000  |
| 4,100    |      | 119,000  | 78,000   | 8,900    |      | 175,000  | 115,000  |
| 4,200    |      | 119,000  | 78,000   | 9,000    |      | 175,000  | 115,000  |
| 4,300    |      | 126,000  | 82,000   | 9,100    |      | 175,000  | 115,000  |
| 4,400    |      | 126,000  | 82,000   | 9,200    |      | 175,000  | 115,000  |
| 4,500    |      | 126,000  | 82,000   | 9,300    |      | 175,000  | 115,000  |
| 4,600    |      | 126,000  | 82,000   | 9,400    |      | 175,000  | 115,000  |
| 4,700    |      | 126,000  | 82,000   | 9,500    |      | 175,000  | 115,000  |
| 4,800    |      | 132,000  | 87,000   | 9,600    |      | 184,000  | 121,000  |
| 4,900    |      | 132,000  | 87,000   | 9,700    |      | 184,000  | 121,000  |
| 5,000    |      | 132,000  | 87,000   | 9,800    |      | 184,000  | 121,000  |
| 5,100    |      | 132,000  | 87,000   | 9,900    |      | 184,000  | 121,000  |
| 5,200    |      | 132,000  | 87,000   | 10,000   |      | 184,000  | 121,000  |
| 5,300    |      | 132,000  | 87,000   | 10,200   |      | 184,000  | 121,000  |
| 5,400    |      | 139,000  | 91,000   | 10,500   |      | 184,000  | 121,000  |
| 5,500    |      | 139,000  | 91,000   | 11,000   |      | 195,000  | 128,000  |
| 5,600    |      | 139,000  | 91,000   | 11,500   |      | 195,000  | 128,000  |
| 5,700    |      | 139,000  | 91,000   | 12,000   |      | 205,000  | 134,000  |
| 5,800    |      | 139,000  | 91,000   |          |      |          |          |
| 5,900    |      | 139,000  | 91,000   |          |      |          |          |
| 6,000    |      | 139,000  | 91,000   |          |      |          |          |

## Punte cilindriche

### Punte elicoidali, lunghe



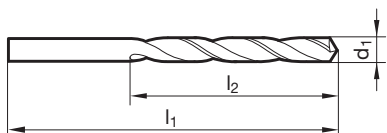
Catalogo n° 71152



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 1,500    |      | 70,000   | 45,000   |
| 1,600    |      | 76,000   | 50,000   |
| 1,900    |      | 80,000   | 53,000   |
| 2,400    |      | 95,000   | 62,000   |
| 2,500    |      | 95,000   | 62,000   |
| 2,700    |      | 100,000  | 66,000   |
| 2,900    |      | 100,000  | 66,000   |
| 3,000    |      | 100,000  | 66,000   |
| 3,300    |      | 106,000  | 69,000   |
| 3,400    |      | 112,000  | 73,000   |
| 3,500    |      | 112,000  | 73,000   |
| 4,000    |      | 119,000  | 78,000   |
| 4,200    |      | 119,000  | 78,000   |
| 4,500    |      | 126,000  | 82,000   |
| 5,000    |      | 132,000  | 87,000   |
| 6,000    |      | 139,000  | 91,000   |
| 6,600    |      | 148,000  | 97,000   |
| 6,800    |      | 156,000  | 102,000  |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 7,000    |      | 156,000  | 102,000  |
| 8,000    |      | 165,000  | 109,000  |
| 9,000    |      | 175,000  | 115,000  |
| 10,000   |      | 184,000  | 121,000  |
| 10,200   |      | 184,000  | 121,000  |
| 11,000   |      | 195,000  | 128,000  |
| 12,000   |      | 205,000  | 134,000  |
| 13,000   |      | 205,000  | 134,000  |

## Punte cilindriche

### Punte elicoidali, lunghe



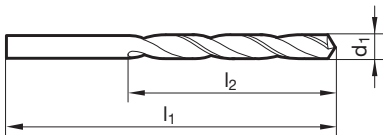
Catalogo n° 61150



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del nocc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- scanalature larghe
- maggiore protezione contro l'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 2,000    |      | 85,000   | 56,000   |
| 2,500    |      | 95,000   | 62,000   |
| 3,000    |      | 100,000  | 66,000   |
| 3,300    |      | 106,000  | 69,000   |
| 3,500    |      | 112,000  | 73,000   |
| 4,000    |      | 119,000  | 78,000   |
| 4,200    |      | 119,000  | 78,000   |
| 4,500    |      | 126,000  | 82,000   |
| 5,000    |      | 132,000  | 87,000   |
| 5,500    |      | 139,000  | 91,000   |
| 6,000    |      | 139,000  | 91,000   |
| 8,000    |      | 165,000  | 109,000  |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,500    |      | 165,000  | 109,000  |
| 10,000   |      | 184,000  | 121,000  |
| 10,200   |      | 184,000  | 121,000  |
| 12,000   |      | 205,000  | 134,000  |

## Punte cilindriche

### Punte elicoidali, lunghe



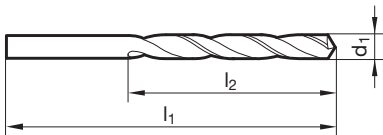
Catalogo n° 71154



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,500    |      | 70,000   | 45,000   | 3,600    |       | 112,000  | 73,000   |
| 1,590    | 1/16 | 76,000   | 50,000   | 3,660    |       | 112,000  | 73,000   |
| 1,600    |      | 76,000   | 50,000   | 3,700    |       | 112,000  | 73,000   |
| 1,610    |      | 76,000   | 50,000   | 3,730    |       | 112,000  | 73,000   |
| 1,700    |      | 76,000   | 50,000   | 3,800    |       | 119,000  | 78,000   |
| 1,750    |      | 80,000   | 53,000   | 3,860    |       | 119,000  | 78,000   |
| 1,780    |      | 80,000   | 53,000   | 3,900    |       | 119,000  | 78,000   |
| 1,800    |      | 80,000   | 53,000   | 3,910    |       | 119,000  | 78,000   |
| 1,850    |      | 80,000   | 53,000   | 3,970    | 5/32  | 119,000  | 78,000   |
| 1,900    |      | 80,000   | 53,000   | 3,990    |       | 119,000  | 78,000   |
| 1,930    |      | 85,000   | 56,000   | 4,000    |       | 119,000  | 78,000   |
| 1,980    | 5/64 | 85,000   | 56,000   | 4,040    |       | 119,000  | 78,000   |
| 1,990    |      | 85,000   | 56,000   | 4,090    |       | 119,000  | 78,000   |
| 2,000    |      | 85,000   | 56,000   | 4,100    |       | 119,000  | 78,000   |
| 2,050    |      | 85,000   | 56,000   | 4,200    |       | 119,000  | 78,000   |
| 2,060    |      | 85,000   | 56,000   | 4,300    |       | 126,000  | 82,000   |
| 2,080    |      | 85,000   | 56,000   | 4,310    |       | 126,000  | 82,000   |
| 2,100    |      | 85,000   | 56,000   | 4,370    | 11/64 | 126,000  | 82,000   |
| 2,180    |      | 90,000   | 59,000   | 4,390    |       | 126,000  | 82,000   |
| 2,200    |      | 90,000   | 59,000   | 4,400    |       | 126,000  | 82,000   |
| 2,260    |      | 90,000   | 59,000   | 4,500    |       | 126,000  | 82,000   |
| 2,300    |      | 90,000   | 59,000   | 4,570    |       | 126,000  | 82,000   |
| 2,370    |      | 95,000   | 62,000   | 4,600    |       | 126,000  | 82,000   |
| 2,380    | 3/32 | 95,000   | 62,000   | 4,700    |       | 126,000  | 82,000   |
| 2,400    |      | 95,000   | 62,000   | 4,760    | 3/16  | 132,000  | 87,000   |
| 2,440    |      | 95,000   | 62,000   | 4,800    |       | 132,000  | 87,000   |
| 2,490    |      | 95,000   | 62,000   | 4,850    |       | 132,000  | 87,000   |
| 2,500    |      | 95,000   | 62,000   | 4,900    |       | 132,000  | 87,000   |
| 2,580    |      | 95,000   | 62,000   | 4,920    |       | 132,000  | 87,000   |
| 2,600    |      | 95,000   | 62,000   | 4,980    |       | 132,000  | 87,000   |
| 2,700    |      | 100,000  | 66,000   | 5,000    |       | 132,000  | 87,000   |
| 2,710    |      | 100,000  | 66,000   | 5,060    |       | 132,000  | 87,000   |
| 2,780    | 7/64 | 100,000  | 66,000   | 5,100    |       | 132,000  | 87,000   |
| 2,800    |      | 100,000  | 66,000   | 5,110    |       | 132,000  | 87,000   |
| 2,870    |      | 100,000  | 66,000   | 5,180    |       | 132,000  | 87,000   |
| 2,900    |      | 100,000  | 66,000   | 5,200    |       | 132,000  | 87,000   |
| 2,950    |      | 100,000  | 66,000   | 5,220    |       | 132,000  | 87,000   |
| 3,000    |      | 100,000  | 66,000   | 5,300    |       | 132,000  | 87,000   |
| 3,100    |      | 106,000  | 69,000   | 5,310    |       | 139,000  | 91,000   |
| 3,170    | 1/8  | 106,000  | 69,000   | 5,400    |       | 139,000  | 91,000   |
| 3,180    |      | 106,000  | 69,000   | 5,410    |       | 139,000  | 91,000   |
| 3,200    |      | 106,000  | 69,000   | 5,500    |       | 139,000  | 91,000   |
| 3,260    |      | 106,000  | 69,000   | 5,560    | 7/32  | 139,000  | 91,000   |
| 3,300    |      | 106,000  | 69,000   | 5,600    |       | 139,000  | 91,000   |
| 3,400    |      | 112,000  | 73,000   | 5,610    |       | 139,000  | 91,000   |
| 3,450    |      | 112,000  | 73,000   | 5,700    |       | 139,000  | 91,000   |
| 3,500    |      | 112,000  | 73,000   | 5,790    |       | 139,000  | 91,000   |
| 3,570    | 9/64 | 112,000  | 73,000   | 5,800    |       | 139,000  | 91,000   |



| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 5,900    |       | 139,000  | 91,000   | 8,610    |       | 175,000  | 115,000  |
| 5,940    |       | 139,000  | 91,000   | 8,700    |       | 175,000  | 115,000  |
| 5,950    | 15/64 | 139,000  | 91,000   | 8,730    | 11/32 | 175,000  | 115,000  |
| 6,000    |       | 139,000  | 91,000   | 8,800    |       | 175,000  | 115,000  |
| 6,040    |       | 148,000  | 97,000   | 8,840    |       | 175,000  | 115,000  |
| 6,100    |       | 148,000  | 97,000   | 8,900    |       | 175,000  | 115,000  |
| 6,150    |       | 148,000  | 97,000   | 9,000    |       | 175,000  | 115,000  |
| 6,200    |       | 148,000  | 97,000   | 9,090    |       | 175,000  | 115,000  |
| 6,250    |       | 148,000  | 97,000   | 9,100    |       | 175,000  | 115,000  |
| 6,300    |       | 148,000  | 97,000   | 9,130    | 23/64 | 175,000  | 115,000  |
| 6,350    | 1/4   | 148,000  | 97,000   | 9,200    |       | 175,000  | 115,000  |
| 6,400    |       | 148,000  | 97,000   | 9,300    |       | 175,000  | 115,000  |
| 6,500    |       | 148,000  | 97,000   | 9,400    |       | 175,000  | 115,000  |
| 6,530    |       | 148,000  | 97,000   | 9,500    |       | 175,000  | 115,000  |
| 6,600    |       | 148,000  | 97,000   | 9,520    | 3/8   | 184,000  | 121,000  |
| 6,700    |       | 148,000  | 97,000   | 9,530    |       | 184,000  | 121,000  |
| 6,750    | 17/64 | 156,000  | 102,000  | 9,580    |       | 184,000  | 121,000  |
| 6,760    |       | 156,000  | 102,000  | 9,600    |       | 184,000  | 121,000  |
| 6,800    |       | 156,000  | 102,000  | 9,700    |       | 184,000  | 121,000  |
| 6,900    |       | 156,000  | 102,000  | 9,800    |       | 184,000  | 121,000  |
| 6,910    |       | 156,000  | 102,000  | 9,900    |       | 184,000  | 121,000  |
| 7,000    |       | 156,000  | 102,000  | 9,920    | 25/64 | 184,000  | 121,000  |
| 7,040    |       | 156,000  | 102,000  | 10,000   |       | 184,000  | 121,000  |
| 7,100    |       | 156,000  | 102,000  | 10,080   |       | 184,000  | 121,000  |
| 7,140    | 9/32  | 156,000  | 102,000  | 10,200   |       | 184,000  | 121,000  |
| 7,200    |       | 156,000  | 102,000  | 10,260   |       | 184,000  | 121,000  |
| 7,300    |       | 156,000  | 102,000  | 10,320   | 13/32 | 184,000  | 121,000  |
| 7,370    |       | 156,000  | 102,000  | 10,490   |       | 184,000  | 121,000  |
| 7,400    |       | 156,000  | 102,000  | 10,500   |       | 184,000  | 121,000  |
| 7,490    |       | 156,000  | 102,000  | 10,720   | 27/64 | 195,000  | 128,000  |
| 7,500    |       | 156,000  | 102,000  | 11,000   |       | 195,000  | 128,000  |
| 7,540    | 19/64 | 165,000  | 109,000  | 11,110   | 7/16  | 195,000  | 128,000  |
| 7,600    |       | 165,000  | 109,000  | 11,500   |       | 195,000  | 128,000  |
| 7,670    |       | 165,000  | 109,000  | 11,510   | 29/64 | 195,000  | 128,000  |
| 7,700    |       | 165,000  | 109,000  | 11,910   | 15/32 | 205,000  | 134,000  |
| 7,800    |       | 165,000  | 109,000  | 12,000   |       | 205,000  | 134,000  |
| 7,900    |       | 165,000  | 109,000  | 12,300   | 31/64 | 205,000  | 134,000  |
| 7,940    | 5/16  | 165,000  | 109,000  | 12,700   | 1/2   | 205,000  | 134,000  |
| 8,000    |       | 165,000  | 109,000  |          |       |          |          |
| 8,030    |       | 165,000  | 109,000  |          |       |          |          |
| 8,100    |       | 165,000  | 109,000  |          |       |          |          |
| 8,200    |       | 165,000  | 109,000  |          |       |          |          |
| 8,300    |       | 165,000  | 109,000  |          |       |          |          |
| 8,330    | 21/64 | 165,000  | 109,000  |          |       |          |          |
| 8,400    |       | 165,000  | 109,000  |          |       |          |          |
| 8,430    |       | 165,000  | 109,000  |          |       |          |          |
| 8,500    |       | 165,000  | 109,000  |          |       |          |          |
| 8,600    |       | 175,000  | 115,000  |          |       |          |          |

## Punte cilindriche

### Punte elicoidali, lunghe



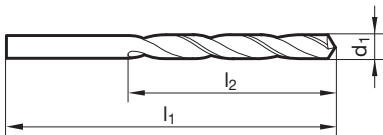
Catalogo n° 71156



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ●        | ○        |          |          |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata
- massima resistenza all'usura



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 1,500    |      | 70,000   | 45,000   | 5,800    |       | 139,000  | 91,000   |
| 1,590    | 1/16 | 76,000   | 50,000   | 5,900    |       | 139,000  | 91,000   |
| 1,600    |      | 76,000   | 50,000   | 6,000    |       | 139,000  | 91,000   |
| 1,700    |      | 76,000   | 50,000   | 6,100    |       | 148,000  | 97,000   |
| 1,800    |      | 80,000   | 53,000   | 6,200    |       | 148,000  | 97,000   |
| 1,900    |      | 80,000   | 53,000   | 6,300    |       | 148,000  | 97,000   |
| 2,000    |      | 85,000   | 56,000   | 6,350    | 1/4   | 148,000  | 97,000   |
| 2,100    |      | 85,000   | 56,000   | 6,400    |       | 148,000  | 97,000   |
| 2,200    |      | 90,000   | 59,000   | 6,500    |       | 148,000  | 97,000   |
| 2,300    |      | 90,000   | 59,000   | 6,600    |       | 148,000  | 97,000   |
| 2,380    | 3/32 | 95,000   | 62,000   | 6,700    |       | 148,000  | 97,000   |
| 2,500    |      | 95,000   | 62,000   | 6,800    |       | 156,000  | 102,000  |
| 2,600    |      | 95,000   | 62,000   | 6,900    |       | 156,000  | 102,000  |
| 2,700    |      | 100,000  | 66,000   | 7,000    |       | 156,000  | 102,000  |
| 2,800    |      | 100,000  | 66,000   | 7,100    |       | 156,000  | 102,000  |
| 2,900    |      | 100,000  | 66,000   | 7,140    | 9/32  | 156,000  | 102,000  |
| 3,000    |      | 100,000  | 66,000   | 7,200    |       | 156,000  | 102,000  |
| 3,100    |      | 106,000  | 69,000   | 7,300    |       | 156,000  | 102,000  |
| 3,170    | 1/8  | 106,000  | 69,000   | 7,400    |       | 156,000  | 102,000  |
| 3,180    |      | 106,000  | 69,000   | 7,500    |       | 156,000  | 102,000  |
| 3,200    |      | 106,000  | 69,000   | 7,600    |       | 165,000  | 109,000  |
| 3,300    |      | 106,000  | 69,000   | 7,700    |       | 165,000  | 109,000  |
| 3,400    |      | 112,000  | 73,000   | 7,800    |       | 165,000  | 109,000  |
| 3,500    |      | 112,000  | 73,000   | 7,900    |       | 165,000  | 109,000  |
| 3,600    |      | 112,000  | 73,000   | 7,940    | 5/16  | 165,000  | 109,000  |
| 3,700    |      | 112,000  | 73,000   | 8,000    |       | 165,000  | 109,000  |
| 3,800    |      | 119,000  | 78,000   | 8,100    |       | 165,000  | 109,000  |
| 3,900    |      | 119,000  | 78,000   | 8,200    |       | 165,000  | 109,000  |
| 3,970    | 5/32 | 119,000  | 78,000   | 8,300    |       | 165,000  | 109,000  |
| 4,000    |      | 119,000  | 78,000   | 8,400    |       | 165,000  | 109,000  |
| 4,100    |      | 119,000  | 78,000   | 8,500    |       | 165,000  | 109,000  |
| 4,200    |      | 119,000  | 78,000   | 8,600    |       | 175,000  | 115,000  |
| 4,300    |      | 126,000  | 82,000   | 8,700    |       | 175,000  | 115,000  |
| 4,400    |      | 126,000  | 82,000   | 8,730    | 11/32 | 175,000  | 115,000  |
| 4,500    |      | 126,000  | 82,000   | 8,800    |       | 175,000  | 115,000  |
| 4,600    |      | 126,000  | 82,000   | 8,900    |       | 175,000  | 115,000  |
| 4,700    |      | 126,000  | 82,000   | 9,000    |       | 175,000  | 115,000  |
| 4,760    | 3/16 | 132,000  | 87,000   | 9,100    |       | 175,000  | 115,000  |
| 4,800    |      | 132,000  | 87,000   | 9,200    |       | 175,000  | 115,000  |
| 4,900    |      | 132,000  | 87,000   | 9,300    |       | 175,000  | 115,000  |
| 5,000    |      | 132,000  | 87,000   | 9,400    |       | 175,000  | 115,000  |
| 5,100    |      | 132,000  | 87,000   | 9,500    |       | 175,000  | 115,000  |
| 5,200    |      | 132,000  | 87,000   | 9,520    | 3/8   | 184,000  | 121,000  |
| 5,300    |      | 132,000  | 87,000   | 9,530    |       | 184,000  | 121,000  |
| 5,400    |      | 139,000  | 91,000   | 9,600    |       | 184,000  | 121,000  |
| 5,500    |      | 139,000  | 91,000   | 9,700    |       | 184,000  | 121,000  |
| 5,600    |      | 139,000  | 91,000   | 9,800    |       | 184,000  | 121,000  |
| 5,700    |      | 139,000  | 91,000   | 9,900    |       | 184,000  | 121,000  |

| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|------|----------|----------|
| 10,000   |       | 184,000  | 121,000  | 13,000   |      | 205,000  | 134,000  |
| 10,200   |       | 184,000  | 121,000  |          |      |          |          |
| 10,320   | 13/32 | 184,000  | 121,000  |          |      |          |          |
| 10,500   |       | 184,000  | 121,000  |          |      |          |          |
| 10,800   |       | 195,000  | 128,000  |          |      |          |          |
| 11,000   |       | 195,000  | 128,000  |          |      |          |          |
| 11,110   | 7/16  | 195,000  | 128,000  |          |      |          |          |
| 11,500   |       | 195,000  | 128,000  |          |      |          |          |
| 11,910   | 15/32 | 205,000  | 134,000  |          |      |          |          |
| 12,000   |       | 205,000  | 134,000  |          |      |          |          |
| 12,500   |       | 205,000  | 134,000  |          |      |          |          |
| 12,700   | 1/2   | 205,000  | 134,000  |          |      |          |          |

## Punte cilindriche

### Punte elicoidali in lunghezze speciali, grandezza 1

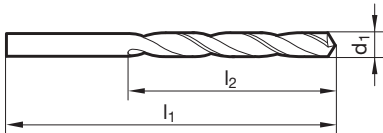


Catalogo n° 71145



|          |          |          |          |          |          |                                      |
|----------|----------|----------|----------|----------|----------|--------------------------------------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> | Parametri di lav.<br>ind. a pag. 188 |
| •        |          | •        | •        |          |          |                                      |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- lucida  $< 2,36$  mm



| d1<br>mm | inch  | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|----------|-------|----------|----------|
| 2,000    |       | 125,000  | 85,000   | 6,400    |       | 215,000  | 150,000  |
| 2,100    |       | 125,000  | 85,000   | 6,500    |       | 215,000  | 150,000  |
| 2,200    |       | 135,000  | 90,000   | 6,600    |       | 215,000  | 150,000  |
| 2,300    |       | 135,000  | 90,000   | 6,700    |       | 215,000  | 150,000  |
| 2,400    |       | 140,000  | 95,000   | 6,750    | 17/64 | 225,000  | 155,000  |
| 2,500    |       | 140,000  | 95,000   | 6,800    |       | 225,000  | 155,000  |
| 2,600    |       | 140,000  | 95,000   | 6,900    |       | 225,000  | 155,000  |
| 2,700    |       | 150,000  | 100,000  | 7,000    |       | 225,000  | 155,000  |
| 2,800    |       | 150,000  | 100,000  | 7,100    |       | 225,000  | 155,000  |
| 2,900    |       | 150,000  | 100,000  | 7,200    |       | 225,000  | 155,000  |
| 3,000    |       | 150,000  | 100,000  | 7,300    |       | 225,000  | 155,000  |
| 3,100    |       | 155,000  | 105,000  | 7,400    |       | 225,000  | 155,000  |
| 3,200    |       | 155,000  | 105,000  | 7,500    |       | 225,000  | 155,000  |
| 3,300    |       | 155,000  | 105,000  | 7,540    | 19/64 | 240,000  | 165,000  |
| 3,400    |       | 165,000  | 115,000  | 7,600    |       | 240,000  | 165,000  |
| 3,500    |       | 165,000  | 115,000  | 7,700    |       | 240,000  | 165,000  |
| 3,600    |       | 165,000  | 115,000  | 7,800    |       | 240,000  | 165,000  |
| 3,700    |       | 165,000  | 115,000  | 7,900    |       | 240,000  | 165,000  |
| 3,800    |       | 175,000  | 120,000  | 7,940    | 5/16  | 240,000  | 165,000  |
| 3,900    |       | 175,000  | 120,000  | 8,000    |       | 240,000  | 165,000  |
| 3,970    | 5/32  | 175,000  | 120,000  | 8,100    |       | 240,000  | 165,000  |
| 4,000    |       | 175,000  | 120,000  | 8,200    |       | 240,000  | 165,000  |
| 4,100    |       | 175,000  | 120,000  | 8,300    |       | 240,000  | 165,000  |
| 4,200    |       | 175,000  | 120,000  | 8,400    |       | 240,000  | 165,000  |
| 4,300    |       | 185,000  | 125,000  | 8,500    |       | 240,000  | 165,000  |
| 4,400    |       | 185,000  | 125,000  | 8,600    |       | 250,000  | 175,000  |
| 4,500    |       | 185,000  | 125,000  | 8,700    |       | 250,000  | 175,000  |
| 4,600    |       | 185,000  | 125,000  | 8,800    |       | 250,000  | 175,000  |
| 4,700    |       | 185,000  | 125,000  | 8,900    |       | 250,000  | 175,000  |
| 4,760    | 3/16  | 195,000  | 135,000  | 9,000    |       | 250,000  | 175,000  |
| 4,800    |       | 195,000  | 135,000  | 9,100    |       | 250,000  | 175,000  |
| 4,900    |       | 195,000  | 135,000  | 9,300    |       | 250,000  | 175,000  |
| 5,000    |       | 195,000  | 135,000  | 9,400    |       | 250,000  | 175,000  |
| 5,100    |       | 195,000  | 135,000  | 9,500    |       | 250,000  | 175,000  |
| 5,200    |       | 195,000  | 135,000  | 9,520    | 3/8   | 265,000  | 185,000  |
| 5,300    |       | 195,000  | 135,000  | 9,600    |       | 265,000  | 185,000  |
| 5,400    |       | 205,000  | 140,000  | 9,700    |       | 265,000  | 185,000  |
| 5,500    |       | 205,000  | 140,000  | 9,800    |       | 265,000  | 185,000  |
| 5,600    |       | 205,000  | 140,000  | 9,900    |       | 265,000  | 185,000  |
| 5,700    |       | 205,000  | 140,000  | 10,000   |       | 265,000  | 185,000  |
| 5,800    |       | 205,000  | 140,000  | 10,100   |       | 265,000  | 185,000  |
| 5,900    |       | 205,000  | 140,000  | 10,200   |       | 265,000  | 185,000  |
| 5,950    | 15/64 | 205,000  | 140,000  | 10,500   |       | 265,000  | 185,000  |
| 6,000    |       | 205,000  | 140,000  | 10,720   | 27/64 | 280,000  | 195,000  |
| 6,100    |       | 215,000  | 150,000  | 10,800   |       | 280,000  | 195,000  |
| 6,200    |       | 215,000  | 150,000  | 11,000   |       | 280,000  | 195,000  |
| 6,300    |       | 215,000  | 150,000  | 11,110   | 7/16  | 280,000  | 195,000  |
| 6,350    | 1/4   | 215,000  | 150,000  | 11,200   |       | 280,000  | 195,000  |

| <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> | <b>d1</b><br><b>mm</b> | <b>inch</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> |
|------------------------|-------------|------------------------|------------------------|------------------------|-------------|------------------------|------------------------|
| <b>11,500</b>          |             | 280,000                | 195,000                | <b>12,700</b>          | 1/2         | 295,000                | 205,000                |
| <b>11,510</b>          | 29/64       | 280,000                | 195,000                | <b>13,000</b>          |             | 295,000                | 205,000                |
| <b>11,800</b>          |             | 280,000                | 195,000                |                        |             |                        |                        |
| <b>11,910</b>          | 15/32       | 295,000                | 205,000                |                        |             |                        |                        |
| <b>12,000</b>          |             | 295,000                | 205,000                |                        |             |                        |                        |
| <b>12,300</b>          | 31/64       | 295,000                | 205,000                |                        |             |                        |                        |

## Punte cilindriche

### Punte elicoidali in lunghezze speciali, grandezza 1

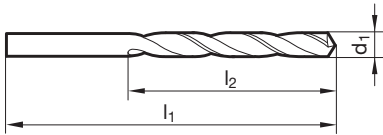


Catalogo n° 71192



|          |          |          |          |          |          |                                      |
|----------|----------|----------|----------|----------|----------|--------------------------------------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> | Parametri di lav.<br>ind. a pag. 188 |
| ●        | ○        | ●        | ●        |          |          |                                      |

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | inch | l1<br>mm | l2<br>mm | d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|-------|----------|----------|
| 3,000    |      | 150,000  | 100,000  | 7,300    |       | 225,000  | 155,000  |
| 3,100    |      | 155,000  | 105,000  | 7,400    |       | 225,000  | 155,000  |
| 3,170    | 1/8  | 155,000  | 105,000  | 7,500    |       | 225,000  | 155,000  |
| 3,200    |      | 155,000  | 105,000  | 7,600    |       | 240,000  | 165,000  |
| 3,300    |      | 155,000  | 105,000  | 7,700    |       | 240,000  | 165,000  |
| 3,400    |      | 165,000  | 115,000  | 7,800    |       | 240,000  | 165,000  |
| 3,500    |      | 165,000  | 115,000  | 7,900    |       | 240,000  | 165,000  |
| 3,600    |      | 165,000  | 115,000  | 7,940    | 5/16  | 240,000  | 165,000  |
| 3,700    |      | 165,000  | 115,000  | 8,000    |       | 240,000  | 165,000  |
| 3,800    |      | 175,000  | 120,000  | 8,100    |       | 240,000  | 165,000  |
| 3,900    |      | 175,000  | 120,000  | 8,200    |       | 240,000  | 165,000  |
| 3,970    | 5/32 | 175,000  | 120,000  | 8,300    |       | 240,000  | 165,000  |
| 4,000    |      | 175,000  | 120,000  | 8,400    |       | 240,000  | 165,000  |
| 4,100    |      | 175,000  | 120,000  | 8,500    |       | 240,000  | 165,000  |
| 4,200    |      | 175,000  | 120,000  | 8,600    |       | 250,000  | 175,000  |
| 4,300    |      | 185,000  | 125,000  | 8,700    |       | 250,000  | 175,000  |
| 4,400    |      | 185,000  | 125,000  | 8,730    | 11/32 | 250,000  | 175,000  |
| 4,500    |      | 185,000  | 125,000  | 8,800    |       | 250,000  | 175,000  |
| 4,600    |      | 185,000  | 125,000  | 8,900    |       | 250,000  | 175,000  |
| 4,700    |      | 185,000  | 125,000  | 9,000    |       | 250,000  | 175,000  |
| 4,760    | 3/16 | 195,000  | 135,000  | 9,100    |       | 250,000  | 175,000  |
| 4,800    |      | 195,000  | 135,000  | 9,200    |       | 250,000  | 175,000  |
| 4,900    |      | 195,000  | 135,000  | 9,300    |       | 250,000  | 175,000  |
| 5,000    |      | 195,000  | 135,000  | 9,400    |       | 250,000  | 175,000  |
| 5,100    |      | 195,000  | 135,000  | 9,500    |       | 250,000  | 175,000  |
| 5,200    |      | 195,000  | 135,000  | 9,530    |       | 265,000  | 185,000  |
| 5,300    |      | 195,000  | 135,000  | 9,600    |       | 265,000  | 185,000  |
| 5,400    |      | 205,000  | 140,000  | 9,700    |       | 265,000  | 185,000  |
| 5,500    |      | 205,000  | 140,000  | 9,900    |       | 265,000  | 185,000  |
| 5,560    | 7/32 | 205,000  | 140,000  | 10,000   |       | 265,000  | 185,000  |
| 5,600    |      | 205,000  | 140,000  | 10,100   |       | 265,000  | 185,000  |
| 5,700    |      | 205,000  | 140,000  | 10,200   |       | 265,000  | 185,000  |
| 5,800    |      | 205,000  | 140,000  | 10,320   | 13/32 | 265,000  | 185,000  |
| 5,900    |      | 205,000  | 140,000  | 10,500   |       | 265,000  | 185,000  |
| 6,000    |      | 205,000  | 140,000  | 10,800   |       | 280,000  | 195,000  |
| 6,100    |      | 215,000  | 150,000  | 11,000   |       | 280,000  | 195,000  |
| 6,200    |      | 215,000  | 150,000  | 11,200   |       | 280,000  | 195,000  |
| 6,300    |      | 215,000  | 150,000  | 11,500   |       | 280,000  | 195,000  |
| 6,350    | 1/4  | 215,000  | 150,000  | 11,800   |       | 280,000  | 195,000  |
| 6,400    |      | 215,000  | 150,000  | 11,910   | 15/32 | 295,000  | 205,000  |
| 6,500    |      | 215,000  | 150,000  | 12,700   | 1/2   | 295,000  | 205,000  |
| 6,600    |      | 215,000  | 150,000  |          |       |          |          |
| 6,700    |      | 215,000  | 150,000  |          |       |          |          |
| 6,800    |      | 225,000  | 155,000  |          |       |          |          |
| 6,900    |      | 225,000  | 155,000  |          |       |          |          |
| 7,000    |      | 225,000  | 155,000  |          |       |          |          |
| 7,100    |      | 225,000  | 155,000  |          |       |          |          |
| 7,200    |      | 225,000  | 155,000  |          |       |          |          |

## Punte cilindriche

### Punte elicoidali in lunghezze speciali, grandezza 2



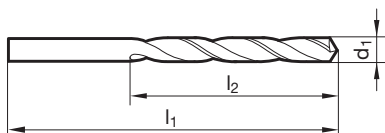
Catalogo n° 71146



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 13,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|
| 3,000    |       | 190,000  | 130,000  |
| 3,170    | 1/8   | 200,000  | 135,000  |
| 3,500    |       | 210,000  | 145,000  |
| 3,570    | 9/64  | 210,000  | 145,000  |
| 3,970    | 5/32  | 220,000  | 150,000  |
| 4,000    |       | 220,000  | 150,000  |
| 4,500    |       | 235,000  | 160,000  |
| 4,760    | 3/16  | 245,000  | 170,000  |
| 5,000    |       | 245,000  | 170,000  |
| 5,500    |       | 260,000  | 180,000  |
| 5,950    | 15/64 | 260,000  | 180,000  |
| 6,000    |       | 260,000  | 180,000  |
| 6,500    |       | 275,000  | 190,000  |
| 6,750    | 17/64 | 290,000  | 200,000  |
| 6,800    |       | 290,000  | 200,000  |
| 7,000    |       | 290,000  | 200,000  |
| 7,500    |       | 290,000  | 200,000  |
| 7,940    | 5/16  | 305,000  | 210,000  |

| d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|
| 8,000    |       | 305,000  | 210,000  |
| 8,500    |       | 305,000  | 210,000  |
| 9,000    |       | 320,000  | 220,000  |
| 9,500    |       | 320,000  | 220,000  |
| 9,520    | 3/8   | 340,000  | 235,000  |
| 9,920    | 25/64 | 340,000  | 235,000  |
| 10,000   |       | 340,000  | 235,000  |
| 10,720   | 27/64 | 365,000  | 250,000  |
| 11,000   |       | 365,000  | 250,000  |
| 11,910   | 15/32 | 375,000  | 260,000  |
| 12,000   |       | 375,000  | 260,000  |
| 12,700   | 1/2   | 375,000  | 260,000  |
| 13,000   |       | 375,000  | 260,000  |

## Punte cilindriche

### Punte elicoidali in lunghezze speciali, grandezza 2



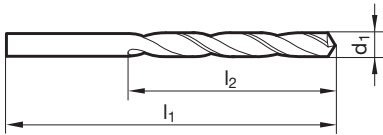
Catalogo n° 71193



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 3,000    |      | 190,000  | 130,000  |
| 3,500    |      | 210,000  | 145,000  |
| 4,000    |      | 220,000  | 150,000  |
| 4,500    |      | 235,000  | 160,000  |
| 5,000    |      | 245,000  | 170,000  |
| 5,500    |      | 260,000  | 180,000  |
| 6,000    |      | 260,000  | 180,000  |
| 6,500    |      | 275,000  | 190,000  |
| 7,000    |      | 290,000  | 200,000  |
| 7,500    |      | 290,000  | 200,000  |
| 8,000    |      | 305,000  | 210,000  |
| 8,500    |      | 305,000  | 210,000  |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 9,000    |      | 320,000  | 220,000  |
| 9,500    |      | 320,000  | 220,000  |
| 10,000   |      | 340,000  | 235,000  |
| 12,000   |      | 375,000  | 260,000  |



## Punte cilindriche

### Punte elicoidali in lunghezze speciali, grandezza 3



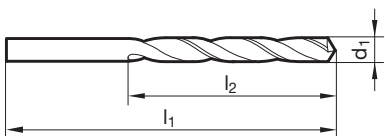
Catalogo n° 71147



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 3,500$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|
| 3,500    |       | 265,000  | 180,000  |
| 4,000    |       | 280,000  | 190,000  |
| 4,500    |       | 295,000  | 200,000  |
| 5,000    |       | 315,000  | 210,000  |
| 5,500    |       | 330,000  | 225,000  |
| 6,000    |       | 330,000  | 225,000  |
| 6,350    | 1/4   | 350,000  | 235,000  |
| 6,500    |       | 350,000  | 235,000  |
| 7,000    |       | 370,000  | 250,000  |
| 7,500    |       | 370,000  | 250,000  |
| 7,940    | 5/16  | 390,000  | 265,000  |
| 8,000    |       | 390,000  | 265,000  |
| 8,500    |       | 390,000  | 265,000  |
| 9,000    |       | 410,000  | 280,000  |
| 9,130    | 23/64 | 410,000  | 280,000  |
| 9,500    |       | 410,000  | 280,000  |
| 9,530    |       | 430,000  | 295,000  |
| 9,920    | 25/64 | 430,000  | 295,000  |

| d1<br>mm | inch  | l1<br>mm | l2<br>mm |
|----------|-------|----------|----------|
| 10,000   |       | 430,000  | 295,000  |
| 10,720   | 27/64 | 455,000  | 310,000  |
| 11,000   |       | 455,000  | 310,000  |
| 11,910   | 15/32 | 480,000  | 330,000  |
| 12,000   |       | 480,000  | 330,000  |
| 12,300   | 31/64 | 480,000  | 330,000  |
| 13,000   |       | 480,000  | 330,000  |

## Punte cilindriche

### Punte elicoidali, extra lunghe



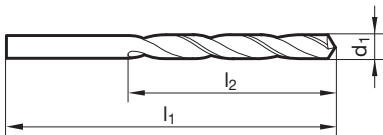
Catalogo n° 71195



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 6,000    | 500,000  | 400,000  |
| 8,000    | 500,000  | 400,000  |
| 10,000   | 600,000  | 500,000  |
| 12,000   | 600,000  | 500,000  |

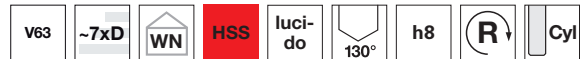
| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
|          |          |          |
|          |          |          |
|          |          |          |

## Punte cilindriche

### Punte elicoidali, extra lunghe



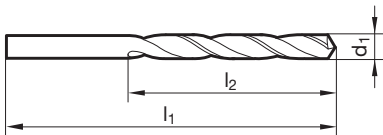
Catalogo n° 71196



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 8,000    | 750,000  | 650,000  |
| 10,000   | 750,000  | 650,000  |
| 12,000   | 750,000  | 650,000  |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
|----------|----------|----------|

## Punte cilindriche

### Punte con fori di refrigerazione



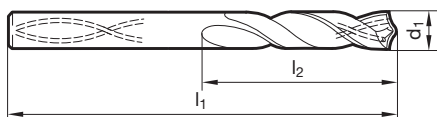
Catalogo n° 71584



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 3,000    | 3,000    | 100,000  | 66,000   | 34,000   |
| 3,300    | 3,300    | 106,000  | 69,000   | 37,000   |
| 3,500    | 3,500    | 112,000  | 73,000   | 39,000   |
| 4,000    | 4,000    | 119,000  | 78,000   | 41,000   |
| 4,200    | 4,200    | 119,000  | 78,000   | 41,000   |
| 4,500    | 4,500    | 126,000  | 82,000   | 44,000   |
| 5,000    | 5,000    | 132,000  | 87,000   | 45,000   |
| 5,500    | 5,500    | 139,000  | 91,000   | 48,000   |
| 6,000    | 6,000    | 139,000  | 91,000   | 48,000   |
| 6,500    | 6,500    | 148,000  | 97,000   | 51,000   |
| 6,800    | 6,800    | 156,000  | 102,000  | 54,000   |
| 7,000    | 7,000    | 156,000  | 102,000  | 54,000   |

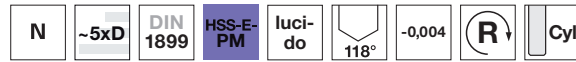
| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l3<br>mm |
|----------|----------|----------|----------|----------|
| 7,500    | 7,500    | 156,000  | 102,000  | 54,000   |
| 8,000    | 8,000    | 165,000  | 109,000  | 56,000   |
| 8,500    | 8,500    | 165,000  | 109,000  | 56,000   |
| 9,000    | 9,000    | 175,000  | 115,000  | 60,000   |
| 9,500    | 9,500    | 175,000  | 115,000  | 60,000   |
| 10,000   | 10,000   | 184,000  | 121,000  | 63,000   |
| 10,200   | 10,200   | 184,000  | 121,000  | 63,000   |
| 10,500   | 10,500   | 184,000  | 121,000  | 63,000   |
| 11,000   | 11,000   | 195,000  | 128,000  | 67,000   |
| 12,000   | 12,000   | 205,000  | 134,000  | 71,000   |
| 13,000   | 13,000   | 205,000  | 134,000  | 71,000   |

## Punte cilindriche

### Micropunte



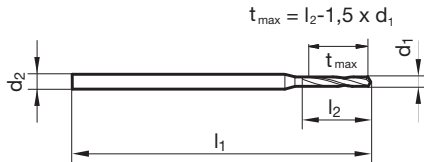
Catalogo n° 71187



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 178

- affilatura su piani
- con codolo rinforzato



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|----------|
| 0,050    | 1,000    | 25,000   | 0,400    |
| 0,060    | 1,000    | 25,000   | 0,400    |
| 0,070    | 1,000    | 25,000   | 0,500    |
| 0,080    | 1,000    | 25,000   | 0,500    |
| 0,090    | 1,000    | 25,000   | 0,500    |
| 0,100    | 1,000    | 25,000   | 0,500    |
| 0,110    | 1,000    | 25,000   | 0,500    |
| 0,120    | 1,000    | 25,000   | 0,500    |
| 0,130    | 1,000    | 25,000   | 0,800    |
| 0,140    | 1,000    | 25,000   | 0,800    |
| 0,150    | 1,000    | 25,000   | 0,800    |
| 0,160    | 1,000    | 25,000   | 1,100    |
| 0,170    | 1,000    | 25,000   | 1,100    |
| 0,180    | 1,000    | 25,000   | 1,100    |
| 0,190    | 1,000    | 25,000   | 1,100    |
| 0,200    | 1,000    | 25,000   | 1,500    |
| 0,210    | 1,000    | 25,000   | 1,500    |
| 0,220    | 1,000    | 25,000   | 1,500    |
| 0,230    | 1,000    | 25,000   | 1,500    |
| 0,240    | 1,000    | 25,000   | 1,500    |
| 0,250    | 1,000    | 25,000   | 1,900    |
| 0,260    | 1,000    | 25,000   | 1,900    |
| 0,270    | 1,000    | 25,000   | 1,900    |
| 0,280    | 1,000    | 25,000   | 1,900    |
| 0,290    | 1,000    | 25,000   | 1,900    |
| 0,300    | 1,000    | 25,000   | 1,900    |
| 0,310    | 1,000    | 25,000   | 2,400    |
| 0,320    | 1,000    | 25,000   | 2,400    |
| 0,330    | 1,000    | 25,000   | 2,400    |
| 0,340    | 1,000    | 25,000   | 2,400    |
| 0,350    | 1,000    | 25,000   | 2,400    |
| 0,360    | 1,000    | 25,000   | 2,400    |
| 0,370    | 1,000    | 25,000   | 2,400    |
| 0,380    | 1,000    | 25,000   | 2,400    |
| 0,390    | 1,000    | 25,000   | 3,000    |
| 0,400    | 1,000    | 25,000   | 3,000    |
| 0,410    | 1,000    | 25,000   | 3,000    |
| 0,420    | 1,000    | 25,000   | 3,000    |
| 0,430    | 1,000    | 25,000   | 3,000    |
| 0,440    | 1,000    | 25,000   | 3,000    |
| 0,450    | 1,000    | 25,000   | 3,000    |
| 0,460    | 1,000    | 25,000   | 3,000    |
| 0,470    | 1,000    | 25,000   | 3,000    |
| 0,480    | 1,000    | 25,000   | 3,000    |
| 0,490    | 1,000    | 25,000   | 3,400    |
| 0,500    | 1,000    | 25,000   | 3,400    |
| 0,510    | 1,000    | 25,000   | 3,400    |
| 0,520    | 1,000    | 25,000   | 3,400    |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|----------|
| 0,530    | 1,000    | 25,000   | 3,400    |
| 0,540    | 1,000    | 25,000   | 3,900    |
| 0,550    | 1,000    | 25,000   | 3,900    |
| 0,560    | 1,000    | 25,000   | 3,900    |
| 0,570    | 1,000    | 25,000   | 3,900    |
| 0,580    | 1,000    | 25,000   | 3,900    |
| 0,590    | 1,000    | 25,000   | 3,900    |
| 0,600    | 1,000    | 25,000   | 3,900    |
| 0,610    | 1,000    | 25,000   | 4,200    |
| 0,620    | 1,000    | 25,000   | 4,200    |
| 0,630    | 1,000    | 25,000   | 4,200    |
| 0,640    | 1,000    | 25,000   | 4,200    |
| 0,650    | 1,000    | 25,000   | 4,200    |
| 0,660    | 1,000    | 25,000   | 4,200    |
| 0,670    | 1,000    | 25,000   | 4,200    |
| 0,680    | 1,000    | 25,000   | 4,800    |
| 0,690    | 1,000    | 25,000   | 4,800    |
| 0,700    | 1,000    | 25,000   | 4,800    |
| 0,710    | 1,000    | 25,000   | 4,800    |
| 0,720    | 1,000    | 25,000   | 4,800    |
| 0,730    | 1,000    | 25,000   | 4,800    |
| 0,740    | 1,000    | 25,000   | 4,800    |
| 0,750    | 1,000    | 25,000   | 4,800    |
| 0,760    | 1,000    | 25,000   | 5,300    |
| 0,770    | 1,000    | 25,000   | 5,300    |
| 0,780    | 1,000    | 25,000   | 5,300    |
| 0,790    | 1,000    | 25,000   | 5,300    |
| 0,800    | 1,500    | 25,000   | 5,300    |
| 0,810    | 1,500    | 25,000   | 5,300    |
| 0,820    | 1,500    | 25,000   | 5,300    |
| 0,830    | 1,500    | 25,000   | 5,300    |
| 0,840    | 1,500    | 25,000   | 5,300    |
| 0,850    | 1,500    | 25,000   | 5,300    |
| 0,860    | 1,500    | 25,000   | 6,000    |
| 0,870    | 1,500    | 25,000   | 6,000    |
| 0,880    | 1,500    | 25,000   | 6,000    |
| 0,890    | 1,500    | 25,000   | 6,000    |
| 0,900    | 1,500    | 25,000   | 6,000    |
| 0,910    | 1,500    | 25,000   | 6,000    |
| 0,920    | 1,500    | 25,000   | 6,000    |
| 0,930    | 1,500    | 25,000   | 6,000    |
| 0,940    | 1,500    | 25,000   | 6,000    |
| 0,950    | 1,500    | 25,000   | 6,000    |
| 0,960    | 1,500    | 25,000   | 6,800    |
| 0,970    | 1,500    | 25,000   | 6,800    |
| 0,980    | 1,500    | 25,000   | 6,800    |
| 0,990    | 1,500    | 25,000   | 6,800    |
| 1,000    | 1,500    | 25,000   | 6,800    |

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|----------|----------|----------|----------|----------|
| 1,010    | 1,500    | 25,000   | 6,800    | 1,250    | 1,500    | 25,000   | 8,500    |
| 1,020    | 1,500    | 25,000   | 6,800    | 1,260    | 1,500    | 25,000   | 8,500    |
| 1,030    | 1,500    | 25,000   | 6,800    | 1,270    | 1,500    | 25,000   | 8,500    |
| 1,040    | 1,500    | 25,000   | 6,800    | 1,280    | 1,500    | 25,000   | 8,500    |
| 1,050    | 1,500    | 25,000   | 6,800    | 1,290    | 1,500    | 25,000   | 8,500    |
| 1,060    | 1,500    | 25,000   | 6,800    | 1,300    | 1,500    | 25,000   | 8,500    |
| 1,070    | 1,500    | 25,000   | 7,600    | 1,310    | 1,500    | 25,000   | 8,500    |
| 1,080    | 1,500    | 25,000   | 7,600    | 1,320    | 1,500    | 25,000   | 8,500    |
| 1,090    | 1,500    | 25,000   | 7,600    | 1,330    | 1,500    | 25,000   | 9,500    |
| 1,100    | 1,500    | 25,000   | 7,600    | 1,340    | 1,500    | 25,000   | 9,500    |
| 1,110    | 1,500    | 25,000   | 7,600    | 1,350    | 1,500    | 25,000   | 9,500    |
| 1,120    | 1,500    | 25,000   | 7,600    | 1,360    | 1,500    | 25,000   | 9,500    |
| 1,130    | 1,500    | 25,000   | 7,600    | 1,370    | 1,500    | 25,000   | 9,500    |
| 1,140    | 1,500    | 25,000   | 7,600    | 1,380    | 1,500    | 25,000   | 9,500    |
| 1,150    | 1,500    | 25,000   | 7,600    | 1,390    | 1,500    | 25,000   | 9,500    |
| 1,160    | 1,500    | 25,000   | 7,600    | 1,400    | 1,500    | 25,000   | 9,500    |
| 1,170    | 1,500    | 25,000   | 7,600    | 1,410    | 1,500    | 25,000   | 9,500    |
| 1,180    | 1,500    | 25,000   | 7,600    | 1,420    | 1,500    | 25,000   | 9,500    |
| 1,190    | 1,500    | 25,000   | 8,500    | 1,430    | 1,500    | 25,000   | 9,500    |
| 1,200    | 1,500    | 25,000   | 8,500    | 1,440    | 1,500    | 25,000   | 9,500    |
| 1,210    | 1,500    | 25,000   | 8,500    | 1,450    | 1,500    | 25,000   | 9,500    |
| 1,220    | 1,500    | 25,000   | 8,500    |          |          |          |          |
| 1,230    | 1,500    | 25,000   | 8,500    |          |          |          |          |
| 1,240    | 1,500    | 25,000   | 8,500    |          |          |          |          |

## Punte cilindriche

### Punte cilindriche per centri CN

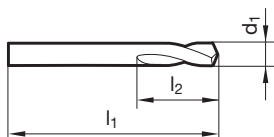


Catalogo n° 71175



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

- spoglia sul cono tagliente
- adatte solo per centrare



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 3,000    | 46,000   | 12,000   |
| 4,000    | 55,000   | 12,000   |
| 5,000    | 62,000   | 14,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 12,000   | 102,000  | 30,000   |
| 16,000   | 115,000  | 37,500   |
| 20,000   | 131,000  | 45,000   |
| 25,000   | 151,000  | 53,000   |
| 25,400   | 156,000  | 53,000   |

## Punte cilindriche

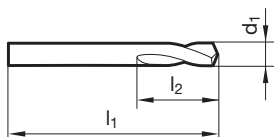
### Punte cilindriche per centri CN



Catalogo n° 61175

|   |    |     |     |     |    |   |     |
|---|----|-----|-----|-----|----|---|-----|
| N | WN | HSS | TiN | 90° | h6 | R | Cyl |
| P | M  | K   | N   | S   | H  |   |     |
| • | •  | •   | •   | •   |    |   |     |

- spoglia sul cono tagliente
- adatte solo per centrare
- maggiore protezione contro l'usura



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 3,000    | 46,000   | 12,000   |
| 4,000    | 55,000   | 12,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |
| 12,000   | 102,000  | 30,000   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 16,000   | 115,000  | 37,500   |
| 20,000   | 131,000  | 45,000   |
| 25,000   | 151,000  | 53,000   |



## Punte cilindriche

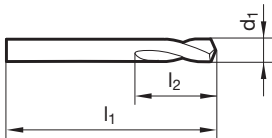
### Punte cilindriche per centri CN



Catalogo n° 71176

|   |    |     |        |      |    |   |     |
|---|----|-----|--------|------|----|---|-----|
| N | WN | HSS | lucido | 120° | h6 | R | Cyl |
| P | M  | K   | N      | S    | H  |   |     |
| • | •  | •   | •      | •    |    |   |     |

- spoglia sul cono tagliente
- adatte solo per centrare



| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 3,000    | 46,000   | 12,000   |
| 4,000    | 55,000   | 12,000   |
| 5,000    | 62,000   | 14,000   |
| 6,000    | 66,000   | 16,000   |
| 8,000    | 79,000   | 21,000   |
| 10,000   | 89,000   | 25,000   |

| d1<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|
| 12,000   | 102,000  | 30,000   |
| 16,000   | 115,000  | 37,500   |
| 20,000   | 131,000  | 45,000   |
| 25,400   | 156,000  | 53,000   |

## Punte con codolo conico Morse

### Punte elicoidali, corte



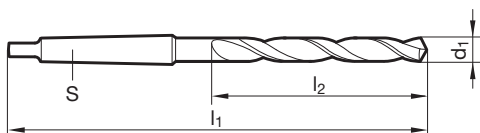
Catalogo n° 71303



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ |   | ○ | ○ |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 10,000$
- spoglia sul cono tagliente
- particolarmente stabile e resistente



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 10,000   | MK-1 | 138,000  | 57,000   |
| 10,200   | MK-1 | 138,000  | 57,000   |
| 10,500   | MK-1 | 138,000  | 57,000   |
| 10,800   | MK-1 | 142,000  | 61,000   |
| 11,000   | MK-1 | 142,000  | 61,000   |
| 11,500   | MK-1 | 142,000  | 61,000   |
| 12,000   | MK-1 | 147,000  | 66,000   |
| 12,500   | MK-1 | 147,000  | 66,000   |
| 13,000   | MK-1 | 147,000  | 66,000   |
| 14,500   | MK-2 | 172,000  | 74,000   |
| 15,000   | MK-2 | 172,000  | 74,000   |
| 16,000   | MK-2 | 176,000  | 78,000   |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 16,500   | MK-2 | 179,000  | 81,000   |
| 17,000   | MK-2 | 179,000  | 81,000   |
| 17,500   | MK-2 | 183,000  | 85,000   |
| 18,000   | MK-2 | 183,000  | 85,000   |
| 18,500   | MK-2 | 186,000  | 88,000   |
| 23,500   | MK-3 | 222,000  | 101,000  |
| 24,000   | MK-3 | 225,000  | 104,000  |
| 24,500   | MK-3 | 225,000  | 104,000  |
| 25,000   | MK-3 | 225,000  | 104,000  |
| 25,500   | MK-4 | 256,000  | 107,000  |

## Punte con codolo conico Morse

### Punte elicoidali, corte



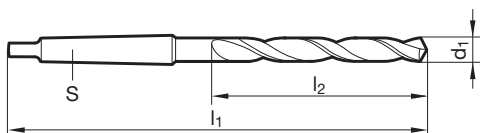
Catalogo n° 71304



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 176

- Assott. del noc.  $\geq \varnothing 12,000$
- spoglia sul cono tagliente
- particolarmente stabile e resistente
- con cono Morse sovradimensionato



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 12,000   | MK-2 | 164,000  | 66,000   |
| 12,500   | MK-2 | 164,000  | 66,000   |
| 12,800   | MK-2 | 164,000  | 66,000   |
| 13,000   | MK-2 | 164,000  | 66,000   |
| 13,500   | MK-2 | 169,000  | 70,000   |
| 14,000   | MK-2 | 169,000  | 70,000   |
| 19,000   | MK-3 | 211,000  | 88,000   |
| 19,500   | MK-3 | 214,000  | 91,000   |
| 20,000   | MK-3 | 214,000  | 91,000   |
| 20,500   | MK-3 | 217,000  | 95,000   |
| 21,000   | MK-3 | 217,000  | 95,000   |
| 21,500   | MK-3 | 221,000  | 98,000   |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 22,000   | MK-3 | 221,000  | 98,000   |
| 22,500   | MK-3 | 224,000  | 101,000  |
| 23,000   | MK-3 | 224,000  | 101,000  |
| 26,000   | MK-4 | 256,000  | 107,000  |
| 26,500   | MK-4 | 261,000  | 107,000  |
| 27,000   | MK-4 | 261,000  | 110,000  |
| 27,500   | MK-4 | 261,000  | 110,000  |
| 28,000   | MK-4 | 261,000  | 110,000  |
| 28,500   | MK-4 | 265,000  | 114,000  |
| 29,000   | MK-4 | 265,000  | 114,000  |
| 29,500   | MK-4 | 265,000  | 114,000  |
| 30,000   | MK-4 | 265,000  | 114,000  |

## Punte con codolo conico Morse

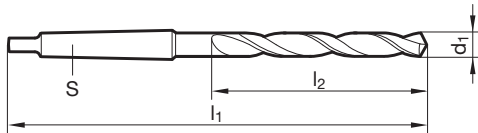
### Punte elicoidali



Catalogo n° 71300

|   |      |         |     |                   |      |                                   |   |    |
|---|------|---------|-----|-------------------|------|-----------------------------------|---|----|
| N | ~5xD | DIN 345 | HSS | trattati a vapore | 118° | h8                                | R | MK |
| P | M    | K       | N   | S                 | H    | Parametri di lav. ind. a pag. 180 |   |    |
| • |      | •       | •   |                   |      |                                   |   |    |

- Assott. del noc.  $\geq \varnothing 14,100$
- spoglia sul cono tagliente

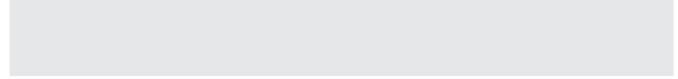
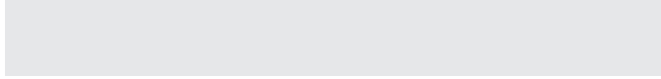
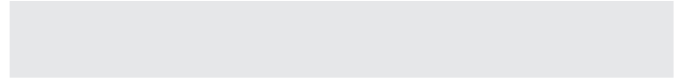
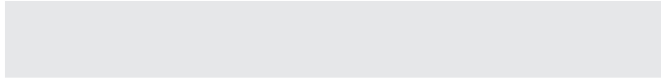


| d1<br>mm | S    | l1<br>mm | l2<br>mm | d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 3,750    | MK-1 | 120,000  | 39,000   | 10,500   | MK-1 | 168,000  | 87,000   |
| 4,000    | MK-1 | 124,000  | 43,000   | 10,600   | MK-1 | 168,000  | 87,000   |
| 4,100    | MK-1 | 124,000  | 43,000   | 10,700   | MK-1 | 175,000  | 94,000   |
| 4,200    | MK-1 | 124,000  | 43,000   | 10,750   | MK-1 | 175,000  | 94,000   |
| 4,250    | MK-1 | 124,000  | 43,000   | 10,800   | MK-1 | 175,000  | 94,000   |
| 4,500    | MK-1 | 128,000  | 47,000   | 10,900   | MK-1 | 175,000  | 94,000   |
| 4,600    | MK-1 | 128,000  | 47,000   | 11,000   | MK-1 | 175,000  | 94,000   |
| 4,900    | MK-1 | 133,000  | 52,000   | 11,100   | MK-1 | 175,000  | 94,000   |
| 5,000    | MK-1 | 133,000  | 52,000   | 11,200   | MK-1 | 175,000  | 94,000   |
| 5,100    | MK-1 | 133,000  | 52,000   | 11,300   | MK-1 | 175,000  | 94,000   |
| 5,500    | MK-1 | 138,000  | 57,000   | 11,400   | MK-1 | 175,000  | 94,000   |
| 5,750    | MK-1 | 138,000  | 57,000   | 11,500   | MK-1 | 175,000  | 94,000   |
| 5,800    | MK-1 | 138,000  | 57,000   | 11,600   | MK-1 | 175,000  | 94,000   |
| 6,000    | MK-1 | 138,000  | 57,000   | 11,700   | MK-1 | 175,000  | 94,000   |
| 6,500    | MK-1 | 144,000  | 63,000   | 11,750   | MK-1 | 175,000  | 94,000   |
| 6,750    | MK-1 | 150,000  | 69,000   | 11,800   | MK-1 | 175,000  | 94,000   |
| 6,800    | MK-1 | 150,000  | 69,000   | 11,900   | MK-1 | 182,000  | 101,000  |
| 7,000    | MK-1 | 150,000  | 69,000   | 12,000   | MK-1 | 182,000  | 101,000  |
| 7,200    | MK-1 | 150,000  | 69,000   | 12,100   | MK-1 | 182,000  | 101,000  |
| 7,250    | MK-1 | 150,000  | 69,000   | 12,200   | MK-1 | 182,000  | 101,000  |
| 7,400    | MK-1 | 150,000  | 69,000   | 12,250   | MK-1 | 182,000  | 101,000  |
| 7,500    | MK-1 | 150,000  | 69,000   | 12,300   | MK-1 | 182,000  | 101,000  |
| 7,800    | MK-1 | 156,000  | 75,000   | 12,400   | MK-1 | 182,000  | 101,000  |
| 7,900    | MK-1 | 156,000  | 75,000   | 12,500   | MK-1 | 182,000  | 101,000  |
| 8,000    | MK-1 | 156,000  | 75,000   | 12,600   | MK-1 | 182,000  | 101,000  |
| 8,100    | MK-1 | 156,000  | 75,000   | 12,700   | MK-1 | 182,000  | 101,000  |
| 8,200    | MK-1 | 156,000  | 75,000   | 12,800   | MK-1 | 182,000  | 101,000  |
| 8,250    | MK-1 | 156,000  | 75,000   | 12,900   | MK-1 | 182,000  | 101,000  |
| 8,300    | MK-1 | 156,000  | 75,000   | 13,000   | MK-1 | 182,000  | 101,000  |
| 8,500    | MK-1 | 156,000  | 75,000   | 13,100   | MK-1 | 182,000  | 101,000  |
| 8,600    | MK-1 | 162,000  | 81,000   | 13,200   | MK-1 | 182,000  | 101,000  |
| 8,700    | MK-1 | 162,000  | 81,000   | 13,300   | MK-1 | 189,000  | 108,000  |
| 8,750    | MK-1 | 162,000  | 81,000   | 13,400   | MK-1 | 189,000  | 108,000  |
| 8,900    | MK-1 | 162,000  | 81,000   | 13,500   | MK-1 | 189,000  | 108,000  |
| 9,000    | MK-1 | 162,000  | 81,000   | 13,600   | MK-1 | 189,000  | 108,000  |
| 9,200    | MK-1 | 162,000  | 81,000   | 13,700   | MK-1 | 189,000  | 108,000  |
| 9,300    | MK-1 | 162,000  | 81,000   | 13,750   | MK-1 | 189,000  | 108,000  |
| 9,400    | MK-1 | 162,000  | 81,000   | 13,800   | MK-1 | 189,000  | 108,000  |
| 9,500    | MK-1 | 162,000  | 81,000   | 13,900   | MK-1 | 189,000  | 108,000  |
| 9,750    | MK-1 | 168,000  | 87,000   | 14,000   | MK-1 | 189,000  | 108,000  |
| 9,800    | MK-1 | 168,000  | 87,000   | 14,100   | MK-2 | 212,000  | 114,000  |
| 9,900    | MK-1 | 168,000  | 87,000   | 14,200   | MK-2 | 212,000  | 114,000  |
| 10,000   | MK-1 | 168,000  | 87,000   | 14,250   | MK-2 | 212,000  | 114,000  |
| 10,100   | MK-1 | 168,000  | 87,000   | 14,300   | MK-2 | 212,000  | 114,000  |
| 10,200   | MK-1 | 168,000  | 87,000   | 14,400   | MK-2 | 212,000  | 114,000  |
| 10,250   | MK-1 | 168,000  | 87,000   | 14,500   | MK-2 | 212,000  | 114,000  |
| 10,300   | MK-1 | 168,000  | 87,000   | 14,600   | MK-2 | 212,000  | 114,000  |
| 10,400   | MK-1 | 168,000  | 87,000   | 14,700   | MK-2 | 212,000  | 114,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm | d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|----------|------|----------|----------|
| 14,750   | MK-2 | 212,000  | 114,000  | 24,750   | MK-3 | 281,000  | 160,000  |
| 14,800   | MK-2 | 212,000  | 114,000  | 25,000   | MK-3 | 281,000  | 160,000  |
| 14,900   | MK-2 | 212,000  | 114,000  | 25,250   | MK-3 | 286,000  | 165,000  |
| 15,000   | MK-2 | 212,000  | 114,000  | 25,500   | MK-3 | 286,000  | 165,000  |
| 15,100   | MK-2 | 218,000  | 120,000  | 25,750   | MK-3 | 286,000  | 165,000  |
| 15,200   | MK-2 | 218,000  | 120,000  | 26,000   | MK-3 | 286,000  | 165,000  |
| 15,250   | MK-2 | 218,000  | 120,000  | 26,500   | MK-3 | 286,000  | 165,000  |
| 15,300   | MK-2 | 218,000  | 120,000  | 27,000   | MK-3 | 291,000  | 170,000  |
| 15,400   | MK-2 | 218,000  | 120,000  | 27,250   | MK-3 | 291,000  | 170,000  |
| 15,500   | MK-2 | 218,000  | 120,000  | 27,500   | MK-3 | 291,000  | 170,000  |
| 15,600   | MK-2 | 218,000  | 120,000  | 27,750   | MK-3 | 291,000  | 170,000  |
| 15,700   | MK-2 | 218,000  | 120,000  | 28,000   | MK-3 | 291,000  | 170,000  |
| 15,750   | MK-2 | 218,000  | 120,000  | 28,500   | MK-3 | 296,000  | 175,000  |
| 15,800   | MK-2 | 218,000  | 120,000  | 28,570   | MK-3 | 296,000  | 175,000  |
| 15,900   | MK-2 | 218,000  | 120,000  | 29,000   | MK-3 | 296,000  | 175,000  |
| 16,000   | MK-2 | 218,000  | 120,000  | 29,250   | MK-3 | 296,000  | 175,000  |
| 16,100   | MK-2 | 223,000  | 125,000  | 29,500   | MK-3 | 296,000  | 175,000  |
| 16,200   | MK-2 | 223,000  | 125,000  | 29,750   | MK-3 | 296,000  | 175,000  |
| 16,250   | MK-2 | 223,000  | 125,000  | 30,000   | MK-3 | 296,000  | 175,000  |
| 16,300   | MK-2 | 223,000  | 125,000  | 30,250   | MK-3 | 301,000  | 180,000  |
| 16,400   | MK-2 | 223,000  | 125,000  | 30,500   | MK-3 | 301,000  | 180,000  |
| 16,500   | MK-2 | 223,000  | 125,000  | 30,750   | MK-3 | 301,000  | 180,000  |
| 16,600   | MK-2 | 223,000  | 125,000  | 31,000   | MK-3 | 301,000  | 180,000  |
| 16,700   | MK-2 | 223,000  | 125,000  | 31,500   | MK-3 | 301,000  | 180,000  |
| 16,750   | MK-2 | 223,000  | 125,000  | 32,000   | MK-4 | 334,000  | 185,000  |
| 16,800   | MK-2 | 223,000  | 125,000  | 32,500   | MK-4 | 334,000  | 185,000  |
| 16,900   | MK-2 | 223,000  | 125,000  | 33,000   | MK-4 | 334,000  | 185,000  |
| 17,000   | MK-2 | 223,000  | 125,000  | 33,340   | MK-4 | 334,000  | 185,000  |
| 17,100   | MK-2 | 228,000  | 130,000  | 33,500   | MK-4 | 334,000  | 185,000  |
| 17,200   | MK-2 | 228,000  | 130,000  | 34,000   | MK-4 | 339,000  | 190,000  |
| 17,300   | MK-2 | 228,000  | 130,000  | 34,500   | MK-4 | 339,000  | 190,000  |
| 17,400   | MK-2 | 228,000  | 130,000  | 35,000   | MK-4 | 339,000  | 190,000  |
| 17,500   | MK-2 | 228,000  | 130,000  | 35,500   | MK-4 | 339,000  | 190,000  |
| 17,600   | MK-2 | 228,000  | 130,000  | 36,000   | MK-4 | 344,000  | 195,000  |
| 17,700   | MK-2 | 228,000  | 130,000  | 36,500   | MK-4 | 344,000  | 195,000  |
| 17,750   | MK-2 | 228,000  | 130,000  | 37,000   | MK-4 | 344,000  | 195,000  |
| 17,800   | MK-2 | 228,000  | 130,000  | 37,500   | MK-4 | 344,000  | 195,000  |
| 17,900   | MK-2 | 228,000  | 130,000  | 38,000   | MK-4 | 349,000  | 200,000  |
| 18,000   | MK-2 | 228,000  | 130,000  | 38,500   | MK-4 | 349,000  | 200,000  |
| 18,100   | MK-2 | 233,000  | 135,000  | 39,000   | MK-4 | 349,000  | 200,000  |
| 18,200   | MK-2 | 233,000  | 135,000  | 39,500   | MK-4 | 349,000  | 200,000  |
| 18,250   | MK-2 | 233,000  | 135,000  | 39,690   | MK-4 | 349,000  | 200,000  |
| 18,300   | MK-2 | 233,000  | 135,000  | 40,000   | MK-4 | 349,000  | 200,000  |
| 18,500   | MK-2 | 233,000  | 135,000  | 40,500   | MK-4 | 354,000  | 205,000  |
| 18,600   | MK-2 | 233,000  | 135,000  | 41,000   | MK-4 | 354,000  | 205,000  |
| 18,750   | MK-2 | 233,000  | 135,000  | 41,500   | MK-4 | 354,000  | 205,000  |
| 19,000   | MK-2 | 233,000  | 135,000  | 42,000   | MK-4 | 354,000  | 205,000  |
| 19,250   | MK-2 | 238,000  | 140,000  | 42,500   | MK-4 | 354,000  | 205,000  |
| 19,500   | MK-2 | 238,000  | 140,000  | 43,000   | MK-4 | 359,000  | 210,000  |
| 19,750   | MK-2 | 238,000  | 140,000  | 43,500   | MK-4 | 359,000  | 210,000  |
| 20,000   | MK-2 | 238,000  | 140,000  | 44,000   | MK-4 | 359,000  | 210,000  |
| 20,100   | MK-2 | 243,000  | 145,000  | 44,500   | MK-4 | 359,000  | 210,000  |
| 20,250   | MK-2 | 243,000  | 145,000  | 45,000   | MK-4 | 359,000  | 210,000  |
| 20,300   | MK-2 | 243,000  | 145,000  | 45,500   | MK-4 | 364,000  | 215,000  |
| 20,400   | MK-2 | 243,000  | 145,000  | 46,000   | MK-4 | 364,000  | 215,000  |
| 20,500   | MK-2 | 243,000  | 145,000  | 46,500   | MK-4 | 364,000  | 215,000  |
| 20,640   | MK-2 | 243,000  | 145,000  | 47,000   | MK-4 | 364,000  | 215,000  |
| 20,750   | MK-2 | 243,000  | 145,000  | 48,000   | MK-4 | 369,000  | 220,000  |
| 21,000   | MK-2 | 243,000  | 145,000  | 48,500   | MK-4 | 369,000  | 220,000  |
| 21,250   | MK-2 | 248,000  | 150,000  | 49,000   | MK-4 | 369,000  | 220,000  |
| 21,430   | MK-2 | 248,000  | 150,000  | 49,500   | MK-4 | 369,000  | 220,000  |
| 21,500   | MK-2 | 248,000  | 150,000  | 50,000   | MK-4 | 369,000  | 220,000  |
| 22,000   | MK-2 | 248,000  | 150,000  | 50,500   | MK-4 | 374,000  | 225,000  |
| 22,250   | MK-2 | 248,000  | 150,000  | 50,800   | MK-4 | 374,000  | 225,000  |
| 22,500   | MK-2 | 253,000  | 155,000  | 51,000   | MK-5 | 412,000  | 225,000  |
| 22,900   | MK-2 | 253,000  | 155,000  | 52,000   | MK-5 | 412,000  | 225,000  |
| 23,000   | MK-2 | 253,000  | 155,000  | 53,500   | MK-5 | 417,000  | 230,000  |
| 23,500   | MK-3 | 276,000  | 155,000  | 54,000   | MK-5 | 417,000  | 230,000  |
| 23,750   | MK-3 | 281,000  | 160,000  | 55,000   | MK-5 | 417,000  | 230,000  |
| 24,000   | MK-3 | 281,000  | 160,000  | 57,000   | MK-5 | 422,000  | 235,000  |
| 24,250   | MK-3 | 281,000  | 160,000  | 58,000   | MK-5 | 422,000  | 235,000  |
| 24,500   | MK-3 | 281,000  | 160,000  | 59,000   | MK-5 | 422,000  | 235,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 60,000   | MK-5 | 422,000  | 235,000  |
| 61,000   | MK-5 | 427,000  | 240,000  |
| 68,000   | MK-5 | 437,000  | 250,000  |

| d1<br>mm | S | l1<br>mm | l2<br>mm |
|----------|---|----------|----------|
|----------|---|----------|----------|

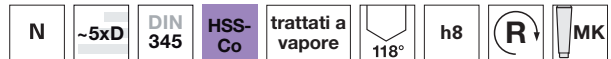


## Punte con codolo conico Morse

### Punte elicoidali



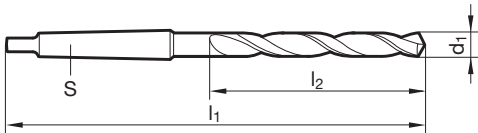
Catalogo n° 71416



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● |   |   |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del nocco.  $\geq \varnothing 5,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 5,000    | MK-1 | 133,000  | 52,000   |
| 8,000    | MK-1 | 156,000  | 75,000   |
| 8,500    | MK-1 | 156,000  | 75,000   |
| 9,000    | MK-1 | 162,000  | 81,000   |
| 9,500    | MK-1 | 162,000  | 81,000   |
| 10,200   | MK-1 | 168,000  | 87,000   |
| 10,500   | MK-1 | 168,000  | 87,000   |
| 10,600   | MK-1 | 168,000  | 87,000   |
| 11,000   | MK-1 | 175,000  | 94,000   |
| 11,500   | MK-1 | 175,000  | 94,000   |
| 12,000   | MK-1 | 182,000  | 101,000  |
| 12,500   | MK-1 | 182,000  | 101,000  |
| 14,000   | MK-1 | 189,000  | 108,000  |
| 14,500   | MK-2 | 212,000  | 114,000  |
| 14,750   | MK-2 | 212,000  | 114,000  |
| 15,000   | MK-2 | 212,000  | 114,000  |
| 15,500   | MK-2 | 218,000  | 120,000  |
| 16,000   | MK-2 | 218,000  | 120,000  |

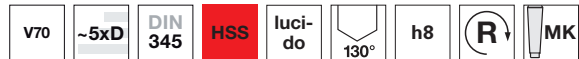
| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 17,000   | MK-2 | 223,000  | 125,000  |
| 17,500   | MK-2 | 228,000  | 130,000  |
| 18,000   | MK-2 | 228,000  | 130,000  |
| 18,500   | MK-2 | 233,000  | 135,000  |
| 19,000   | MK-2 | 233,000  | 135,000  |
| 20,000   | MK-2 | 238,000  | 140,000  |
| 20,500   | MK-2 | 243,000  | 145,000  |
| 21,000   | MK-2 | 243,000  | 145,000  |
| 21,500   | MK-2 | 248,000  | 150,000  |
| 22,000   | MK-2 | 248,000  | 150,000  |
| 23,000   | MK-2 | 253,000  | 155,000  |
| 23,500   | MK-3 | 276,000  | 155,000  |
| 24,000   | MK-3 | 281,000  | 160,000  |
| 25,000   | MK-3 | 281,000  | 160,000  |
| 26,000   | MK-3 | 286,000  | 165,000  |
| 26,500   | MK-3 | 286,000  | 165,000  |
| 30,500   | MK-3 | 301,000  | 180,000  |
| 33,000   | MK-4 | 334,000  | 185,000  |

## Punte con codolo conico Morse

### Punte elicoidali



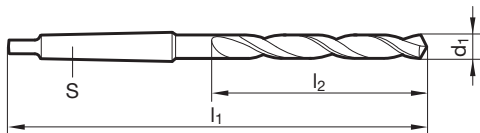
Catalogo n° 71305



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 180

- Assott. del noc.  $\geq \varnothing 7,940$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 7,940    | MK-1 | 156,000  | 75,000   |
| 8,000    | MK-1 | 156,000  | 75,000   |
| 8,250    | MK-1 | 156,000  | 75,000   |
| 8,500    | MK-1 | 156,000  | 75,000   |
| 8,750    | MK-1 | 162,000  | 81,000   |
| 9,000    | MK-1 | 162,000  | 81,000   |
| 9,250    | MK-1 | 162,000  | 81,000   |
| 9,500    | MK-1 | 162,000  | 81,000   |
| 10,000   | MK-1 | 168,000  | 87,000   |
| 10,200   | MK-1 | 168,000  | 87,000   |
| 10,250   | MK-1 | 168,000  | 87,000   |
| 10,500   | MK-1 | 168,000  | 87,000   |
| 10,750   | MK-1 | 175,000  | 94,000   |
| 11,000   | MK-1 | 175,000  | 94,000   |
| 11,500   | MK-1 | 175,000  | 94,000   |
| 11,750   | MK-1 | 175,000  | 94,000   |
| 12,000   | MK-1 | 182,000  | 101,000  |
| 12,250   | MK-1 | 182,000  | 101,000  |
| 12,700   | MK-1 | 182,000  | 101,000  |
| 13,000   | MK-1 | 182,000  | 101,000  |
| 13,500   | MK-1 | 189,000  | 108,000  |
| 14,000   | MK-1 | 189,000  | 108,000  |
| 14,500   | MK-2 | 212,000  | 114,000  |
| 15,000   | MK-2 | 212,000  | 114,000  |
| 15,500   | MK-2 | 218,000  | 120,000  |
| 16,000   | MK-2 | 218,000  | 120,000  |
| 16,500   | MK-2 | 223,000  | 125,000  |
| 17,000   | MK-2 | 223,000  | 125,000  |
| 17,500   | MK-2 | 228,000  | 130,000  |
| 18,000   | MK-2 | 228,000  | 130,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 18,500   | MK-2 | 233,000  | 135,000  |
| 19,000   | MK-2 | 233,000  | 135,000  |
| 20,000   | MK-2 | 238,000  | 140,000  |
| 20,500   | MK-2 | 243,000  | 145,000  |
| 21,000   | MK-2 | 243,000  | 145,000  |
| 22,000   | MK-2 | 248,000  | 150,000  |
| 23,000   | MK-2 | 253,000  | 155,000  |
| 24,000   | MK-3 | 281,000  | 160,000  |
| 25,000   | MK-3 | 281,000  | 160,000  |
| 25,500   | MK-3 | 286,000  | 165,000  |
| 26,000   | MK-3 | 286,000  | 165,000  |
| 26,500   | MK-3 | 286,000  | 165,000  |
| 26,990   | MK-3 | 291,000  | 170,000  |
| 27,000   | MK-3 | 291,000  | 170,000  |
| 27,500   | MK-3 | 291,000  | 170,000  |
| 28,000   | MK-3 | 291,000  | 170,000  |
| 28,570   | MK-3 | 296,000  | 175,000  |
| 29,000   | MK-3 | 296,000  | 175,000  |
| 29,500   | MK-3 | 296,000  | 175,000  |
| 31,000   | MK-3 | 301,000  | 180,000  |
| 31,500   | MK-3 | 301,000  | 180,000  |
| 32,000   | MK-4 | 334,000  | 185,000  |

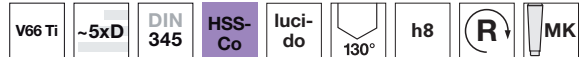


## Punte con codolo conico Morse

### Punte elicoidali



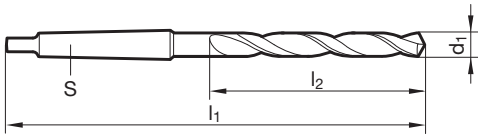
Catalogo n° 71312



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | • |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del noc.  $\geq \varnothing 8,500$
- spoglia sul cono tagliente
- alta rigidità



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,500    | MK-1 | 156,000  | 75,000   |
| 9,000    | MK-1 | 162,000  | 81,000   |
| 9,500    | MK-1 | 162,000  | 81,000   |
| 10,000   | MK-1 | 168,000  | 87,000   |
| 10,200   | MK-1 | 168,000  | 87,000   |
| 10,500   | MK-1 | 168,000  | 87,000   |
| 11,000   | MK-1 | 175,000  | 94,000   |
| 11,250   | MK-1 | 175,000  | 94,000   |
| 11,500   | MK-1 | 175,000  | 94,000   |
| 12,000   | MK-1 | 182,000  | 101,000  |
| 12,500   | MK-1 | 182,000  | 101,000  |
| 13,000   | MK-1 | 182,000  | 101,000  |
| 13,500   | MK-1 | 189,000  | 108,000  |
| 14,000   | MK-1 | 189,000  | 108,000  |
| 14,500   | MK-2 | 212,000  | 114,000  |
| 15,000   | MK-2 | 212,000  | 114,000  |
| 15,500   | MK-2 | 218,000  | 120,000  |
| 16,000   | MK-2 | 218,000  | 120,000  |
| 16,250   | MK-2 | 223,000  | 125,000  |
| 16,500   | MK-2 | 223,000  | 125,000  |
| 17,000   | MK-2 | 223,000  | 125,000  |
| 17,500   | MK-2 | 228,000  | 130,000  |
| 18,000   | MK-2 | 228,000  | 130,000  |
| 18,500   | MK-2 | 233,000  | 135,000  |

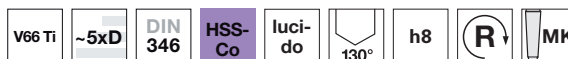
| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 19,000   | MK-2 | 233,000  | 135,000  |
| 19,500   | MK-2 | 238,000  | 140,000  |
| 20,000   | MK-2 | 238,000  | 140,000  |
| 20,250   | MK-2 | 243,000  | 145,000  |
| 21,000   | MK-2 | 243,000  | 145,000  |
| 22,000   | MK-2 | 248,000  | 150,000  |
| 23,000   | MK-2 | 253,000  | 155,000  |
| 24,000   | MK-3 | 281,000  | 160,000  |
| 25,000   | MK-3 | 281,000  | 160,000  |
| 26,000   | MK-3 | 286,000  | 165,000  |
| 27,000   | MK-3 | 291,000  | 170,000  |
| 27,500   | MK-3 | 291,000  | 170,000  |
| 28,000   | MK-3 | 291,000  | 170,000  |
| 30,000   | MK-3 | 296,000  | 175,000  |
| 32,000   | MK-4 | 334,000  | 185,000  |

## Punte con codolo conico Morse

### Punte elicoidali



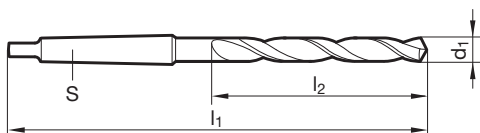
Catalogo n° 71313



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | • |   |

Parametri di lav.  
ind. a pag. 182

- Assott. del nocc.  $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- alta rigidità
- con cono Morse rinforzato



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 11,000   | MK-2 | 192,000  | 94,000   |
| 12,000   | MK-2 | 199,000  | 101,000  |
| 12,500   | MK-2 | 199,000  | 101,000  |
| 12,800   | MK-2 | 199,000  | 101,000  |
| 13,000   | MK-2 | 199,000  | 101,000  |
| 13,500   | MK-2 | 206,000  | 108,000  |
| 14,000   | MK-2 | 206,000  | 108,000  |
| 20,000   | MK-3 | 261,000  | 140,000  |
| 20,500   | MK-3 | 266,000  | 145,000  |
| 21,500   | MK-3 | 271,000  | 150,000  |
| 23,000   | MK-3 | 276,000  | 155,000  |
| 26,000   | MK-4 | 314,000  | 165,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 27,000   | MK-4 | 319,000  | 170,000  |
| 29,000   | MK-4 | 324,000  | 175,000  |

## Punte con codolo conico Morse

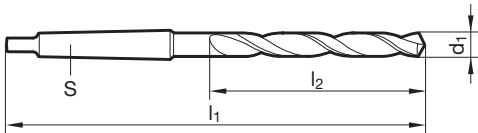
### Punte per foratura con bussola di guida



Catalogo n° 71320

|   |       |         |     |                   |      |                                   |   |    |
|---|-------|---------|-----|-------------------|------|-----------------------------------|---|----|
| N | -10xD | DIN 341 | HSS | trattati a vapore | 118° | h8                                | R | MK |
| P | M     | K       | N   | S                 | H    | Parametri di lav. ind. a pag. 186 |   |    |
| ● |       | ●       |     |                   |      |                                   |   |    |

- Assott. del noc.  $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- per forare con bussola di guida



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 6,000    | MK-1 | 161,000  | 80,000   |
| 6,500    | MK-1 | 167,000  | 86,000   |
| 6,800    | MK-1 | 174,000  | 93,000   |
| 7,000    | MK-1 | 174,000  | 93,000   |
| 8,000    | MK-1 | 181,000  | 100,000  |
| 8,200    | MK-1 | 181,000  | 100,000  |
| 8,500    | MK-1 | 181,000  | 100,000  |
| 8,750    | MK-1 | 188,000  | 107,000  |
| 8,800    | MK-1 | 188,000  | 107,000  |
| 9,000    | MK-1 | 188,000  | 107,000  |
| 9,500    | MK-1 | 188,000  | 107,000  |
| 10,000   | MK-1 | 197,000  | 116,000  |
| 10,100   | MK-1 | 197,000  | 116,000  |
| 10,200   | MK-1 | 197,000  | 116,000  |
| 11,000   | MK-1 | 206,000  | 125,000  |
| 11,500   | MK-1 | 206,000  | 125,000  |
| 12,000   | MK-1 | 215,000  | 134,000  |
| 12,500   | MK-1 | 215,000  | 134,000  |
| 12,750   | MK-1 | 215,000  | 134,000  |
| 13,000   | MK-1 | 215,000  | 134,000  |
| 13,500   | MK-1 | 223,000  | 142,000  |
| 13,750   | MK-1 | 223,000  | 142,000  |
| 13,800   | MK-1 | 223,000  | 142,000  |
| 13,900   | MK-1 | 223,000  | 142,000  |
| 14,000   | MK-1 | 223,000  | 142,000  |
| 14,500   | MK-2 | 245,000  | 147,000  |
| 15,000   | MK-2 | 245,000  | 147,000  |
| 16,000   | MK-2 | 251,000  | 153,000  |
| 16,250   | MK-2 | 257,000  | 159,000  |
| 16,500   | MK-2 | 257,000  | 159,000  |
| 16,750   | MK-2 | 257,000  | 159,000  |
| 17,000   | MK-2 | 257,000  | 159,000  |
| 17,500   | MK-2 | 263,000  | 165,000  |
| 18,000   | MK-2 | 263,000  | 165,000  |
| 18,500   | MK-2 | 269,000  | 171,000  |
| 18,750   | MK-2 | 269,000  | 171,000  |

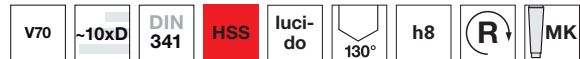
| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 19,000   | MK-2 | 269,000  | 171,000  |
| 19,250   | MK-2 | 275,000  | 177,000  |
| 19,500   | MK-2 | 275,000  | 177,000  |
| 20,000   | MK-2 | 275,000  | 177,000  |
| 21,000   | MK-2 | 282,000  | 184,000  |
| 22,000   | MK-2 | 289,000  | 191,000  |
| 22,500   | MK-2 | 296,000  | 198,000  |
| 23,000   | MK-2 | 296,000  | 198,000  |
| 24,000   | MK-3 | 327,000  | 206,000  |
| 25,000   | MK-3 | 327,000  | 206,000  |
| 26,000   | MK-3 | 335,000  | 214,000  |
| 26,500   | MK-3 | 335,000  | 214,000  |
| 27,000   | MK-3 | 343,000  | 222,000  |
| 28,000   | MK-3 | 343,000  | 222,000  |
| 29,500   | MK-3 | 351,000  | 230,000  |
| 30,000   | MK-3 | 351,000  | 230,000  |
| 31,000   | MK-3 | 360,000  | 239,000  |
| 32,000   | MK-4 | 397,000  | 248,000  |
| 33,000   | MK-4 | 397,000  | 248,000  |
| 34,000   | MK-4 | 406,000  | 257,000  |
| 35,000   | MK-4 | 406,000  | 257,000  |
| 36,000   | MK-4 | 416,000  | 267,000  |
| 38,000   | MK-4 | 426,000  | 277,000  |
| 40,000   | MK-4 | 426,000  | 277,000  |
| 45,000   | MK-4 | 447,000  | 298,000  |

## Punte con codolo conico Morse

### Punte per foratura con bussola di guida



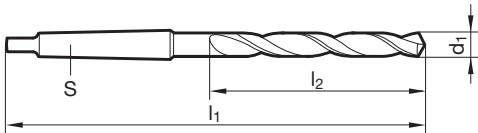
Catalogo n° 71322



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del noc.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-1 | 181,000  | 100,000  |
| 8,500    | MK-1 | 181,000  | 100,000  |
| 8,730    | MK-1 | 188,000  | 107,000  |
| 8,750    | MK-1 | 188,000  | 107,000  |
| 9,000    | MK-1 | 188,000  | 107,000  |
| 9,500    | MK-1 | 188,000  | 107,000  |
| 9,920    | MK-1 | 197,000  | 116,000  |
| 10,000   | MK-1 | 197,000  | 116,000  |
| 10,250   | MK-1 | 197,000  | 116,000  |
| 10,320   | MK-1 | 197,000  | 116,000  |
| 10,500   | MK-1 | 197,000  | 116,000  |
| 10,720   | MK-1 | 206,000  | 125,000  |
| 10,750   | MK-1 | 206,000  | 125,000  |
| 11,000   | MK-1 | 206,000  | 125,000  |
| 11,750   | MK-1 | 206,000  | 125,000  |
| 12,500   | MK-1 | 215,000  | 134,000  |
| 12,700   | MK-1 | 215,000  | 134,000  |
| 12,750   | MK-1 | 215,000  | 134,000  |
| 13,000   | MK-1 | 215,000  | 134,000  |
| 13,750   | MK-1 | 223,000  | 142,000  |
| 14,000   | MK-1 | 223,000  | 142,000  |
| 14,500   | MK-2 | 245,000  | 147,000  |
| 15,000   | MK-2 | 245,000  | 147,000  |
| 16,000   | MK-2 | 251,000  | 153,000  |
| 16,500   | MK-2 | 257,000  | 159,000  |
| 17,500   | MK-2 | 263,000  | 165,000  |
| 17,750   | MK-2 | 263,000  | 165,000  |
| 18,000   | MK-2 | 263,000  | 165,000  |
| 18,260   | MK-2 | 269,000  | 171,000  |
| 18,650   | MK-2 | 269,000  | 171,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 19,000   | MK-2 | 269,000  | 171,000  |
| 19,250   | MK-2 | 275,000  | 177,000  |
| 20,000   | MK-2 | 275,000  | 177,000  |
| 21,750   | MK-2 | 289,000  | 191,000  |
| 22,000   | MK-2 | 289,000  | 191,000  |
| 22,250   | MK-2 | 289,000  | 191,000  |
| 23,020   | MK-2 | 296,000  | 198,000  |
| 23,420   | MK-3 | 319,000  | 198,000  |
| 23,500   | MK-3 | 319,000  | 198,000  |
| 24,000   | MK-3 | 327,000  | 206,000  |
| 25,000   | MK-3 | 327,000  | 206,000  |
| 26,000   | MK-3 | 335,000  | 214,000  |
| 28,000   | MK-3 | 343,000  | 222,000  |
| 28,500   | MK-3 | 351,000  | 230,000  |
| 29,500   | MK-3 | 351,000  | 230,000  |
| 30,000   | MK-3 | 351,000  | 230,000  |
| 31,500   | MK-3 | 360,000  | 239,000  |
| 31,750   | MK-3 | 369,000  | 248,000  |
| 32,000   | MK-4 | 397,000  | 248,000  |
| 37,000   | MK-4 | 416,000  | 267,000  |
| 37,500   | MK-4 | 416,000  | 267,000  |
| 39,000   | MK-4 | 426,000  | 277,000  |
| 40,000   | MK-4 | 426,000  | 277,000  |
| 44,000   | MK-4 | 447,000  | 298,000  |

## Punte con codolo conico Morse

### Punte elicoidali in lunghezze speciali, grandezza 1



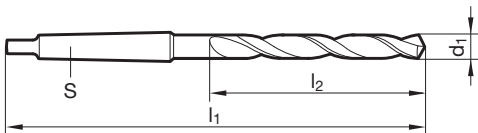
Catalogo n° 71325



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del nocco.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- vaporizzato  $\leq \varnothing 16$  mm



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-1 | 265,000  | 165,000  |
| 8,330    | MK-1 | 265,000  | 165,000  |
| 8,500    | MK-1 | 265,000  | 165,000  |
| 9,000    | MK-1 | 275,000  | 175,000  |
| 10,000   | MK-1 | 285,000  | 185,000  |
| 10,500   | MK-1 | 285,000  | 185,000  |
| 11,000   | MK-1 | 300,000  | 195,000  |
| 11,500   | MK-1 | 300,000  | 195,000  |
| 12,000   | MK-1 | 310,000  | 205,000  |
| 12,300   | MK-1 | 310,000  | 205,000  |
| 12,500   | MK-1 | 310,000  | 205,000  |
| 13,000   | MK-1 | 310,000  | 205,000  |
| 13,500   | MK-1 | 325,000  | 220,000  |
| 14,000   | MK-1 | 325,000  | 220,000  |
| 14,500   | MK-2 | 340,000  | 220,000  |
| 15,000   | MK-2 | 340,000  | 220,000  |
| 15,500   | MK-2 | 355,000  | 230,000  |
| 16,000   | MK-2 | 355,000  | 230,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 17,000   | MK-2 | 355,000  | 230,000  |
| 17,500   | MK-2 | 370,000  | 245,000  |
| 18,000   | MK-2 | 370,000  | 245,000  |
| 18,500   | MK-2 | 370,000  | 245,000  |
| 19,000   | MK-2 | 370,000  | 245,000  |
| 19,500   | MK-2 | 385,000  | 260,000  |
| 20,000   | MK-2 | 385,000  | 260,000  |
| 21,000   | MK-2 | 385,000  | 260,000  |
| 21,500   | MK-2 | 405,000  | 270,000  |
| 22,000   | MK-2 | 405,000  | 270,000  |
| 23,000   | MK-2 | 405,000  | 270,000  |
| 24,000   | MK-3 | 440,000  | 290,000  |
| 25,000   | MK-3 | 440,000  | 290,000  |
| 26,000   | MK-3 | 440,000  | 290,000  |
| 26,990   | MK-3 | 460,000  | 305,000  |
| 28,000   | MK-3 | 460,000  | 305,000  |
| 30,000   | MK-3 | 460,000  | 305,000  |

## Punte con codolo conico Morse

### Punte elicoidali in lunghezze speciali, grandezza 2



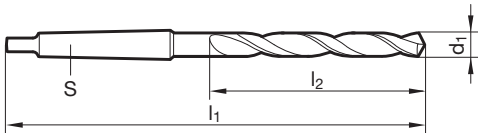
Catalogo n° 71326



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- vaporizzato  $\leq \varnothing 16$  mm



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-1 | 330,000  | 210,000  |
| 8,730    | MK-1 | 345,000  | 220,000  |
| 9,000    | MK-1 | 345,000  | 220,000  |
| 10,000   | MK-1 | 360,000  | 235,000  |
| 11,000   | MK-1 | 375,000  | 250,000  |
| 11,500   | MK-1 | 375,000  | 250,000  |
| 12,000   | MK-1 | 395,000  | 260,000  |
| 12,700   | MK-1 | 395,000  | 260,000  |
| 13,000   | MK-1 | 395,000  | 260,000  |
| 13,500   | MK-1 | 410,000  | 275,000  |
| 14,000   | MK-1 | 410,000  | 275,000  |
| 14,500   | MK-2 | 425,000  | 275,000  |
| 15,000   | MK-2 | 425,000  | 275,000  |
| 15,500   | MK-2 | 445,000  | 295,000  |
| 16,000   | MK-2 | 445,000  | 295,000  |
| 16,500   | MK-2 | 445,000  | 295,000  |
| 17,000   | MK-2 | 445,000  | 295,000  |
| 17,500   | MK-2 | 465,000  | 310,000  |

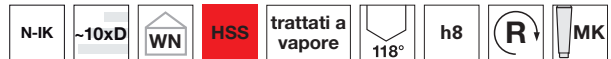
| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 17,860   | MK-2 | 465,000  | 310,000  |
| 18,000   | MK-2 | 465,000  | 310,000  |
| 19,000   | MK-2 | 465,000  | 310,000  |
| 20,000   | MK-2 | 490,000  | 325,000  |
| 20,500   | MK-2 | 490,000  | 325,000  |
| 21,000   | MK-2 | 490,000  | 325,000  |
| 22,000   | MK-2 | 515,000  | 345,000  |
| 23,000   | MK-2 | 515,000  | 345,000  |
| 24,000   | MK-3 | 555,000  | 365,000  |
| 25,000   | MK-3 | 555,000  | 365,000  |
| 26,000   | MK-3 | 555,000  | 365,000  |
| 26,500   | MK-3 | 555,000  | 365,000  |
| 30,000   | MK-3 | 580,000  | 385,000  |
| 31,750   | MK-3 | 610,000  | 410,000  |
| 43,000   | MK-4 | 735,000  | 490,000  |

## Punte con codolo conico Morse

### Punte con fori di refrigerazione



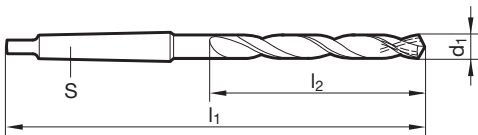
Catalogo n° 71554



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del nocco.  $\geq \varnothing 10,000$
- spoglia sul cono tagliente
- per forare con bussola di guida



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 10,000   | MK-2 | 233,000  | 116,000  |
| 11,000   | MK-2 | 242,000  | 125,000  |
| 12,000   | MK-2 | 251,000  | 134,000  |
| 13,000   | MK-2 | 251,000  | 134,000  |
| 14,000   | MK-2 | 259,000  | 142,000  |
| 15,000   | MK-2 | 264,000  | 147,000  |
| 16,000   | MK-2 | 270,000  | 153,000  |
| 17,000   | MK-2 | 276,000  | 159,000  |
| 18,000   | MK-2 | 282,000  | 165,000  |
| 19,000   | MK-3 | 307,000  | 171,000  |
| 20,000   | MK-3 | 313,000  | 177,000  |
| 21,000   | MK-3 | 320,000  | 184,000  |
| 22,000   | MK-3 | 327,000  | 191,000  |
| 23,000   | MK-3 | 334,000  | 198,000  |
| 24,000   | MK-3 | 342,000  | 206,000  |
| 25,000   | MK-3 | 342,000  | 206,000  |
| 26,000   | MK-3 | 350,000  | 214,000  |
| 27,000   | MK-4 | 385,000  | 222,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 28,000   | MK-4 | 385,000  | 222,000  |
| 29,000   | MK-4 | 393,000  | 230,000  |
| 30,000   | MK-4 | 393,000  | 230,000  |
| 32,000   | MK-4 | 421,000  | 248,000  |
| 33,000   | MK-4 | 421,000  | 248,000  |
| 34,000   | MK-4 | 430,000  | 257,000  |
| 35,000   | MK-4 | 430,000  | 257,000  |
| 40,000   | MK-4 | 450,000  | 277,000  |

## Punte con codolo conico Morse

### Punte elicoidali lunghe con refrigerazione interna



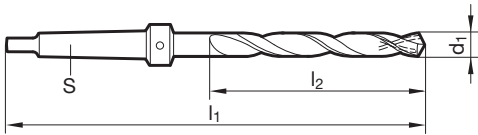
Catalogo n° 71550



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 186

- Assott. del nocc.  $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 14,500   | MK-2 | 297,000  | 147,000  |
| 15,000   | MK-2 | 297,000  | 147,000  |
| 15,500   | MK-2 | 303,000  | 153,000  |
| 16,000   | MK-2 | 303,000  | 153,000  |
| 17,000   | MK-2 | 309,000  | 159,000  |
| 18,000   | MK-2 | 315,000  | 165,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 24,000   | MK-3 | 374,000  | 206,000  |
| 24,500   | MK-3 | 374,000  | 206,000  |
| 25,000   | MK-3 | 374,000  | 206,000  |
| 26,000   | MK-3 | 382,000  | 214,000  |
| 32,000   | MK-4 | 461,000  | 248,000  |



## Punte con codolo conico Morse

### Punte elicoidali lunghe con refrigerazione interna



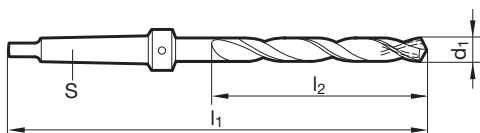
Catalogo n° 71553



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| •        |          | •        | •        |          |          |

Parametri di lav.  
ind. a pag. 186

- Assott. del nocco.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-2 | 250,000  | 100,000  |
| 8,500    | MK-2 | 250,000  | 100,000  |
| 9,000    | MK-2 | 257,000  | 107,000  |
| 9,500    | MK-2 | 257,000  | 107,000  |
| 10,000   | MK-2 | 266,000  | 116,000  |
| 10,500   | MK-2 | 266,000  | 116,000  |
| 11,500   | MK-2 | 275,000  | 125,000  |
| 12,000   | MK-2 | 284,000  | 134,000  |
| 12,500   | MK-2 | 284,000  | 134,000  |
| 13,000   | MK-2 | 284,000  | 134,000  |
| 14,000   | MK-2 | 292,000  | 142,000  |
| 19,500   | MK-3 | 345,000  | 177,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 20,000   | MK-3 | 345,000  | 177,000  |
| 20,500   | MK-3 | 352,000  | 184,000  |
| 21,000   | MK-3 | 352,000  | 184,000  |
| 21,500   | MK-3 | 359,000  | 191,000  |
| 22,000   | MK-3 | 359,000  | 191,000  |
| 23,000   | MK-3 | 366,000  | 198,000  |
| 27,000   | MK-4 | 435,000  | 222,000  |
| 27,500   | MK-4 | 435,000  | 222,000  |
| 28,500   | MK-4 | 443,000  | 230,000  |
| 29,000   | MK-4 | 443,000  | 230,000  |
| 29,500   | MK-4 | 443,000  | 230,000  |
| 31,500   | MK-4 | 452,000  | 239,000  |

## Punte con codolo conico Morse

### Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



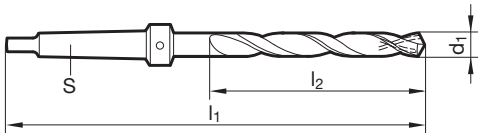
Catalogo n° 71565



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 14,500   | MK-2 | 370,000  | 220,000  |
| 15,000   | MK-2 | 370,000  | 220,000  |
| 15,480   | MK-2 | 380,000  | 230,000  |
| 15,500   | MK-2 | 380,000  | 230,000  |
| 16,000   | MK-2 | 380,000  | 230,000  |
| 17,860   | MK-2 | 395,000  | 245,000  |
| 18,000   | MK-2 | 395,000  | 245,000  |
| 19,000   | MK-2 | 395,000  | 245,000  |
| 19,840   | MK-2 | 410,000  | 260,000  |
| 20,000   | MK-2 | 410,000  | 260,000  |
| 21,430   | MK-2 | 420,000  | 270,000  |
| 21,500   | MK-2 | 420,000  | 270,000  |
| 22,000   | MK-2 | 420,000  | 270,000  |
| 22,220   | MK-2 | 420,000  | 270,000  |
| 22,500   | MK-2 | 420,000  | 270,000  |
| 23,500   | MK-3 | 438,000  | 270,000  |
| 23,810   | MK-3 | 458,000  | 290,000  |
| 25,000   | MK-3 | 458,000  | 290,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 25,500   | MK-3 | 458,000  | 290,000  |
| 26,000   | MK-3 | 458,000  | 290,000  |
| 27,780   | MK-3 | 473,000  | 305,000  |
| 28,500   | MK-3 | 473,000  | 305,000  |
| 28,570   | MK-3 | 473,000  | 305,000  |
| 29,000   | MK-3 | 473,000  | 305,000  |
| 29,370   | MK-3 | 473,000  | 305,000  |
| 29,500   | MK-3 | 473,000  | 305,000  |
| 30,000   | MK-3 | 473,000  | 305,000  |
| 31,000   | MK-3 | 488,000  | 320,000  |
| 31,500   | MK-3 | 488,000  | 320,000  |

## Punte con codolo conico Morse

### Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



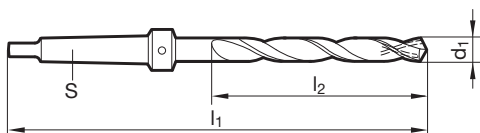
Catalogo n° 71567



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-2 | 315,000  | 165,000  |
| 9,000    | MK-2 | 325,000  | 175,000  |
| 9,500    | MK-2 | 325,000  | 175,000  |
| 10,000   | MK-2 | 335,000  | 185,000  |
| 10,320   | MK-2 | 335,000  | 185,000  |
| 10,500   | MK-2 | 335,000  | 185,000  |
| 10,720   | MK-2 | 345,000  | 195,000  |
| 11,000   | MK-2 | 345,000  | 195,000  |
| 11,110   | MK-2 | 345,000  | 195,000  |
| 11,500   | MK-2 | 345,000  | 195,000  |
| 11,510   | MK-2 | 345,000  | 195,000  |
| 12,000   | MK-2 | 355,000  | 205,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 12,500   | MK-2 | 355,000  | 205,000  |
| 13,000   | MK-2 | 355,000  | 205,000  |
| 13,100   | MK-2 | 355,000  | 205,000  |
| 13,490   | MK-2 | 370,000  | 220,000  |
| 14,000   | MK-2 | 370,000  | 220,000  |

## Punte con codolo conico Morse

### Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



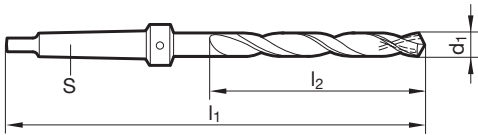
Catalogo n° 71566



|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ●        | ○        | ○        |          |

Parametri di lav.  
ind. a pag. 188

- Assott. del noc.  $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 14,500   | MK-2 | 425,000  | 275,000  |
| 15,000   | MK-2 | 425,000  | 275,000  |
| 15,500   | MK-2 | 445,000  | 295,000  |
| 16,000   | MK-2 | 445,000  | 295,000  |
| 17,500   | MK-2 | 460,000  | 310,000  |
| 18,000   | MK-2 | 460,000  | 310,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 23,500   | MK-3 | 513,000  | 345,000  |
| 24,000   | MK-3 | 533,000  | 365,000  |
| 25,000   | MK-3 | 533,000  | 365,000  |
| 25,500   | MK-3 | 533,000  | 365,000  |
| 27,000   | MK-4 | 598,000  | 385,000  |
| 32,000   | MK-4 | 623,000  | 410,000  |

## Punte con codolo conico Morse

### Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



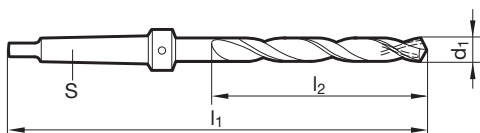
Catalogo n° 71568



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

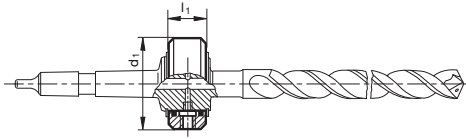
Parametri di lav.  
ind. a pag. 188

- Assott. del nocc.  $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 8,000    | MK-2 | 360,000  | 210,000  |
| 8,500    | MK-2 | 360,000  | 210,000  |
| 9,000    | MK-2 | 370,000  | 220,000  |
| 10,000   | MK-2 | 385,000  | 235,000  |
| 10,500   | MK-2 | 385,000  | 235,000  |
| 11,000   | MK-2 | 400,000  | 250,000  |
| 11,500   | MK-2 | 400,000  | 250,000  |
| 13,000   | MK-2 | 410,000  | 260,000  |
| 14,000   | MK-2 | 425,000  | 275,000  |
| 19,000   | MK-3 | 478,000  | 310,000  |
| 19,500   | MK-3 | 493,000  | 325,000  |
| 21,000   | MK-3 | 493,000  | 325,000  |

| d1<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|------|----------|----------|
| 21,500   | MK-3 | 513,000  | 345,000  |
| 28,000   | MK-4 | 598,000  | 385,000  |
| 29,000   | MK-4 | 598,000  | 385,000  |
| 29,500   | MK-4 | 598,000  | 385,000  |
| 30,000   | MK-4 | 598,000  | 385,000  |
| 31,000   | MK-4 | 623,000  | 410,000  |
| 31,500   | MK-4 | 623,000  | 410,000  |

**Alimentatori per punte con fori di refrigerazione****Alimentatori per punte con fori di refrigerazione****Catalogo n° 71560**

| <b>Grandezza</b> | <b>Codice</b> | <b>d1<br/>mm</b> | <b>l1<br/>mm</b> |
|------------------|---------------|------------------|------------------|
| <b>MK-2</b>      | <b>1,000</b>  | 58,000           | 24,000           |
| <b>MK-3</b>      | <b>2,000</b>  | 58,000           | 24,000           |
| <b>MK-4</b>      | <b>3,000</b>  | 80,000           | 28,000           |

## Punte a gradino

### Punte a gradino ad eliche indipendenti, cil.

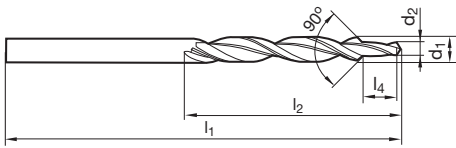


Catalogo n° 71501



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

- Assott. del nocc.  $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie fine
- per svasature per teste di viti  $90^\circ$
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Grandezza |
|----------|----------|----------|----------|----------|-----------|
| 6,000    | 3,200    | 93,000   | 57,000   | 9,000    | M 3       |
| 8,000    | 4,300    | 117,000  | 75,000   | 11,000   | M 4       |
| 10,000   | 5,300    | 133,000  | 87,000   | 13,000   | M 5       |
| 11,500   | 6,400    | 142,000  | 94,000   | 15,000   | M 6       |
| 15,000   | 8,400    | 169,000  | 114,000  | 19,000   | M 8       |
| 19,000   | 10,500   | 198,000  | 135,000  | 23,000   | M 10      |

## Punte a gradino

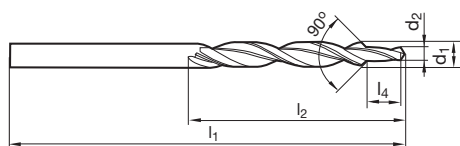
### Punte a gradino ad eliche indipendenti, cil.



Catalogo n° 71503



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |



- Assott. del nocch.  $\geq \varnothing 3,400$
- spoglia sul cono tagliente
- per fori filettati secondo DIN 336
- per svasature a 90° corrispondenti a fori passanti secondo DIN EN 20273, serie media
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Grandezza |
|----------|----------|----------|----------|----------|-----------|
| 3,400    | 2,500    | 70,000   | 39,000   | 8,800    | M 3       |
| 4,500    | 3,300    | 80,000   | 47,000   | 11,400   | M 4       |
| 5,500    | 4,200    | 93,000   | 57,000   | 13,600   | M 5       |
| 6,600    | 5,000    | 101,000  | 63,000   | 16,500   | M 6       |
| 9,000    | 6,800    | 125,000  | 81,000   | 21,000   | M 8       |
| 11,000   | 8,500    | 142,000  | 94,000   | 25,500   | M 10      |
| 13,500   | 10,200   | 160,000  | 108,000  | 30,000   | M 12      |



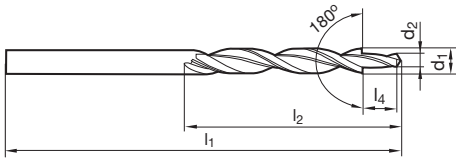
## Punte a gradino

### Punte a gradino ad eliche indipendenti, cil.



Catalogo n° 71500

|   |          |     |                   |      |    |   |     |
|---|----------|-----|-------------------|------|----|---|-----|
| N | DIN 8376 | HSS | trattati a vapore | 118° | h8 | R | Cyl |
| P | M        | K   | N                 | S    | H  |   |     |
| • |          | •   |                   |      |    |   |     |



- Assott. del nocc.  $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie media
- per svasature per teste di viti 180° secondo DIN 974-1, serie 1
- per viti secondo DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore

| d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Grandezza |
|----------|----------|----------|----------|----------|-----------|
| 6,000    | 3,400    | 93,000   | 57,000   | 9,000    | M 3       |
| 8,000    | 4,500    | 117,000  | 75,000   | 11,000   | M 4       |
| 10,000   | 5,500    | 133,000  | 87,000   | 13,000   | M 5       |
| 11,000   | 6,600    | 142,000  | 94,000   | 15,000   | M 6       |
| 15,000   | 9,000    | 169,000  | 114,000  | 19,000   | M 8       |
| 18,000   | 11,000   | 191,000  | 130,000  | 23,000   | M 10      |

## Punte a gradino

### Punte a gradino ad eliche indipendenti, CM

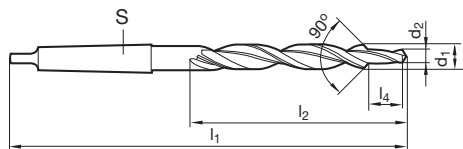


Catalogo n° 71523



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

- Assott. del nocc.  $\geq \varnothing 9,000$
- spoglia sul cono tagliente
- per fori filettati secondo DIN 336
- per svasature a  $90^\circ$  corrispondenti a fori passanti secondo DIN EN 20273, serie media
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



| d1<br>mm | d2<br>mm | S    | l1<br>mm | l2<br>mm | l4<br>mm | Grandezza |
|----------|----------|------|----------|----------|----------|-----------|
| 9,000    | 6,800    | MK-1 | 162,000  | 81,000   | 21,000   | M 8       |
| 11,000   | 8,500    | MK-1 | 175,000  | 94,000   | 25,500   | M 10      |
| 13,500   | 10,200   | MK-1 | 189,000  | 108,000  | 30,000   | M 12      |
| 15,500   | 12,000   | MK-2 | 218,000  | 120,000  | 34,500   | M 14      |
| 17,500   | 14,000   | MK-2 | 228,000  | 130,000  | 38,500   | M 16      |
| 20,000   | 15,500   | MK-2 | 238,000  | 140,000  | 43,500   | M 18      |
| 22,000   | 17,500   | MK-2 | 248,000  | 150,000  | 47,500   | M 20      |

## Punte a gradino

### Punte a gradino ad eliche indipendenti, CM

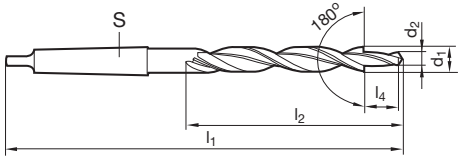


Catalogo n° 71520



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

- Assott. del nocc.  $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie media
- per svasature per teste di viti 180° secondo DIN 974-1, serie 1
- per viti secondo DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



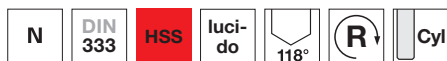
| d1<br>mm | d2<br>mm | S    | l1<br>mm | l2<br>mm | l4<br>mm | Grandezza |
|----------|----------|------|----------|----------|----------|-----------|
| 11,000   | 6,600    | MK-1 | 175,000  | 94,000   | 15,000   | M 6       |
| 15,000   | 9,000    | MK-2 | 212,000  | 114,000  | 19,000   | M 8       |
| 18,000   | 11,000   | MK-2 | 228,000  | 130,000  | 23,000   | M 10      |
| 20,000   | 13,500   | MK-2 | 238,000  | 140,000  | 27,000   | M 12      |
| 24,000   | 15,500   | MK-3 | 281,000  | 160,000  | 31,000   | M 14      |
| 26,000   | 17,500   | MK-3 | 286,000  | 165,000  | 35,000   | M 16      |

## Punte a centrare

### Punte a centrare senza piano

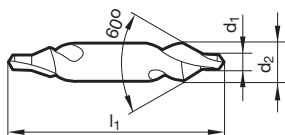


Catalogo n° 71600



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

- Assott. del nocc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A
- $d1 \leq 0,8$  mm: 1 solo lato tagliente



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 0,500    | 3,150    | 25,000   |
| 0,800    | 3,150    | 25,000   |
| 1,000    | 3,150    | 31,500   |
| 1,250    | 3,150    | 31,500   |
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |
| 6,300    | 16,000   | 71,000   |
| 8,000    | 20,000   | 80,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 10,000   | 25,000   | 100,000  |
| 12,500   | 31,500   | 125,000  |

## Punte a centrare

### Punte a centrare senza piano

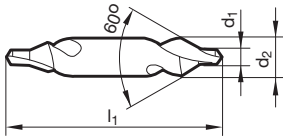


Catalogo n° 71601



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A
- $d1 \leq 0,8$  mm: 1 solo lato tagliente



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 0,500    | 3,150    | 25,000   |
| 0,800    | 3,150    | 25,000   |
| 1,000    | 3,150    | 31,500   |
| 1,250    | 3,150    | 31,500   |
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |

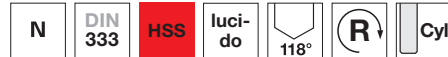
| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |
| 6,300    | 16,000   | 71,000   |
| 8,000    | 20,000   | 80,000   |

## Punte a centrare

### Punte a centrare senza piano

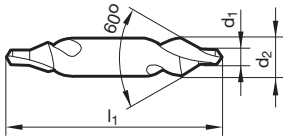


Catalogo n° 71602



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R
- $d1 \leq 0,8$  mm: 1 solo lato tagliente



| d1<br>mm | d2<br>mm | l1<br>mm | d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|----------|----------|----------|
| 0,500    | 3,150    | 25,000   | 10,000   | 25,000   | 100,000  |
| 0,800    | 3,150    | 25,000   |          |          |          |
| 1,000    | 3,150    | 31,500   |          |          |          |
| 1,250    | 3,150    | 31,500   |          |          |          |
| 1,600    | 4,000    | 35,500   |          |          |          |
| 2,000    | 5,000    | 40,000   |          |          |          |
| 2,500    | 6,300    | 45,000   |          |          |          |
| 3,150    | 8,000    | 50,000   |          |          |          |
| 4,000    | 10,000   | 56,000   |          |          |          |
| 5,000    | 12,500   | 63,000   |          |          |          |
| 6,300    | 16,000   | 71,000   |          |          |          |
| 8,000    | 20,000   | 80,000   |          |          |          |

## Punte a centrare

### Punte a centrare senza piano

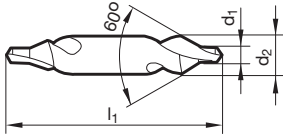


Catalogo n° 61602



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R
- maggiore protezione contro l'usura
- $d1 \leq 0,8$  mm: 1 solo lato tagliente



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 0,800    | 3,150    | 25,000   |
| 1,000    | 3,150    | 31,500   |
| 1,250    | 3,150    | 31,500   |
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 3,150    | 8,000    | 50,000   |
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |
| 6,300    | 16,000   | 71,000   |

## Punte a centrare

### Punte a centrare senza piano

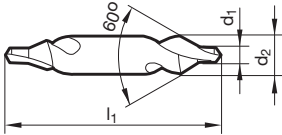


Catalogo n° 71605



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- maggiore resistenza alla rottura grazie al rigonfiamento
- la cavità tra la svasatura e il foro serve da contenitore addizionale di lubrificante
- per fori a centrare secondo DIN 332, foglio 1, forma A



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 1,000    | 3,150    | 31,500   |
| 1,250    | 3,150    | 31,500   |
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |
| 6,300    | 16,000   | 71,000   |

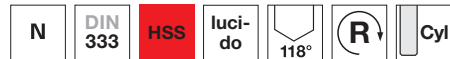


## Punte a centrare

### Punte a centrare senza piano

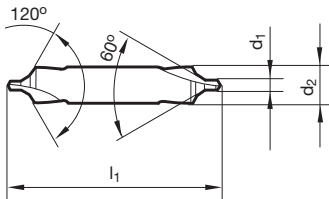


Catalogo n° 71604



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma B
- con smusso di protezione  $120^\circ$



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 1,000    | 4,000    | 35,500   |
| 1,250    | 5,000    | 40,000   |
| 1,600    | 6,300    | 45,000   |
| 2,000    | 8,000    | 50,000   |
| 2,500    | 10,000   | 56,000   |
| 3,150    | 11,200   | 60,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 4,000    | 14,000   | 67,000   |
| 5,000    | 18,000   | 75,000   |
| 6,300    | 20,000   | 80,000   |

## Punte a centrare

### Punte a centrare con piano

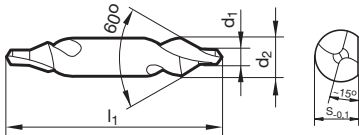


Catalogo n° 71607



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ | ○ |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 6,300    | 16,000   | 71,000   |

## Punte a centrare

### Punte a centrare con piano

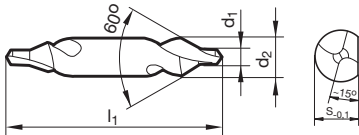


Catalogo n° 71609



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

- Assott. del noc.  $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R



| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 1,600    | 4,000    | 35,500   |
| 2,000    | 5,000    | 40,000   |
| 2,500    | 6,300    | 45,000   |
| 3,150    | 8,000    | 50,000   |
| 4,000    | 10,000   | 56,000   |
| 5,000    | 12,500   | 63,000   |

| d1<br>mm | d2<br>mm | l1<br>mm |
|----------|----------|----------|
| 6,300    | 16,000   | 71,000   |
| 8,000    | 20,000   | 80,000   |

## Allargatori

### Allargatori cilindrici

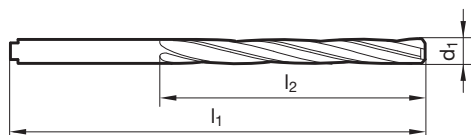


Catalogo n° 72200



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

- spoglia sul cono tagliente
- stabilità elevata
- con dente di trascinamento secondo DIN 1809
- per fori prefusi, precolati, preforati
- corregge la precisione di allineamento
- corregge la mancanza di rotondità
- finitura di superf. del foro migliorata
- $\varnothing$  imbocco < al foro da praticare
- considerare la quota "d0" come misura più piccola del foro pilota



| d1<br>mm | d0<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|----------|
| 4,800    | 3,5      | 108,000  | 74,000   |
| 5,000    | 3,5      | 108,000  | 74,000   |
| 5,800    | 4,2      | 116,000  | 80,000   |
| 6,000    | 4,2      | 116,000  | 80,000   |
| 6,800    | 4,9      | 133,000  | 93,000   |
| 7,000    | 4,9      | 133,000  | 93,000   |
| 7,800    | 5,6      | 142,000  | 100,000  |
| 8,000    | 5,6      | 142,000  | 100,000  |
| 8,800    | 6,3      | 151,000  | 107,000  |
| 9,000    | 6,3      | 151,000  | 107,000  |
| 9,800    | 7,0      | 162,000  | 116,000  |
| 10,000   | 7,0      | 162,000  | 116,000  |

| d1<br>mm | d0<br>mm | l1<br>mm | l2<br>mm |
|----------|----------|----------|----------|
| 10,750   | 7,7      | 173,000  | 125,000  |
| 11,000   | 7,7      | 173,000  | 125,000  |
| 11,750   | 8,4      | 184,000  | 134,000  |
| 12,000   | 8,4      | 184,000  | 134,000  |
| 12,750   | 9,1      | 184,000  | 134,000  |
| 13,000   | 9,1      | 184,000  | 134,000  |
| 13,750   | 9,8      | 194,000  | 142,000  |
| 14,750   | 10,5     | 202,000  | 147,000  |
| 16,000   | 11,2     | 211,000  | 153,000  |

## Allargatori

### Allargatori con attacco cono morse

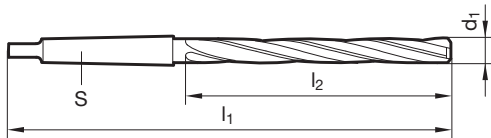


Catalogo n° 72210



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   |   |   |

- spoglia sul cono tagliente
- stabilità elevata
- per fori prefusi, precolati, preforati
- corregge la precisione di allineamento
- corregge la mancanza di rotondità
- finitura di superf. del foro migliorata
- $\varnothing$  imbocco < al foro da praticare
- considerare la quota "d0" come misura più piccola del foro pilota



| d1<br>mm | d0<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|----------|------|----------|----------|
| 9,000    | 6,3      | MK-1 | 162,000  | 81,000   |
| 9,800    | 7,0      | MK-1 | 168,000  | 87,000   |
| 10,000   | 7,0      | MK-1 | 168,000  | 87,000   |
| 11,750   | 8,4      | MK-1 | 182,000  | 101,000  |
| 12,750   | 9,1      | MK-1 | 182,000  | 101,000  |
| 13,750   | 9,8      | MK-1 | 189,000  | 108,000  |
| 14,000   | 9,8      | MK-1 | 189,000  | 108,000  |
| 14,750   | 10,5     | MK-2 | 212,000  | 114,000  |
| 15,000   | 10,5     | MK-2 | 212,000  | 114,000  |
| 15,750   | 11,2     | MK-2 | 218,000  | 120,000  |
| 16,000   | 11,2     | MK-2 | 218,000  | 120,000  |
| 16,750   | 11,9     | MK-2 | 223,000  | 125,000  |
| 17,000   | 11,9     | MK-2 | 223,000  | 125,000  |
| 17,750   | 12,6     | MK-2 | 228,000  | 130,000  |
| 18,000   | 12,6     | MK-2 | 228,000  | 130,000  |
| 18,700   | 13,3     | MK-2 | 233,000  | 135,000  |
| 19,000   | 13,3     | MK-2 | 233,000  | 135,000  |
| 19,700   | 14,0     | MK-2 | 238,000  | 140,000  |
| 20,000   | 14,0     | MK-2 | 238,000  | 140,000  |
| 21,000   | 14,6     | MK-2 | 243,000  | 145,000  |
| 21,700   | 15,3     | MK-2 | 248,000  | 150,000  |
| 22,000   | 15,3     | MK-2 | 248,000  | 150,000  |
| 22,500   | 16,0     | MK-2 | 253,000  | 155,000  |
| 22,700   | 16,0     | MK-2 | 253,000  | 155,000  |

| d1<br>mm | d0<br>mm | S    | l1<br>mm | l2<br>mm |
|----------|----------|------|----------|----------|
| 23,000   | 16,0     | MK-2 | 253,000  | 155,000  |
| 23,700   | 16,6     | MK-3 | 281,000  | 160,000  |
| 24,000   | 16,6     | MK-3 | 281,000  | 160,000  |
| 24,700   | 17,3     | MK-3 | 281,000  | 160,000  |
| 25,700   | 18,0     | MK-3 | 286,000  | 165,000  |
| 26,000   | 18,0     | MK-3 | 286,000  | 165,000  |
| 26,700   | 18,6     | MK-3 | 291,000  | 170,000  |
| 27,700   | 19,3     | MK-3 | 291,000  | 170,000  |
| 29,700   | 20,5     | MK-3 | 296,000  | 175,000  |
| 31,600   | 22,0     | MK-4 | 334,000  | 185,000  |
| 34,600   | 25,0     | MK-4 | 339,000  | 190,000  |
| 38,000   | 26,5     | MK-4 | 349,000  | 200,000  |
| 48,600   | 34,0     | MK-4 | 369,000  | 220,000  |





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## UTENSILI PER FILETTARE



## CODICI ISO

|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

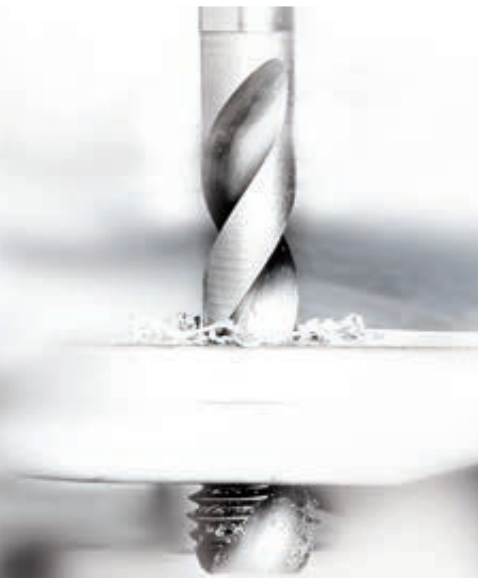
- Idoneità ottima
- Idoneità limitata



## LEGENDA DEI PITTOGRAMMI

|                      |                      |                 |                    |                    |                     |                    |                     |                    |                   |          |             |               |
|----------------------|----------------------|-----------------|--------------------|--------------------|---------------------|--------------------|---------------------|--------------------|-------------------|----------|-------------|---------------|
| MATERIALE TAGLIANTE  | <b>VHM</b>           | <b>HSS</b>      | <b>HSS-E</b>       | <b>HSS-E-PM</b>    |                     |                    |                     |                    |                   |          |             |               |
|                      | Int. in metallo duro |                 |                    |                    |                     |                    |                     |                    |                   |          |             |               |
| TRATT. DI SUPERFICIE | lucido               | nitrurato       | tratt. a vapore    | TiCN               | Al-TiZrN            | TiAlN              | TiN                 | Al-TiN             | Al-CrN            |          |             |               |
| CLASSE DI TOLLERANZA | ISO2/6H              | 6HX             | ISO3/6G            | 2B                 | 6GX                 | 6g                 |                     |                    |                   |          |             |               |
| FORMA                | <b>B</b>             | <b>C</b>        | <b>D</b>           | <b>E</b>           |                     |                    |                     |                    |                   |          |             |               |
| DIREZIONE DI TAGLIO  |                      |                 |                    |                    |                     |                    |                     |                    |                   |          |             |               |
|                      | a destra             |                 | a sinistra         |                    |                     |                    |                     |                    |                   |          |             |               |
| FORMA DEL CODOLO     |                      |                 |                    |                    |                     |                    |                     |                    |                   |          |             |               |
| PROFONDITÀ           | <b>1xD</b>           | <b>2xD</b>      |                    |                    |                     |                    |                     |                    |                   |          |             |               |
| NORMA                | <b>DIN 371</b>       | <b>DIN 376</b>  | <b>DIN 374</b>     | <b>DIN 371/376</b> | <b>~DIN 371</b>     | <b>~DIN 376</b>    | <b>~DIN 371/376</b> | <b>~DIN 374</b>    | <b>DIN 5156</b>   |          |             |               |
|                      | <b>DIN 40432</b>     | <b>DIN 2180</b> | <b>DIN 352</b>     | <b>~DIN 352</b>    | <b>DIN 357</b>      | <b>DIN 5157</b>    | <b>DIN EN 22568</b> |                    |                   |          |             |               |
|                      | Norma di fabbrica    |                 |                    |                    |                     |                    |                     |                    |                   |          |             |               |
| TIPO                 | Produktiv Synchro    | Produktiv N-X   | Produktiv N        | Intensiv Synchro   | Intensiv N-X        | Intensiv N         | Produktiv HX        | Produktiv HDX      | N                 | Massiv N | Intensiv HX | Intensiv HDX  |
|                      | <b>HGX</b>           | <b>H</b>        | Produktiv <b>H</b> | <b>HR15</b>        | Produktiv <b>HD</b> | Intensiv <b>HD</b> | <b>GG</b>           | Produktiv <b>W</b> | Intensiv <b>W</b> | Durativ  | <b>VA</b>   | <b>TMC SP</b> |





## La gamma dei nostri utensili per filettare

Gli utensili per filettare sono, insieme a punte, alesatori e frese, gli utensili di precisione più importanti della gamma STOCK. La varietà di design, insieme alle diverse tipologie di di filettatura, alle tolleranze ed agli standard DIN od in caso, utensili

speciali, offrono una vasta scelta per risolvere i problemi di filettatura. La qualità del foro, la dimensione del pre foro, la rotondità, la linearità e la rugosità della superficie hanno una rilevante influenza sui filetti prodotti.

Per andare sul sicuro e ottenere risultati migliori si consiglia di utilizzare le punte STOCK. Richiedi il nostro catalogo oppure contattaci per la scelta dell' utensile più adatto.



## STOCK-

### Utensili per filettare

maschi  
 maschi a rullare  
 maschi a mano  
 filiere  
 frese a filettare

## STOCK-

### Frese

HSS  
 HSS-E  
 HSS-E-PM  
 Metallo Duro

## STOCK-

### Filettature standard

Metrico,  
 Metrico fine,  
 UNC, UNF, BSW  
 G, PG, NPT

## STOCK-

### Codici Colore

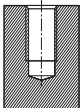
-  Acciai in genere fino a 800 N/mm<sup>2</sup>
-  Materiali con resistenza alla trazione da 800 a 1200 N/mm<sup>2</sup>
-  Acciai inossidabili e resistenti agli acidi
-  Applicazioni universali > 1100 N/mm<sup>2</sup>
-  Alluminio e sue leghe
-  Ghisa

### Spiegazione dei Simboli per la tipologia dei fori

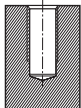
 = foro passante, corto

 = foro cieco 1 x D

 = foro passante 1 x D

 = foro cieco 2 x D

 = foro passante 2 x D

 = foro cieco

## STOCK-

### Tipi Standard

#### PRODUKTIV

N, W, H, HD, HDX, HX, N-X e maschi Synchro con taglienti dritti con angolo d'elica per fori passanti.

#### INTENSIV

Tipo N, W, H, HD, HDX, HX e Synchro  
 Maschi a macchina Synchro con taglienti elicoidali da 10°, 15°, 25°, 40°, 45° e 50° per fori ciechi.

#### MASSIV

Tipo N  
 Maschi per fori passanti per la applicazioni di foratura o punzonatura di lamiera.

#### DURATIV

Tipo N  
 Maschi a rullare con o senza canali di lubrificazione.

## STOCK-

### Soluzioni

Produciamo utensili speciali per filettare come maschi, maschi a rullare, frese a filettare con o senza lubrificazione, per lavorazioni a secco o con lubrificazione minimale e per la lavorazione di materiali temprati. Per un migliore risultato gli utensili possono essere lucidi, vaporizzati, nitrurati o rivestiti con TiN, TiCN, TiAlN o MoS<sub>2</sub> per una migliore lubrificazione.

| P | M | K | N | S | H | Tipo | Forma | classe di tolleranza | Materiale tagliente | Superficie | Norma | d1 | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|

## Maschi a macchina per filettatura metrica ISO

|  |   |   |   |   |   |                   |   |         |          |                   |                     |           |       |     |
|--|---|---|---|---|---|-------------------|---|---------|----------|-------------------|---------------------|-----------|-------|-----|
|  | • | • | • | • | ○ | Produktiv Synchro | B | ISO2/6H | HSS-E-PM | TiCN              | DIN 371             | M 2 - M10 | 53053 | 362 |
|  | • | • | • | • | ○ | Produktiv Synchro | B | ISO2/6H | HSS-E-PM | TiCN              | DIN 376             | M12 - M20 | 53054 | 363 |
|  | • | • | • | ○ | • | Produktiv N-X     | B | 6HX     | HSS-E    | AlTiZrN           | ~DIN 371/-DIN 376   | M 2 - M30 | 53733 | 364 |
|  | • | ○ | ○ | ○ | ○ | Produktiv N       | B | ISO2/6H | HSS-E    | TiN               | DIN 371             | M 3 - M10 | 63033 | 365 |
|  | • | ○ | ○ | ○ | ○ | Produktiv N       | B | ISO2/6H | HSS-E    | trattati a vapore | DIN 371             | M 3 - M10 | 73033 | 366 |
|  | • | ○ | ○ | ○ | ○ | Produktiv N       | B | ISO2/6H | HSS-E    | trattati a vapore | DIN 376             | M12 - M24 | 73038 | 367 |
|  | • | • | • | • | ○ | Intensiv Synchro  | C | 6HX     | HSS-E-PM | TiCN              | DIN 371             | M 5 - M10 | 53050 | 368 |
|  | • | • | • | • | ○ | Intensiv Synchro  | C | 6HX     | HSS-E-PM | TiCN              | DIN 376             | M12 - M20 | 53051 | 369 |
|  | • | • | • | ○ | ○ | Intensiv N-X      | C | 6HX     | HSS-E    | TiAlN             | ~DIN 371/-DIN 376   | M 2 - M30 | 53746 | 370 |
|  | • | ○ | ○ | ○ | ○ | Intensiv N        | C | ISO2/6H | HSS-E    | TiN               | DIN 371             | M 3 - M10 | 63046 | 371 |
|  | • | ○ | ○ | ○ | ○ | Intensiv N        | C | ISO2/6H | HSS-E    | trattati a vapore | DIN 371             | M 3 - M10 | 73046 | 372 |
|  | • | ○ | ○ | ○ | ○ | Intensiv N        | C | 6HX     | HSS-E    | TiN               | DIN 376             | M12 - M20 | 63048 | 373 |
|  | • | ○ | ○ | ○ | ○ | Intensiv N        | C | ISO2/6H | HSS-E    | trattati a vapore | DIN 376             | M12 - M24 | 73048 | 374 |
|  | • | ○ | ○ | ○ | ○ | Intensiv N        | E | ISO2/6H | HSS-E    | lucido            | DIN 371             | M 4 - M10 | 73047 | 375 |
|  | • | ○ | ○ | ○ | • | Produktiv HX      | B | 6HX     | HSS-E-PM | AlTiN             | DIN 371/<br>DIN 376 | M 3 - M16 | 53669 | 376 |
|  | • | ○ | ○ | ○ | • | Intensiv HDX      | B | 6HX     | HSS-E-PM | TiCN              | DIN 371/<br>DIN 376 | M 3 - M16 | 53667 | 377 |

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## Maschi a macchina per filettatura metrica ISO

|  |   |   |   |   |   |   |              |   |         |              |        |                     |             |              |     |
|--|---|---|---|---|---|---|--------------|---|---------|--------------|--------|---------------------|-------------|--------------|-----|
|  | • |   |   | ○ |   |   | N            | C | ISO2/6H | HSS-E        | lucido | DIN 371             | M 1 - M10   | <b>73185</b> | 378 |
|  | • |   |   | ○ |   |   | N            | C | ISO2/6H | HSS-E        | lucido | DIN 376             | M 6 - M22   | <b>73191</b> | 379 |
|  | • |   |   | ○ |   |   | Massiv N     | B | ISO2/6H | HSS-E        | lucido | DIN 371             | M 2,3 - M10 | <b>73126</b> | 380 |
|  |   |   | ○ |   | • | • | Intensiv HX  | C | 6HX     | HSS-E-PM     | AlTiN  | DIN 371/<br>DIN 376 | M 3 - M16   | <b>53668</b> | 381 |
|  |   | • |   |   | • |   | Intensiv HDX | C | 6HX     | HSS-E-PM     | TiCN   | DIN 371/<br>DIN 376 | M 3 - M16   | <b>53666</b> | 382 |
|  | • |   |   | ○ | • | ○ | HCX          | C | 6HX     | HSS-E-PM     | TiCN   | DIN 371             | M 5 - M10   | <b>53670</b> | 383 |
|  |   |   |   | • |   |   | H            | C | 6HX     | Metallo duro | lucido | DIN 371             | M 3 - M10   | <b>73011</b> | 384 |
|  | • |   |   | ○ |   |   | Produktiv N  | B | ISO2/6H | HSS-E        | TiN    | DIN 371             | M 3 - M10   | <b>63133</b> | 385 |
|  | • |   |   | ○ |   |   | Produktiv N  | B | ISO3/6G | HSS-E        | lucido | DIN 371             | M 2,5 - M10 | <b>73132</b> | 386 |
|  | • |   |   | ○ |   |   | Produktiv N  | B | ISO2/6H | HSS-E        | lucido | DIN 371             | M 2 - M10   | <b>73133</b> | 387 |
|  | • |   |   | ○ |   |   | Produktiv N  | B | ISO2/6H | HSS-E        | TiN    | DIN 376             | M12 - M20   | <b>63138</b> | 388 |
|  | • |   |   | ○ |   |   | Produktiv N  | B | ISO2/6H | HSS-E        | lucido | DIN 376             | M 2 - M24   | <b>73138</b> | 389 |
|  | • |   |   | ○ |   |   | Intensiv N   | C | ISO2/6H | HSS-E        | TiN    | DIN 371             | M 3 - M10   | <b>63146</b> | 390 |
|  | • |   |   | ○ |   |   | Intensiv N   | C | ISO3/6G | HSS-E        | lucido | DIN 371             | M 3 - M10   | <b>73145</b> | 391 |
|  | • |   |   | ○ |   |   | Intensiv N   | C | ISO2/6H | HSS-E        | lucido | DIN 371             | M 2 - M10   | <b>73146</b> | 392 |
|  | • |   |   | ○ |   |   | Intensiv N   | C | ISO2/6H | HSS-E        | lucido | DIN 371             | M 2 - M10   | <b>73221</b> | 393 |

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## Maschi a macchina per filettatura metrica ISO

|  |   |  |   |   |  |             |   |         |          |          |                     |           |              |     |
|--|---|--|---|---|--|-------------|---|---------|----------|----------|---------------------|-----------|--------------|-----|
|  | • |  |   | ○ |  | Intensiv N  | C | ISO2/6H | HSS-E    | TiN      | DIN 376             | M12 - M20 | <b>63148</b> | 394 |
|  | • |  |   | ○ |  | Intensiv N  | C | ISO2/6H | HSS-E    | lucido   | DIN 376             | M 3 - M30 | <b>73148</b> | 395 |
|  | • |  |   | ○ |  | Intensiv N  | C | ISO2/6H | HSS-E    | lucido   | DIN 376             | M 3 - M20 | <b>73227</b> | 396 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E-PM | TiCN     | DIN 371/<br>DIN 376 | M 3 - M10 | <b>53640</b> | 397 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E    | TiCN     | DIN 371             | M 2 - M10 | <b>53642</b> | 398 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E-PM | TiN      | DIN 371             | M 3 - M10 | <b>63641</b> | 399 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E-PM | lucido   | DIN 371             | M 3 - M10 | <b>73640</b> | 400 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E    | nitruato | DIN 371             | M 2 - M10 | <b>73642</b> | 401 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E-PM | TiN      | DIN 376             | M12 - M20 | <b>63643</b> | 402 |
|  | • |  | ○ |   |  | Produktiv H | B | ISO2/6H | HSS-E    | nitruato | DIN 376             | M12 - M20 | <b>73645</b> | 403 |
|  | • |  | ○ |   |  | Intensiv H  | C | ISO2/6H | HSS-E    | TiCN     | DIN 371/<br>DIN 376 | M 2 - M10 | <b>53661</b> | 404 |
|  | • |  |   | ○ |  | Intensiv H  | C | ISO2/6H | HSS-E    | TiN      | DIN 371             | M 3 - M10 | <b>63674</b> | 405 |
|  | • |  | ○ |   |  | H R15       | C | ISO2/6H | HSS-E-PM | lucido   | DIN 371             | M 3 - M10 | <b>73619</b> | 406 |
|  | • |  | ○ |   |  | Intensiv H  | C | ISO2/6H | HSS-E    | lucido   | DIN 371             | M 3 - M10 | <b>73661</b> | 407 |
|  | • |  | ○ |   |  | Intensiv H  | C | ISO2/6H | HSS-E    | TiN      | DIN 376             | M12 - M20 | <b>63675</b> | 408 |
|  | • |  | ○ |   |  | Intensiv H  | C | ISO2/6H | HSS-E    | lucido   | DIN 376             | M12 - M20 | <b>73664</b> | 409 |

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## Maschi a macchina per filettatura metrica ISO

|  |  |  |  |  |  |              |   |         |              |                   |          |           |              |     |
|--|--|--|--|--|--|--------------|---|---------|--------------|-------------------|----------|-----------|--------------|-----|
|  |  |  |  |  |  | H R15        | C | ISO2/6H | HSS-E-PM     | lucido            | DIN 376  | M12 - M20 | <b>73666</b> | 410 |
|  |  |  |  |  |  | H            | D | ISO2/6H | Metallo duro | TiCN              | ~DIN 371 | M 3 - M12 | <b>63010</b> | 411 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E-PM     | TiCN              | DIN 371  | M 3 - M10 | <b>53641</b> | 412 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E        | TiN               | DIN 371  | M 3 - M10 | <b>63176</b> | 413 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E        | trattati a vapore | DIN 371  | M 3 - M10 | <b>73176</b> | 414 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E-PM     | lucido            | DIN 371  | M 3 - M10 | <b>73641</b> | 415 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E-PM     | TiCN              | DIN 376  | M12 - M16 | <b>53643</b> | 416 |
|  |  |  |  |  |  | Produttiv HD | B | 6HX     | HSS-E        | TiN               | DIN 376  | M12 - M16 | <b>63177</b> | 417 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E        | trattati a vapore | DIN 376  | M12 - M20 | <b>73177</b> | 418 |
|  |  |  |  |  |  | Produttiv HD | B | ISO2/6H | HSS-E-PM     | lucido            | DIN 376  | M12 - M22 | <b>73643</b> | 419 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E-PM     | TiCN              | DIN 371  | M 3 - M10 | <b>53662</b> | 420 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E-PM     | TiN               | DIN 371  | M 3 - M10 | <b>63662</b> | 421 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E        | trattati a vapore | DIN 371  | M 3 - M10 | <b>73660</b> | 422 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E-PM     | lucido            | DIN 371  | M 3 - M10 | <b>73662</b> | 423 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E-PM     | TiCN              | DIN 376  | M12 - M16 | <b>53665</b> | 424 |
|  |  |  |  |  |  | Intensiv HD  | C | ISO2/6H | HSS-E-PM     | TiN               | DIN 376  | M12 - M16 | <b>63665</b> | 425 |

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## Maschi a macchina per filettatura metrica ISO

|  |  |             |   |         |          |                   |         |           |              |     |
|--|--|-------------|---|---------|----------|-------------------|---------|-----------|--------------|-----|
|  |  | Intensiv HD | C | ISO2/6H | HSS-E    | trattati a vapore | DIN 376 | M12 - M20 | <b>73659</b> | 426 |
|  |  | Intensiv HD | C | ISO2/6H | HSS-E-PM | lucido            | DIN 376 | M12 - M24 | <b>73665</b> | 427 |
|  |  | GG          | C | 6HX     | HSS-E    | AlTiN             | DIN 371 | M 3 - M10 | <b>63201</b> | 428 |
|  |  | GG          | C | 6HX     | HSS-E    | nitruato          | DIN 371 | M 3 - M10 | <b>73201</b> | 429 |
|  |  | GG          | C | 6HX     | HSS-E    | nitruato          | DIN 376 | M12 - M20 | <b>73211</b> | 430 |
|  |  | Produktiv W | B | ISO2/6H | HSS-E    | lucido            | DIN 371 | M 2 - M10 | <b>73131</b> | 431 |
|  |  | Produktiv W | B | ISO2/6H | HSS-E    | lucido            | DIN 376 | M12 - M20 | <b>73189</b> | 432 |
|  |  | Intensiv W  | C | ISO2/6H | HSS-E    | lucido            | DIN 371 | M 2 - M10 | <b>73156</b> | 433 |
|  |  | Intensiv W  | C | ISO2/6H | HSS-E    | lucido            | DIN 376 | M12 - M20 | <b>73136</b> | 434 |

## Maschi a macchina per fil. metr. ISO passo fine

|  |  |                   |   |         |          |                   |         |                      |              |     |
|--|--|-------------------|---|---------|----------|-------------------|---------|----------------------|--------------|-----|
|  |  | Intensiv N-X      | C | 6HX     | HSS-E    | TiAlN             | DIN 374 | M 6 X0,75 - M24 X1,5 | <b>53780</b> | 435 |
|  |  | Produktiv N-X     | B | 6HX     | HSS-E    | AlTiZrN           | DIN 374 | M 6 X0,75 - M24 X1,5 | <b>53778</b> | 436 |
|  |  | Produktiv Synchro | B | ISO2/6H | HSS-E-PM | TiCN              | DIN 374 | M 8 X1 - M16 X1,5    | <b>53055</b> | 437 |
|  |  | Intensiv Synchro  | C | 6HX     | HSS-E-PM | TiCN              | DIN 374 | M 8 X1 - M20 X1,5    | <b>53052</b> | 438 |
|  |  | Produktiv N       | B | ISO2/6H | HSS-E    | trattati a vapore | DIN 374 | M 6 X0,75 - M20 X1,5 | <b>73183</b> | 439 |
|  |  | Intensiv N        | C | ISO2/6H | HSS-E    | trattati a vapore | DIN 374 | M 6 X0,75 - M20 X1,5 | <b>73187</b> | 440 |

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## Maschi a macchina per fil. metr. ISO passo fine

|  |              |   |         |       |                   |         |                      |              |     |
|--|--------------|---|---------|-------|-------------------|---------|----------------------|--------------|-----|
|  | N            | C | ISO2/6H | HSS-E | lucido            | DIN 374 | M 8 X0,75 - M24 X1,5 | <b>73237</b> | 441 |
|  | Produttiv N  | B | ISO2/6H | HSS-E | lucido            | DIN 374 | M 4 X0,5 - M36 X1,5  | <b>73250</b> | 442 |
|  | Intensiv N   | C | ISO2/6H | HSS-E | lucido            | DIN 374 | M 3 X0,35 - M30 X2   | <b>73173</b> | 443 |
|  | Intensiv N   | C | ISO2/6H | HSS-E | TiN               | DIN 374 | M 8 X1 - M20 X1,5    | <b>63173</b> | 444 |
|  | Produttiv H  | B | ISO2/6H | HSS-E | nitruato          | DIN 374 | M 3 X0,35 - M22 X1,5 | <b>73646</b> | 445 |
|  | Produttiv HD | B | ISO2/6H | HSS-E | trattati a vapore | DIN 374 | M 5 X0,5 - M20 X1,5  | <b>73178</b> | 446 |
|  | Intensiv HD  | C | ISO2/6H | HSS-E | trattati a vapore | DIN 374 | M 8 X1 - M20 X1,5    | <b>73180</b> | 447 |
|  | GG           | C | 6HX     | HSS-E | nitruato          | DIN 374 | M 8 X1 - M20 X1,5    | <b>73194</b> | 448 |

## Maschi a macchina per filettatura UNC

|  |              |   |    |       |                   |          |                   |              |     |
|--|--------------|---|----|-------|-------------------|----------|-------------------|--------------|-----|
|  | Produttiv N  | B | 2B | HSS-E | trattati a vapore | ~DIN 371 | 4 -40 - 3/8 -16   | <b>73308</b> | 449 |
|  | Produttiv N  | B | 2B | HSS-E | trattati a vapore | ~DIN 376 | 1/2 -13 - 3/4 -10 | <b>73309</b> | 450 |
|  | Intensiv N   | C | 2B | HSS-E | trattati a vapore | ~DIN 371 | 4 -40 - 3/8 -16   | <b>73322</b> | 451 |
|  | Intensiv N   | C | 2B | HSS-E | trattati a vapore | ~DIN 376 | 1/2 -13 - 3/4 -10 | <b>73323</b> | 452 |
|  | Produttiv HD | B | 2B | HSS-E | trattati a vapore | ~DIN 371 | 4 -40 - 3/8 -16   | <b>73297</b> | 453 |
|  | Produttiv HD | B | 2B | HSS-E | trattati a vapore | ~DIN 376 | 1/2 -13 - 1 - 8   | <b>73298</b> | 454 |
|  | Intensiv HD  | C | 2B | HSS-E | trattati a vapore | ~DIN 371 | 4 -40 - 3/8 -16   | <b>73304</b> | 455 |



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## Maschi a macchina per filettatura UNC

|  |  |             |   |    |       |                   |          |                   |              |     |
|--|--|-------------|---|----|-------|-------------------|----------|-------------------|--------------|-----|
|  |  | Intensiv HD | C | 2B | HSS-E | trattati a vapore | ~DIN 376 | 1/2 -13 - 3/4 -10 | <b>73305</b> | 456 |
|  |  | GG          | C | 2B | HSS-E | nitruato          | ~DIN 371 | 8 -32 - 3/8 -16   | <b>73326</b> | 457 |
|  |  | GG          | C | 2B | HSS-E | nitruato          | ~DIN 376 | 1/2 -13 - 1/8 -   | <b>73327</b> | 458 |

## Maschi a macchina per filettatura UNF

|  |  |              |   |    |       |                   |          |                  |              |     |
|--|--|--------------|---|----|-------|-------------------|----------|------------------|--------------|-----|
|  |  | Produktiv N  | B | 2B | HSS-E | trattati a vapore | ~DIN 374 | 10 -32 - 5/8 -18 | <b>73310</b> | 459 |
|  |  | Intensiv N   | C | 2B | HSS-E | trattati a vapore | ~DIN 374 | 10 -32 - 5/8 -18 | <b>73324</b> | 460 |
|  |  | Produktiv HD | B | 2B | HSS-E | trattati a vapore | ~DIN 374 | 10 -32 - 5/8 -18 | <b>73299</b> | 461 |
|  |  | Intensiv HD  | C | 2B | HSS-E | trattati a vapore | ~DIN 374 | 10 -32 - 3/4 -16 | <b>73306</b> | 462 |

## Maschi a macchina per filettatura NPT

|  |  |    |   |  |       |                   |               |           |              |     |
|--|--|----|---|--|-------|-------------------|---------------|-----------|--------------|-----|
|  |  | VA | C |  | HSS-E | trattati a vapore | Norma di fab. | 1/8 - 3/4 | <b>73293</b> | 463 |
|--|--|----|---|--|-------|-------------------|---------------|-----------|--------------|-----|

## Maschi a macchina per filettatura Whitworth BSP

|  |  |              |   |   |       |                   |          |                |              |     |
|--|--|--------------|---|---|-------|-------------------|----------|----------------|--------------|-----|
|  |  | Produktiv N  | B |   | HSS-E | trattati a vapore | DIN 5156 | G 1/8 - G1     | <b>73321</b> | 464 |
|  |  | Intensiv N   | C |   | HSS-E | trattati a vapore | DIN 5156 | G 1/8 - G1     | <b>73325</b> | 465 |
|  |  | Intensiv N-X | C | X | HSS-E | TiAlN             | DIN 5156 | G 1/16 - G1    | <b>53788</b> | 466 |
|  |  | Intensiv N   | C |   | HSS-E | lucido            | DIN 5156 | G 1/8 - G1 1/2 | <b>73286</b> | 467 |
|  |  | Produktiv HD | B |   | HSS-E | trattati a vapore | DIN 5156 | G 1/8 - G1     | <b>73300</b> | 468 |

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### Maschi a macchina per filettatura Whitworth BSP

|  |   |   |   |   |   |               |   |   |       |                   |          |             |              |     |
|--|---|---|---|---|---|---------------|---|---|-------|-------------------|----------|-------------|--------------|-----|
|  | • |   |   | ○ |   | Intensiv HD   | C |   | HSS-E | trattati a vapore | DIN 5156 | G 1/8 - G1  | <b>73288</b> | 469 |
|  |   | • |   |   |   | GG            | C |   | HSS-E | nitruato          | DIN 5156 | G 1/8 - G1  | <b>73345</b> | 470 |
|  | • | • | • | ○ | ○ | Produktiv N-X | B | X | HSS-E | AlTiZrN           | DIN 5156 | G 1/16 - G1 | <b>53787</b> | 471 |

### Maschi a macchina per filettatura Pg

|  |   |  |   |   |  |   |   |  |       |        |           |              |              |     |
|--|---|--|---|---|--|---|---|--|-------|--------|-----------|--------------|--------------|-----|
|  | • |  | ○ | ○ |  | N | B |  | HSS-E | lucido | DIN 40432 | PG 7 - PG 16 | <b>73296</b> | 472 |
|--|---|--|---|---|--|---|---|--|-------|--------|-----------|--------------|--------------|-----|

### Maschi corti per filettatura NPT

|  |   |  |   |   |  |   |   |  |       |        |               |          |              |     |
|--|---|--|---|---|--|---|---|--|-------|--------|---------------|----------|--------------|-----|
|  | • |  | ○ | ○ |  | N | C |  | HSS-E | lucido | Norma di fab. | 1/16 - 1 | <b>73295</b> | 473 |
|--|---|--|---|---|--|---|---|--|-------|--------|---------------|----------|--------------|-----|

### Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO

|  |   |   |  |   |  |         |   |     |          |        |          |           |              |     |
|--|---|---|--|---|--|---------|---|-----|----------|--------|----------|-----------|--------------|-----|
|  | • | • |  | • |  | Durativ | C | 6HX | HSS-E    | lucido | ~DIN 371 | M 3 - M10 | <b>73120</b> | 474 |
|  | • | • |  | • |  | Durativ | C | 6HX | HSS-E    | TiN    | ~DIN 371 | M 3 - M10 | <b>63120</b> | 475 |
|  | • | • |  | • |  | Durativ | C | 6GX | HSS-E    | TiN    | ~DIN 371 | M 3 - M10 | <b>63119</b> | 476 |
|  | • | • |  | • |  | Durativ | C | 6HX | HSS-E    | TiN    | ~DIN 376 | M12 - M16 | <b>63122</b> | 477 |
|  | • | • |  | • |  | Durativ | C | 6HX | HSS-E-PM | AlCrN  | ~DIN 371 | M 3 - M10 | <b>53620</b> | 478 |
|  | • | • |  | • |  | Durativ | C | 6GX | HSS-E-PM | AlCrN  | ~DIN 371 | M 3 - M10 | <b>53621</b> | 479 |
|  | • | • |  | • |  | Durativ | C | 6HX | HSS-E-PM | AlCrN  | ~DIN 376 | M12 - M20 | <b>53622</b> | 480 |

| P | M | K | N | S | H | Tipo | Forma | classe di tolleranza | Materiale tagliente | Superficie | Norma | d1 | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|

### Maschi a rullare forati e c.canalini di lubr. per fil. metrica ISO



|   |   |   |   |   |   |         |   |     |              |      |          |           |       |     |
|---|---|---|---|---|---|---------|---|-----|--------------|------|----------|-----------|-------|-----|
| • | • | • | • | • | • | Durativ | C | 6HX | Metallo duro | TiCN | ~DIN 371 | M 3 - M10 | 63013 | 481 |
|---|---|---|---|---|---|---------|---|-----|--------------|------|----------|-----------|-------|-----|

### Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO



|   |   |   |   |   |   |         |   |     |       |        |         |           |       |     |
|---|---|---|---|---|---|---------|---|-----|-------|--------|---------|-----------|-------|-----|
| • | • | • | • | • | • | Durativ | C | 6HX | HSS-E | lucido | DIN 371 | M 2 - M10 | 73121 | 482 |
|---|---|---|---|---|---|---------|---|-----|-------|--------|---------|-----------|-------|-----|



|   |   |   |   |   |   |         |   |     |       |     |         |           |       |     |
|---|---|---|---|---|---|---------|---|-----|-------|-----|---------|-----------|-------|-----|
| • | • | • | • | • | • | Durativ | C | 6HX | HSS-E | TiN | DIN 371 | M 2 - M10 | 63121 | 483 |
|---|---|---|---|---|---|---------|---|-----|-------|-----|---------|-----------|-------|-----|



|   |   |   |   |   |   |         |   |     |       |     |          |           |       |     |
|---|---|---|---|---|---|---------|---|-----|-------|-----|----------|-----------|-------|-----|
| • | • | • | • | • | • | Durativ | C | 6HX | HSS-E | TiN | ~DIN 376 | M12 - M20 | 63123 | 484 |
|---|---|---|---|---|---|---------|---|-----|-------|-----|----------|-----------|-------|-----|

### Frese a filettare con fase di svasatura per filettatura metrica ISO



|   |   |   |   |   |   |        |  |  |              |        |               |           |       |     |
|---|---|---|---|---|---|--------|--|--|--------------|--------|---------------|-----------|-------|-----|
| • | • | • | • | • | • | TMC SP |  |  | Metallo duro | lucido | Norma di fab. | M 3 - M20 | 73810 | 485 |
|---|---|---|---|---|---|--------|--|--|--------------|--------|---------------|-----------|-------|-----|



|   |   |   |   |   |   |        |   |  |              |      |               |           |       |     |
|---|---|---|---|---|---|--------|---|--|--------------|------|---------------|-----------|-------|-----|
| • | • | • | • | • | • | TMC SP | ○ |  | Metallo duro | TiCN | Norma di fab. | M 3 - M20 | 53810 | 486 |
|---|---|---|---|---|---|--------|---|--|--------------|------|---------------|-----------|-------|-----|

### Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



|   |   |   |   |   |   |        |   |  |              |      |               |                     |       |     |
|---|---|---|---|---|---|--------|---|--|--------------|------|---------------|---------------------|-------|-----|
| • | • | • | • | • | • | TMC SP | ○ |  | Metallo duro | TiCN | Norma di fab. | M 4 X0,5 - M16 X1,5 | 53820 | 487 |
|---|---|---|---|---|---|--------|---|--|--------------|------|---------------|---------------------|-------|-----|



|   |   |   |   |   |   |        |  |  |              |        |               |                     |       |     |
|---|---|---|---|---|---|--------|--|--|--------------|--------|---------------|---------------------|-------|-----|
| • | • | • | • | • | • | TMC SP |  |  | Metallo duro | lucido | Norma di fab. | M 4 X0,5 - M16 X1,5 | 73820 | 488 |
|---|---|---|---|---|---|--------|--|--|--------------|--------|---------------|---------------------|-------|-----|

### Frese a filettare senza fase di svasatura per filettatura metrica ISO



|   |   |   |   |   |   |       |  |  |              |        |               |                |       |     |
|---|---|---|---|---|---|-------|--|--|--------------|--------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | TM SP |  |  | Metallo duro | lucido | Norma di fab. | M 6 - M20 X1,5 | 73830 | 489 |
|---|---|---|---|---|---|-------|--|--|--------------|--------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |       |   |  |              |      |               |                |       |     |
|---|---|---|---|---|---|-------|---|--|--------------|------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | TM SP | ○ |  | Metallo duro | TiCN | Norma di fab. | M 6 - M20 X1,5 | 53830 | 490 |
|---|---|---|---|---|---|-------|---|--|--------------|------|---------------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Forma | classe di tolleranza | Materiale tagliente | Superficie | Norma | d1 | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|

### Serie du maschi a mano per filettature metriche ISO destri



|   |   |   |   |   |   |   |       |         |            |        |         |           |              |     |
|---|---|---|---|---|---|---|-------|---------|------------|--------|---------|-----------|--------------|-----|
| • | ○ | • | • | • | • | N | A/D/C | ISO2/6H | <b>HSS</b> | lucido | DIN 352 | M 1 - M24 | <b>73531</b> | 491 |
|---|---|---|---|---|---|---|-------|---------|------------|--------|---------|-----------|--------------|-----|

### Serie di maschi a mano per filettature metriche ISO sinistri



|   |   |   |   |   |   |   |       |         |            |        |         |           |              |     |
|---|---|---|---|---|---|---|-------|---------|------------|--------|---------|-----------|--------------|-----|
| • | ○ | • | • | • | • | N | A/D/C | ISO2/6H | <b>HSS</b> | lucido | DIN 352 | M 4 - M16 | <b>73532</b> | 492 |
|---|---|---|---|---|---|---|-------|---------|------------|--------|---------|-----------|--------------|-----|

### Maschio a mano per filettatura metrica fine ISO, kit



|   |   |   |   |   |   |   |     |         |            |        |          |                     |              |     |
|---|---|---|---|---|---|---|-----|---------|------------|--------|----------|---------------------|--------------|-----|
| • | ○ | • | • | • | • | N | D/C | ISO2/6H | <b>HSS</b> | lucido | DIN 2181 | M 5 X0,5 - M18 X1,5 | <b>73521</b> | 493 |
|---|---|---|---|---|---|---|-----|---------|------------|--------|----------|---------------------|--------------|-----|

### Maschio a macchina per filettatura UNC, kit



|   |   |   |   |   |   |   |       |    |            |        |          |                 |              |     |
|---|---|---|---|---|---|---|-------|----|------------|--------|----------|-----------------|--------------|-----|
| • | ○ | • | • | • | • | N | A/D/C | 2B | <b>HSS</b> | lucido | ~DIN 352 | 4 -40 - 3/4 -10 | <b>73535</b> | 494 |
|---|---|---|---|---|---|---|-------|----|------------|--------|----------|-----------------|--------------|-----|

### Maschio a macchina per filettatura BSW, kit



|   |   |   |   |   |   |   |       |  |            |        |          |               |              |     |
|---|---|---|---|---|---|---|-------|--|------------|--------|----------|---------------|--------------|-----|
| • | ○ | • | • | • | • | N | A/D/C |  | <b>HSS</b> | lucido | ~DIN 352 | W 1/8 - W 3/4 | <b>73534</b> | 495 |
|---|---|---|---|---|---|---|-------|--|------------|--------|----------|---------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Forma | classe di tolleranza | Materiale tagliente | Superficie | Norma | d1 | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|
|---|---|---|---|---|---|------|-------|----------------------|---------------------|------------|-------|----|-------------|--------|

## Maschio a mano per filettatura gas, kit



|   |   |   |   |   |   |   |     |  |            |        |          |               |              |     |
|---|---|---|---|---|---|---|-----|--|------------|--------|----------|---------------|--------------|-----|
| ● | ○ | ● | ● | ○ | ● | N | D/C |  | <b>HSS</b> | lucido | DIN 5157 | G 1/8 - G 1/2 | <b>73522</b> | 496 |
|---|---|---|---|---|---|---|-----|--|------------|--------|----------|---------------|--------------|-----|

## Utensili combinati per fil. metrica ISO



|   |   |   |   |   |   |   |   |         |              |        |               |           |              |     |
|---|---|---|---|---|---|---|---|---------|--------------|--------|---------------|-----------|--------------|-----|
| ● | ○ | ● | ● | ○ | ● | N | D | ISO2/6H | <b>HSS-E</b> | lucido | Norma di fab. | M 3 - M12 | <b>73248</b> | 497 |
|---|---|---|---|---|---|---|---|---------|--------------|--------|---------------|-----------|--------------|-----|

## Maschi a macchina per dadi per fil. metrica ISO



|   |   |   |   |   |   |   |  |         |              |        |         |           |              |     |
|---|---|---|---|---|---|---|--|---------|--------------|--------|---------|-----------|--------------|-----|
| ● | ○ | ● | ● | ○ | ● | N |  | ISO2/6H | <b>HSS-E</b> | lucido | DIN 357 | M 3 - M18 | <b>73243</b> | 498 |
|---|---|---|---|---|---|---|--|---------|--------------|--------|---------|-----------|--------------|-----|

## Filiere per filettatura metrica ISO



|   |   |   |   |   |   |  |   |    |            |        |              |           |              |     |
|---|---|---|---|---|---|--|---|----|------------|--------|--------------|-----------|--------------|-----|
| ● | ○ | ● | ● | ○ | ● |  | B | 6h | <b>HSS</b> | lucido | DIN EN 22568 | M 1 - M30 | <b>73400</b> | 499 |
|---|---|---|---|---|---|--|---|----|------------|--------|--------------|-----------|--------------|-----|



|   |   |   |   |   |   |  |   |    |            |        |              |           |              |     |
|---|---|---|---|---|---|--|---|----|------------|--------|--------------|-----------|--------------|-----|
| ● | ○ | ○ | ● | ○ | ● |  | B | 6g | <b>HSS</b> | lucido | DIN EN 22568 | M 3 - M18 | <b>73410</b> | 500 |
|---|---|---|---|---|---|--|---|----|------------|--------|--------------|-----------|--------------|-----|



|   |   |   |   |   |   |  |   |    |              |          |              |             |              |     |
|---|---|---|---|---|---|--|---|----|--------------|----------|--------------|-------------|--------------|-----|
| ● | ● | ○ | ● | ○ | ● |  | B | 6g | <b>HSS-E</b> | nitruato | DIN EN 22568 | M 2,5 - M20 | <b>73413</b> | 501 |
|---|---|---|---|---|---|--|---|----|--------------|----------|--------------|-------------|--------------|-----|

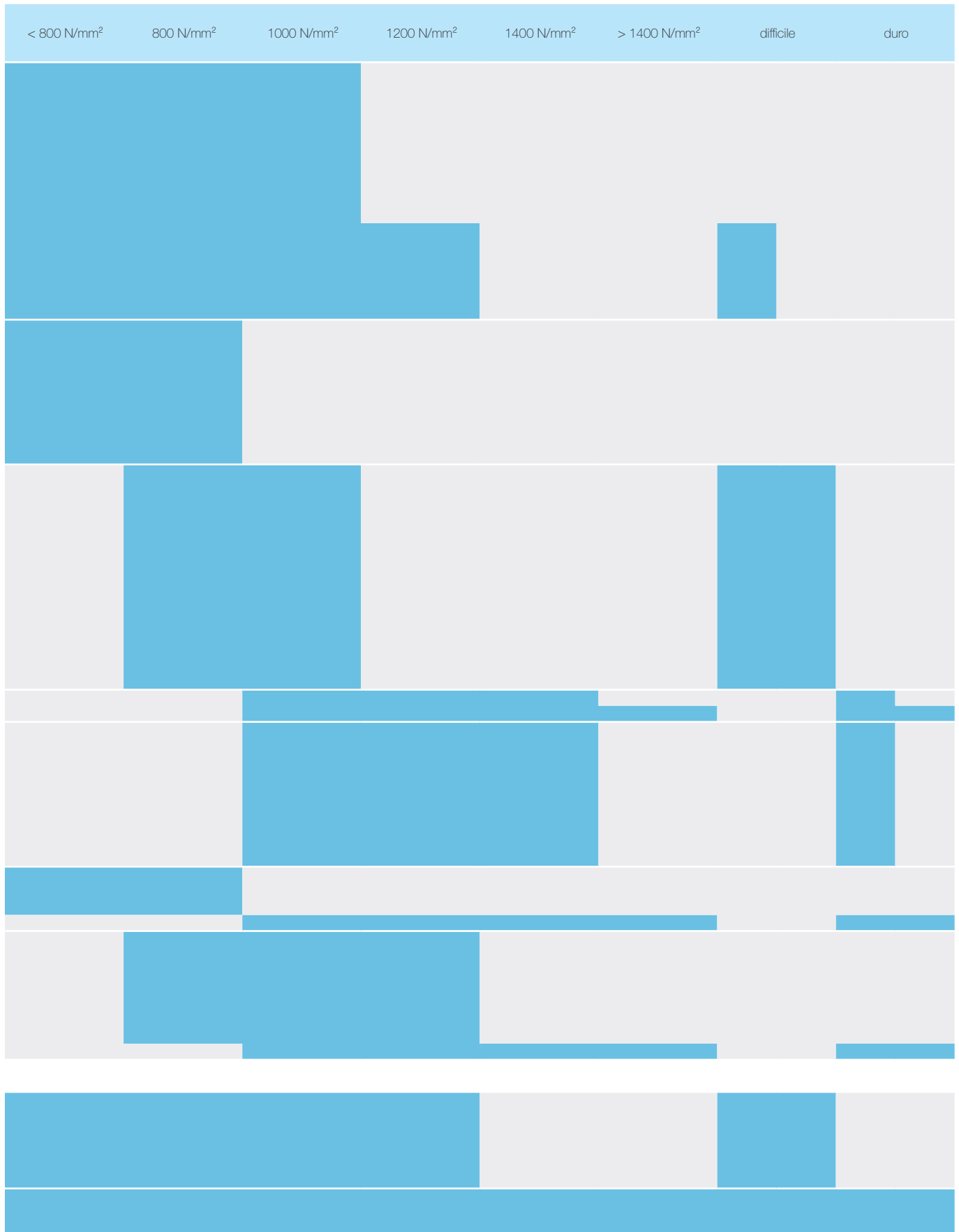
# Applicazione

Per materiale

| Colore anello                     | Catalogo n° |          | materiali non ferrosi, alluminio | acciai | ghise | acciai inossidabili e resistenti agli acidi | nichel e leghe di titanio | acciai temprati |
|-----------------------------------|-------------|----------|----------------------------------|--------|-------|---|---------------------------|-----------------|
|                                   | Produktiv   | Intensiv |                                  |        |       |   |                           |                 |
| verde                             | 73033       | 73046    |                                  |        |       |   |                           |                 |
|                                   | 73038       | 73048    |                                  |        |       |   |                           |                 |
|                                   | 73183       | 73187    |                                  |        |       |   |                           |                 |
|                                   | 73308       | 73322    |                                  |        |       |   |                           |                 |
|                                   | 73309       | 73323    |                                  |        |       |   |                           |                 |
|                                   | 73310       | 73324    |                                  |        |       |   |                           |                 |
|                                   | 73321       | 73325    |                                  |        |       |   |                           |                 |
|                                   | 63033       | 63046    |                                  |        |       |   |                           |                 |
|                                   |             | 63048    |                                  |        |       |   |                           |                 |
|                                   |             | 73047    |                                  |        |       |   |                           |                 |
|                                   | 53733       | 53746    |                                  |        |       |   |                           |                 |
|                                   | 53778       | 53780    |                                  |        |       |   |                           |                 |
|                                   | 53787       | 53788    |                                  |        |       |   |                           |                 |
|                                   | 53053       | 53050    |                                  |        |       |   |                           |                 |
| verde Synchro                     | 53054       | 53051    |                                  |        |       |   |                           |                 |
|                                   | 53055       | 53052    |                                  |        |       |   |                           |                 |
| giallo                            | 73133       | 73146    |                                  |        |       |   |                           |                 |
|                                   | 73132       | 73145    |                                  |        |       |   |                           |                 |
|                                   | 73138       | 73148    |                                  |        |       |   |                           |                 |
|                                   | 73250       | 73173    |                                  |        |       |   |                           |                 |
|                                   |             | 73227    |                                  |        |       |   |                           |                 |
|                                   |             | 73286    |                                  |        |       |   |                           |                 |
|                                   | 63133       | 63146    |                                  |        |       |   |                           |                 |
|                                   | 63138       | 63148    |                                  |        |       |   |                           |                 |
|                                   |             | 63173    |                                  |        |       |   |                           |                 |
|                                   |             | 73660    |                                  |        |       |   |                           |                 |
| blu                               | 73176       | 73660    |                                  |        |       |   |                           |                 |
|                                   | 73177       | 73659    |                                  |        |       |   |                           |                 |
|                                   | 73178       | 73180    |                                  |        |       |   |                           |                 |
|                                   | 73297       | 73304    |                                  |        |       |   |                           |                 |
|                                   | 73298       | 73305    |                                  |        |       |   |                           |                 |
|                                   | 73299       | 73306    |                                  |        |       |   |                           |                 |
|                                   | 73300       | 73288    |                                  |        |       |   |                           |                 |
|                                   | 63176       | 73662    |                                  |        |       |   |                           |                 |
|                                   | 63177       | 73665    |                                  |        |       |   |                           |                 |
|                                   | 73641       | 63662    |                                  |        |       |   |                           |                 |
|                                   | 73643       | 63665    |                                  |        |       |   |                           |                 |
|                                   | 53641       | 53662    |                                  |        |       |   |                           |                 |
|                                   | 53643       | 53665    |                                  |        |       |   |                           |                 |
|                                   | ohne Ring   | 53667    | 53666                            |        |       |   |                           |                 |
| 53669                             |             | 53668    |                                  |        |       |   |                           |                 |
| rosso                             | 73642       | 53661    |                                  |        |       |   |                           |                 |
|                                   | 73645       | 73619    |                                  |        |       |   |                           |                 |
|                                   | 73646       | 73661    |                                  |        |       |   |                           |                 |
|                                   | 53642       | 73664    |                                  |        |       |   |                           |                 |
|                                   | 73640       | 73666    |                                  |        |       |   |                           |                 |
|                                   | 63641       | 63010    |                                  |        |       |   |                           |                 |
|                                   | 63643       | 63674    |                                  |        |       |   |                           |                 |
|                                   | 53640       | 63675    |                                  |        |       |   |                           |                 |
| 53670                             | 53670       |          |                                  |        |       |   |                           |                 |
| nero                              | 73131       | 73156    |                                  |        |       |   |                           |                 |
|                                   | 73189       | 73136    |                                  |        |       |   |                           |                 |
|                                   | 73011       | 73011    |                                  |        |       |   |                           |                 |
|                                   | 53670       | 53670    |                                  |        |       |   |                           |                 |
| bianco                            | 73201       | 73201    |                                  |        |       |   |                           |                 |
|                                   | 73211       | 73211    |                                  |        |       |   |                           |                 |
|                                   | 73194       | 73194    |                                  |        |       |   |                           |                 |
|                                   | 73326       | 73326    |                                  |        |       |   |                           |                 |
|                                   | 73327       | 73327    |                                  |        |       |   |                           |                 |
|                                   | 73345       | 73345    |                                  |        |       |   |                           |                 |
|                                   | 63201       | 63201    |                                  |        |       |   |                           |                 |
|                                   | 53670       | 53670    |                                  |        |       |   |                           |                 |
| per fori passanti e ciechi        |             |          |                                  |        |       |   |                           |                 |
| Filettature Rullate               | 73121       | 63122    |                                  |        |       |   |                           |                 |
|                                   | 63121       | 53620    |                                  |        |       |   |                           |                 |
|                                   | 63123       | 53621    |                                  |        |       |   |                           |                 |
|                                   | 73120       | 53622    |                                  |        |       |   |                           |                 |
|                                   | 63120       | 63013    |                                  |        |       |   |                           |                 |
|                                   | 63119       |          |                                  |        |       |   |                           |                 |
| Filettatura con frese a filettare | 73810       | 53820    |                                  |        |       |   |                           |                 |
|                                   | 73820       | 73830    |                                  |        |       |   |                           |                 |
|                                   | 53810       | 53830    |                                  |        |       |   |                           |                 |

■ ottimale    ■ adatto bene

### Per resistenza alla trazione



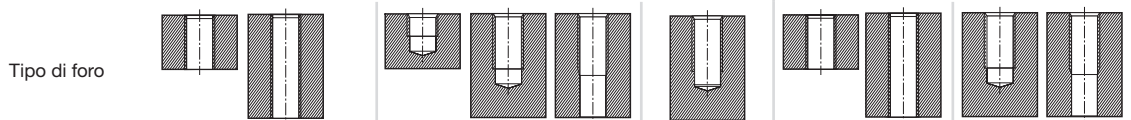
# Campi d'applicazione per maschi



Esempi di materiale

per l'applicazione universale in materiale <math>< 1100 \text{ N/mm}^2</math>, p. e. : acciaio da costruzione, acciai automatici acciai temprati, acciai da bonifica acciai niturati ghisa sferoidale

per lavorazione Synchro per l'applicazione universale in materiale fino a <math>1200 \text{ N/mm}^2</math>



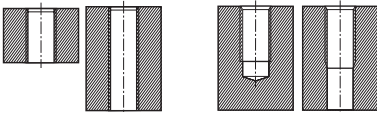
| Mat. tagliente       | HSS-E       |           |            | HSS-E-PM          | HSS-E-PM         |
|----------------------|-------------|-----------|------------|-------------------|------------------|
| Tipo                 | Produttiv N |           | Intensiv N | Produttiv-Synchro | Intensiv-Synchro |
| Forma                | B           |           | C          | B                 | C                |
| Tratt. di superficie | vap.        | TiN       | vap.       | TiN               | lucido           |
| $v_c$ m/min          | $\leq 15$   | $\leq 20$ | $\leq 15$  | $\leq 20$         | $\leq 15$        |

| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina          |                          |                                      |                           |                                |                           |
|---------------------|-------------------------|------------|--------------------------------------|--------------------------|--------------------------------------|---------------------------|--------------------------------|---------------------------|
| M                   | DIN 371                 | ISO 2 6H   | 73033<br>M3 - M10<br>366             | 63033<br>M3 - M10<br>365 | 73046<br>M3 - M10<br>372             | 63046<br>M3 - M10<br>371  | 73047<br>M4 - M10<br>375       | 53053<br>M2 - M10<br>362  |
|                     |                         | 6HX        |                                      |                          |                                      |                           |                                | 53050<br>M5 - M10<br>368  |
|                     | DIN 376                 | ISO 2 6H   | 73038<br>M12 - M24<br>367            |                          | 73048<br>M12 - M24<br>374            | 63048<br>M12 - M20<br>373 |                                | 53054<br>M12 - M20<br>363 |
|                     |                         | 6HX        |                                      |                          |                                      |                           |                                | 53051<br>M12 - M20<br>369 |
| MF                  | DIN 374                 | ISO 2 6H   | 73183<br>M6x0,75 -<br>M20x1,5<br>439 |                          | 73187<br>M6x0,75 -<br>M20x1,5<br>440 |                           | 53055<br>M8x1 - M16x1,5<br>437 |                           |
|                     |                         | 6HX        |                                      |                          |                                      |                           | 53052<br>M8x1 - M20x1,5<br>438 |                           |
| UNC                 | DIN ~ 371               | 2B         | 73308<br>Nr.4-40 - 3/8-16<br>449     |                          | 73322<br>Nr.4-40 - 3/8-16<br>451     |                           |                                |                           |
|                     | DIN ~ 376               | 2B         | 73309<br>1/2-13 - 3/4-10<br>450      |                          | 73323<br>1/2-13 - 3/4-10<br>452      |                           |                                |                           |
| UNF                 | DIN ~ 374               | 2B         | 73310<br>Nr.10-32 - 5/8-18<br>459    |                          | 73324<br>Nr.10-32 - 5/8-18<br>460    |                           |                                |                           |
| G                   | DIN 5156                | -          | 73321<br>G1/8 - G1<br>464            |                          | 73325<br>G1/8 - G1<br>465            |                           |                                |                           |





applicazioni universali  
per acciai fino a 1300 N/mm<sup>2</sup>  
incl. inossidabile e resistente agli acidi, ghisa,  
metalli non ferrosi



| HSS-E                                 | HSS-E                                 |
|---------------------------------------|---------------------------------------|
| ProduktivN-X                          | IntensivN-X                           |
| B                                     | C                                     |
| AlTiZrN                               | TiAlN                                 |
| ≤ 20                                  | ≤ 20                                  |
| Catalogo n°/Diametro/Pagina           |                                       |
| 53733<br>M2 - M10<br>364              | 53746<br>M2 - M10<br>370              |
| 53733<br>M12 - M30<br>364             | 53746<br>M12 - M30<br>370             |
| 53778<br>MF 6x0,75 - MF 24x1,5<br>436 | 53780<br>MF 6x0,75 - MF 24x1,5<br>435 |
| 53787<br>G1/16 - G1<br>471            | 53788<br>G1/16 - G1<br>466            |

## STOCK ProduktivN-X

Maschi per foro passante, imbocco B  
HSS-E, TiAlN.

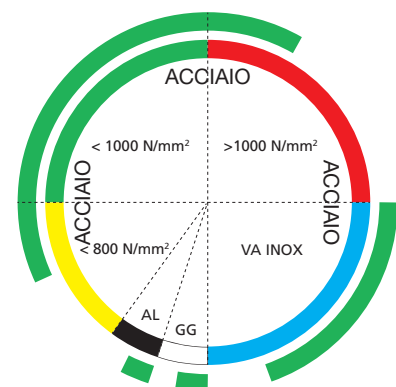
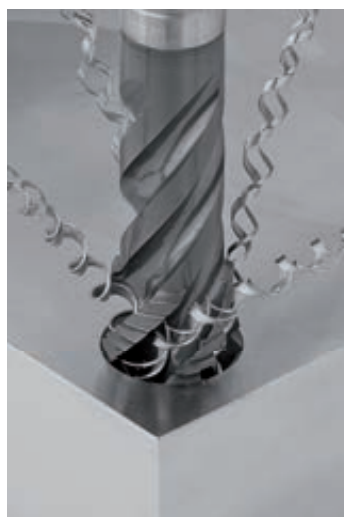
## STOCK IntensivN-X

Maschi per foro cieco, imbocco C  
elica a 45°, HSS-E, TiAlN.



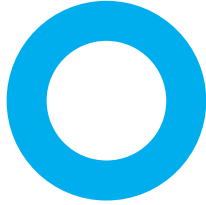
Un maschio universale per la produzione di filettature interne in quasi tutte le applicazioni. Per la lavorazione di acciaio al carbonio, temprato, bonificato, inossidabile e resistente agli acidi ma anche di ghisa e vari metalli non ferrosi in un range di resistenza alla trazione tra < 600 N/mm<sup>2</sup> e 1300 N/mm<sup>2</sup>. Efficiente evacuazione del truciolo, miglior vita utensile e precisione nelle filettature prodotte.

L'innovativa geometria del tagliente, il rivestimento TiAlN anti-usura e le corrette tolleranze producono filettature di alta qualità. La produzione di filettature con tolleranza 6HX, viene ottenuta in modo più economico ed efficiente grazie all'incremento delle performance, per una più vasta, affidabile ed universale applicazione.



Campi d'applicazione

# Campi d'applicazione per maschi

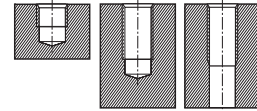
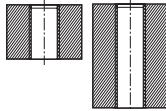


Esempi di materiale

per  
acciaio inossidabile e resistente e acido p. e. :  
acciai solforati  
acciai austenitici  
acciai martensitici  
acciai ferritici

per  
acciaio inossidabile e resistente e acido p. e. :  
acciai solforati  
acciai austenitici  
acciai martensitici  
acciai ferritici

Tipo di foro



|                      |              |      |          |      |             |        |          |      |
|----------------------|--------------|------|----------|------|-------------|--------|----------|------|
| Mat. tagliente       | HSS-E        |      | HSS-E-PM |      | HSS-E       |        | HSS-E-PM |      |
| Tipo                 | Produttiv HD |      |          |      | Intensiv HD |        |          |      |
| Forma                | B            |      |          |      | C           |        |          |      |
| Tratt. di superficie | vap.         | TiN  | lucido   | TiCN | vap.        | lucido | TiCN     | TiN  |
| $v_c$ m/min          | ≤ 15         | ≤ 20 | ≤ 15     | ≤ 20 | ≤ 15        | ≤ 15   | ≤ 20     | ≤ 20 |

| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina         |                           |                           |                           |                           |                                   |                           |                           |
|---------------------|-------------------------|------------|-------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-----------------------------------|---------------------------|---------------------------|
| M                   | DIN 371                 | ISO 2 6H   | 73176<br>M3 - M10<br>414            | 63176<br>M3 - M10<br>413  | 73641<br>M3 - M10<br>415  | 53641<br>M3 - M10<br>412  | 73660<br>M3 - M10<br>422  | 73662<br>M3 - M10<br>423          | 53662<br>M3 - M10<br>420  | 63662<br>M3 - M10<br>421  |
|                     |                         | 6HX        |                                     |                           |                           |                           |                           |                                   |                           |                           |
|                     | DIN 376                 | ISO 2 6H   | 73177<br>M12 - M20<br>418           | 63177<br>M12 - M16<br>417 | 73643<br>M12 - M22<br>419 | 53643<br>M12 - M16<br>416 | 73659<br>M12 - M20<br>426 | 73665<br>M12 - M24<br>427         | 53665<br>M12 - M16<br>424 | 63665<br>M12 - M16<br>425 |
|                     |                         | 6HX        |                                     |                           |                           |                           |                           |                                   |                           |                           |
| MF                  | DIN 374                 | ISO 2 6H   | 73178<br>M5x0,5 -<br>M20x1,5<br>446 |                           |                           |                           |                           | 73180<br>M8x1 -<br>M20x1,5<br>447 |                           |                           |
| UNC                 | DIN ~ 371               | 2B         | 73297<br>Nr.4-40 - 3/8-16<br>453    |                           |                           |                           |                           | 73304<br>Nr.4-40 - 3/8-16<br>455  |                           |                           |
|                     | DIN ~ 376               | 2B         | 73298<br>1/2-13 - 1-8<br>454        |                           |                           |                           |                           | 73305<br>1/2-13 - 3/4-10<br>456   |                           |                           |
| UNF                 | DIN ~ 374               | 2B         | 73299<br>Nr.10-32- 5/8-18<br>461    |                           |                           |                           |                           | 73306<br>Nr.10-32- 3/4-16<br>462  |                           |                           |
| G                   | DIN 5156                | -          | 73300<br>G1/8 - G1<br>468           |                           |                           |                           |                           | 73288<br>G1/8 - G1<br>469         |                           |                           |
| NPT                 | a norma                 | -          | 73293<br>1/8 - 3/4<br>463           |                           |                           |                           |                           |                                   |                           |                           |

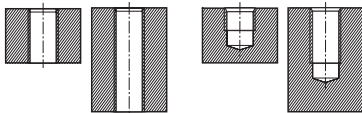


per titanio e leghe di titanio



### Stabili su materiali difficili da lavorare.

Specialmente affidabile per lavorazioni di titanio e leghe di titanio. I maschi HDX completano la nostra gamma di maschi HD.



| HSS-E-PM                    |                           |
|-----------------------------|---------------------------|
| Produktiv HDX               | Intensiv HDX              |
| B                           | C                         |
| TiCN                        | TiCN                      |
| ≤ 20                        | ≤ 20                      |
| Catalogo n°/Diametro/Pagina |                           |
| 53667<br>M3 - M10<br>377    | 53666<br>M3 - M10<br>382  |
| 53667<br>M12 - M16<br>377   | 53666<br>M12 - M16<br>382 |
|                             |                           |
|                             |                           |
|                             |                           |
|                             |                           |
|                             |                           |
|                             |                           |

### Vantaggi:

- alta qualità di filetto
- ottimizzata evacuazione del truciolo
- non incolla
- bassa usura
- lunga vita dell'utensile
- massima affidabilità di processo



# Campi d'applicazione per maschi

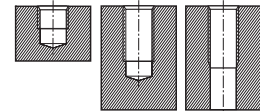
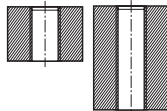


Esempi di materiale

per acciai ad alta resistenza  
 $\geq 1100 \dots 1400 \text{ N/mm}^2$ , p. e. :  
 acciai da bonifica  
 acciai per utensili legati a freddo  
 acciaio rapido

per acciai ad alta resistenza  
 $\geq 1100 \dots 1400 \text{ N/mm}^2$ , p. e. :  
 acciai da bonifica  
 acciai per utensili legati a freddo  
 acciaio rapido

Tipo di foro



| Mat. tagliente       | HSS-E       |           | HSS-E-PM  |           |            | HSS-E     |           |           | HSS-E-PM  |
|----------------------|-------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|
| Tipo                 | Produttiv H |           |           |           | Intensiv H |           |           | HR 15     |           |
| Forma                | B           |           |           |           | C          |           |           | C         |           |
| Tratt. di superficie | nitruato    | TiCN      | lucido    | TiN       | TiCN       | lucido    | TiCN      | TiN       | lucido    |
| $v_c$ m/min          | $\leq 15$   | $\leq 20$ | $\leq 15$ | $\leq 20$ | $\leq 20$  | $\leq 15$ | $\leq 20$ | $\leq 20$ | $\leq 15$ |

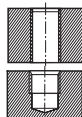
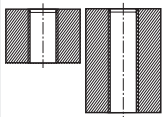
| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina          |                          |                           |                           |                           |                          |                           |                          |                           |  |
|---------------------|-------------------------|------------|--------------------------------------|--------------------------|---------------------------|---------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--|
| M                   | DIN 371                 | ISO 2 6H   | 73642<br>M2 - M10<br>401             | 53642<br>M2 - M10<br>398 | 73640<br>M3 - M10<br>400  | 63641<br>M3 - M10<br>399  | 53640<br>M3 - M10<br>397  | 73661<br>M3 - M10<br>407 | 53661<br>M2 - M10<br>404  | 63674<br>M3 - M10<br>405 | 73619<br>M3 - M10<br>406  |  |
|                     |                         | 6HX        |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |
|                     | DIN 376                 | ISO 2 6H   | 73645<br>M12 - M20<br>403            |                          |                           | 63643<br>M12 - M20<br>402 | 73664<br>M12 - M20<br>409 |                          | 63675<br>M12 - M20<br>408 |                          | 73666<br>M12 - M20<br>410 |  |
|                     |                         | 6HX        |                                      |                          | 53640<br>M12 - M16<br>397 | 53661<br>M12 - M16<br>404 |                           |                          |                           |                          |                           |  |
|                     | a norma                 | ISO 2 6H   |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |
| MF                  | DIN 374                 | ISO 2 6H   | 73646<br>M3x0,35 -<br>M22x1,5<br>445 |                          |                           |                           |                           |                          |                           |                          |                           |  |
| UNC                 | DIN ~ 371               | 2B         |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |
|                     | DIN ~ 376               | 2B         |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |
| UNF                 | DIN ~ 374               | 2B         |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |
| G                   | DIN 5156                | -          |                                      |                          |                           |                           |                           |                          |                           |                          |                           |  |



per materiale ad alta resistenza  $\geq 1400 \text{ N/mm}^2$

per leghe speciale ad alta resistenza  $\geq 1400 \text{ N/mm}^2$ , p. e. : Inconel

per acciai ad alta resistenza 54-62HRC



| HSS-E-PM  |              | HSS-E-PM    |  | M.D.I.   |
|-----------|--------------|-------------|--|----------|
| HCX       | Produktiv HX | Intensiv HX |  | H        |
| C         | B            | B           |  | D        |
| TiCN      | AlTiN        | AlTiN       |  | TiCN     |
| $\leq 20$ | $\leq 20$    | $\leq 20$   |  | $\leq 2$ |

Catalogo n°/Diametro/Pagina

|                          |                           |                           |                          |
|--------------------------|---------------------------|---------------------------|--------------------------|
| 53670<br>M5 - M10<br>383 | 53669<br>M3 - M10<br>376  | 53668<br>M3 - M10<br>381  |                          |
|                          | 53669<br>M12 - M16<br>376 | 53668<br>M12 - M16<br>381 |                          |
|                          |                           |                           | 63010<br>M3 - M12<br>411 |

### In casi difficili.

Con i maschi di tipo HX e HCX STOCK vengono offerte soluzioni speciali per la lavorazione di materiali con alta resistenza alla trazione. Il rivestimento speciale permette una miglior resistenza all'usura nel caso di lavorazioni in condizioni difficili.

#### Applicazioni **HX**:

- Inconel
- Hastelloy
- Waspalloy
- Leghe di nickel

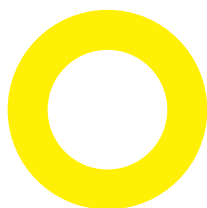
#### Applicazioni **HCX**:

- acciai per utensili
- tutti gli acciai trattabili a caldo
- acciai ad alta velocità
- ghisa lamellare
- ghisa sferoidale
- bronzi duri
- materiali duri speciali
- Ampco >21

#### Vantaggi:

- maschiatura affidabile
- lunga vita dell'utensile
- elevata precisione

# Campi d'applicazione per maschi



|                      |   |  |  |   |  |           |           |
|----------------------|---|--|--|---|--|-----------|-----------|
| Esempi di materiale  | per acciai generici $\leq 800 \text{ N/mm}^2$ e metalli non ferrosi | per acciai generici $\leq 800 \text{ N/mm}^2$ , p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica | per acciai generici $\leq 800 \text{ N/mm}^2$ , p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica | per acciai generici $\leq 800 \text{ N/mm}^2$ e metalli non ferrosi | per acciai generici $\leq 800 \text{ N/mm}^2$ , p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica |           |           |
| Tipo di foro         |   |  |  |   |  |           |           |
| Mat. tagliente       | HSS-E   |  |  |   |  |           |           |
| Tipo                 | Massiv N  | N  | Produktiv N  |   | Intensiv N   |           |           |
| Forma                | B   | C  | B  |   | C  |           |           |
| Tratt. di superficie | lucido  | lucido   | lucido   | TiN   | lucido   | lucido    | TiN       |
| $v_c$ m/min          | $\leq 15$   | $\leq 15$  | $\leq 15$  | $\leq 20$   | $\leq 15$  | $\leq 15$ | $\leq 20$ |

| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina       |                                   |                            |                           |                          |                                 |                                |
|---------------------|-------------------------|------------|-----------------------------------|-----------------------------------|----------------------------|---------------------------|--------------------------|---------------------------------|--------------------------------|
| M                   | DIN 371                 | ISO 2 6H   | 73126<br>M2,3 - M10<br>380        | 73185<br>M1 - M10<br>378          | 73133<br>M2 - M10<br>387   | 63133<br>M3 - M10<br>385  | 73221<br>M2 - M10<br>393 | 73146<br>M2 - M10<br>392        | 63146<br>M3 - M10<br>390       |
|                     |                         | ISO 3 6G   |                                   |                                   | 73132<br>M2,5 - M10<br>386 |                           |                          | 73145<br>M3 - M10<br>391        |                                |
|                     | DIN 376                 | ISO 2 6H   |                                   | 73191<br>M6 - M22<br>379          | 73138<br>M2 - M24<br>389   | 63138<br>M12 - M20<br>388 | 73227<br>M3 - M20<br>396 | 73148<br>M3 - M30<br>395        | 63148<br>M12 - M20<br>394      |
| MF                  | DIN 374                 | ISO 2 6H   | 73237<br>M8x0,75 - M24x1,5<br>441 | 73250<br>M4x0,50 - M36x1,5<br>442 |                            |                           |                          | 73173<br>M3x0,35 - M30x2<br>443 | 63173<br>M8x1 - M20x1,5<br>444 |
| G                   | DIN 5156                | -          |                                   |                                   |                            |                           |                          | 73286<br>G1/8 - G1 1/2<br>467   |                                |



Esempi di materiale

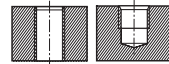
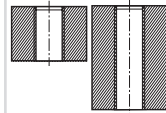
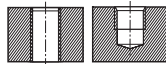
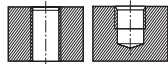
per materiali non ferrosi a truciolo corto. es: Alsi > 10% Si

es: alluminio puro e leghe con Si < 10%

per Al e sue leghe a truciolo corto metalli non ferrosi plastica

per ghise, p. e.:  
ghisa grigia  
ghisa malleabile  
ghisa sferoidale  
ghisa

Tipo di foro



Mat. tagliente

HSS-E-PM

HSS-E

M.D.I.

HSS-E-PM

HSS-E

Tipo

HCX

Produktiv W

Intensiv W

H

HCX

GG

Forma

C

B

C

C

C

Tratt. di superficie

TICN

lucido

lucido

lucido

TICN

nitruato

AlTiN

$v_c$  m/min

$\leq 20$

$\leq 15$

$\leq 15$

$\leq 15$

$\leq 20$

$\leq 20$

$\leq 30$

| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina |                           |                           |                          |                                     |                           |                          |
|---------------------|-------------------------|------------|-----------------------------|---------------------------|---------------------------|--------------------------|-------------------------------------|---------------------------|--------------------------|
| M                   | DIN 371                 | ISO 2 6H   |                             | 73131<br>M2 - M10<br>431  | 73156<br>M2 - M10<br>433  |                          |                                     |                           |                          |
|                     |                         | 6HX        | 53670<br>M5 - M10<br>383    |                           |                           | 73011<br>M3 - M10<br>384 | 53670<br>M5 - M10<br>383            | 73201<br>M3 - M10<br>429  | 63201<br>M3 - M10<br>428 |
|                     | DIN 376                 | ISO 2 6H   |                             | 73189<br>M12 - M20<br>432 | 73136<br>M12 - M20<br>434 |                          |                                     |                           |                          |
|                     |                         | 6HX        |                             |                           |                           |                          |                                     | 73211<br>M12 - M20<br>430 |                          |
| MF                  | DIN 374                 | 6HX        |                             |                           |                           |                          | 73194<br>M8x1 -<br>M20x1,5<br>448   |                           |                          |
| UNC                 | DIN ~ 371               | 2B         |                             |                           |                           |                          | 73326<br>Nr.8-32 -<br>3/8-16<br>457 |                           |                          |
|                     | DIN ~ 376               | 2B         |                             |                           |                           |                          | 73327<br>1/2-13 - 1-8<br>458        |                           |                          |
| G                   | DIN 5156                | -          |                             |                           |                           |                          | 73345<br>G1/8 - G1<br>470           |                           |                          |

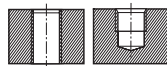
# Campi d'applicazione per maschi a mano, maschi a macchina corto e maschi speciali



Esempi di materiale per acciai generici  $\leq 800 \text{ N/mm}^2$ , p. e.: acciaio da costruzione, acciai automatici, acciai temprati, acciai da bonifica  
i maschi 73531 e 73532 sono utilizzabili anche per acciaio ad alta resistenza e resistente agli acidi

per acciai generici  $\leq 800 \text{ N/mm}^2$ , p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica

Tipo di foro



Mat. tagliente

HSS

HSS-E

Tipo

N

N

Forma

-

B

Kombi

-

Tratt. di superficie

lucido

lucido

lucido

lucido

$v_c$  m/min

-

$\leq 15$

$\leq 15$

$\leq 15$

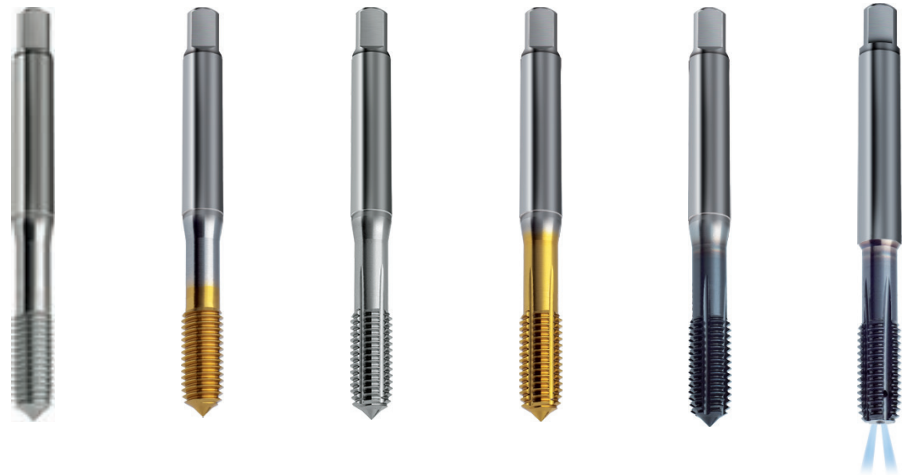
| Tipo di filettatura | Dimensioni a DIN 2184-1 | Tolleranza | Catalogo n°/Diametro/Pagina  |   |                            |
|---------------------|-------------------------|------------|--|---|----------------------------|
| M                   | DIN 352                 | ISO 2 6H   | 73531 (set) RH:<br>V 73101<br>M 73102<br>F 73103<br>M1 - M24<br>491    | 73532 (set) LH:<br>V 73105<br>M 73106<br>F 73107<br>M4 - M16<br>492 | 73243<br>M3 - M18<br>498   |
|                     | a norma                 | ISO 2 6H   |  |   | 73248<br>M3 - M12<br>497   |
| MF                  | DIN 2181                | ISO 2 6H   | 73521 (set):<br>V 73110 / F 73111<br>M5x0,5 - M18x1,5<br>493           |   |                            |
| UNC                 | ~DIN 352                | 2B         | 73535 (set):<br>V 73301 / M 73302 / F 73303<br>Nr.4-40 - 3/4-10<br>494 |   |                            |
| BSW                 | ~DIN 352                | -          | 73534 (set):<br>V 73311 / M 73312 / F 73313<br>W1/8 - W3/4<br>495      |   |                            |
| G                   | DIN 5157                | -          | 73522 (set):<br>V 73315 / F 73316<br>G1/8 - G1/2<br>496                |   |                            |
| Pg                  | DIN 40432               | -          |  |   | 73296<br>Pg7 - PG16<br>472 |
| NPT                 | a norma                 | -          |  |   | 73295<br>1 1/16 - 1<br>473 |



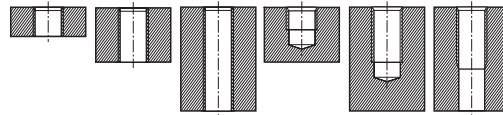


Disponibili anche con:  
**MASCHIATORI STOCK**

# Campi d'applicazione per maschi a rullare



Tipo di foro



Esempi di materiale

per acciai generici  $\geq 800 \dots 1000 \text{ N/mm}^2$ ,  
acciaio inossidabile e resistente e acido,  
per l'applicazione universale in materiale  $< 1000 \text{ N/mm}^2$   
Al e leghe di Al

|                     |                       | HSS-E                       |                           | HSS-E-PM                 |                           | M.D.I.                    |                          |                          |
|---------------------|-----------------------|-----------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
|                     |                       | Durativ                     |                           |                          |                           |                           |                          |                          |
|                     |                       | C senza canalini di lub.    |                           | C con canalini di lub.   |                           |                           |                          |                          |
|                     |                       | lucido                      | TiN                       | lucido                   | TiN                       | AlCrN                     | TiCN                     |                          |
|                     |                       | 4-50                        | 4-50                      | 4-50                     | 4-50                      | 4-50                      | 4-50                     |                          |
| Tipo di filettatura | Dimensioni a DIN 2174 | Catalogo n°/Diametro/Pagina |                           |                          |                           |                           |                          |                          |
| M                   | ~<br>DIN 371          | 6HX                         | 73121<br>M2 - M10<br>482  | 63121<br>M2 - M10<br>483 | 73120<br>M3 - M10<br>474  | 63120<br>M3 - M10<br>475  | 53620<br>M3 - M10<br>478 | 63013<br>M3 - M10<br>481 |
|                     |                       |                             | 6GX                       |                          | 63119<br>M3 - M10<br>476  | 53621<br>M3 - M10<br>479  |                          |                          |
|                     | ~<br>DIN 376          | 6HX                         | 63123<br>M12 - M20<br>484 |                          | 63122<br>M12 - M16<br>477 | 53622<br>M12 - M20<br>480 |                          |                          |

# Campi d'applicazione per frese a filettare



Tipo di foro

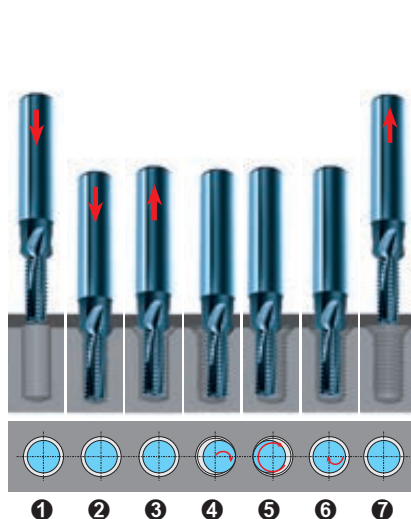


Esempi di materiale

per l'applicazione universale:  
acciaio da costruzione, acciai automatici, acciai temprati,  
acciai da bonifica, acciai per utensili, acciaio rapido,  
acciai austenitici e martensitici e solforati, leghe speciale,  
Al e leghe di Al, ghise,  
metalli non ferrosi, plastica, leghe di magnesio, Titanio

| Mat. tagliente       | M.D.I.                |          | M.D.I.                |          |
|----------------------|-----------------------|----------|-----------------------|----------|
| Tipo                 | TMC SP                |          | TM SP                 |          |
| Forma                | -                     | -        | -                     | -        |
| Tratt. di superficie | lucido                | TiCN     | lucido                | TiCN     |
| $v_c$ m/min          | 100 - 300 (Ti: 40-60) | 50 - 200 | 100 - 300 (Ti: 40-60) | 50 - 200 |

| Tipo di filettatura | Dimensioni a | Prof. di filettatura | Catalogo n°/Diametro/Pagina      |                                  |                                |                                |
|---------------------|--------------|----------------------|----------------------------------|----------------------------------|--------------------------------|--------------------------------|
| <b>M</b>            | a norma      | 2,0 x D              | 73810<br>M3 - M20<br>485         | 53810<br>M3 - M20<br>486         | 73830<br>M6 - M20<br>489       | 53830<br>M6 - M20<br>490       |
| <b>MF</b>           | a norma      | 2,0 x D              | 73820<br>M4x0,5 - M16x1,5<br>488 | 53820<br>M4x0,5 - M16x1,5<br>487 | 73830<br>M8x1 - M20x1,5<br>489 | 53830<br>M8x1 - M20x1,5<br>490 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



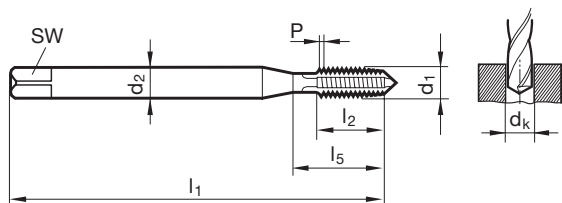
Catalogo n° 53053



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 8,000  | 13,500 |
| <b>M 2,2</b> | 0,450 | 2,800  | 2,100 | 1,75 | 45,000  | 9,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M 10</b>  | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



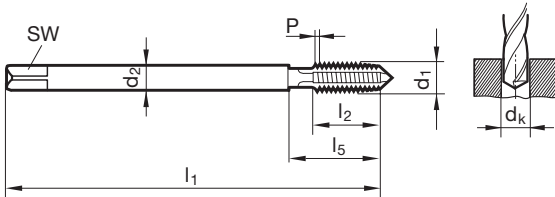
Catalogo n° 53054



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ | ○ |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M18</b> | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 30,000 | 62,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

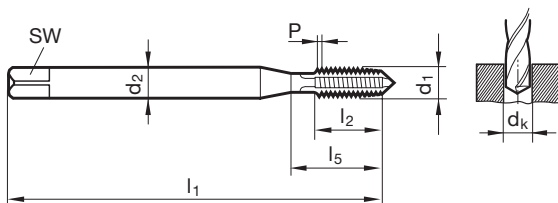


Catalogo n° 53733

|                         |                 |          |              |                 |          |            |
|-------------------------|-----------------|----------|--------------|-----------------|----------|------------|
| Produktiv<br><b>N-X</b> | ~DIN<br>371/376 | <b>B</b> | <b>HSS-E</b> | <b>Al-TiZrN</b> | <b>R</b> | <b>6HX</b> |
|-------------------------|-----------------|----------|--------------|-----------------|----------|------------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ●        | ●        | ○        | ●        |          |

Parametri di lav.  
ind. a pag. 348



- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise

| d1           | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------------|---------|----------|----------|----------|----------|----------|----------|
| <b>M 2</b>   | 0,400   | 2,800    | 2,100    | 1,60     | 45,000   | 8,000    | 13,500   |
| <b>M 2,5</b> | 0,450   | 2,800    | 2,100    | 2,05     | 50,000   | 9,000    | 14,500   |
| <b>M 3</b>   | 0,500   | 3,500    | 2,700    | 2,50     | 56,000   | 10,000   | 18,000   |
| <b>M 4</b>   | 0,700   | 4,500    | 3,400    | 3,30     | 63,000   | 12,000   | 21,000   |
| <b>M 5</b>   | 0,800   | 6,000    | 4,900    | 4,20     | 70,000   | 14,000   | 25,000   |
| <b>M 6</b>   | 1,000   | 6,000    | 4,900    | 5,00     | 80,000   | 16,000   | 30,000   |
| <b>M 8</b>   | 1,250   | 8,000    | 6,200    | 6,80     | 90,000   | 17,000   | 35,000   |
| <b>M10</b>   | 1,500   | 10,000   | 8,000    | 8,50     | 100,000  | 20,000   | 39,000   |
| <b>M12</b>   | 1,750   | 9,000    | 7,000    | 10,20    | 110,000  | 24,000   | 49,000   |
| <b>M14</b>   | 2,000   | 11,000   | 9,000    | 12,00    | 110,000  | 26,000   | 53,000   |
| <b>M16</b>   | 2,000   | 12,000   | 9,000    | 14,00    | 110,000  | 26,000   | 54,000   |
| <b>M18</b>   | 2,500   | 14,000   | 11,000   | 15,50    | 125,000  | 30,000   | 62,000   |
| <b>M20</b>   | 2,500   | 16,000   | 12,000   | 17,50    | 140,000  | 32,000   | 62,000   |
| <b>M24</b>   | 3,000   | 18,000   | 14,500   | 21,00    | 160,000  | 36,000   | 73,000   |
| <b>M30</b>   | 3,500   | 22,000   | 18,000   | 26,50    | 180,000  | 40,000   | 85,000   |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



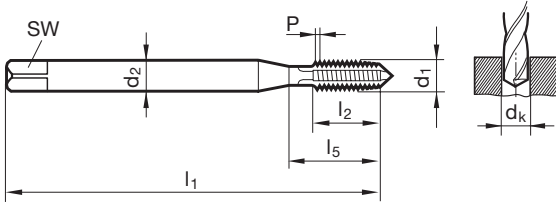
Catalogo n° 63033

|                       |                          |          |              |            |          |                |
|-----------------------|--------------------------|----------|--------------|------------|----------|----------------|
| Produttiv<br><b>N</b> | <b>DIN</b><br><b>371</b> | <b>B</b> | <b>HSS-E</b> | <b>TiN</b> | <b>R</b> | <b>ISO2/6H</b> |
|-----------------------|--------------------------|----------|--------------|------------|----------|----------------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



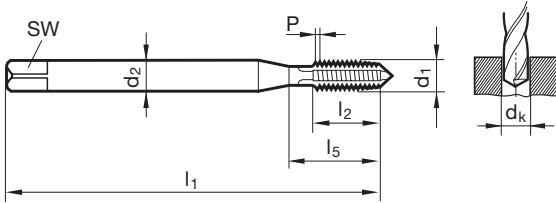
Catalogo n° 73033

|                       |                          |          |              |                      |            |         |
|-----------------------|--------------------------|----------|--------------|----------------------|------------|---------|
| Produttiv<br><b>N</b> | <b>DIN</b><br><b>371</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>(R)</b> | ISO2/6H |
|-----------------------|--------------------------|----------|--------------|----------------------|------------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



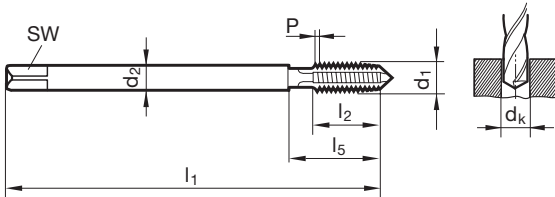
Catalogo n° 73038

|                       |                   |          |              |                      |            |         |
|-----------------------|-------------------|----------|--------------|----------------------|------------|---------|
| Produttiv<br><b>N</b> | <b>DIN</b><br>376 | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>(R)</b> | ISO2/6H |
|-----------------------|-------------------|----------|--------------|----------------------|------------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M18</b> | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 30,000 | 62,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |
| <b>M22</b> | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 32,000 | 62,000 |
| <b>M24</b> | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 36,000 | 73,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



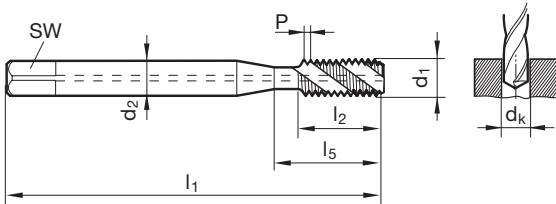
Catalogo n° 53050



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2    | l5     |
|------------|-------|--------|-------|------|---------|-------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm    | mm     |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 4,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 5,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 6,300 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 7,500 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



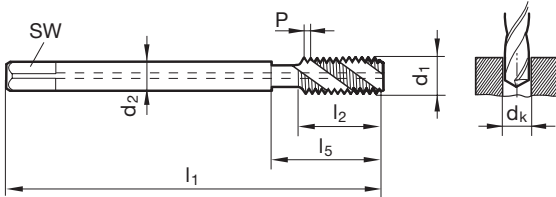
Catalogo n° 53051



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



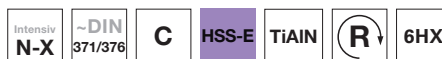
| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 8,800  | 63,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 10,000 | 58,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 10,000 | 58,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 12,500 | 85,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

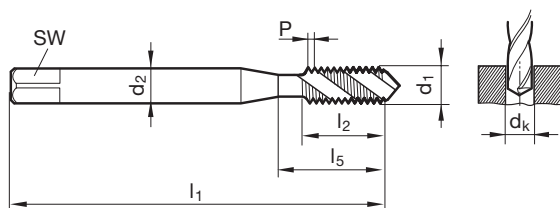


Catalogo n° 53746



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348



- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise

| d1    | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|-------|-------|--------|--------|-------|---------|--------|--------|
|       | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| M 2   | 0,400 | 2,800  | 2,100  | 1,60  | 45,000  | 4,500  | 13,500 |
| M 2,5 | 0,450 | 2,800  | 2,100  | 2,05  | 50,000  | 5,000  | 14,500 |
| M 3   | 0,500 | 3,500  | 2,700  | 2,50  | 56,000  | 6,000  | 18,000 |
| M 4   | 0,700 | 4,500  | 3,400  | 3,30  | 63,000  | 7,500  | 21,000 |
| M 5   | 0,800 | 6,000  | 4,900  | 4,20  | 70,000  | 8,500  | 25,000 |
| M 6   | 1,000 | 6,000  | 4,900  | 5,00  | 80,000  | 11,000 | 30,000 |
| M 8   | 1,250 | 8,000  | 6,200  | 6,80  | 90,000  | 14,000 | 35,000 |
| M10   | 1,500 | 10,000 | 8,000  | 8,50  | 100,000 | 16,000 | 39,000 |
| M12   | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| M14   | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| M16   | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| M18   | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| M20   | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |
| M24   | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 30,000 | 73,000 |
| M30   | 3,500 | 22,000 | 18,000 | 26,50 | 180,000 | 35,000 | 85,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



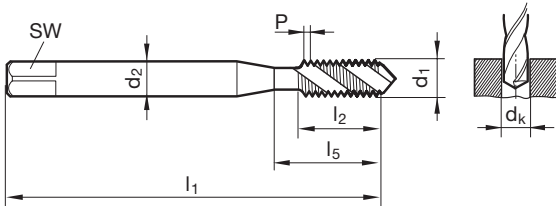
Catalogo n° 63046



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



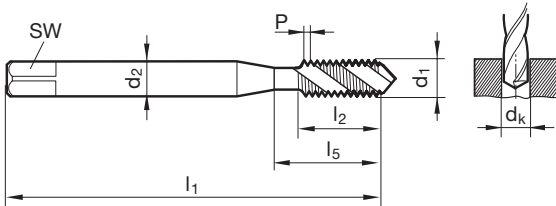
Catalogo n° 73046



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



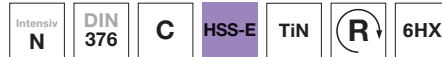
| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



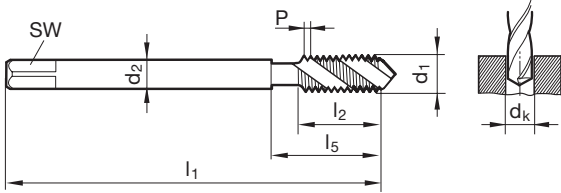
Catalogo n° 63048



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



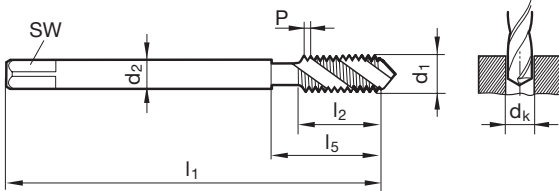
Catalogo n° 73048



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| d1  | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|-----|-------|--------|--------|-------|---------|--------|--------|
|     | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| M12 | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| M14 | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| M16 | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| M18 | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| M20 | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |
| M22 | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 27,000 | 62,000 |
| M24 | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 30,000 | 73,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



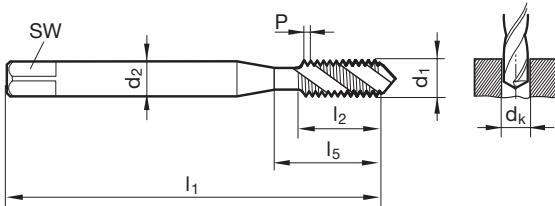
Catalogo n° 73047



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- imbocco corto per profondità di filetto vicine alla base del foro
- acciai fino a 1100 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



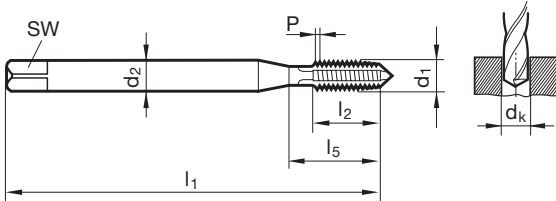
Catalogo n° 53669



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | ○ |   | ● | ● |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, acciai temprati
- nickel e leghe di nickel
- ampco > 21, ghisa refrigerate, Inconel



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50  | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30  | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20  | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00  | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80  | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50  | 100,000 | 20,000 | 39,000 |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



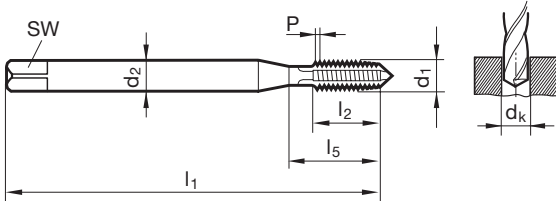
Catalogo n° 53667



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali
- titanio e leghe di titanio
- materiali duri fino a 1400 N / mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50  | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30  | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20  | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00  | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80  | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50  | 100,000 | 20,000 | 39,000 |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

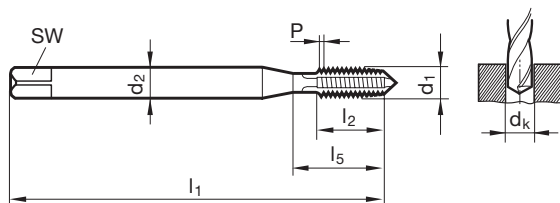


Catalogo n° 73185



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai fino a 800 N/mm<sup>2</sup>



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 1</b>   | 0,250 | 2,500  | 2,100 | 0,75 | 40,000  | 5,500  |        |
| <b>M 1,2</b> | 0,250 | 2,500  | 2,100 | 0,95 | 40,000  | 5,500  |        |
| <b>M 1,4</b> | 0,300 | 2,500  | 2,100 | 1,10 | 40,000  | 7,000  |        |
| <b>M 1,6</b> | 0,350 | 2,500  | 2,100 | 1,25 | 40,000  | 4,500  |        |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 4,500  | 13,500 |
| <b>M 2,3</b> | 0,400 | 2,800  | 2,100 | 1,90 | 45,000  | 4,500  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 5,000  | 14,500 |
| <b>M 2,6</b> | 0,450 | 2,800  | 2,100 | 2,15 | 50,000  | 5,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

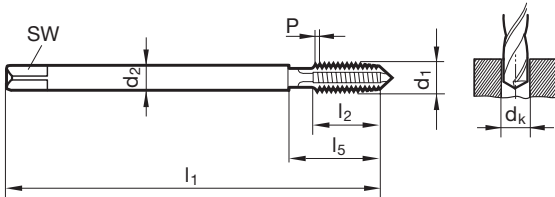


Catalogo n° 73191

|   |     |         |   |       |        |   |         |
|---|-----|---------|---|-------|--------|---|---------|
| N | 1xD | DIN 376 | C | HSS-E | lucido | R | ISO2/6H |
| P | M   | K       | N | S     | H      |   |         |
| ● |     |         | ○ |       |        |   |         |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai fino a 800 N/mm<sup>2</sup>



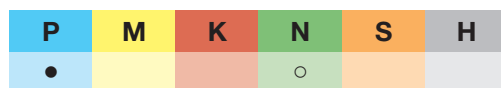
| d1  | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|-----|-------|--------|--------|-------|---------|--------|--------|
|     | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| M 6 | 1,000 | 4,500  | 3,400  | 5,00  | 80,000  | 11,000 | 30,000 |
| M 8 | 1,250 | 6,000  | 4,900  | 6,80  | 90,000  | 14,000 | 35,000 |
| M10 | 1,500 | 7,000  | 5,500  | 8,50  | 100,000 | 16,000 | 39,000 |
| M12 | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| M14 | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| M16 | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| M18 | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| M20 | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |
| M22 | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 27,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

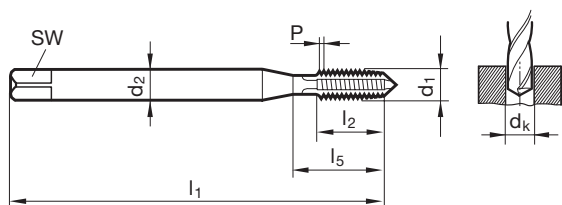


Catalogo n° 73126



Parametri di lav.  
ind. a pag. 348

- per fori passanti
- per profondità di filetto fino a 1xD
- soprattutto per lamiera e occhielli in lamiera



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2,3</b> | 0,400 | 2,800  | 2,100 | 1,90 | 45,000  | 9,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 9,000  | 14,500 |
| <b>M 2,6</b> | 0,450 | 2,800  | 2,100 | 2,15 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 12,000 | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



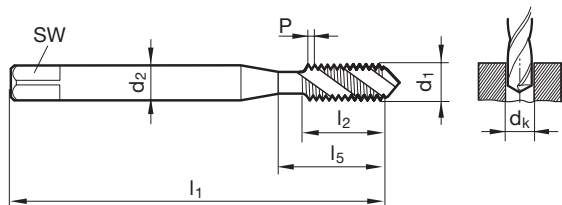
Catalogo n° 53668



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | ○ |   | ● | ● |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 10°
- evacuazione truciolo nella direzione del codolo
- leghe speciali, acciai temprati
- nickel e leghe di nickel
- ampc > 21, ghisa refrigerate, Inconel



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50  | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30  | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20  | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00  | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80  | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50  | 100,000 | 20,000 | 39,000 |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



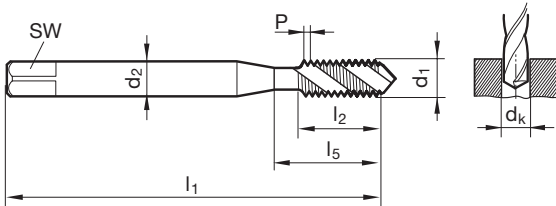
Catalogo n° 53666



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- leghe speciali
- titanio e leghe di titanio
- materiali duri fino a 1400 N / mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50  | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30  | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20  | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00  | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80  | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50  | 100,000 | 20,000 | 39,000 |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



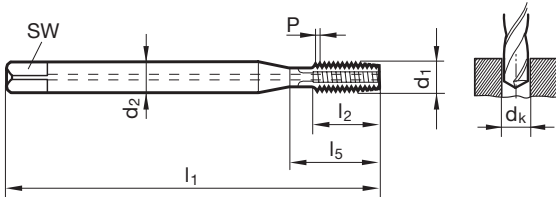
Catalogo n° 53670



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- con condotto interno del refrigerante  $\geq$  M5
- uscita centrale del lubrificante
- acciaio ad alta resistenza fino a 1600 N / mm<sup>2</sup>
- materiali duri come ferro, bronzo, leghe Al-Si ad elevato contenuto di Si



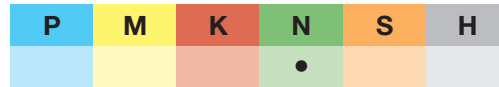
| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

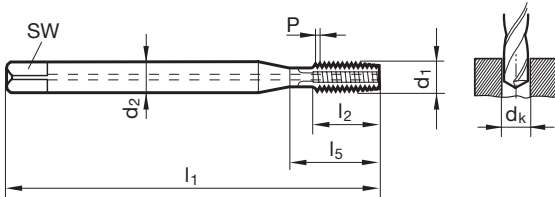


Catalogo n° 73011



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- con condotto interno del refrigerante  $\geq$  M5
- uscita centrale del lubrificante
- leghe di alluminio e leghe di alluminio a truciolo corto, Metalli NE, a truciolo corto e fragili



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 8,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 10,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 10,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 12,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 16,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 18,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



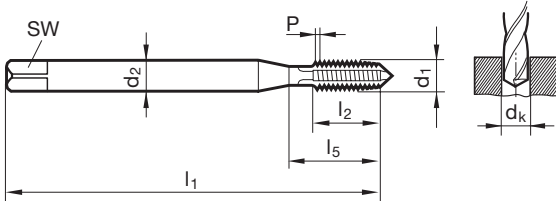
Catalogo n° 63133

|                       |                          |          |              |            |          |                |
|-----------------------|--------------------------|----------|--------------|------------|----------|----------------|
| Produttiv<br><b>N</b> | <b>DIN</b><br><b>371</b> | <b>B</b> | <b>HSS-E</b> | <b>TiN</b> | <b>R</b> | <b>ISO2/6H</b> |
|-----------------------|--------------------------|----------|--------------|------------|----------|----------------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          |          | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



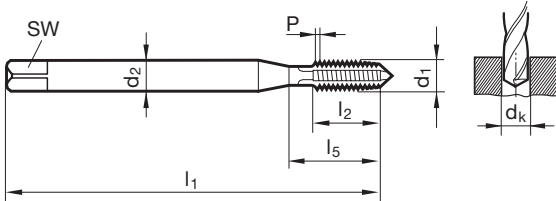
Catalogo n° 73132



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



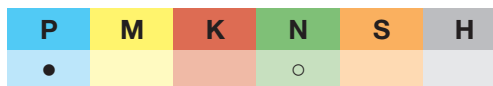
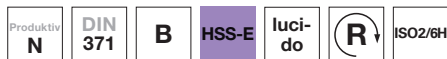
| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

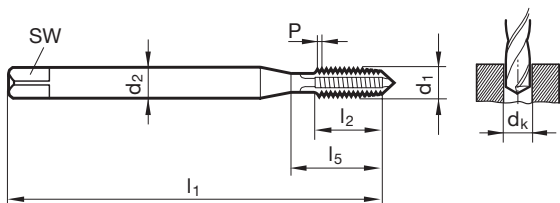


Catalogo n° 73133



Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 8,000  | 13,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 12,000 | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 7</b>   | 1,000 | 7,000  | 5,500 | 6,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



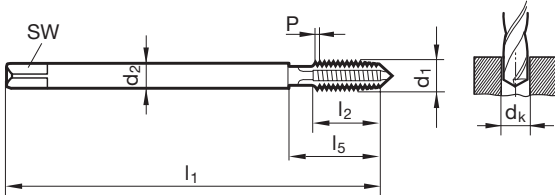
Catalogo n° 63138

|                       |                   |          |              |            |          |         |
|-----------------------|-------------------|----------|--------------|------------|----------|---------|
| Produttiv<br><b>N</b> | <b>DIN</b><br>376 | <b>B</b> | <b>HSS-E</b> | <b>TiN</b> | <b>R</b> | ISO2/6H |
|-----------------------|-------------------|----------|--------------|------------|----------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          |          | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



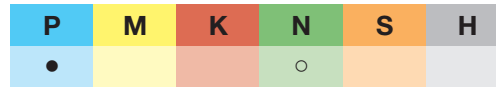
| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

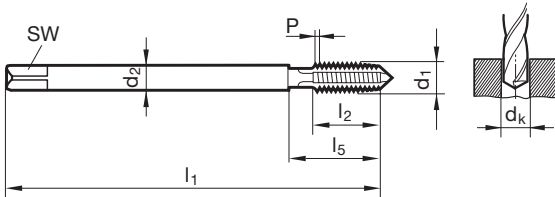


Catalogo n° 73138



Parametri di lav. ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1           | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|--------------|-------|--------|--------|-------|---------|--------|--------|
|              | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 1,400  |        | 1,60  | 45,000  | 8,000  | 13,500 |
| <b>M 2,5</b> | 0,450 | 1,800  |        | 2,05  | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 2,200  |        | 2,50  | 56,000  | 10,000 | 18,000 |
| <b>M 3,5</b> | 0,600 | 2,500  | 2,100  | 2,90  | 56,000  | 12,000 | 20,000 |
| <b>M 4</b>   | 0,700 | 2,800  | 2,100  | 3,30  | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 3,500  | 2,700  | 4,20  | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 4,500  | 3,400  | 5,00  | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 6,000  | 4,900  | 6,80  | 90,000  | 17,000 | 35,000 |
| <b>M10</b>   | 1,500 | 7,000  | 5,500  | 8,50  | 100,000 | 20,000 | 39,000 |
| <b>M12</b>   | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b>   | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b>   | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M18</b>   | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 30,000 | 62,000 |
| <b>M20</b>   | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |
| <b>M22</b>   | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 32,000 | 62,000 |
| <b>M24</b>   | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 36,000 | 73,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



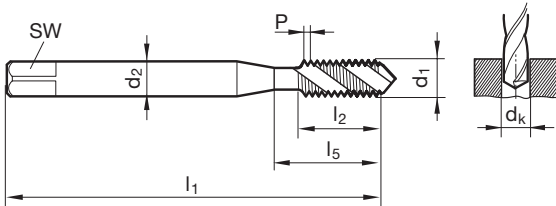
Catalogo n° 63146



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



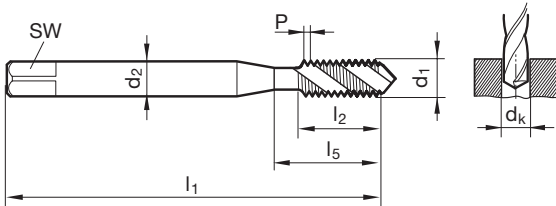
Catalogo n° 73145



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



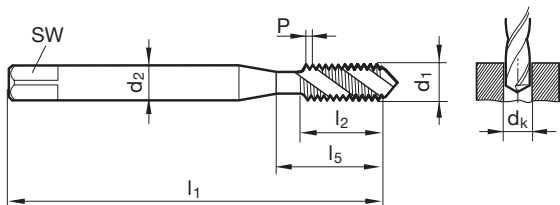
Catalogo n° 73146



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



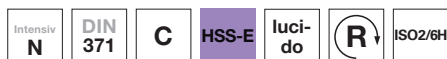
| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 4,500  | 13,500 |
| <b>M 2,2</b> | 0,450 | 2,800  | 2,100 | 1,75 | 45,000  | 5,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 5,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 7,000  | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



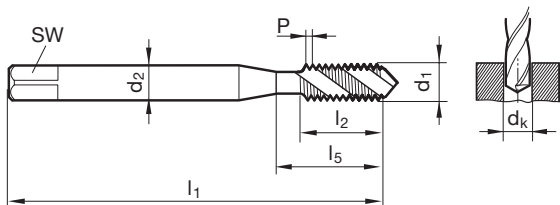
Catalogo n° 73221



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 4,500  | 13,500 |
| <b>M 2,2</b> | 0,450 | 2,800  | 2,100 | 1,75 | 45,000  | 5,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 5,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 7,000  | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



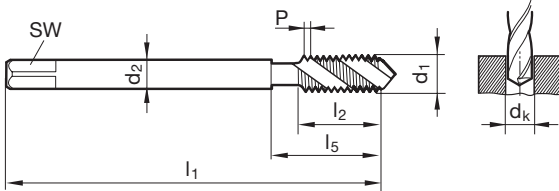
Catalogo n° 63148



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1  | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|-----|-------|--------|--------|-------|---------|--------|--------|
|     | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| M12 | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| M16 | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| M20 | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



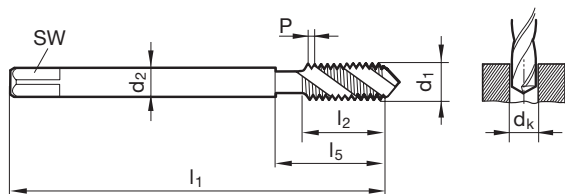
Catalogo n° 73148



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1  | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|-----|-------|--------|--------|-------|---------|--------|--------|
|     | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| M 3 | 0,500 | 2,200  |        | 2,50  | 56,000  | 6,000  | 18,000 |
| M 4 | 0,700 | 2,800  | 2,100  | 3,30  | 63,000  | 7,500  | 21,000 |
| M 5 | 0,800 | 3,500  | 2,700  | 4,20  | 70,000  | 8,500  | 25,000 |
| M 6 | 1,000 | 4,500  | 3,400  | 5,00  | 80,000  | 11,000 | 30,000 |
| M 8 | 1,250 | 6,000  | 4,900  | 6,80  | 90,000  | 14,000 | 35,000 |
| M10 | 1,500 | 7,000  | 5,500  | 8,50  | 100,000 | 16,000 | 39,000 |
| M12 | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| M14 | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| M16 | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| M18 | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| M20 | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |
| M22 | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 27,000 | 62,000 |
| M24 | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 30,000 | 73,000 |
| M27 | 3,000 | 20,000 | 16,000 | 24,00 | 160,000 | 30,000 | 73,000 |
| M30 | 3,500 | 22,000 | 18,000 | 26,50 | 180,000 | 35,000 | 85,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



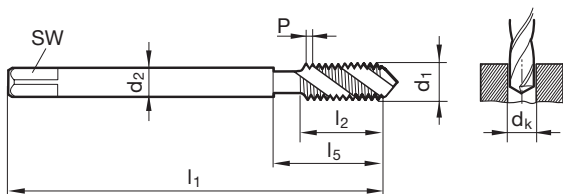
Catalogo n° 73227



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 2,200  |        | 2,50  | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 2,800  | 2,100  | 3,30  | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 3,500  | 2,700  | 4,20  | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 4,500  | 3,400  | 5,00  | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 6,000  | 4,900  | 6,80  | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 7,000  | 5,500  | 8,50  | 100,000 | 16,000 | 39,000 |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M18</b> | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



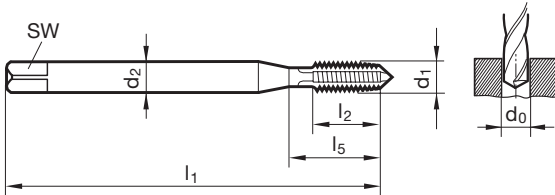
Catalogo n° 53640

|                       |                |          |              |      |          |         |
|-----------------------|----------------|----------|--------------|------|----------|---------|
| Produktiv<br><b>H</b> | DIN<br>371/376 | <b>B</b> | HSS-E-<br>PM | TiCN | <b>R</b> | ISO2/6H |
|-----------------------|----------------|----------|--------------|------|----------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          | ○        |          |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



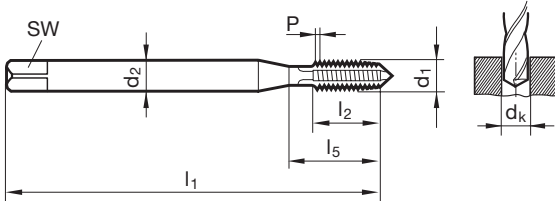
Catalogo n° 53642



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, leghe di nickel
- materiali duri fino a 1400 N / mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b> | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 8,000  | 13,500 |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



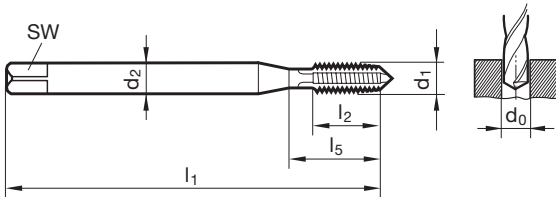
Catalogo n° 63641



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, leghe di nickel
- materiali duri fino a 1400 N / mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



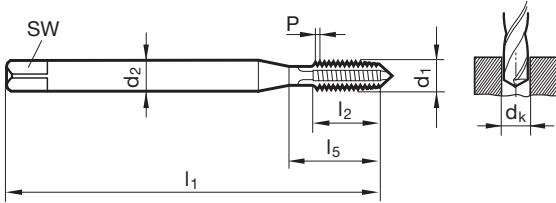
Catalogo n° 73640

|                       |                   |          |                      |             |          |         |
|-----------------------|-------------------|----------|----------------------|-------------|----------|---------|
| Produttiv<br><b>H</b> | <b>DIN</b><br>371 | <b>B</b> | <b>HSS-E-<br/>PM</b> | luci-<br>do | <b>R</b> | ISO2/6H |
|-----------------------|-------------------|----------|----------------------|-------------|----------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          | ○        |          |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



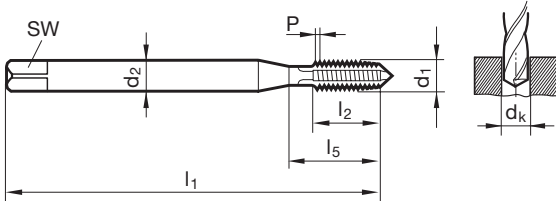
Catalogo n° 73642



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b> | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 8,000  | 13,500 |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



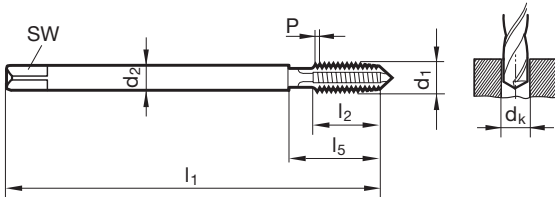
Catalogo n° 63643

|                       |                   |          |              |     |          |         |
|-----------------------|-------------------|----------|--------------|-----|----------|---------|
| Produktiv<br><b>H</b> | DIN<br><b>376</b> | <b>B</b> | HSS-E-<br>PM | TiN | <b>R</b> | ISO2/6H |
|-----------------------|-------------------|----------|--------------|-----|----------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          | ○        |          |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



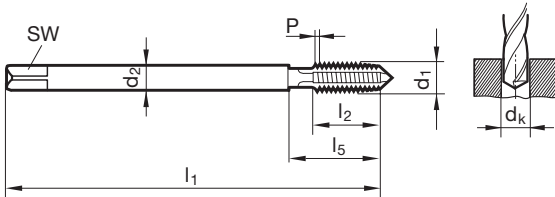
Catalogo n° 73645

|                       |                   |          |              |                |          |         |
|-----------------------|-------------------|----------|--------------|----------------|----------|---------|
| Produttiv<br><b>H</b> | <b>DIN</b><br>376 | <b>B</b> | <b>HSS-E</b> | nitru-<br>rato | <b>R</b> | ISO2/6H |
|-----------------------|-------------------|----------|--------------|----------------|----------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        |          | ○        |          |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



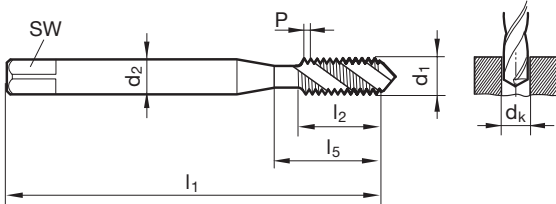
Catalogo n° 53661



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



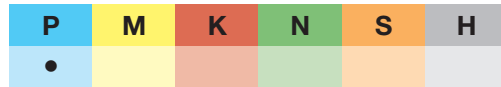
| d1          | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|-------------|-------|--------|-------|------|---------|--------|--------|
|             | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>  | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 4,500  | 13,500 |
| <b>M 3</b>  | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b>  | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>  | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>  | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>  | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M 10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

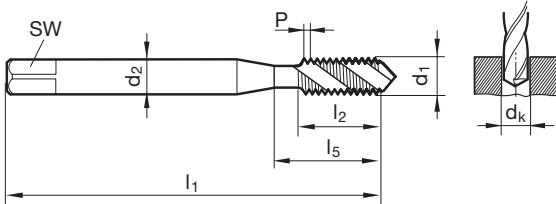


Catalogo n° 63674



Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



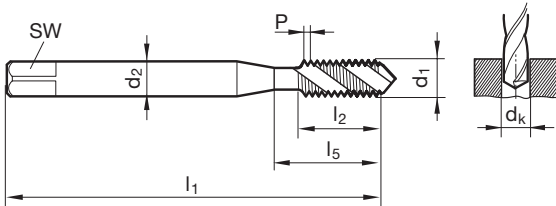
Catalogo n° 73619



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



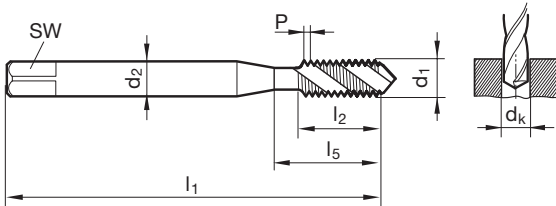
Catalogo n° 73661



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



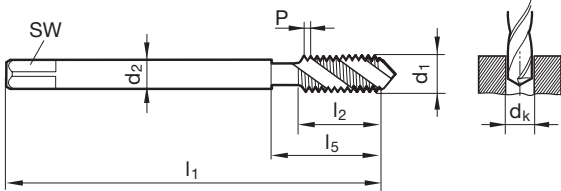
Catalogo n° 63675



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



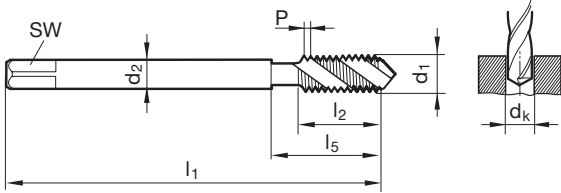
Catalogo n° 73664



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



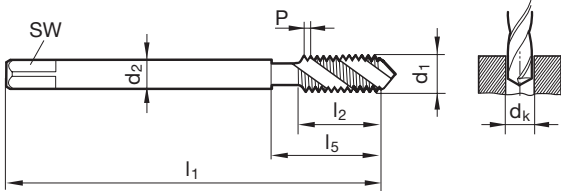
Catalogo n° 73666



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



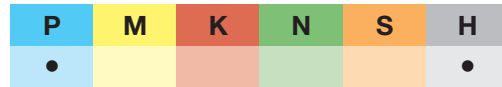
| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

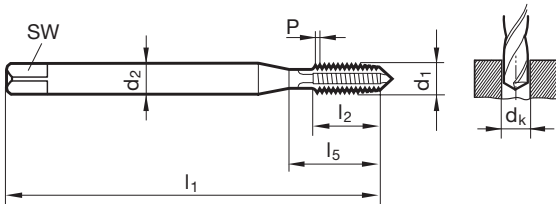


Catalogo n° 63010



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai temprati da 54 a 62 HRC



| d1         | P     | d2     | SW    | dk    | l1      | l2     |
|------------|-------|--------|-------|-------|---------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,60  | 56,000  | 12,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,40  | 63,000  | 14,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,30  | 70,000  | 17,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,10  | 80,000  | 20,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,90  | 90,000  | 20,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,60  | 100,000 | 24,000 |
| <b>M12</b> | 1,750 | 12,000 | 9,000 | 10,40 | 110,000 | 28,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



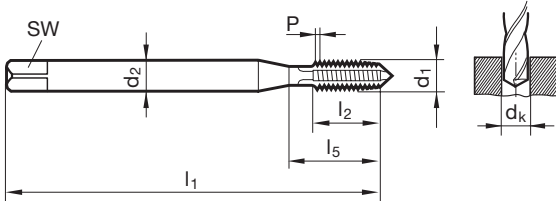
Catalogo n° 53641



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



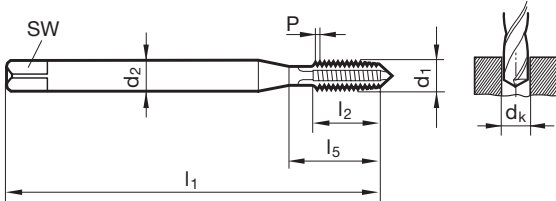
Catalogo n° 63176



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



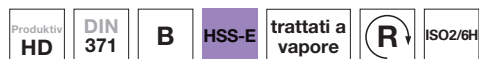
| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



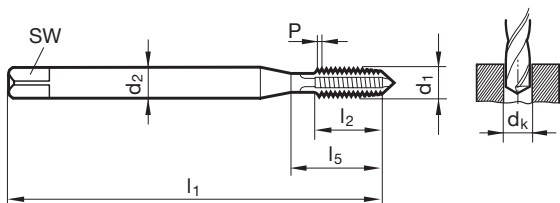
Catalogo n° 73176



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



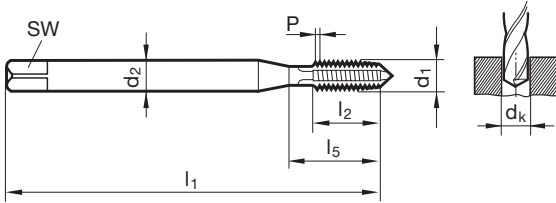
Catalogo n° 73641



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



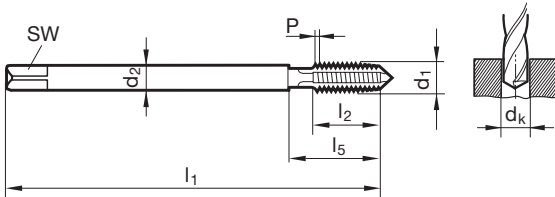
Catalogo n° 53643

|                        |                   |          |                      |      |            |         |
|------------------------|-------------------|----------|----------------------|------|------------|---------|
| Produttiv<br><b>HD</b> | <b>DIN</b><br>376 | <b>B</b> | <b>HSS-E-<br/>PM</b> | TiCN | <b>(R)</b> | ISO2/6H |
|------------------------|-------------------|----------|----------------------|------|------------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
|          | •        |          |          | ○        |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000 | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



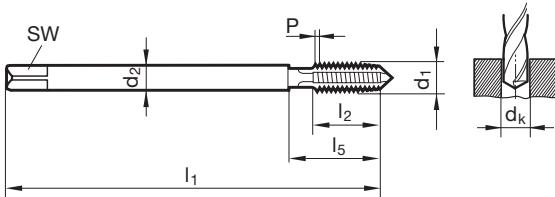
Catalogo n° 63177



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



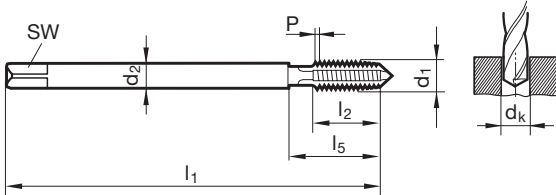
Catalogo n° 73177



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



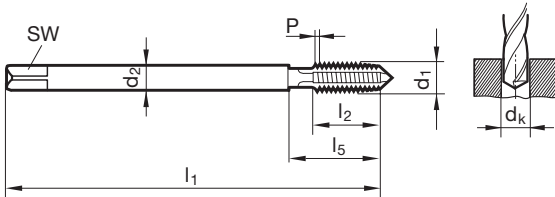
Catalogo n° 73643

|                        |                   |          |                      |             |            |         |
|------------------------|-------------------|----------|----------------------|-------------|------------|---------|
| Produttiv<br><b>HD</b> | <b>DIN</b><br>376 | <b>B</b> | <b>HSS-E-<br/>PM</b> | luci-<br>do | <b>(R)</b> | ISO2/6H |
|------------------------|-------------------|----------|----------------------|-------------|------------|---------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
|          | •        |          | ○        | ○        |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M18</b> | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 30,000 | 62,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |
| <b>M22</b> | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



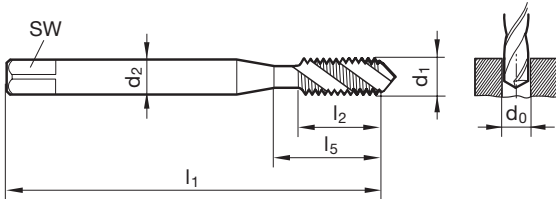
Catalogo n° 53662



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



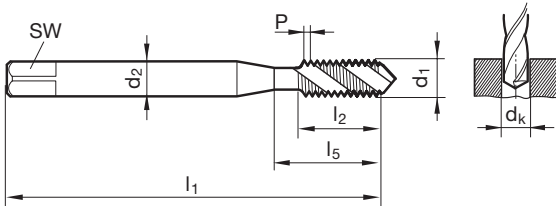
Catalogo n° 63662



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

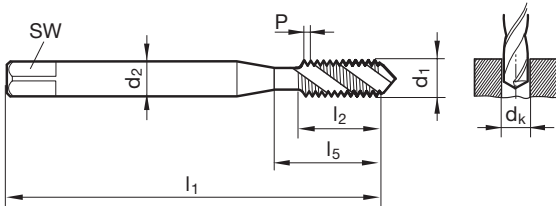


Catalogo n° 73660

|                       |                   |          |              |                      |            |         |
|-----------------------|-------------------|----------|--------------|----------------------|------------|---------|
| Intensiv<br><b>HD</b> | <b>DIN</b><br>371 | <b>C</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>(R)</b> | ISO2/6H |
| <b>P</b>              | <b>M</b>          | <b>K</b> | <b>N</b>     | <b>S</b>             | <b>H</b>   |         |
|                       | •                 |          |              | ○                    |            |         |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |



## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



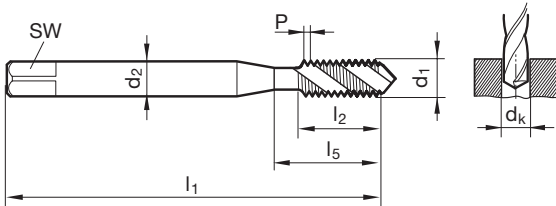
Catalogo n° 73662



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 7,000  | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M10</b>   | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



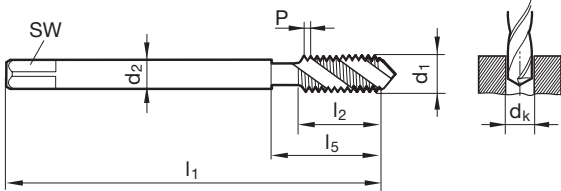
Catalogo n° 53665



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000 | 12,00 | 110,000 | 20,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 20,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



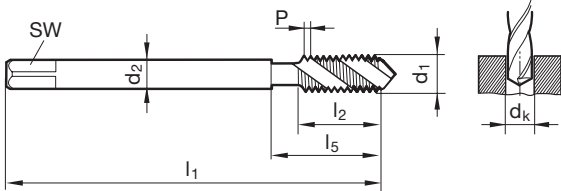
Catalogo n° 63665



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 14,00 | 110,000 | 20,000 | 54,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



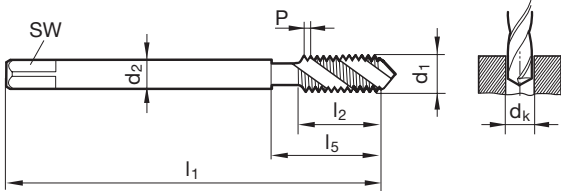
Catalogo n° 73659



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



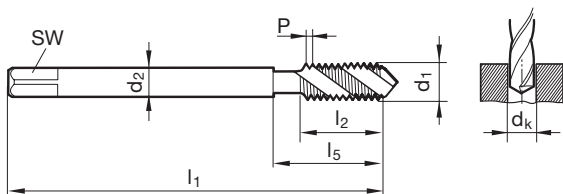
Catalogo n° 73665



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



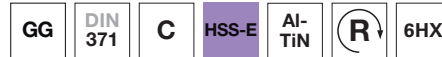
| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 12,00 | 110,000 | 20,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M18</b> | 2,500 | 14,000 | 11,000 | 15,50 | 125,000 | 25,000 | 62,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |
| <b>M22</b> | 2,500 | 18,000 | 14,500 | 19,50 | 140,000 | 27,000 | 62,000 |
| <b>M24</b> | 3,000 | 18,000 | 14,500 | 21,00 | 160,000 | 30,000 | 73,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



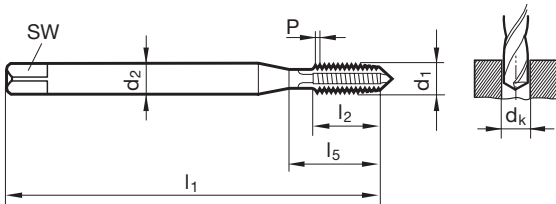
Catalogo n° 63201



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



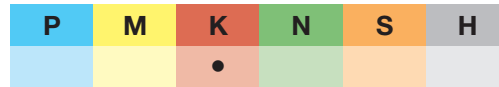
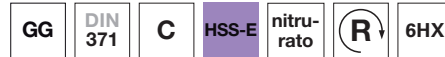
| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

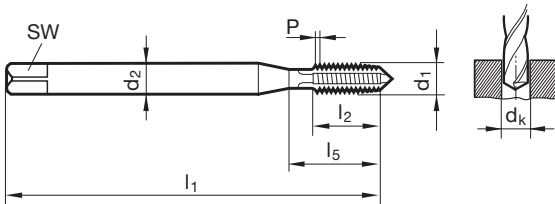


Catalogo n° 73201



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



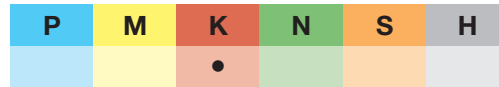
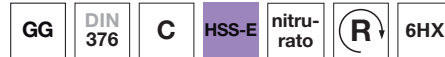
| d1           | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------------|---------|----------|----------|----------|----------|----------|----------|
| <b>M 3</b>   | 0,500   | 3,500    | 2,700    | 2,50     | 56,000   | 10,000   | 18,000   |
| <b>M 3,5</b> | 0,600   | 4,000    | 3,000    | 2,90     | 56,000   | 12,000   | 20,000   |
| <b>M 4</b>   | 0,700   | 4,500    | 3,400    | 3,30     | 63,000   | 12,000   | 21,000   |
| <b>M 5</b>   | 0,800   | 6,000    | 4,900    | 4,20     | 70,000   | 14,000   | 25,000   |
| <b>M 6</b>   | 1,000   | 6,000    | 4,900    | 5,00     | 80,000   | 16,000   | 30,000   |
| <b>M 8</b>   | 1,250   | 8,000    | 6,200    | 6,80     | 90,000   | 17,000   | 35,000   |
| <b>M10</b>   | 1,500   | 10,000   | 8,000    | 8,50     | 100,000  | 20,000   | 39,000   |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

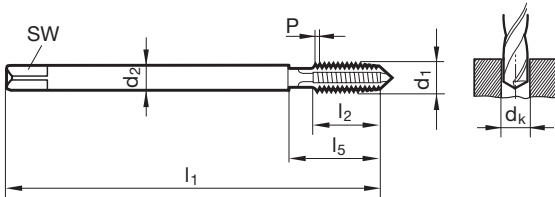


Catalogo n° 73211



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



| d1         | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|------------|---------|----------|----------|----------|----------|----------|----------|
| <b>M12</b> | 1,750   | 9,000    | 7,000    | 10,20    | 110,000  | 24,000   | 49,000   |
| <b>M14</b> | 2,000   | 11,000   | 9,000    | 12,00    | 110,000  | 26,000   | 53,000   |
| <b>M16</b> | 2,000   | 12,000   | 9,000    | 14,00    | 110,000  | 26,000   | 54,000   |
| <b>M18</b> | 2,500   | 14,000   | 11,000   | 15,50    | 125,000  | 30,000   | 62,000   |
| <b>M20</b> | 2,500   | 16,000   | 12,000   | 17,50    | 140,000  | 32,000   | 62,000   |

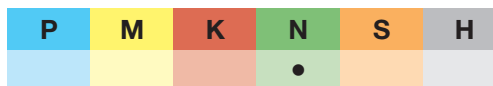


## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

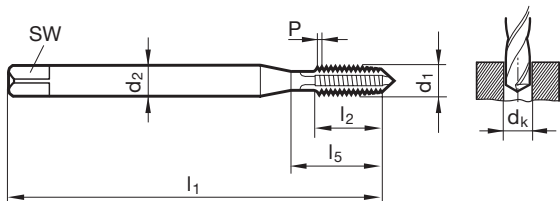


Catalogo n° 73131



Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 8,000  | 13,500 |
| <b>M 2,3</b> | 0,400 | 2,800  | 2,100 | 1,90 | 45,000  | 9,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 9,000  | 14,500 |
| <b>M 2,6</b> | 0,450 | 2,800  | 2,100 | 2,15 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 10,000 | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 2,90 | 56,000  | 12,000 | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 17,000 | 35,000 |
| <b>M 10</b>  | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

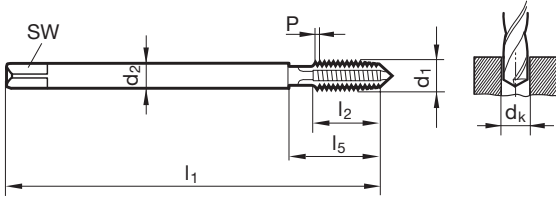


Catalogo n° 73189



Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 24,000 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO



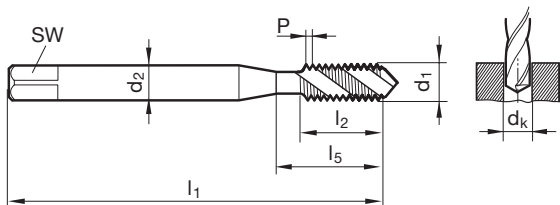
Catalogo n° 73156



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



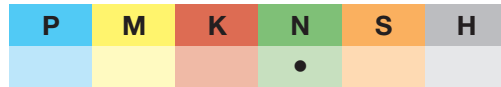
| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,60 | 45,000  | 4,500  | 13,500 |
| <b>M 2,3</b> | 0,400 | 2,800  | 2,100 | 1,90 | 45,000  | 4,500  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,05 | 50,000  | 5,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,50 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,30 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,20 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,00 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 6,80 | 90,000  | 14,000 | 35,000 |
| <b>M 10</b>  | 1,500 | 10,000 | 8,000 | 8,50 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura metrica ISO

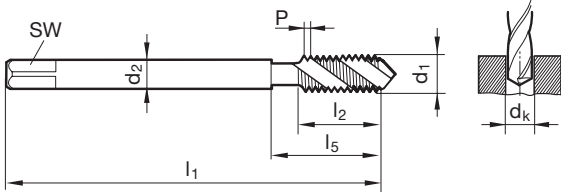


Catalogo n° 73136



Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



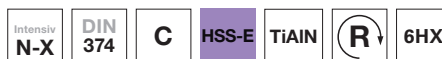
| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 10,20 | 110,000 | 18,500 | 49,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 14,00 | 110,000 | 20,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 17,50 | 140,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



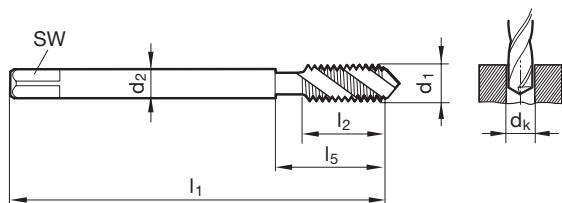
Catalogo n° 53780



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



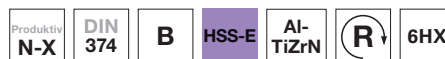
| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 6,004  | M 6 X0,75 | 4,500  | 3,400  | 5,20  | 80,000  | 8,000  | 30,000 |
| 8,004  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 80,000  | 8,000  | 30,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 11,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 11,000 | 35,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 14,000 | 39,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 11,000 | 40,000 |
| 12,006 | M12 X1,25 | 9,000  | 7,000  | 10,80 | 100,000 | 16,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 16,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 15,000 | 40,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| 18,007 | M18 X1,5  | 14,000 | 11,000 | 16,50 | 110,000 | 16,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 16,000 | 44,000 |
| 24,007 | M24 X1,5  | 18,000 | 14,500 | 22,50 | 140,000 | 16,000 | 48,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



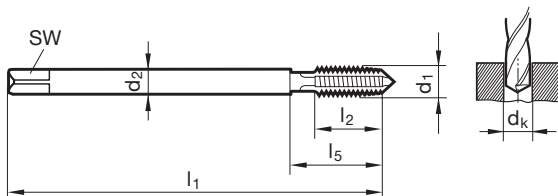
Catalogo n° 53778



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 6,004  | M 6 X0,75 | 4,500  | 3,400  | 5,20  | 80,000  | 13,000 | 30,000 |
| 8,004  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 80,000  | 14,000 | 30,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 16,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 16,000 | 35,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 20,000 | 39,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 20,000 | 40,000 |
| 12,006 | M12 X1,25 | 9,000  | 7,000  | 10,80 | 100,000 | 20,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 20,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 20,000 | 40,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 22,000 | 44,000 |
| 18,007 | M18 X1,5  | 14,000 | 11,000 | 16,50 | 110,000 | 25,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 25,000 | 44,000 |
| 24,007 | M24 X1,5  | 18,000 | 14,500 | 22,50 | 140,000 | 28,000 | 48,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



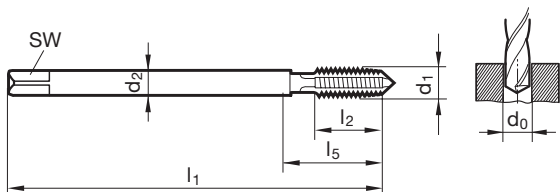
Catalogo n° 53055



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



| Codice | d1       | d2     | SW    | dk    | l1      | l2     | l5     |
|--------|----------|--------|-------|-------|---------|--------|--------|
|        |          | mm     | mm    | mm    | mm      | mm     | mm     |
| 8,005  | M 8 X1   | 6,000  | 4,900 | 7,00  | 90,000  | 16,000 | 35,000 |
| 10,005 | M10 X1   | 7,000  | 5,500 | 9,00  | 90,000  | 16,000 | 35,000 |
| 12,005 | M12 X1   | 9,000  | 7,000 | 11,00 | 100,000 | 20,000 | 40,000 |
| 12,007 | M12 X1,5 | 9,000  | 7,000 | 10,50 | 100,000 | 20,000 | 40,000 |
| 14,007 | M14 X1,5 | 11,000 | 9,000 | 12,50 | 100,000 | 20,000 | 40,000 |
| 16,007 | M16 X1,5 | 12,000 | 9,000 | 14,50 | 100,000 | 22,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



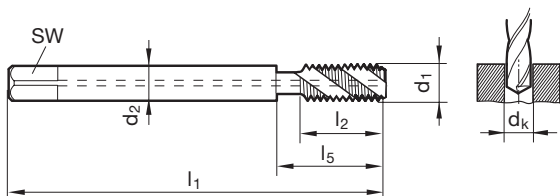
Catalogo n° 53052



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm<sup>2</sup>



| Codice | d1       | d2     | SW     | dk    | l1      | l2    | l5     |
|--------|----------|--------|--------|-------|---------|-------|--------|
|        |          | mm     | mm     | mm    | mm      | mm    | mm     |
| 8,005  | M 8 X1   | 6,000  | 4,900  | 7,00  | 90,000  | 5,000 | 44,000 |
| 10,005 | M10 X1   | 7,000  | 5,500  | 9,00  | 90,000  | 5,000 | 44,000 |
| 12,005 | M12 X1   | 9,000  | 7,000  | 11,00 | 100,000 | 5,000 | 53,000 |
| 12,007 | M12 X1,5 | 9,000  | 7,000  | 10,50 | 100,000 | 7,500 | 53,000 |
| 14,007 | M14 X1,5 | 11,000 | 9,000  | 12,50 | 100,000 | 7,500 | 48,000 |
| 16,007 | M16 X1,5 | 12,000 | 9,000  | 14,50 | 100,000 | 7,500 | 48,000 |
| 18,007 | M18 X1,5 | 14,000 | 11,000 | 16,50 | 110,000 | 7,500 | 58,000 |
| 20,007 | M20 X1,5 | 16,000 | 12,000 | 18,50 | 125,000 | 7,500 | 70,000 |

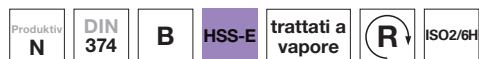


## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



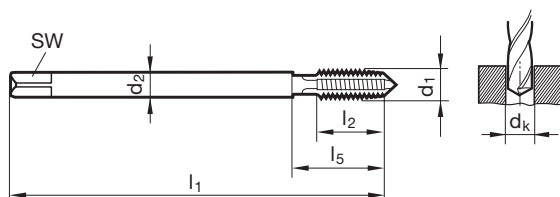
Catalogo n° 73183



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



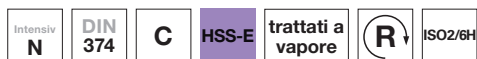
| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 6,004  | M 6 X0,75 | 4,500  | 3,400  | 5,20  | 80,000  | 13,000 | 30,000 |
| 8,004  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 80,000  | 14,000 | 30,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 16,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 16,000 | 35,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 20,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 20,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 20,000 | 40,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 22,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 25,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



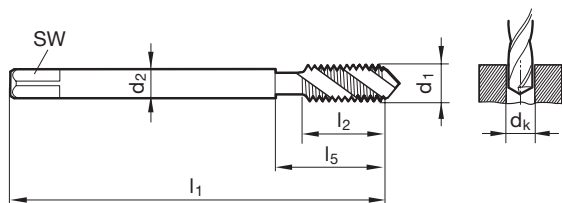
Catalogo n° 73187



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



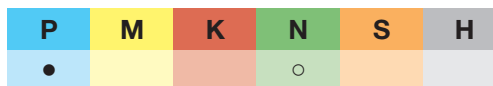
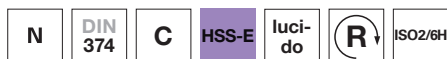
| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 6,004  | M 6 X0,75 | 4,500  | 3,400  | 5,20  | 80,000  | 8,000  | 30,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 11,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 11,000 | 35,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 14,000 | 39,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 11,000 | 40,000 |
| 12,006 | M12 X1,25 | 9,000  | 7,000  | 10,80 | 100,000 | 16,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 16,000 | 40,000 |
| 14,005 | M14 X1    | 11,000 | 9,000  | 13,00 | 100,000 | 11,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 15,000 | 40,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| 18,007 | M18 X1,5  | 14,000 | 11,000 | 16,50 | 110,000 | 16,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 16,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine

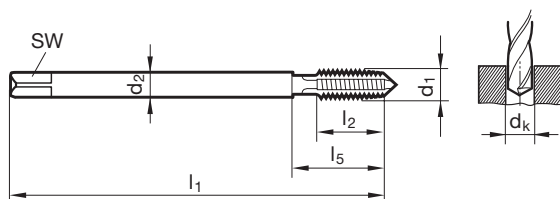


Catalogo n° 73237



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- acciai fino a 800 N/mm<sup>2</sup>



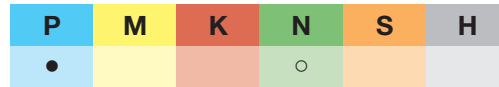
| Codice        | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|---------------|-----------|--------|--------|-------|---------|--------|--------|
|               |           | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>8,004</b>  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 80,000  | 14,000 | 30,000 |
| <b>10,005</b> | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 16,000 | 35,000 |
| <b>10,006</b> | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 20,000 | 39,000 |
| <b>12,006</b> | M12 X1,25 | 9,000  | 7,000  | 10,80 | 100,000 | 16,000 | 40,000 |
| <b>12,007</b> | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 16,000 | 40,000 |
| <b>16,007</b> | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| <b>20,007</b> | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 16,000 | 44,000 |
| <b>22,007</b> | M22 X1,5  | 18,000 | 14,500 | 20,50 | 125,000 | 16,000 | 44,000 |
| <b>24,007</b> | M24 X1,5  | 18,000 | 14,500 | 22,50 | 140,000 | 16,000 | 48,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine

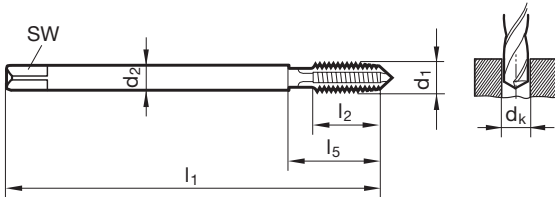


Catalogo n° 73250



Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



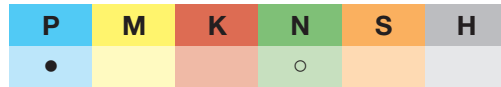
| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 4,003  | M 4 X0,5  | 2,800  | 2,100  | 3,50  | 63,000  | 8,000  | 21,000 |
| 5,003  | M 5 X0,5  | 3,500  | 2,700  | 4,50  | 70,000  | 10,000 | 25,000 |
| 6,003  | M 6 X0,5  | 4,500  | 3,400  | 5,50  | 80,000  | 13,000 | 30,000 |
| 6,004  | M 6 X0,75 | 4,500  | 3,400  | 5,20  | 80,000  | 13,000 | 30,000 |
| 8,004  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 80,000  | 14,000 | 30,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 16,000 | 35,000 |
| 9,005  | M 9 X1    | 7,000  | 5,500  | 8,00  | 90,000  | 16,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 16,000 | 35,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 20,000 | 39,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 20,000 | 40,000 |
| 12,006 | M12 X1,25 | 9,000  | 7,000  | 10,80 | 100,000 | 20,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 20,000 | 40,000 |
| 14,005 | M14 X1    | 11,000 | 9,000  | 13,00 | 100,000 | 20,000 | 40,000 |
| 14,006 | M14 X1,25 | 11,000 | 9,000  | 12,80 | 100,000 | 20,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 20,000 | 40,000 |
| 16,005 | M16 X1    | 12,000 | 9,000  | 15,00 | 100,000 | 22,000 | 44,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 22,000 | 44,000 |
| 18,005 | M18 X1    | 14,000 | 11,000 | 17,00 | 110,000 | 25,000 | 44,000 |
| 18,007 | M18 X1,5  | 14,000 | 11,000 | 16,50 | 110,000 | 25,000 | 44,000 |
| 20,005 | M20 X1    | 16,000 | 12,000 | 19,00 | 125,000 | 25,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 25,000 | 44,000 |
| 20,008 | M20 X2    | 16,000 | 12,000 | 18,00 | 140,000 | 32,000 | 60,000 |
| 22,005 | M22 X1    | 18,000 | 14,500 | 21,00 | 125,000 | 25,000 | 44,000 |
| 22,007 | M22 X1,5  | 18,000 | 14,500 | 20,50 | 125,000 | 25,000 | 44,000 |
| 24,007 | M24 X1,5  | 18,000 | 14,500 | 22,50 | 140,000 | 28,000 | 48,000 |
| 24,008 | M24 X2    | 18,000 | 14,500 | 22,00 | 140,000 | 28,000 | 48,000 |
| 27,007 | M27 X1,5  | 20,000 | 16,000 | 25,50 | 140,000 | 28,000 | 53,000 |
| 30,007 | M30 X1,5  | 22,000 | 18,000 | 28,50 | 150,000 | 28,000 | 53,000 |
| 30,008 | M30 X2    | 22,000 | 18,000 | 28,00 | 150,000 | 28,000 | 53,000 |
| 36,007 | M36 X1,5  | 28,000 | 22,000 | 34,50 | 170,000 | 30,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine

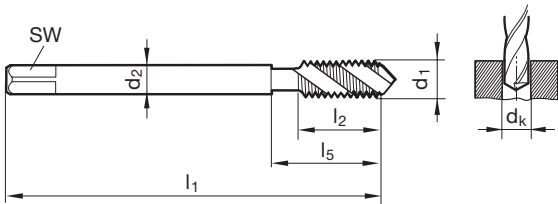


Catalogo n° 73173



Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice | d1        | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------|-----------|----------|----------|----------|----------|----------|----------|
| 3,002  | M 3 X0,35 | 2,200    |          | 2,65     | 56,000   | 4,000    | 18,000   |
| 4,003  | M 4 X0,5  | 2,800    | 2,100    | 3,50     | 63,000   | 5,000    | 21,000   |
| 5,003  | M 5 X0,5  | 3,500    | 2,700    | 4,50     | 70,000   | 5,000    | 25,000   |
| 6,003  | M 6 X0,5  | 4,500    | 3,400    | 5,50     | 80,000   | 5,000    | 30,000   |
| 6,004  | M 6 X0,75 | 4,500    | 3,400    | 5,20     | 80,000   | 8,000    | 30,000   |
| 8,004  | M 8 X0,75 | 6,000    | 4,900    | 7,20     | 80,000   | 8,000    | 30,000   |
| 8,005  | M 8 X1    | 6,000    | 4,900    | 7,00     | 90,000   | 11,000   | 35,000   |
| 10,005 | M10 X1    | 7,000    | 5,500    | 9,00     | 90,000   | 11,000   | 35,000   |
| 10,006 | M10 X1,25 | 7,000    | 5,500    | 8,80     | 100,000  | 14,000   | 39,000   |
| 11,005 | M11 X1    | 8,000    | 6,200    | 10,00    | 90,000   | 11,000   | 33,000   |
| 12,005 | M12 X1    | 9,000    | 7,000    | 11,00    | 100,000  | 11,000   | 40,000   |
| 12,006 | M12 X1,25 | 9,000    | 7,000    | 10,80    | 100,000  | 16,000   | 40,000   |
| 12,007 | M12 X1,5  | 9,000    | 7,000    | 10,50    | 100,000  | 16,000   | 40,000   |
| 14,005 | M14 X1    | 11,000   | 9,000    | 13,00    | 100,000  | 11,000   | 40,000   |
| 14,006 | M14 X1,25 | 11,000   | 9,000    | 12,80    | 100,000  | 15,000   | 40,000   |
| 14,007 | M14 X1,5  | 11,000   | 9,000    | 12,50    | 100,000  | 15,000   | 40,000   |
| 16,005 | M16 X1    | 12,000   | 9,000    | 15,00    | 100,000  | 11,000   | 44,000   |
| 16,007 | M16 X1,5  | 12,000   | 9,000    | 14,50    | 100,000  | 15,000   | 44,000   |
| 18,005 | M18 X1    | 14,000   | 11,000   | 17,00    | 110,000  | 12,000   | 44,000   |
| 18,007 | M18 X1,5  | 14,000   | 11,000   | 16,50    | 110,000  | 16,000   | 44,000   |
| 20,007 | M20 X1,5  | 16,000   | 12,000   | 18,50    | 125,000  | 16,000   | 44,000   |
| 22,007 | M22 X1,5  | 18,000   | 14,500   | 20,50    | 125,000  | 16,000   | 44,000   |
| 24,007 | M24 X1,5  | 18,000   | 14,500   | 22,50    | 140,000  | 16,000   | 48,000   |
| 24,008 | M24 X2    | 18,000   | 14,500   | 22,00    | 140,000  | 22,000   | 48,000   |
| 26,007 | M26 X1,5  | 18,000   | 14,500   | 24,50    | 140,000  | 20,000   | 50,000   |
| 30,007 | M30 X1,5  | 22,000   | 18,000   | 28,50    | 150,000  | 20,000   | 53,000   |
| 30,008 | M30 X2    | 22,000   | 18,000   | 28,00    | 150,000  | 20,000   | 53,000   |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



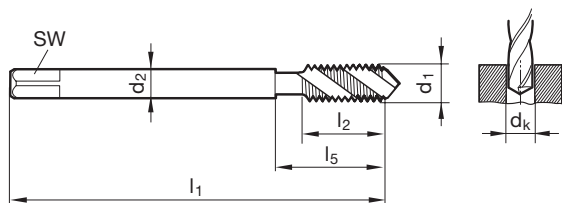
Catalogo n° 63173



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



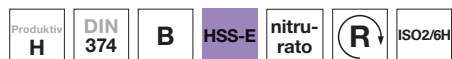
| Codice | d1        | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----------|--------|--------|-------|---------|--------|--------|
|        |           | mm     | mm     | mm    | mm      | mm     | mm     |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 90,000  | 11,000 | 35,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 90,000  | 11,000 | 35,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 100,000 | 14,000 | 39,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 100,000 | 11,000 | 40,000 |
| 12,007 | M12 X1,5  | 9,000  | 7,000  | 10,50 | 100,000 | 16,000 | 40,000 |
| 14,007 | M14 X1,5  | 11,000 | 9,000  | 12,50 | 100,000 | 15,000 | 40,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| 20,007 | M20 X1,5  | 16,000 | 12,000 | 18,50 | 125,000 | 16,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



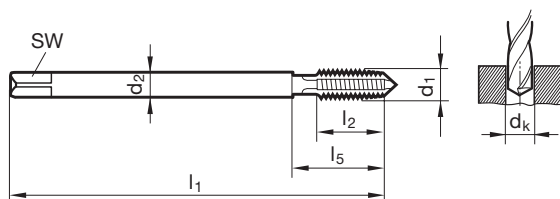
Catalogo n° 73646



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm<sup>2</sup>



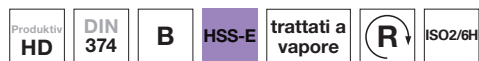
| Codice | d1        | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------|-----------|----------|----------|----------|----------|----------|----------|
| 3,002  | M 3 X0,35 | 2,200    |          | 2,65     | 56,000   | 7,000    | 18,000   |
| 4,003  | M 4 X0,5  | 2,800    | 2,100    | 3,50     | 63,000   | 8,000    | 21,000   |
| 5,003  | M 5 X0,5  | 3,500    | 2,700    | 4,50     | 70,000   | 10,000   | 25,000   |
| 6,004  | M 6 X0,75 | 4,500    | 3,400    | 5,20     | 80,000   | 13,000   | 30,000   |
| 8,004  | M 8 X0,75 | 6,000    | 4,900    | 7,20     | 80,000   | 14,000   | 30,000   |
| 8,005  | M 8 X1    | 6,000    | 4,900    | 7,00     | 90,000   | 16,000   | 35,000   |
| 10,005 | M10 X1    | 7,000    | 5,500    | 9,00     | 90,000   | 16,000   | 35,000   |
| 12,007 | M12 X1,5  | 9,000    | 7,000    | 10,50    | 100,000  | 20,000   | 40,000   |
| 14,007 | M14 X1,5  | 11,000   | 9,000    | 12,50    | 100,000  | 20,000   | 40,000   |
| 16,007 | M16 X1,5  | 12,000   | 9,000    | 14,50    | 100,000  | 22,000   | 44,000   |
| 18,007 | M18 X1,5  | 14,000   | 11,000   | 16,50    | 110,000  | 25,000   | 44,000   |
| 20,007 | M20 X1,5  | 16,000   | 12,000   | 18,50    | 125,000  | 25,000   | 44,000   |
| 22,007 | M22 X1,5  | 18,000   | 14,500   | 20,50    | 125,000  | 25,000   | 44,000   |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



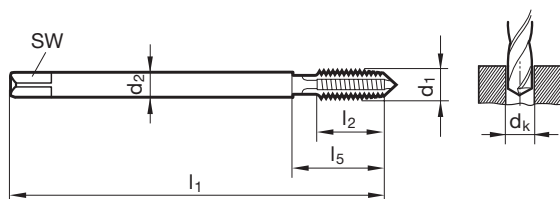
Catalogo n° 73178



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice | d1        | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------|-----------|----------|----------|----------|----------|----------|----------|
| 5,003  | M 5 X0,5  | 3,500    | 2,700    | 4,50     | 70,000   | 10,000   | 25,000   |
| 6,004  | M 6 X0,75 | 4,500    | 3,400    | 5,20     | 80,000   | 13,000   | 30,000   |
| 8,005  | M 8 X1    | 6,000    | 4,900    | 7,00     | 90,000   | 16,000   | 35,000   |
| 10,005 | M10 X1    | 7,000    | 5,500    | 9,00     | 90,000   | 16,000   | 35,000   |
| 12,005 | M12 X1    | 9,000    | 7,000    | 11,00    | 100,000  | 20,000   | 40,000   |
| 12,007 | M12 X1,5  | 9,000    | 7,000    | 10,50    | 100,000  | 20,000   | 40,000   |
| 14,007 | M14 X1,5  | 11,000   | 9,000    | 12,50    | 100,000  | 20,000   | 40,000   |
| 16,007 | M16 X1,5  | 12,000   | 9,000    | 14,50    | 100,000  | 22,000   | 44,000   |
| 18,007 | M18 X1,5  | 14,000   | 11,000   | 16,50    | 110,000  | 25,000   | 44,000   |
| 20,007 | M20 X1,5  | 16,000   | 12,000   | 18,50    | 125,000  | 25,000   | 44,000   |



## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine



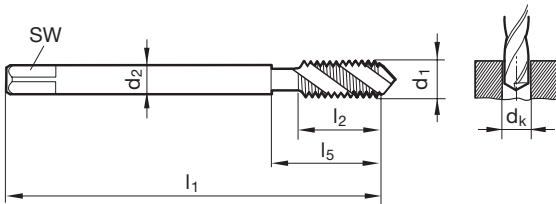
Catalogo n° 73180



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



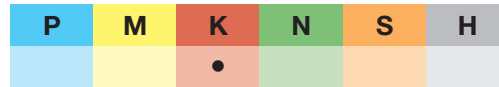
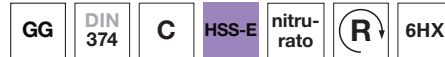
| Codice | d1       | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|----------|--------|--------|-------|---------|--------|--------|
|        |          | mm     | mm     | mm    | mm      | mm     | mm     |
| 8,005  | M 8 X1   | 6,000  | 4,900  | 7,00  | 90,000  | 11,000 | 35,000 |
| 10,005 | M10 X1   | 7,000  | 5,500  | 9,00  | 90,000  | 11,000 | 35,000 |
| 12,005 | M12 X1   | 9,000  | 7,000  | 11,00 | 100,000 | 11,000 | 40,000 |
| 12,007 | M12 X1,5 | 9,000  | 7,000  | 10,50 | 100,000 | 16,000 | 40,000 |
| 14,007 | M14 X1,5 | 11,000 | 9,000  | 12,50 | 100,000 | 15,000 | 40,000 |
| 16,007 | M16 X1,5 | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| 18,007 | M18 X1,5 | 14,000 | 11,000 | 16,50 | 110,000 | 16,000 | 44,000 |
| 20,007 | M20 X1,5 | 16,000 | 12,000 | 18,50 | 125,000 | 16,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per fil. metr. ISO passo fine

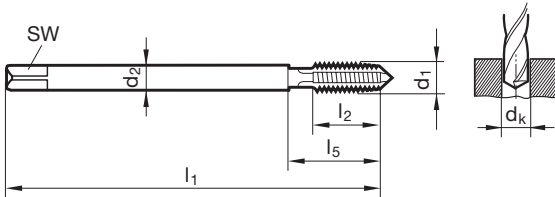


Catalogo n° 73194



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



| Codice | d1       | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|----------|--------|--------|-------|---------|--------|--------|
|        |          | mm     | mm     | mm    | mm      | mm     | mm     |
| 8,005  | M 8 X1   | 6,000  | 4,900  | 7,00  | 90,000  | 16,000 | 35,000 |
| 10,005 | M10 X1   | 7,000  | 5,500  | 9,00  | 90,000  | 16,000 | 35,000 |
| 12,007 | M12 X1,5 | 9,000  | 7,000  | 10,50 | 100,000 | 20,000 | 40,000 |
| 14,007 | M14 X1,5 | 11,000 | 9,000  | 12,50 | 100,000 | 20,000 | 40,000 |
| 16,007 | M16 X1,5 | 12,000 | 9,000  | 14,50 | 100,000 | 22,000 | 44,000 |
| 18,007 | M18 X1,5 | 14,000 | 11,000 | 16,50 | 110,000 | 25,000 | 44,000 |
| 20,007 | M20 X1,5 | 16,000 | 12,000 | 18,50 | 125,000 | 25,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



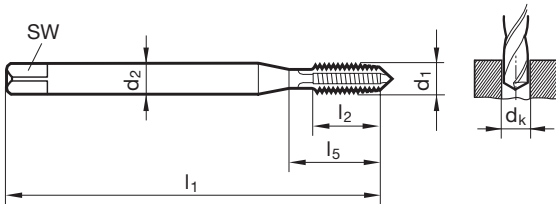
Catalogo n° 73308

|                       |                    |          |              |                      |          |           |
|-----------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttiv<br><b>N</b> | ~DIN<br><b>371</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|-----------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice       | d1       | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|----------|--------|-------|------|---------|--------|--------|
|              |          | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>2,845</b> | 4 -40    | 3,500  | 2,700 | 2,35 | 56,000  | 11,000 | 18,000 |
| <b>3,505</b> | 6 -32    | 4,000  | 3,000 | 2,85 | 56,000  | 12,000 | 20,000 |
| <b>4,166</b> | 8 -32    | 4,500  | 3,400 | 3,50 | 63,000  | 12,000 | 21,000 |
| <b>4,826</b> | 10 -24   | 6,000  | 4,900 | 3,90 | 70,000  | 14,000 | 25,000 |
| <b>6,350</b> | 1/4 -20  | 7,000  | 5,500 | 5,10 | 80,000  | 16,000 | 30,000 |
| <b>7,938</b> | 5/16 -18 | 8,000  | 6,200 | 6,60 | 90,000  | 18,000 | 35,000 |
| <b>9,525</b> | 3/8 -16  | 10,000 | 8,000 | 8,00 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



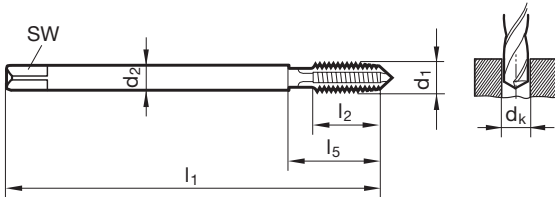
Catalogo n° 73309

|                          |                    |          |              |                      |          |           |
|--------------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttività<br><b>N</b> | ~DIN<br><b>376</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|--------------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice        | d1      | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---------------|---------|----------|----------|----------|----------|----------|----------|
| <b>12,700</b> | 1/2 -13 | 9,000    | 7,000    | 10,80    | 110,000  | 25,000   | 49,000   |
| <b>15,875</b> | 5/8 -11 | 12,000   | 9,000    | 13,50    | 110,000  | 30,000   | 53,000   |
| <b>19,050</b> | 3/4 -10 | 14,000   | 11,000   | 16,50    | 125,000  | 33,000   | 62,000   |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



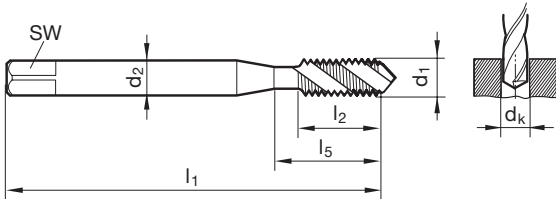
Catalogo n° 73322

|                      |                    |          |              |                      |          |           |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Intensiv<br><b>N</b> | ~DIN<br><b>371</b> | <b>C</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice       | d1       | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|----------|--------|-------|------|---------|--------|--------|
|              |          | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>2,845</b> | 4 -40    | 3,500  | 2,700 | 2,35 | 56,000  | 7,000  | 18,000 |
| <b>3,505</b> | 6 -32    | 4,000  | 3,000 | 2,85 | 56,000  | 8,000  | 20,000 |
| <b>4,166</b> | 8 -32    | 4,500  | 3,400 | 3,50 | 63,000  | 8,000  | 21,000 |
| <b>4,826</b> | 10 -24   | 6,000  | 4,900 | 3,90 | 70,000  | 11,000 | 25,000 |
| <b>6,350</b> | 1/4 -20  | 7,000  | 5,500 | 5,10 | 80,000  | 13,000 | 30,000 |
| <b>7,938</b> | 5/16 -18 | 8,000  | 6,200 | 6,60 | 90,000  | 14,000 | 35,000 |
| <b>9,525</b> | 3/8 -16  | 10,000 | 8,000 | 8,00 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



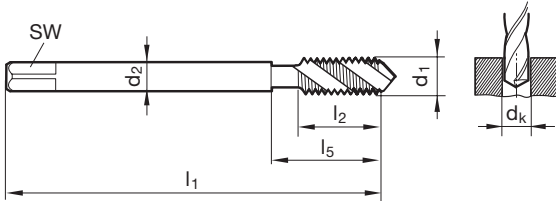
Catalogo n° 73323

|                      |                    |          |              |                      |          |           |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Intensiv<br><b>N</b> | ~DIN<br><b>376</b> | <b>C</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice        | d1      | d2     | SW     | dk    | l1      | l2     | l5     |
|---------------|---------|--------|--------|-------|---------|--------|--------|
|               |         | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>12,700</b> | 1/2 -13 | 9,000  | 7,000  | 10,80 | 110,000 | 20,000 | 49,000 |
| <b>15,875</b> | 5/8 -11 | 12,000 | 9,000  | 13,50 | 110,000 | 24,000 | 53,000 |
| <b>19,050</b> | 3/4 -10 | 14,000 | 11,000 | 16,50 | 125,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



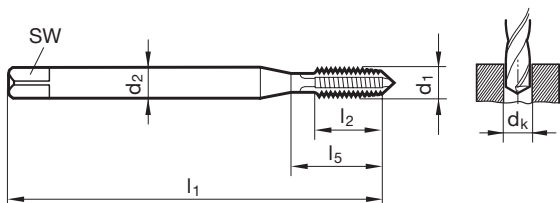
Catalogo n° 73297

|                           |                    |          |              |                      |          |           |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttività<br><b>HD</b> | ~DIN<br><b>371</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
|          | •        |          |          | ○        |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice       | d1       | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|----------|--------|-------|------|---------|--------|--------|
|              | mm       | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>2,845</b> | 4 -40    | 3,500  | 2,700 | 2,35 | 56,000  | 11,000 | 18,000 |
| <b>3,505</b> | 6 -32    | 4,000  | 3,000 | 2,85 | 56,000  | 12,000 | 20,000 |
| <b>4,166</b> | 8 -32    | 4,500  | 3,400 | 3,50 | 63,000  | 12,000 | 21,000 |
| <b>4,826</b> | 10 -24   | 6,000  | 4,900 | 3,90 | 70,000  | 14,000 | 25,000 |
| <b>6,350</b> | 1/4 -20  | 7,000  | 5,500 | 5,10 | 80,000  | 16,000 | 30,000 |
| <b>7,938</b> | 5/16 -18 | 8,000  | 6,200 | 6,60 | 90,000  | 18,000 | 35,000 |
| <b>9,525</b> | 3/8 -16  | 10,000 | 8,000 | 8,00 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



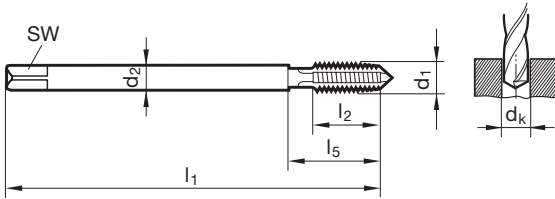
Catalogo n° 73298

|                           |                    |          |              |                      |          |           |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttività<br><b>HD</b> | ~DIN<br><b>376</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
|          | •        |          |          | ○        |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice        | d1      | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---------------|---------|----------|----------|----------|----------|----------|----------|
| <b>12,700</b> | 1/2 -13 | 9,000    | 7,000    | 10,80    | 110,000  | 25,000   | 49,000   |
| <b>15,875</b> | 5/8 -11 | 12,000   | 9,000    | 13,50    | 110,000  | 30,000   | 53,000   |
| <b>19,050</b> | 3/4 -10 | 14,000   | 11,000   | 16,50    | 125,000  | 33,000   | 62,000   |
| <b>25,400</b> | 1 - 8   | 18,000   | 14,500   | 22,25    | 160,000  | 38,000   | 73,000   |



## Maschi a macchina

### Maschi a macchina per filettatura UNC



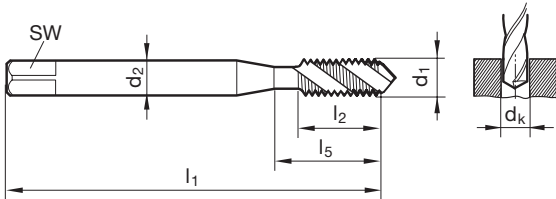
Catalogo n° 73304



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice | d1       | d2     | SW    | dk   | l1      | l2     | l5     |
|--------|----------|--------|-------|------|---------|--------|--------|
|        |          | mm     | mm    | mm   | mm      | mm     | mm     |
| 2,845  | 4 -40    | 3,500  | 2,700 | 2,35 | 56,000  | 7,000  | 18,000 |
| 3,505  | 6 -32    | 4,000  | 3,000 | 2,85 | 56,000  | 8,000  | 20,000 |
| 4,166  | 8 -32    | 4,500  | 3,400 | 3,50 | 63,000  | 8,000  | 21,000 |
| 4,826  | 10 -24   | 6,000  | 4,900 | 3,90 | 70,000  | 11,000 | 25,000 |
| 6,350  | 1/4 -20  | 7,000  | 5,500 | 5,10 | 80,000  | 13,000 | 30,000 |
| 7,938  | 5/16 -18 | 8,000  | 6,200 | 6,60 | 90,000  | 14,000 | 35,000 |
| 9,525  | 3/8 -16  | 10,000 | 8,000 | 8,00 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



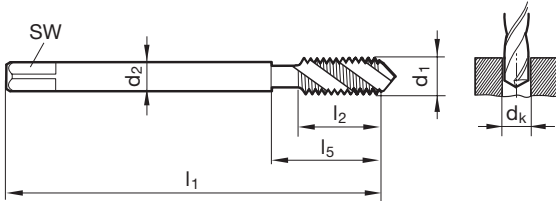
Catalogo n° 73305



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice | d1      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|---------|--------|--------|-------|---------|--------|--------|
|        |         | mm     | mm     | mm    | mm      | mm     | mm     |
| 12,700 | 1/2 -13 | 9,000  | 7,000  | 10,80 | 110,000 | 20,000 | 49,000 |
| 15,875 | 5/8 -11 | 12,000 | 9,000  | 13,50 | 110,000 | 24,000 | 53,000 |
| 19,050 | 3/4 -10 | 14,000 | 11,000 | 16,50 | 125,000 | 25,000 | 62,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



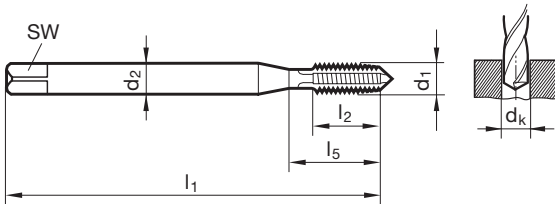
Catalogo n° 73326

|    |             |   |       |                |   |    |
|----|-------------|---|-------|----------------|---|----|
| GG | ~DIN<br>371 | C | HSS-E | nitru-<br>rato | R | 2B |
|----|-------------|---|-------|----------------|---|----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



| Codice | d1      | d2     | SW    | dk   | l1      | l2     | l5     |
|--------|---------|--------|-------|------|---------|--------|--------|
|        |         | mm     | mm    | mm   | mm      | mm     | mm     |
| 4,166  | 8 -32   | 4,500  | 3,400 | 3,50 | 63,000  | 12,000 | 21,000 |
| 4,826  | 10 -24  | 6,000  | 4,900 | 3,90 | 70,000  | 14,000 | 25,000 |
| 6,350  | 1/4 -20 | 7,000  | 5,500 | 5,10 | 80,000  | 16,000 | 30,000 |
| 7,938  | 5/16-18 | 8,000  | 6,200 | 6,60 | 90,000  | 18,000 | 35,000 |
| 9,525  | 3/8 -16 | 10,000 | 8,000 | 8,00 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNC



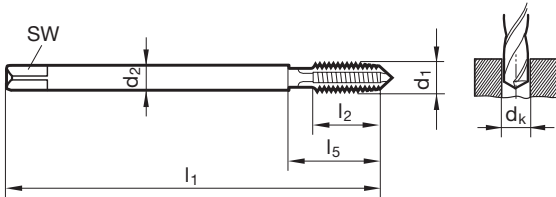
Catalogo n° 73327

|    |             |   |       |                |   |    |
|----|-------------|---|-------|----------------|---|----|
| GG | ~DIN<br>376 | C | HSS-E | nitru-<br>rato | R | 2B |
|----|-------------|---|-------|----------------|---|----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • |   |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



| Codice | d1      | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------|---------|----------|----------|----------|----------|----------|----------|
| 12,700 | 1/2 -13 | 9,000    | 7,000    | 10,80    | 110,000  | 25,000   | 49,000   |
| 15,875 | 5/8 -11 | 12,000   | 9,000    | 13,50    | 110,000  | 30,000   | 53,000   |
| 19,050 | 3/4 -10 | 14,000   | 11,000   | 16,50    | 125,000  | 33,000   | 62,000   |
| 25,400 | 1 - 8   | 18,000   | 14,500   | 22,25    | 160,000  | 38,000   | 73,000   |

## Maschi a macchina

### Maschi a macchina per filettatura UNF



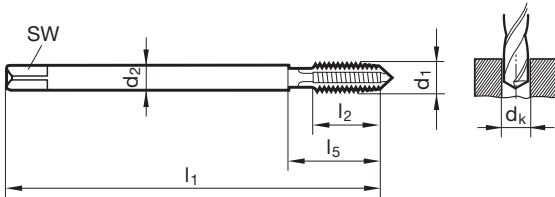
Catalogo n° 73310

|                       |                    |          |              |                      |          |           |
|-----------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttiv<br><b>N</b> | ~DIN<br><b>374</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|-----------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice        | d1      | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---------------|---------|----------|----------|----------|----------|----------|----------|
| <b>4,826</b>  | 10 -32  | 3,500    | 2,700    | 4,10     | 70,000   | 14,000   | 25,000   |
| <b>6,350</b>  | 1/4 -28 | 4,500    | 3,400    | 5,50     | 80,000   | 16,000   | 30,000   |
| <b>9,525</b>  | 3/8 -24 | 7,000    | 5,500    | 8,50     | 90,000   | 18,000   | 35,000   |
| <b>15,875</b> | 5/8 -18 | 12,000   | 9,000    | 14,50    | 100,000  | 22,000   | 44,000   |

## Maschi a macchina

### Maschi a macchina per filettatura UNF



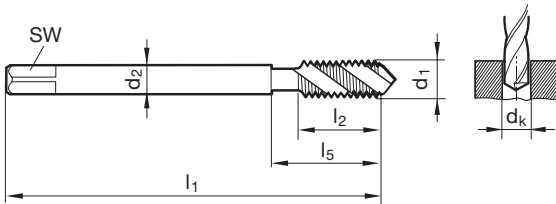
Catalogo n° 73324

|                      |                    |          |              |                      |          |           |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Intensiv<br><b>N</b> | ~DIN<br><b>374</b> | <b>C</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|----------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
| ●        | ○        | ○        | ○        |          |          |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice        | d1      | d2     | SW    | dk    | l1      | l2     | l5     |
|---------------|---------|--------|-------|-------|---------|--------|--------|
|               |         | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>4,826</b>  | 10 -32  | 3,500  | 2,700 | 4,10  | 70,000  | 8,500  | 25,000 |
| <b>6,350</b>  | 1/4 -28 | 4,500  | 3,400 | 5,50  | 80,000  | 9,000  | 30,000 |
| <b>7,938</b>  | 5/16-24 | 6,000  | 4,900 | 6,90  | 90,000  | 11,000 | 35,000 |
| <b>9,525</b>  | 3/8 -24 | 7,000  | 5,500 | 8,50  | 90,000  | 11,000 | 35,000 |
| <b>11,113</b> | 7/16-20 | 8,000  | 6,200 | 9,90  | 100,000 | 13,000 | 42,000 |
| <b>12,700</b> | 1/2 -20 | 9,000  | 7,000 | 11,50 | 100,000 | 13,000 | 40,000 |
| <b>15,875</b> | 5/8 -18 | 12,000 | 9,000 | 14,50 | 100,000 | 15,000 | 44,000 |

## Maschi a macchina

### Maschi a macchina per filettatura UNF



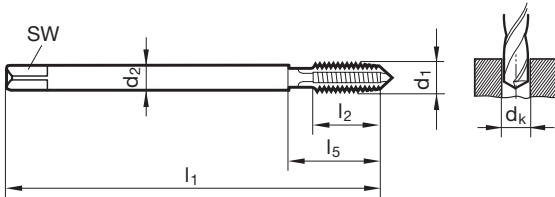
Catalogo n° 73299

|                           |                    |          |              |                      |          |           |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|
| Produttività<br><b>HD</b> | ~DIN<br><b>374</b> | <b>B</b> | <b>HSS-E</b> | trattati a<br>vapore | <b>R</b> | <b>2B</b> |
|---------------------------|--------------------|----------|--------------|----------------------|----------|-----------|

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> |
|          | •        |          |          | ○        |          |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice        | d1      | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---------------|---------|----------|----------|----------|----------|----------|----------|
| <b>4,826</b>  | 10 -32  | 3,500    | 2,700    | 4,10     | 70,000   | 14,000   | 25,000   |
| <b>6,350</b>  | 1/4 -28 | 4,500    | 3,400    | 5,50     | 80,000   | 16,000   | 30,000   |
| <b>9,525</b>  | 3/8 -24 | 7,000    | 5,500    | 8,50     | 90,000   | 18,000   | 35,000   |
| <b>15,875</b> | 5/8 -18 | 12,000   | 9,000    | 14,50    | 100,000  | 22,000   | 44,000   |

## Maschi a macchina

### Maschi a macchina per filettatura UNF



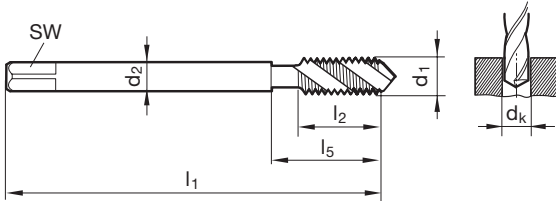
Catalogo n° 73306



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice | d1      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|---------|--------|--------|-------|---------|--------|--------|
|        |         | mm     | mm     | mm    | mm      | mm     | mm     |
| 4,826  | 10 -32  | 3,500  | 2,700  | 4,10  | 70,000  | 8,500  | 25,000 |
| 6,350  | 1/4 -28 | 4,500  | 3,400  | 5,50  | 80,000  | 9,000  | 30,000 |
| 7,938  | 5/16-24 | 6,000  | 4,900  | 6,90  | 90,000  | 11,000 | 35,000 |
| 9,525  | 3/8 -24 | 7,000  | 5,500  | 8,50  | 90,000  | 11,000 | 35,000 |
| 11,113 | 7/16-20 | 8,000  | 6,200  | 9,90  | 100,000 | 13,000 | 42,000 |
| 12,700 | 1/2 -20 | 9,000  | 7,000  | 11,50 | 100,000 | 13,000 | 40,000 |
| 15,875 | 5/8 -18 | 12,000 | 9,000  | 14,50 | 100,000 | 15,000 | 44,000 |
| 19,050 | 3/4 -16 | 14,000 | 11,000 | 17,50 | 110,000 | 16,000 | 44,000 |



## Maschi a macchina

### Maschi a macchina per filettatura NPT



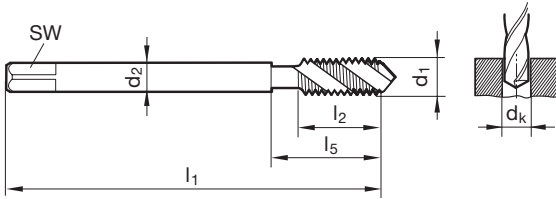
Catalogo n° 73293



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● | ○ | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra di circa 25°
- per profondità di filetto fino a 2xD
- evacuazione truciolo nella direzione del codolo



| Codice | d1  | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-----|--------|--------|--------|-------|---------|--------|--------|
|        |     | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 10,620 | 1/8 | 27,000 | 11,000 | 9,000  | 8,50  | 90,000  | 15,000 | 29,000 |
| 14,140 | 1/4 | 18,000 | 14,000 | 11,000 | 11,20 | 100,000 | 21,000 | 40,000 |
| 17,570 | 3/8 | 18,000 | 16,000 | 12,000 | 14,40 | 110,000 | 21,000 | 35,000 |
| 21,900 | 1/2 | 14,000 | 18,000 | 14,500 | 18,00 | 125,000 | 27,000 | 44,000 |
| 27,230 | 3/4 | 14,000 | 22,000 | 18,000 | 23,40 | 140,000 | 27,000 | 52,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



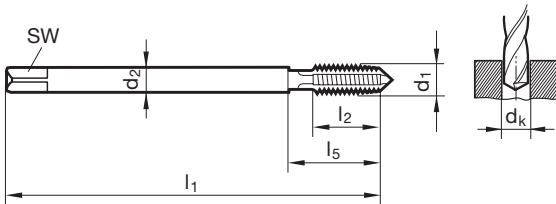
Catalogo n° 73321



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice | d1    | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-------|--------|--------|--------|-------|---------|--------|--------|
|        |       | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8 | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 18,000 | 35,000 |
| 13,157 | G 1/4 | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 20,000 | 40,000 |
| 16,662 | G 3/8 | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 22,000 | 44,000 |
| 20,955 | G 1/2 | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 25,000 | 44,000 |
| 26,441 | G 3/4 | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 28,000 | 53,000 |
| 33,249 | G1    | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 30,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



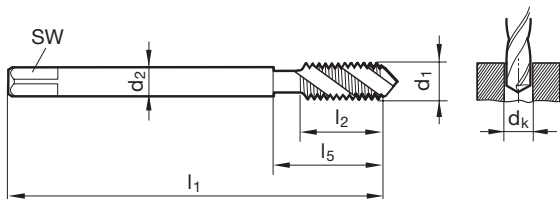
Catalogo n° 73325



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ○ | ○ |   |   |

Parametri di lav. ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice | d1    | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-------|--------|--------|--------|-------|---------|--------|--------|
|        |       | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8 | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 11,000 | 35,000 |
| 13,157 | G 1/4 | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 14,000 | 40,000 |
| 16,662 | G 3/8 | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 14,000 | 44,000 |
| 20,955 | G 1/2 | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 18,000 | 44,000 |
| 26,441 | G 3/4 | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 20,000 | 53,000 |
| 33,249 | G1    | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 24,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



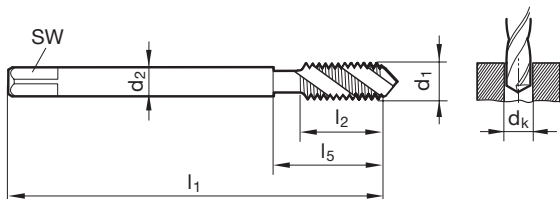
Catalogo n° 53788



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



| Codice | d1     | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|--------|--------|--------|--------|-------|---------|--------|--------|
|        |        | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 7,723  | G 1/16 | 28,000 | 6,000  | 4,900  | 6,80  | 90,000  | 11,000 | 30,000 |
| 9,728  | G 1/8  | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 11,000 | 35,000 |
| 13,157 | G 1/4  | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 14,000 | 40,000 |
| 16,662 | G 3/8  | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 14,000 | 44,000 |
| 20,955 | G 1/2  | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 18,000 | 44,000 |
| 22,911 | G 5/8  | 14,000 | 18,000 | 14,500 | 21,00 | 125,000 | 18,000 | 48,000 |
| 26,441 | G 3/4  | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 20,000 | 53,000 |
| 30,201 | G 7/8  | 14,000 | 22,000 | 18,000 | 28,25 | 150,000 | 22,000 | 53,000 |
| 33,249 | G1     | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 24,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



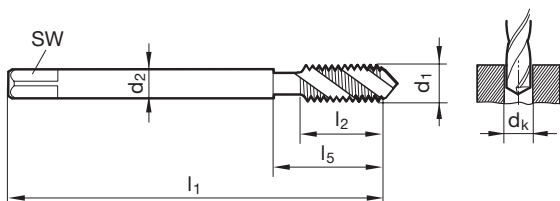
Catalogo n° 73286



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm<sup>2</sup>



| Codice | d1     | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|--------|--------|--------|--------|-------|---------|--------|--------|
|        |        | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8  | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 11,000 | 35,000 |
| 13,157 | G 1/4  | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 14,000 | 40,000 |
| 16,662 | G 3/8  | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 14,000 | 44,000 |
| 20,955 | G 1/2  | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 18,000 | 44,000 |
| 26,441 | G 3/4  | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 20,000 | 53,000 |
| 33,249 | G1     | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 24,000 | 56,000 |
| 41,910 | G1 1/4 | 11,000 | 32,000 | 24,000 | 39,50 | 170,000 | 25,000 | 57,000 |
| 47,803 | G1 1/2 | 11,000 | 36,000 | 29,000 | 45,25 | 190,000 | 27,000 | 60,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



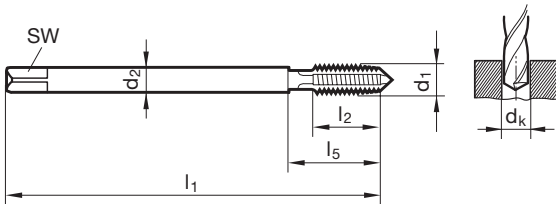
Catalogo n° 73300



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| Codice | d1    | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-------|--------|--------|--------|-------|---------|--------|--------|
|        |       | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8 | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 18,000 | 35,000 |
| 13,157 | G 1/4 | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 20,000 | 40,000 |
| 16,662 | G 3/8 | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 22,000 | 44,000 |
| 20,955 | G 1/2 | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 25,000 | 44,000 |
| 26,441 | G 3/4 | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 28,000 | 53,000 |
| 33,249 | G1    | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 30,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



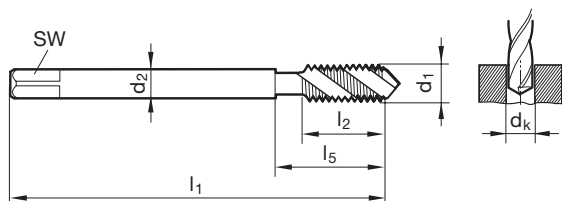
Catalogo n° 73288



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



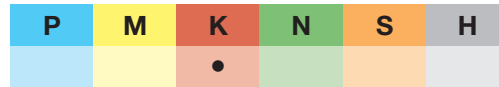
| Codice | d1    | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-------|--------|--------|--------|-------|---------|--------|--------|
|        |       | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8 | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 11,000 | 35,000 |
| 13,157 | G 1/4 | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 14,000 | 40,000 |
| 16,662 | G 3/8 | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 14,000 | 44,000 |
| 20,955 | G 1/2 | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 18,000 | 44,000 |
| 26,441 | G 3/4 | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 20,000 | 53,000 |
| 33,249 | G1    | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 24,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP

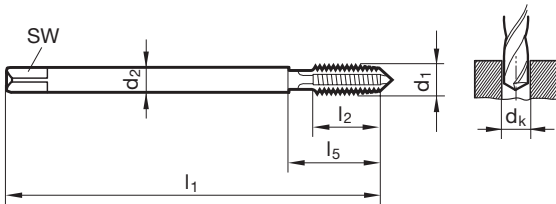


Catalogo n° 73345



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



| Codice | d1    | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|-------|--------|--------|--------|-------|---------|--------|--------|
|        |       | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 9,728  | G 1/8 | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 18,000 | 35,000 |
| 13,157 | G 1/4 | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 20,000 | 40,000 |
| 16,662 | G 3/8 | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 22,000 | 44,000 |
| 20,955 | G 1/2 | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 25,000 | 44,000 |
| 26,441 | G 3/4 | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 28,000 | 53,000 |
| 33,249 | G1    | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 30,000 | 56,000 |



## Maschi a macchina

### Maschi a macchina per filettatura Whitworth BSP



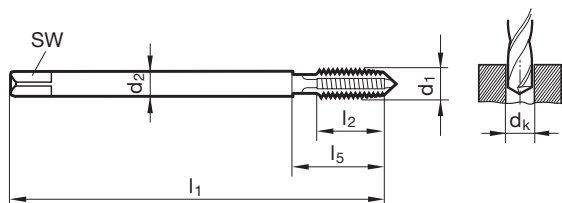
Catalogo n° 53787



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



| Codice | d1     | P      | d2     | SW     | dk    | l1      | l2     | l5     |
|--------|--------|--------|--------|--------|-------|---------|--------|--------|
|        |        | G/inch | mm     | mm     | mm    | mm      | mm     | mm     |
| 7,723  | G 1/16 | 28,000 | 6,000  | 4,900  | 6,80  | 90,000  | 18,000 | 30,000 |
| 9,728  | G 1/8  | 28,000 | 7,000  | 5,500  | 8,80  | 90,000  | 18,000 | 35,000 |
| 13,157 | G 1/4  | 19,000 | 11,000 | 9,000  | 11,80 | 100,000 | 20,000 | 40,000 |
| 16,662 | G 3/8  | 19,000 | 12,000 | 9,000  | 15,25 | 100,000 | 22,000 | 44,000 |
| 20,955 | G 1/2  | 14,000 | 16,000 | 12,000 | 19,00 | 125,000 | 25,000 | 44,000 |
| 22,911 | G 5/8  | 14,000 | 18,000 | 14,500 | 21,00 | 125,000 | 25,000 | 48,000 |
| 26,441 | G 3/4  | 14,000 | 20,000 | 16,000 | 24,50 | 140,000 | 28,000 | 53,000 |
| 30,201 | G 7/8  | 14,000 | 22,000 | 18,000 | 28,25 | 150,000 | 28,000 | 53,000 |
| 33,249 | G1     | 11,000 | 25,000 | 20,000 | 30,75 | 160,000 | 30,000 | 56,000 |

## Maschi a macchina

### Maschi a macchina per filettatura Pg



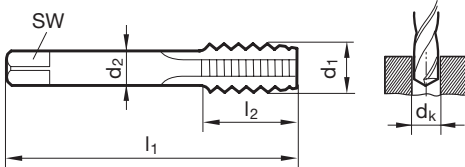
Catalogo n° 73296



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



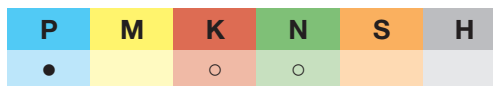
| Codice | d1      | P      | d2     | SW     | dk    | l1     | l2     |
|--------|---------|--------|--------|--------|-------|--------|--------|
|        |         | G/inch | mm     | mm     | mm    | mm     | mm     |
| 12,500 | PG 7    | 20,000 | 9,000  | 7,000  | 11,40 | 70,000 | 22,000 |
| 15,200 | PG 9    | 18,000 | 12,000 | 9,000  | 14,00 | 70,000 | 22,000 |
| 18,600 | PG 11   | 18,000 | 14,000 | 11,000 | 17,30 | 80,000 | 22,000 |
| 20,400 | PG 13,5 | 18,000 | 16,000 | 12,000 | 19,00 | 80,000 | 22,000 |
| 22,500 | PG 16   | 18,000 | 18,000 | 14,500 | 21,30 | 80,000 | 22,000 |

## Maschi a macchina

### Maschi corti per filettatura NPT

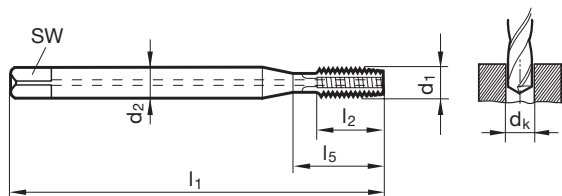


Catalogo n° 73295



Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- uso universale
- acciai fino a 1100 N/mm<sup>2</sup>



| Codice | d1   | P<br>G/inch | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------|------|-------------|----------|----------|----------|----------|----------|----------|
| 8,190  | 1/16 | 27,000      | 6,000    | 4,900    | 6,15     | 56,000   | 14,000   | 27,000   |
| 10,620 | 1/8  | 27,000      | 7,000    | 5,500    | 8,40     | 63,000   | 15,000   | 29,000   |
| 14,140 | 1/4  | 18,000      | 11,000   | 9,000    | 11,10    | 63,000   | 21,000   | 33,000   |
| 17,570 | 3/8  | 18,000      | 12,000   | 9,000    | 14,30    | 70,000   | 21,000   | 35,000   |
| 21,900 | 1/2  | 14,000      | 16,000   | 12,000   | 17,90    | 80,000   | 27,000   | 41,000   |
| 27,230 | 3/4  | 14,000      | 20,000   | 16,000   | 23,30    | 100,000  | 27,000   | 42,000   |
| 34,180 | 1    | 11,500      | 25,000   | 20,000   | 29,00    | 110,000  | 32,000   | 53,000   |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



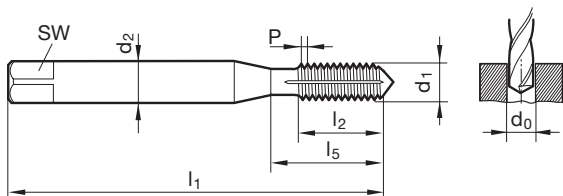
Catalogo n° 73120

|         |             |   |       |        |   |     |
|---------|-------------|---|-------|--------|---|-----|
| Durativ | ~DIN<br>371 | C | HSS-E | lucido | R | 6HX |
|---------|-------------|---|-------|--------|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1    | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|-------|-------|--------|-------|------|---------|--------|--------|
|       | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| M 3   | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| M 3,5 | 0,600 | 4,000  | 3,000 | 3,25 | 56,000  | 12,000 | 20,000 |
| M 4   | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| M 5   | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| M 6   | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| M 8   | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| M 10  | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



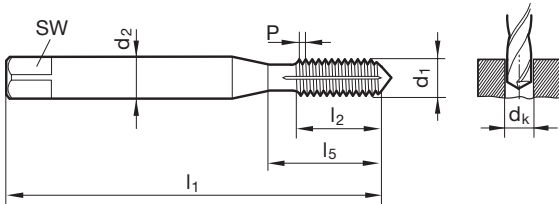
Catalogo n° 63120

|         |             |   |       |     |   |     |
|---------|-------------|---|-------|-----|---|-----|
| Durativ | ~DIN<br>371 | C | HSS-E | TiN | R | 6HX |
|---------|-------------|---|-------|-----|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



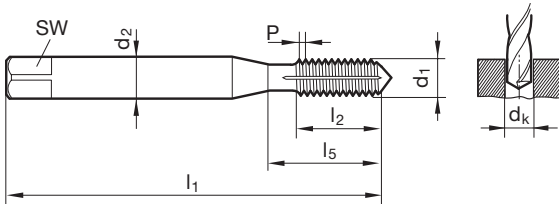
Catalogo n° 63119

|         |             |   |       |     |   |     |
|---------|-------------|---|-------|-----|---|-----|
| Durativ | ~DIN<br>371 | C | HSS-E | TiN | R | 6GX |
|---------|-------------|---|-------|-----|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



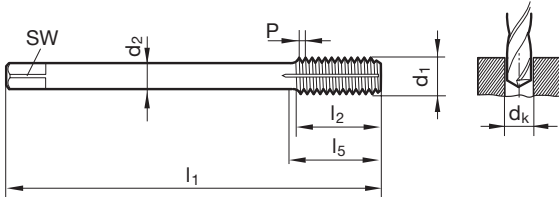
Catalogo n° 63122

|         |             |   |       |     |  |     |
|---------|-------------|---|-------|-----|--|-----|
| Durativ | ~DIN<br>376 | C | HSS-E | TiN |  | 6HX |
|---------|-------------|---|-------|-----|--|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk    | l1      | l2     | l5     |
|------------|-------|--------|-------|-------|---------|--------|--------|
|            | mm    | mm     | mm    | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000 | 11,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000 | 13,10 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000 | 15,10 | 110,000 | 26,000 | 54,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



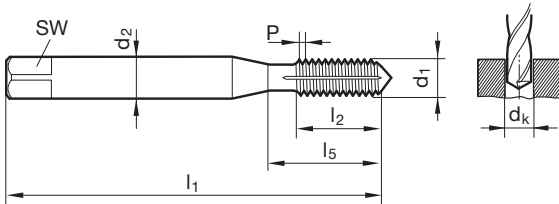
Catalogo n° 53620

|         |             |   |              |            |   |     |
|---------|-------------|---|--------------|------------|---|-----|
| Durativ | ~DIN<br>371 | C | HSS-E-<br>PM | Al-<br>CrN | R | 6HX |
|---------|-------------|---|--------------|------------|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |



## Maschi a macchina a rullare

### Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



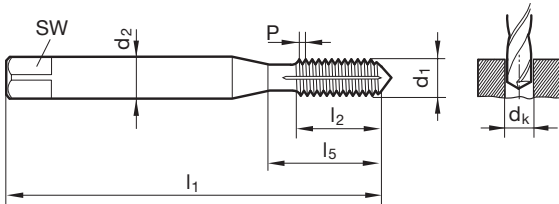
Catalogo n° 53621

|         |             |   |              |            |   |     |
|---------|-------------|---|--------------|------------|---|-----|
| Durativ | ~DIN<br>371 | C | HSS-E-<br>PM | Al-<br>CrN | R | 6GX |
|---------|-------------|---|--------------|------------|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



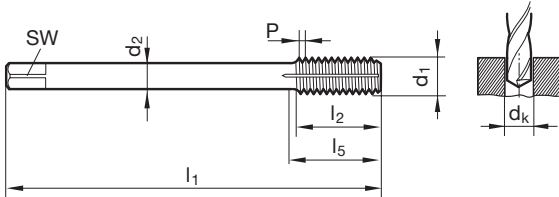
Catalogo n° 53622

|         |             |   |              |            |   |     |
|---------|-------------|---|--------------|------------|---|-----|
| Durativ | ~DIN<br>376 | C | HSS-E-<br>PM | Al-<br>CrN | R | 6HX |
|---------|-------------|---|--------------|------------|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW     | dk    | l1      | l2     | l5     |
|------------|-------|--------|--------|-------|---------|--------|--------|
|            | mm    | mm     | mm     | mm    | mm      | mm     | mm     |
| <b>M12</b> | 1,750 | 9,000  | 7,000  | 11,20 | 110,000 | 24,000 | 49,000 |
| <b>M14</b> | 2,000 | 11,000 | 9,000  | 13,10 | 110,000 | 26,000 | 53,000 |
| <b>M16</b> | 2,000 | 12,000 | 9,000  | 15,10 | 110,000 | 26,000 | 54,000 |
| <b>M20</b> | 2,500 | 16,000 | 12,000 | 18,90 | 140,000 | 32,000 | 62,000 |

## Maschi a macchina a rullare

### Maschi a rullare forati per fil. metrica ISO



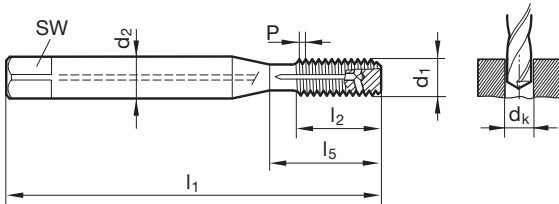
Catalogo n° 63013

|         |             |   |     |      |   |     |
|---------|-------------|---|-----|------|---|-----|
| Durativ | ~DIN<br>371 | C | VHM | TiCN | R | 6HX |
|---------|-------------|---|-----|------|---|-----|

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1         | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|------------|-------|--------|-------|------|---------|--------|--------|
|            | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 6,000  | 18,000 |
| <b>M 4</b> | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 7,500  | 21,000 |
| <b>M 5</b> | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 8,500  | 25,000 |
| <b>M 6</b> | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 11,000 | 30,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 14,000 | 35,000 |
| <b>M10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 16,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



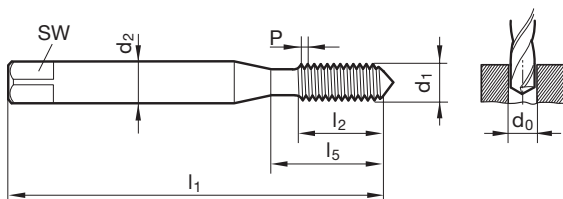
Catalogo n° 73121



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



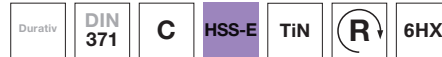
| d1           | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|--------------|-------|--------|-------|------|---------|--------|--------|
|              | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>   | 0,400 | 2,800  | 2,100 | 1,85 | 45,000  | 8,000  | 13,500 |
| <b>M 2,2</b> | 0,450 | 2,800  | 2,100 | 2,03 | 45,000  | 9,000  | 14,500 |
| <b>M 2,3</b> | 0,400 | 2,800  | 2,100 | 2,10 | 45,000  | 9,000  | 14,500 |
| <b>M 2,5</b> | 0,450 | 2,800  | 2,100 | 2,30 | 50,000  | 9,000  | 14,500 |
| <b>M 3</b>   | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 3,5</b> | 0,600 | 4,000  | 3,000 | 3,25 | 56,000  | 12,000 | 20,000 |
| <b>M 4</b>   | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>   | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>   | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>   | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M 10</b>  | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



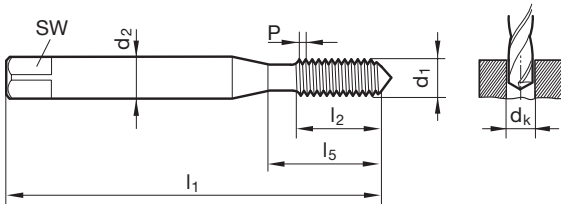
Catalogo n° 63121



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



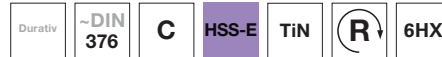
| d1          | P     | d2     | SW    | dk   | l1      | l2     | l5     |
|-------------|-------|--------|-------|------|---------|--------|--------|
|             | mm    | mm     | mm    | mm   | mm      | mm     | mm     |
| <b>M 2</b>  | 0,400 | 2,800  | 2,100 | 1,85 | 45,000  | 8,000  | 13,500 |
| <b>M 3</b>  | 0,500 | 3,500  | 2,700 | 2,80 | 56,000  | 10,000 | 18,000 |
| <b>M 4</b>  | 0,700 | 4,500  | 3,400 | 3,70 | 63,000  | 12,000 | 21,000 |
| <b>M 5</b>  | 0,800 | 6,000  | 4,900 | 4,65 | 70,000  | 14,000 | 25,000 |
| <b>M 6</b>  | 1,000 | 6,000  | 4,900 | 5,55 | 80,000  | 16,000 | 30,000 |
| <b>M 8</b>  | 1,250 | 8,000  | 6,200 | 7,40 | 90,000  | 17,000 | 35,000 |
| <b>M 10</b> | 1,500 | 10,000 | 8,000 | 9,30 | 100,000 | 20,000 | 39,000 |

## Maschi a macchina a rullare

### Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



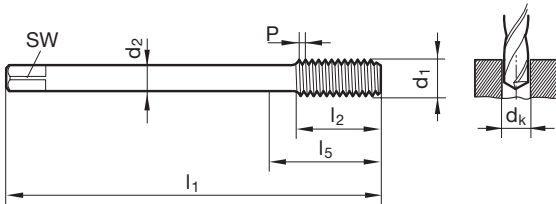
Catalogo n° 63123



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

Parametri di lav.  
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm<sup>2</sup>
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



| d1  | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|-----|---------|----------|----------|----------|----------|----------|----------|
| M12 | 1,750   | 9,000    | 7,000    | 11,20    | 110,000  | 24,000   | 49,000   |
| M16 | 2,000   | 12,000   | 9,000    | 15,10    | 110,000  | 26,000   | 54,000   |
| M20 | 2,500   | 16,000   | 12,000   | 18,90    | 140,000  | 32,000   | 62,000   |

## Frese a filettare

### Frese a filettare con fase di svasatura per filettatura metrica ISO



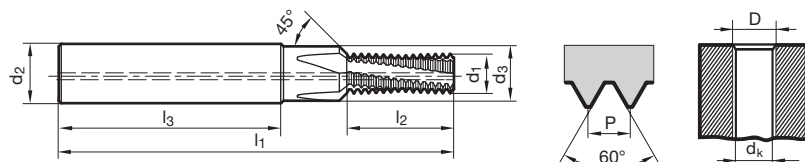
Catalogo n° 73810



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- uso universale



| Codice | D   | P<br>mm | d1<br>mm | d2<br>mm | d3<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Z |
|--------|-----|---------|----------|----------|----------|----------|----------|----------|----------|---|
| 3,000  | M 3 | 0,500   | 2,300    | 6,000    | 3,400    | 2,50     | 48,000   | 6,800    | 36,000   | 3 |
| 4,000  | M 4 | 0,700   | 3,000    | 6,000    | 4,500    | 3,30     | 48,000   | 8,800    | 36,000   | 3 |
| 5,000  | M 5 | 0,800   | 4,000    | 6,000    | 5,500    | 4,20     | 54,000   | 10,800   | 36,000   | 3 |
| 6,000  | M 6 | 1,000   | 4,800    | 8,000    | 6,600    | 5,00     | 62,000   | 13,500   | 36,000   | 3 |
| 8,000  | M 8 | 1,250   | 6,400    | 10,000   | 9,000    | 6,80     | 74,000   | 18,100   | 40,000   | 3 |
| 10,000 | M10 | 1,500   | 7,950    | 12,000   | 11,000   | 8,50     | 80,000   | 21,800   | 45,000   | 4 |
| 12,000 | M12 | 1,750   | 9,950    | 14,000   | 13,500   | 10,20    | 90,000   | 25,400   | 45,000   | 4 |
| 14,000 | M14 | 2,000   | 11,200   | 16,000   | 15,500   | 12,00    | 102,000  | 31,000   | 48,000   | 4 |
| 16,000 | M16 | 2,000   | 12,800   | 18,000   | 17,500   | 14,00    | 102,000  | 35,000   | 48,000   | 4 |
| 20,000 | M20 | 2,500   | 14,500   | 20,000   | 21,500   | 17,50    | 125,000  | 41,300   | 50,000   | 4 |

## Frese a filettare

### Frese a filettare con fase di svasatura per filettatura metrica ISO



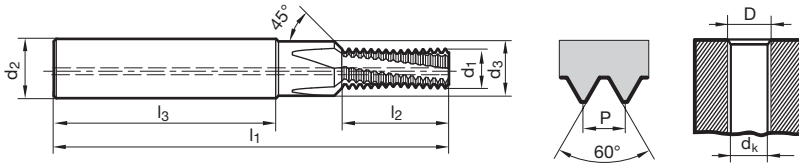
Catalogo n° 53810



| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Parametri di lav.  
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali

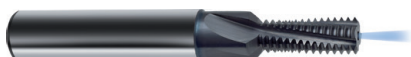


| Codice | D   | P<br>mm | d1<br>mm | d2<br>mm | d3<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Z |
|--------|-----|---------|----------|----------|----------|----------|----------|----------|----------|---|
| 3,000  | M 3 | 0,500   | 2,300    | 6,000    | 3,400    | 2,50     | 48,000   | 6,800    | 36,000   | 3 |
| 4,000  | M 4 | 0,700   | 3,000    | 6,000    | 4,500    | 3,30     | 48,000   | 8,800    | 36,000   | 3 |
| 5,000  | M 5 | 0,800   | 4,000    | 6,000    | 5,500    | 4,20     | 54,000   | 10,800   | 36,000   | 3 |
| 6,000  | M 6 | 1,000   | 4,800    | 8,000    | 6,600    | 5,00     | 62,000   | 13,500   | 36,000   | 3 |
| 8,000  | M 8 | 1,250   | 6,400    | 10,000   | 9,000    | 6,80     | 74,000   | 18,100   | 40,000   | 3 |
| 10,000 | M10 | 1,500   | 7,950    | 12,000   | 11,000   | 8,50     | 80,000   | 21,800   | 45,000   | 4 |
| 12,000 | M12 | 1,750   | 9,950    | 14,000   | 13,500   | 10,20    | 90,000   | 25,400   | 45,000   | 4 |
| 14,000 | M14 | 2,000   | 11,200   | 16,000   | 15,500   | 12,00    | 102,000  | 31,000   | 48,000   | 4 |
| 16,000 | M16 | 2,000   | 12,800   | 18,000   | 17,500   | 14,00    | 102,000  | 35,000   | 48,000   | 4 |
| 20,000 | M20 | 2,500   | 14,500   | 20,000   | 21,500   | 17,50    | 125,000  | 41,300   | 50,000   | 4 |



## Frese a filettare

### Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



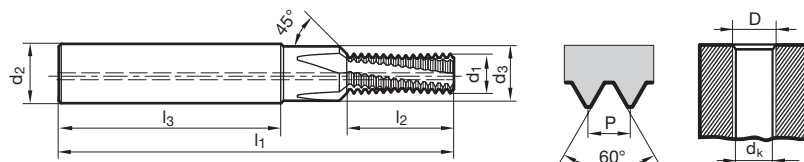
Catalogo n° 53820



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ● | ○ |

Parametri di lav.  
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



| Codice | D         | d1<br>mm | d2<br>mm | d3<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Z |
|--------|-----------|----------|----------|----------|----------|----------|----------|----------|---|
| 4,003  | M 4 X0,5  | 3,000    | 6,000    | 4,500    | 3,50     | 48,000   | 8,800    | 36,000   | 3 |
| 5,003  | M 5 X0,5  | 4,000    | 6,000    | 5,500    | 4,50     | 54,000   | 10,800   | 36,000   | 3 |
| 6,003  | M 6 X0,5  | 4,800    | 8,000    | 6,600    | 5,50     | 62,000   | 12,800   | 36,000   | 3 |
| 6,004  | M 6 X0,75 | 4,800    | 8,000    | 6,600    | 5,20     | 62,000   | 13,100   | 36,000   | 3 |
| 8,004  | M 8 X0,75 | 6,400    | 10,000   | 9,000    | 7,20     | 74,000   | 16,900   | 40,000   | 3 |
| 8,005  | M 8 X1    | 6,400    | 10,000   | 9,000    | 7,00     | 74,000   | 17,500   | 40,000   | 3 |
| 10,005 | M10 X1    | 7,950    | 12,000   | 11,000   | 9,00     | 80,000   | 21,500   | 45,000   | 4 |
| 10,006 | M10 X1,25 | 7,950    | 12,000   | 11,000   | 8,80     | 80,000   | 21,900   | 45,000   | 4 |
| 12,005 | M12 X1    | 9,950    | 14,000   | 13,500   | 11,00    | 90,000   | 25,500   | 45,000   | 4 |
| 12,007 | M12 X1,5  | 9,950    | 14,000   | 13,500   | 10,50    | 90,000   | 26,300   | 45,000   | 4 |
| 14,007 | M14 X1,5  | 11,200   | 16,000   | 15,500   | 12,50    | 102,000  | 30,800   | 48,000   | 4 |
| 16,007 | M16 X1,5  | 12,800   | 18,000   | 17,500   | 14,50    | 102,000  | 33,800   | 48,000   | 4 |

## Frese a filettare

### Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



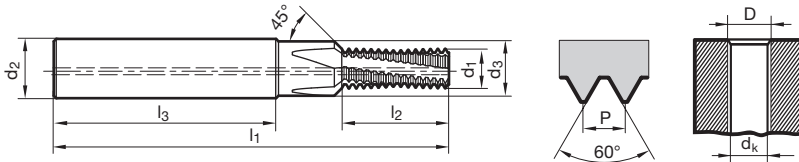
Catalogo n° 73820



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



| Codice | D         | d1<br>mm | d2<br>mm | d3<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | Z |
|--------|-----------|----------|----------|----------|----------|----------|----------|----------|---|
| 4,003  | M 4 X0,5  | 3,000    | 6,000    | 4,500    | 3,50     | 48,000   | 8,800    | 36,000   | 3 |
| 5,003  | M 5 X0,5  | 4,000    | 6,000    | 5,500    | 4,50     | 54,000   | 10,800   | 36,000   | 3 |
| 6,003  | M 6 X0,5  | 4,800    | 8,000    | 6,600    | 5,50     | 62,000   | 12,800   | 36,000   | 3 |
| 6,004  | M 6 X0,75 | 4,800    | 8,000    | 6,600    | 5,20     | 62,000   | 13,100   | 36,000   | 3 |
| 8,004  | M 8 X0,75 | 6,400    | 10,000   | 9,000    | 7,20     | 74,000   | 16,900   | 40,000   | 3 |
| 8,005  | M 8 X1    | 6,400    | 10,000   | 9,000    | 7,00     | 74,000   | 17,500   | 40,000   | 3 |
| 10,005 | M10 X1    | 7,950    | 12,000   | 11,000   | 9,00     | 80,000   | 21,500   | 45,000   | 4 |
| 10,006 | M10 X1,25 | 7,950    | 12,000   | 11,000   | 8,80     | 80,000   | 21,900   | 45,000   | 4 |
| 12,005 | M12 X1    | 9,950    | 14,000   | 13,500   | 11,00    | 90,000   | 25,500   | 45,000   | 4 |
| 12,007 | M12 X1,5  | 9,950    | 14,000   | 13,500   | 10,50    | 90,000   | 26,300   | 45,000   | 4 |
| 14,007 | M14 X1,5  | 11,200   | 16,000   | 15,500   | 12,50    | 102,000  | 30,800   | 48,000   | 4 |
| 16,007 | M16 X1,5  | 12,800   | 18,000   | 17,500   | 14,50    | 102,000  | 33,800   | 48,000   | 4 |

## Frese a filettare

### Frese a filettare senza fase di svasatura per filettatura metrica ISO



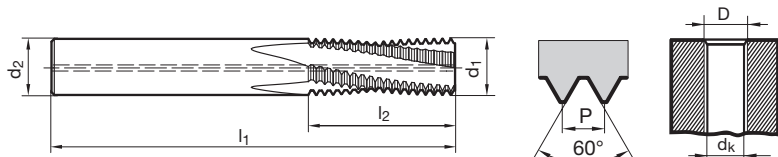
Catalogo n° 73830



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ● |   |

Parametri di lav.  
ind. a pag. 348

- frese a filettare senza smusso, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



| Codice | d1        | P     | d1     | d2     | dk    | l1      | l2     | Z |
|--------|-----------|-------|--------|--------|-------|---------|--------|---|
|        |           | mm    | mm     | mm     | mm    | mm      | mm     |   |
| 6,000  | M 6       | 1,000 | 4,800  | 6,000  | 5,00  | 54,000  | 13,500 | 3 |
| 8,000  | M 8       | 1,250 | 6,400  | 8,000  | 6,80  | 62,000  | 18,100 | 3 |
| 8,005  | M 8 X1    | 1,000 | 6,400  | 8,000  | 7,00  | 62,000  | 14,500 | 3 |
| 10,000 | M10       | 1,500 | 7,950  | 10,000 | 8,50  | 74,000  | 21,800 | 3 |
| 10,005 | M10 X1    | 1,000 | 7,950  | 10,000 | 9,00  | 74,000  | 14,500 | 3 |
| 10,006 | M10 X1,25 | 1,250 | 7,950  | 10,000 | 8,80  | 74,000  | 18,100 | 3 |
| 12,000 | M12       | 1,750 | 9,950  | 10,000 | 10,20 | 74,000  | 25,400 | 4 |
| 14,000 | M14       | 2,000 | 11,200 | 12,000 | 12,00 | 90,000  | 31,000 | 4 |
| 14,007 | M14 X1,5  | 1,500 | 11,200 | 12,000 | 12,50 | 90,000  | 23,300 | 4 |
| 16,000 | M16       | 2,000 | 12,800 | 14,000 | 14,00 | 90,000  | 35,000 | 4 |
| 16,007 | M16 X1,5  | 1,500 | 12,800 | 14,000 | 14,50 | 90,000  | 26,300 | 4 |
| 20,000 | M20       | 2,500 | 14,950 | 16,000 | 17,50 | 102,000 | 41,300 | 4 |
| 20,007 | M20 X1,5  | 1,500 | 14,950 | 16,000 | 18,50 | 102,000 | 24,800 | 4 |

## Frese a filettare

### Frese a filettare senza fase di svasatura per filettatura metrica ISO



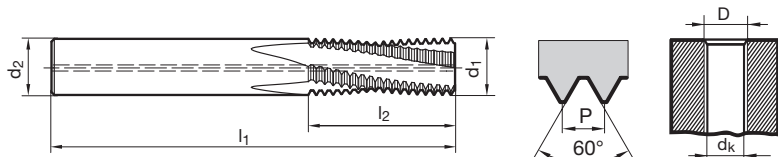
Catalogo n° 53830



| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Parametri di lav.  
ind. a pag. 348

- frese a filettare senza smusso, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



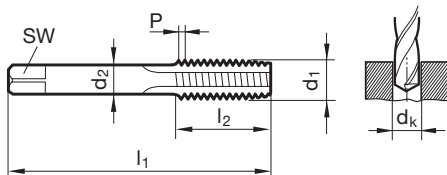
| Codice | d1        | P     | d1     | d2     | dk    | l1      | l2     | Z |
|--------|-----------|-------|--------|--------|-------|---------|--------|---|
|        |           | mm    | mm     | mm     | mm    | mm      | mm     |   |
| 6,000  | M 6       | 1,000 | 4,800  | 6,000  | 5,00  | 54,000  | 13,500 | 3 |
| 8,000  | M 8       | 1,250 | 6,400  | 8,000  | 6,80  | 62,000  | 18,100 | 3 |
| 8,005  | M 8 X1    | 1,000 | 6,400  | 8,000  | 7,00  | 62,000  | 14,500 | 3 |
| 10,000 | M10       | 1,500 | 7,950  | 10,000 | 8,50  | 74,000  | 21,800 | 3 |
| 10,005 | M10 X1    | 1,000 | 7,950  | 10,000 | 9,00  | 74,000  | 14,500 | 3 |
| 10,006 | M10 X1,25 | 1,250 | 7,950  | 10,000 | 8,80  | 74,000  | 18,100 | 3 |
| 12,000 | M12       | 1,750 | 9,950  | 10,000 | 10,20 | 74,000  | 25,400 | 4 |
| 14,000 | M14       | 2,000 | 11,200 | 12,000 | 12,00 | 90,000  | 31,000 | 4 |
| 14,007 | M14 X1,5  | 1,500 | 11,200 | 12,000 | 12,50 | 90,000  | 23,300 | 4 |
| 16,000 | M16       | 2,000 | 12,800 | 14,000 | 14,00 | 90,000  | 35,000 | 4 |
| 16,007 | M16 X1,5  | 1,500 | 12,800 | 14,000 | 14,50 | 90,000  | 26,300 | 4 |
| 20,000 | M20       | 2,500 | 14,950 | 16,000 | 17,50 | 102,000 | 41,300 | 4 |
| 20,007 | M20 X1,5  | 1,500 | 14,950 | 16,000 | 18,50 | 102,000 | 24,800 | 4 |

## Maschi a mano

### Serie di maschi a mano per filettature metriche ISO destri



Catalogo n° 73531



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav. ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73101
- medio 73102
- finitore 73103

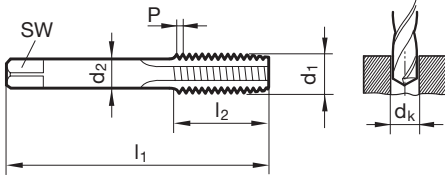
| d1    | P     | d2     | SW     | dk    | l1      | l2     |
|-------|-------|--------|--------|-------|---------|--------|
|       | mm    | mm     | mm     | mm    | mm      | mm     |
| M 1   | 0,250 | 2,500  | 2,100  | 0,75  | 32,000  | 5,500  |
| M 1,2 | 0,250 | 2,500  | 2,100  | 0,95  | 32,000  | 5,500  |
| M 1,4 | 0,300 | 2,500  | 2,100  | 1,10  | 32,000  | 7,000  |
| M 1,6 | 0,350 | 2,500  | 2,100  | 1,25  | 32,000  | 8,000  |
| M 1,7 | 0,350 | 2,500  | 2,100  | 1,35  | 32,000  | 8,000  |
| M 2   | 0,400 | 2,800  | 2,100  | 1,60  | 36,000  | 8,000  |
| M 2,3 | 0,400 | 2,800  | 2,100  | 1,90  | 36,000  | 9,000  |
| M 2,5 | 0,450 | 2,800  | 2,100  | 2,05  | 40,000  | 9,000  |
| M 2,6 | 0,450 | 2,800  | 2,100  | 2,15  | 40,000  | 9,000  |
| M 3   | 0,500 | 3,500  | 2,700  | 2,50  | 40,000  | 10,000 |
| M 3,5 | 0,600 | 4,000  | 3,000  | 2,90  | 45,000  | 12,000 |
| M 4   | 0,700 | 4,500  | 3,400  | 3,30  | 45,000  | 12,000 |
| M 4,5 | 0,750 | 6,000  | 4,900  | 3,70  | 50,000  | 14,000 |
| M 5   | 0,800 | 6,000  | 4,900  | 4,20  | 50,000  | 14,000 |
| M 6   | 1,000 | 6,000  | 4,900  | 5,00  | 56,000  | 16,000 |
| M 7   | 1,000 | 6,000  | 4,900  | 6,00  | 56,000  | 16,000 |
| M 8   | 1,250 | 6,000  | 4,900  | 6,80  | 63,000  | 17,000 |
| M10   | 1,500 | 7,000  | 5,500  | 8,50  | 70,000  | 20,000 |
| M12   | 1,750 | 9,000  | 7,000  | 10,20 | 75,000  | 24,000 |
| M14   | 2,000 | 11,000 | 9,000  | 12,00 | 80,000  | 26,000 |
| M16   | 2,000 | 12,000 | 9,000  | 14,00 | 80,000  | 26,000 |
| M18   | 2,500 | 14,000 | 11,000 | 15,50 | 95,000  | 30,000 |
| M20   | 2,500 | 16,000 | 12,000 | 17,50 | 95,000  | 32,000 |
| M24   | 3,000 | 18,000 | 14,500 | 21,00 | 110,000 | 36,000 |

## Maschi a mano

### Serie di maschi a mano per filettature metriche ISO sinistri



Catalogo n° 73532



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73105
- medio 73106
- finitore 73107

| d1  | P     | d2     | SW    | dk    | l1     | l2     |
|-----|-------|--------|-------|-------|--------|--------|
|     | mm    | mm     | mm    | mm    | mm     | mm     |
| M 4 | 0,700 | 4,500  | 3,400 | 3,30  | 45,000 | 12,000 |
| M 5 | 0,800 | 6,000  | 4,900 | 4,20  | 50,000 | 14,000 |
| M 6 | 1,000 | 6,000  | 4,900 | 5,00  | 56,000 | 16,000 |
| M 8 | 1,250 | 6,000  | 4,900 | 6,80  | 63,000 | 17,000 |
| M10 | 1,500 | 7,000  | 5,500 | 8,50  | 70,000 | 20,000 |
| M12 | 1,750 | 9,000  | 7,000 | 10,20 | 75,000 | 24,000 |
| M14 | 2,000 | 11,000 | 9,000 | 12,00 | 80,000 | 26,000 |
| M16 | 2,000 | 12,000 | 9,000 | 14,00 | 80,000 | 26,000 |

## Maschi a mano

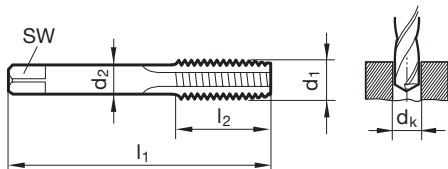
### Maschio a mano per filettatura metrica fine ISO, kit



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 358

Catalogo n° 73521



- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73110
- Finitore 73111

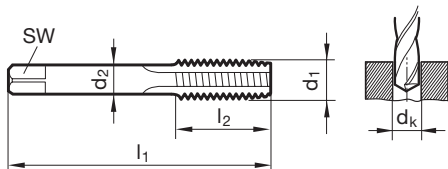
| Codice | d1        | d2     | SW     | dk    | l1     | l2     |
|--------|-----------|--------|--------|-------|--------|--------|
|        |           | mm     | mm     | mm    | mm     | mm     |
| 5,003  | M 5 X0,5  | 6,000  | 4,900  | 4,50  | 50,000 | 11,000 |
| 6,003  | M 6 X0,5  | 6,000  | 4,900  | 5,50  | 56,000 | 12,000 |
| 6,004  | M 6 X0,75 | 6,000  | 4,900  | 5,20  | 56,000 | 12,000 |
| 8,004  | M 8 X0,75 | 6,000  | 4,900  | 7,20  | 56,000 | 14,000 |
| 8,005  | M 8 X1    | 6,000  | 4,900  | 7,00  | 63,000 | 17,000 |
| 10,005 | M10 X1    | 7,000  | 5,500  | 9,00  | 63,000 | 16,000 |
| 10,006 | M10 X1,25 | 7,000  | 5,500  | 8,80  | 63,000 | 20,000 |
| 11,005 | M11 X1    | 8,000  | 6,200  | 10,00 | 63,000 | 18,000 |
| 12,005 | M12 X1    | 9,000  | 7,000  | 11,00 | 70,000 | 20,000 |
| 16,007 | M16 X1,5  | 12,000 | 9,000  | 14,50 | 70,000 | 20,000 |
| 18,007 | M18 X1,5  | 14,000 | 11,000 | 16,50 | 80,000 | 22,000 |

## Maschi a mano

### Maschio a macchina per filettatura UNC, kit



Catalogo n° 73535



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav. ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73301
- medio 73302
- finitore 73303

| Codice | d1       | d2     | SW     | dk    | l1     | l2     |
|--------|----------|--------|--------|-------|--------|--------|
|        | mm       | mm     | mm     | mm    | mm     | mm     |
| 2,845  | 4 -40    | 3,500  | 2,700  | 2,35  | 40,000 | 11,000 |
| 3,175  | 5 -40    | 4,000  | 2,700  | 2,65  | 40,000 | 11,000 |
| 3,505  | 6 -32    | 4,000  | 3,000  | 2,85  | 45,000 | 12,000 |
| 4,166  | 8 -32    | 4,500  | 3,400  | 3,50  | 45,000 | 12,000 |
| 4,826  | 10 -24   | 6,000  | 4,900  | 3,90  | 50,000 | 14,000 |
| 6,350  | 1/4 -20  | 6,000  | 4,900  | 5,10  | 56,000 | 16,000 |
| 7,938  | 5/16 -18 | 6,000  | 4,900  | 6,60  | 63,000 | 18,000 |
| 9,525  | 3/8 -16  | 7,000  | 5,500  | 8,00  | 70,000 | 20,000 |
| 11,113 | 7/16 -14 | 8,000  | 6,200  | 9,40  | 70,000 | 22,000 |
| 12,700 | 1/2 -13  | 9,000  | 7,000  | 10,80 | 75,000 | 25,000 |
| 15,875 | 5/8 -11  | 12,000 | 9,000  | 13,50 | 80,000 | 30,000 |
| 19,050 | 3/4 -10  | 16,000 | 11,000 | 16,50 | 95,000 | 33,000 |

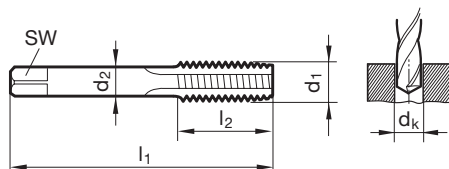


## Maschi a mano

### Maschio a macchina per filettatura BSW, kit



Catalogo n° 73534



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73311
- medio 73312
- finitore 73313

| Codice | d1     | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm |
|--------|--------|----------|----------|----------|----------|----------|
| 3,175  | W 1/8  | 4,000    | 2,700    | 2,50     | 40,000   | 11,000   |
| 3,969  | W 5/32 | 4,500    | 3,400    | 3,20     | 45,000   | 12,000   |
| 4,762  | W 3/16 | 6,000    | 4,900    | 3,60     | 50,000   | 14,000   |
| 6,350  | W 1/4  | 6,000    | 4,900    | 5,10     | 56,000   | 16,000   |
| 7,938  | W 5/16 | 6,000    | 4,900    | 6,50     | 63,000   | 18,000   |
| 9,525  | W 3/8  | 7,000    | 5,500    | 7,90     | 70,000   | 20,000   |
| 11,113 | W 7/16 | 8,000    | 6,200    | 9,20     | 70,000   | 22,000   |
| 12,700 | W 1/2  | 9,000    | 7,000    | 10,50    | 75,000   | 25,000   |
| 14,287 | W 9/16 | 11,000   | 9,000    | 12,00    | 80,000   | 28,000   |
| 15,876 | W 5/8  | 12,000   | 9,000    | 13,50    | 80,000   | 30,000   |
| 19,051 | W 3/4  | 16,000   | 11,000   | 16,25    | 95,000   | 33,000   |

## Maschi a mano

### Maschio a mano per filettatura gas, kit

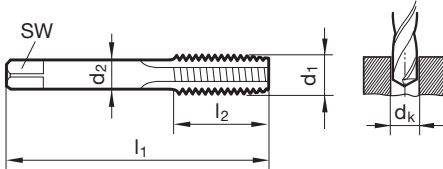


|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 358

#### Catalogo n° 73522

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73315
- Finitore 73316



| Codice | d1    | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm |
|--------|-------|----------|----------|----------|----------|----------|
| 9,728  | G 1/8 | 7,000    | 5,500    | 8,80     | 63,000   | 18,000   |
| 13,157 | G 1/4 | 11,000   | 9,000    | 11,80    | 70,000   | 20,000   |
| 16,662 | G 3/8 | 12,000   | 9,000    | 15,25    | 70,000   | 20,000   |
| 20,955 | G 1/2 | 16,000   | 12,000   | 19,00    | 80,000   | 22,000   |

## Utensili combinati

### Utensili combinati per fil. metrica ISO

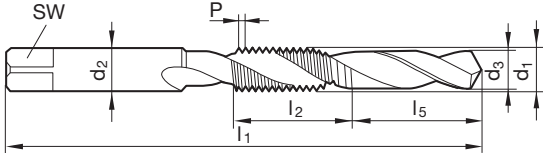


Catalogo n° 73248



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

- per fori passanti
- acciai fino a 800 N/mm<sup>2</sup>



| d1         | P     | Codice | d2    | d3     | SW    | l1      | l5     | l2     |
|------------|-------|--------|-------|--------|-------|---------|--------|--------|
|            | mm    |        | mm    | mm     | mm    | mm      | mm     | mm     |
| <b>M 3</b> | 0,500 | 3,000  | 3,500 | 2,500  | 2,700 | 62,000  | 11,000 | 12,000 |
| <b>M 4</b> | 0,700 | 4,000  | 4,500 | 3,300  | 3,400 | 66,000  | 10,000 | 16,000 |
| <b>M 5</b> | 0,800 | 5,000  | 6,000 | 4,200  | 4,900 | 75,000  | 12,000 | 18,000 |
| <b>M 6</b> | 1,000 | 6,000  | 6,000 | 5,000  | 4,900 | 81,000  | 14,000 | 20,000 |
| <b>M 8</b> | 1,250 | 8,000  | 6,000 | 6,800  | 4,900 | 93,000  | 20,000 | 12,000 |
| <b>M10</b> | 1,500 | 10,000 | 7,000 | 8,500  | 5,500 | 99,000  | 22,000 | 14,000 |
| <b>M12</b> | 1,750 | 12,000 | 9,000 | 10,200 | 7,000 | 106,000 | 25,000 | 16,000 |

## Maschi a macchina per per dadi

### Maschi a macchina per dadi per fil. metrica ISO

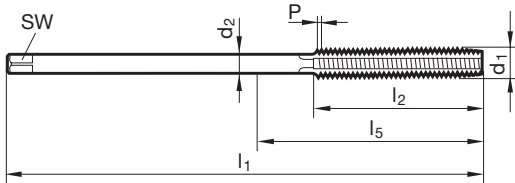


Catalogo n° 73243



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

- per fori passanti
- per dadi con profondità di filetto fino a 1xD
- Imbocco circa 20 filetti



| d1           | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|--------------|---------|----------|----------|----------|----------|----------|----------|
| <b>M 3</b>   | 0,500   | 2,200    |          | 2,50     | 70,000   | 22,000   | 30,000   |
| <b>M 3,5</b> | 0,600   | 2,500    | 2,100    | 2,90     | 80,000   | 25,000   | 31,000   |
| <b>M 4</b>   | 0,700   | 2,800    | 2,100    | 3,30     | 90,000   | 25,000   | 33,000   |
| <b>M 5</b>   | 0,800   | 3,500    | 2,700    | 4,20     | 100,000  | 28,000   | 38,000   |
| <b>M 6</b>   | 1,000   | 4,500    | 3,400    | 5,00     | 110,000  | 32,000   | 44,000   |
| <b>M 8</b>   | 1,250   | 6,000    | 4,900    | 6,80     | 125,000  | 40,000   | 61,000   |
| <b>M10</b>   | 1,500   | 7,000    | 5,500    | 8,50     | 140,000  | 45,000   | 85,000   |
| <b>M12</b>   | 1,750   | 9,000    | 7,000    | 10,20    | 180,000  | 50,000   | 120,000  |
| <b>M14</b>   | 2,000   | 11,000   | 9,000    | 12,00    | 200,000  | 56,000   | 130,000  |
| <b>M16</b>   | 2,000   | 12,000   | 9,000    | 14,00    | 200,000  | 63,000   | 145,000  |
| <b>M18</b>   | 2,500   | 14,000   | 11,000   | 15,50    | 220,000  | 63,000   | 155,000  |

## Filiere

### Filiere per filettatura metrica ISO

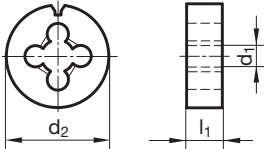


Catalogo n° 73400



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ |   | ● |   |   |

• lavorazione generale



| d1    | P     | d2     | l1     | Workpiece Ø | Codice |
|-------|-------|--------|--------|-------------|--------|
|       | mm    | mm     | mm     | mm          |        |
| M 1   | 0,250 | 16,000 | 5,000  | 0,970       | 1,000  |
| M 1,2 | 0,250 | 16,000 | 5,000  | 1,170       | 1,200  |
| M 2,2 | 0,450 | 16,000 | 5,000  | 2,130       | 2,200  |
| M 2,3 | 0,400 | 16,000 | 5,000  | 2,250       | 2,300  |
| M 3   | 0,500 | 20,000 | 5,000  | 2,920       | 3,000  |
| M 3,5 | 0,600 | 20,000 | 5,000  | 3,410       | 3,500  |
| M 4   | 0,700 | 20,000 | 5,000  | 3,910       | 4,000  |
| M 5   | 0,800 | 20,000 | 7,000  | 4,900       | 5,000  |
| M 6   | 1,000 | 20,000 | 7,000  | 5,880       | 6,000  |
| M 7   | 1,000 | 25,000 | 9,000  | 6,880       | 7,000  |
| M 8   | 1,250 | 25,000 | 9,000  | 7,870       | 8,000  |
| M10   | 1,500 | 30,000 | 11,000 | 9,850       | 10,000 |
| M12   | 1,750 | 38,000 | 14,000 | 11,830      | 12,000 |
| M14   | 2,000 | 38,000 | 14,000 | 13,820      | 14,000 |
| M16   | 2,000 | 45,000 | 18,000 | 15,820      | 16,000 |
| M18   | 2,500 | 45,000 | 18,000 | 17,790      | 18,000 |
| M20   | 2,500 | 45,000 | 18,000 | 19,790      | 20,000 |
| M24   | 3,000 | 55,000 | 22,000 | 23,770      | 24,000 |
| M30   | 3,500 | 65,000 | 25,000 | 29,730      | 30,000 |

## Filiere

### Filiere per filettatura metrica ISO

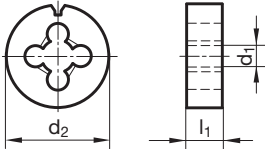


Catalogo n° 73410



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ● |   |   |

- esecuzione lappata per metalli NE
- lavorazione generale



| d1         | P     | d2     | l1     | Workpiece Ø | Codice |
|------------|-------|--------|--------|-------------|--------|
|            | mm    | mm     | mm     | mm          |        |
| <b>M 3</b> | 0,500 | 20,000 | 5,000  | 2,920       | 3,000  |
| <b>M 4</b> | 0,700 | 20,000 | 5,000  | 3,910       | 4,000  |
| <b>M 6</b> | 1,000 | 20,000 | 7,000  | 5,880       | 6,000  |
| <b>M 8</b> | 1,250 | 25,000 | 9,000  | 7,870       | 8,000  |
| <b>M10</b> | 1,500 | 30,000 | 11,000 | 9,850       | 10,000 |
| <b>M12</b> | 1,750 | 38,000 | 14,000 | 11,830      | 12,000 |
| <b>M14</b> | 2,000 | 38,000 | 14,000 | 13,820      | 14,000 |
| <b>M18</b> | 2,500 | 45,000 | 18,000 | 17,790      | 18,000 |

## Filiere

### Filiere per filettatura metrica ISO

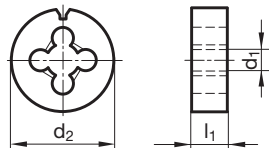


Catalogo n° 73413



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | • |   |   |

- esecuzione lappata per metalli NE
- lavorazione generale



| d1           | P     | d2     | l1     | Workpiece Ø | Codice |
|--------------|-------|--------|--------|-------------|--------|
|              | mm    | mm     | mm     | mm          |        |
| <b>M 2,5</b> | 0,450 | 16,000 | 5,000  | 2,430       | 2,500  |
| <b>M 3</b>   | 0,500 | 20,000 | 5,000  | 2,920       | 3,020  |
| <b>M 4</b>   | 0,700 | 20,000 | 5,000  | 3,910       | 4,020  |
| <b>M 5</b>   | 0,800 | 20,000 | 7,000  | 4,900       | 5,000  |
| <b>M 6</b>   | 1,000 | 20,000 | 7,000  | 5,880       | 6,000  |
| <b>M 8</b>   | 1,250 | 25,000 | 9,000  | 7,870       | 8,000  |
| <b>M10</b>   | 1,500 | 30,000 | 11,000 | 9,850       | 10,000 |
| <b>M12</b>   | 1,750 | 38,000 | 14,000 | 11,830      | 12,000 |
| <b>M14</b>   | 2,000 | 38,000 | 14,000 | 13,820      | 14,000 |
| <b>M16</b>   | 2,000 | 45,000 | 18,000 | 15,820      | 16,000 |
| <b>M20</b>   | 2,500 | 45,000 | 18,000 | 19,790      | 20,000 |







UTENSILI A FRESARE

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**SUPER F-UT**

## CODICI ISO



|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata

## LEGENDA DEI PITTOGRAMMI



|                         |   |
|-------------------------|---|
| MATERIALE TAGLIANTE     | <b>VHM</b>  |
|                         | Int. in metallo duro  |
| TRATT. DI SUPERFICIE    | luci-do    AlTiN nano    TiAl-SiN    TiAlN    Al-TiN+               |
| TOLLERANZA SUL Ø        | h10    e8   |
| CONDIZIONI DI FRESATURA | <b>HPC</b>  |
| DIREZIONE DI TAGLIO     | <b>R</b>  |
|                         | a destra  |
| FORMA DEL CODOLO        | HB    HA  |
| ANGOLI DELL'ELICA       |   |
| NORMA                   | DIN 6527L    DIN 6527K    WN  |
|                         | Norma di fabbrica   |
| TIPO                    | N    NX    N-F    N-3    N-5    Ti    H                             |
|                         | VA    VA-X    VA-X IK    VA-XF    VA-IK    AI    AL-F    AL-3    FS |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elic° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|--------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|--------------|---------------------|------------|-------|-------|-------------|--------|

### Frese SuperF-UT NX

|  |   |   |   |   |   |              |    |          |              |         |           |                |       |     |
|--|---|---|---|---|---|--------------|----|----------|--------------|---------|-----------|----------------|-------|-----|
|  | • | • | • | • | • | SuperF-UT NX | HA | 36/38/37 | Metallo duro | TiAlSiN | DIN 6527L | 4,000 - 20,000 | 54590 | 518 |
|  | • | • | • | • | • | SuperF-UT NX | HB | 36/38/37 | Metallo duro | TiAlSiN | DIN 6527L | 4,000 - 20,000 | 54591 | 519 |

### Frese SuperF-UT N

|  |   |   |   |   |   |               |    |          |              |       |               |                 |       |     |
|--|---|---|---|---|---|---------------|----|----------|--------------|-------|---------------|-----------------|-------|-----|
|  | • | • | • | • | • | SuperF-UT N   | HB | 35/38    | Metallo duro | TiAlN | DIN 6527K     | 6,000 - 20,000  | 64550 | 520 |
|  | • | • | • | • | • | SuperF-UT N   | HA | 35/38    | Metallo duro | TiAlN | DIN 6527L     | 4,000 - 20,000  | 54551 | 521 |
|  | • | • | • | • | • | SuperF-UT N   | HB | 35/38    | Metallo duro | TiAlN | DIN 6527L     | 4,000 - 25,000  | 64551 | 522 |
|  | • | • | • | • | • | SuperF-UT N   | HA | 35/38    | Metallo duro | TiAlN | Norma di fab. | 6,000 - 20,000  | 54562 | 523 |
|  | • | • | • | • | • | SuperF-UT N   | HB | 35/38    | Metallo duro | TiAlN | Norma di fab. | 6,000 - 20,000  | 54563 | 524 |
|  | • | • | • | • | • | SuperF-UT N   | HA | 35/38    | Metallo duro | TiAlN | Norma di fab. | 10,000 - 25,000 | 54552 | 525 |
|  | • | • | ○ | • | ○ | SuperF-UT N-F | HA | 30/32    | Metallo duro | TiAlN | DIN 6527L     | 6,000 - 25,000  | 54566 | 526 |
|  | • | • | ○ | • | ○ | SuperF-UT N-F | HB | 30/32    | Metallo duro | TiAlN | DIN 6527L     | 6,000 - 25,000  | 54567 | 527 |
|  | • | ○ | • | ○ | • | SuperF-UT N-3 | HA | 41/43/45 | Metallo duro | TiAlN | Norma di fab. | 3,000 - 20,000  | 54564 | 528 |
|  | • | ○ | • | ○ | • | SuperF-UT N-3 | HB | 41/43/45 | Metallo duro | TiAlN | Norma di fab. | 3,000 - 20,000  | 54565 | 529 |
|  | • | • | • | • | • | SuperF-UT N-5 | HA | 45       | Metallo duro | TiAlN | Norma di fab. | 4,000 - 20,000  | 54579 | 530 |
|  | • | • | • | • | • | SuperF-UT N-5 | HB | 45       | Metallo duro | TiAlN | Norma di fab. | 4,000 - 20,000  | 54580 | 531 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

### Frese SuperF-UT FS

|  |   |   |   |   |   |   |              |    |          |              |       |               |                |       |     |
|--|---|---|---|---|---|---|--------------|----|----------|--------------|-------|---------------|----------------|-------|-----|
|  | • | • | • | • | • | • | SuperF-UT FS | HA | 44/45/46 | Metallo duro | TiAlN | Norma di fab. | 8,000 - 25,000 | 64558 | 552 |
|  | • | • | • | • | • | • | SuperF-UT FS | HB | 44/45/46 | Metallo duro | TiAlN | Norma di fab. | 8,000 - 25,000 | 64559 | 553 |

### Frese SuperF-UT Ti

|  |   |   |   |   |   |   |              |    |       |              |        |           |                |       |     |
|--|---|---|---|---|---|---|--------------|----|-------|--------------|--------|-----------|----------------|-------|-----|
|  | • | • | ○ | • | • | • | SuperF-UT Ti | HA | 35/38 | Metallo duro | AlTiN+ | DIN 6527L | 6,000 - 20,000 | 54560 | 532 |
|  | • | • | ○ | • | • | • | SuperF-UT Ti | HB | 35/38 | Metallo duro | AlTiN+ | DIN 6527L | 6,000 - 20,000 | 54561 | 533 |

### Frese SuperF-UT H

|  |   |   |   |   |   |   |             |    |       |              |         |           |                |       |     |
|--|---|---|---|---|---|---|-------------|----|-------|--------------|---------|-----------|----------------|-------|-----|
|  | • | • | • | • | • | • | SuperF-UT H | HA | 40/42 | Metallo duro | TiAlSiN | DIN 6527L | 6,000 - 20,000 | 54572 | 550 |
|  | • | • | • | • | • | • | SuperF-UT H | HB | 40/42 | Metallo duro | TiAlSiN | DIN 6527L | 6,000 - 20,000 | 54573 | 551 |

### Frese VA-X Super-UT

|  |   |   |   |   |   |   |                   |    |       |              |            |           |                |       |     |
|--|---|---|---|---|---|---|-------------------|----|-------|--------------|------------|-----------|----------------|-------|-----|
|  | • | • | • | • | • | • | SuperF-UT VA-X    | HB | 36/38 | Metallo duro | AlTiN nano | DIN 6527K | 4,000 - 20,000 | 54576 | 534 |
|  | • | • | • | • | • | • | SuperF-UT VA-X    | HA | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 3,000 - 25,000 | 54558 | 535 |
|  | • | • | • | • | • | • | SuperF-UT VA-X    | HB | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 3,000 - 25,000 | 54559 | 536 |
|  | • | • | • | • | • | • | SuperF-UT VA-X IK | HA | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 6,000 - 25,000 | 54574 | 537 |
|  | • | • | • | • | • | • | SuperF-UT VA-X IK | HB | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 6,000 - 25,000 | 54575 | 538 |
|  | • | • | • | • | • | • | SuperF-UT VA-XF   | HA | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 6,000 - 25,000 | 54568 | 539 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

## Frese VA-X Super-UT

|  |  |  |  |  |  |                 |    |       |              |            |           |                |       |     |
|--|--|--|--|--|--|-----------------|----|-------|--------------|------------|-----------|----------------|-------|-----|
|  |  |  |  |  |  | SuperF-UT VA-XF | HB | 36/38 | Metallo duro | AlTiN nano | DIN 6527L | 6,000 - 25,000 | 54569 | 540 |
|  |  |  |  |  |  | SuperF-UT S     | HA | 40/42 | Metallo duro | AlTiN nano | DIN 6527L | 4,000 - 20,000 | 54556 | 541 |
|  |  |  |  |  |  | SuperF-UT VA    | HB | 40/42 | Metallo duro | TiAlN      | DIN 6527L | 4,000 - 20,000 | 64557 | 542 |
|  |  |  |  |  |  | SuperF-UT VA-IK | HB | 40/42 | Metallo duro | TiAlN      | DIN 6527L | 6,000 - 20,000 | 64567 | 543 |

## Frese SuperF-UT Alluminio

|  |  |  |  |  |  |                |    |          |              |        |               |                |       |     |
|--|--|--|--|--|--|----------------|----|----------|--------------|--------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | SuperF-UT Al   | HA | 40/42    | Metallo duro | lucido | DIN 6527L     | 4,000 - 20,000 | 74554 | 544 |
|  |  |  |  |  |  | SuperF-UT Al   | HB | 40/42    | Metallo duro | lucido | DIN 6527L     | 4,000 - 20,000 | 74555 | 545 |
|  |  |  |  |  |  | SuperF-UT Al-F | HA | 29/30/31 | Metallo duro | lucido | Norma di fab. | 6,000 - 25,000 | 54570 | 546 |
|  |  |  |  |  |  | SuperF-UT Al-F | HB | 29/30/31 | Metallo duro | lucido | Norma di fab. | 6,000 - 25,000 | 54571 | 547 |
|  |  |  |  |  |  | SuperF-UT Al-3 | HA | 39/40/41 | Metallo duro | lucido | Norma di fab. | 3,000 - 20,000 | 74552 | 548 |
|  |  |  |  |  |  | SuperF-UT Al-3 | HB | 39/40/41 | Metallo duro | lucido | Norma di fab. | 3,000 - 20,000 | 74553 | 549 |

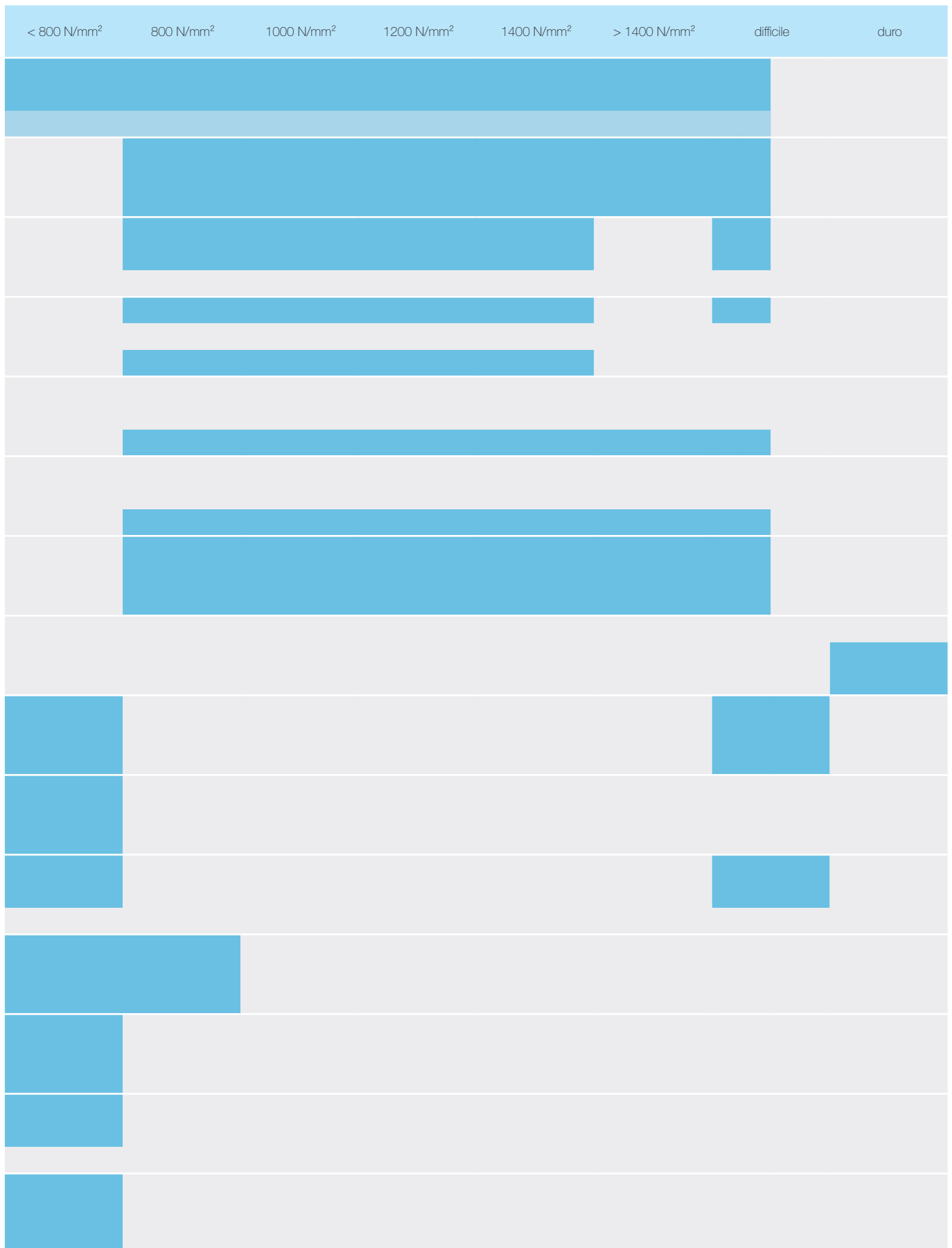
# Applicazione

Per materiale

| Tipo              | Catalogo n°  | Applicazione    | metalli non ferrosi,<br>alluminio | acciaio     | ghise | acciaio inossidabile<br>resistente e acido | nicel,<br>leghe di titanio | acciai<br>temprati |  |
|-------------------|--|-----------------|-----------------------------------|-------------|-------|--|----------------------------|--------------------|--|
| SuperF-UT NX      | 54590<br>54591                                     | per cave        |                                   | ottimale    |       |  |                            |                    |  |
|                   |  | per sgrossatura |                                   | ottimale    |       |  |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  |                            |                    |  |
| SuperF-UT N       | 64550<br>54551<br>64551<br>54562<br>54563<br>54552 | per cave        |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per cave        |                                   | adatto bene |       |  | ottimale                   |                    |  |
| SuperF-UT N-F     | 54566<br>54567                                     | per sgrossatura |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per cave        |                                   | adatto bene |       |  | ottimale                   |                    |  |
| SuperF-UT N-3     | 54564<br>54565                                     | per cave        |                                   | ottimale    |       |  |                            |                    |  |
|                   |  | per sgrossatura |                                   | ottimale    |       |  |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  |                            |                    |  |
| SuperF-UT N-5     | 54579<br>54580                                     | per cave        |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  |                            |                    |  |
| SuperF-UT FS      | 64558<br>64559                                     | per cave        |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  |                            |                    |  |
| SuperF-UT Ti      | 54560<br>54561                                     | per cave        |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       |  | ottimale                   |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  | ottimale                   |                    |  |
| SuperF-UT H       | 54572<br>54573                                     | per cave        |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       |  |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       |  |                            |                    |  |
| SuperF-UT VA-X    | 54576<br>54558<br>54559                            | per cave        |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
| SuperF-UT VA-X IK | 54574<br>54575                                     | per cave        |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
| SuperF-UT VA-XF   | 54568<br>54569                                     | per cave        |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
| SuperF-UT VA      | 54556<br>64557<br>64567                            | per cave        |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per sgrossatura |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
|                   |  | per finitura    |                                   | adatto bene |       | adatto bene                                |                            |                    |  |
| SuperF-UT AI-3    | 74552<br>74553                                     | per cave        | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per sgrossatura | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per finitura    | adatto bene                       |             |       |  |                            |                    |  |
| SuperF-UT AI-F    | 54570<br>54571                                     | per cave        | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per sgrossatura | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per finitura    | adatto bene                       |             |       |  |                            |                    |  |
| SuperF-UT AI      | 74554<br>74555                                     | per cave        | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per sgrossatura | adatto bene                       |             |       |  |                            |                    |  |
|                   |  | per finitura    | adatto bene                       |             |       |  |                            |                    |  |

ottimale    adatto bene

## Per resistenza alla trazione



# Raccomandazioni generali

Le frese F-UT STOCK sono state progettate per applicazioni sotto condizioni ottimali di lavorazione, esempi:

- alte prestazioni
- sufficiente refrigerazione
- pezzo e serraggio rigido

Nel caso in cui non ci sono sufficienti condizioni di lavorazione, noi raccomandiamo l'utilizzo della Super F-UT con il nuovo profilo di sgrossatura e finitura, esempio N-F e VA-XF.

Per lavorare gli acciai (di solito si usa la Super F-UT tipo N) con una fresa raggiata noi raccomandiamo la Super F-UT Ti, n° catalogo 54560 o 54561.

Noi raccomandiamo anche la fresatura sincronizzata.

## Foratura:

- ridurre l'avanzamento  $v_f$  (mm/min.)
- con profondità di foro  $> 0.5 \times D$  o per passare a lavorazione radiale bisogna anche scaricare

**Attenzione:** pericolo di rottura con repentino aumento di carico!

## Lavorazione a tuffo inclinata fino a 15° (da preferire):

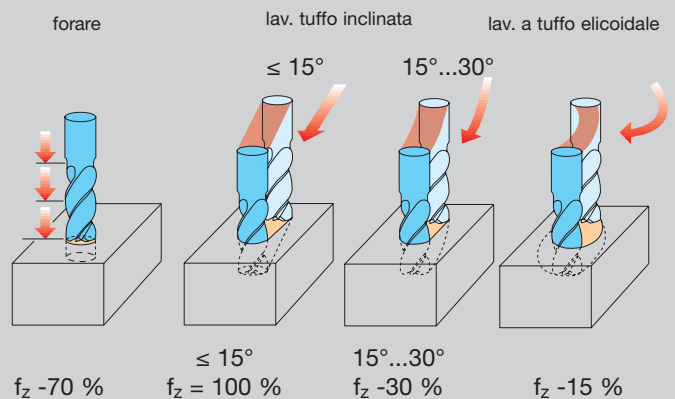
- l'avanzamento  $v_f$  (mm/min.) può anche non essere ridotto

## Lavorazione a tuffo inclinata da 15° a 30°:

- ridurre l'avanzamento  $v_f$  (mm/min.) in base al grafico qui a lato

## Lavorazione a tuffo per interpolazione:

- per lavorare ad interpolazione/a tuffo elicoidale consigliamo un incremento radiale da 0.1 to 0.2 per giro
- ridurre l'avanzamento  $v_f$  (mm/min.) in base al grafico qui a lato
- scegliere preferibilmente un diametro del foro di  $1.8 \times D$



## Formule:

Rivoluzione per min .  $n$  [min<sup>-1</sup>]

$$n = \frac{v_c \cdot 1000}{\pi \cdot D}$$

Avanzamento per min .  $v_f$  [mm/min]

$$v_f = f_z \cdot n \cdot Z_c$$

$f_z$  = avanzamento per dente [mm/Z]

$Z_c$  = no efficace . di denti

$D$  = diametro utensile [mm]

Volume Chip  $Q$  [mm<sup>3</sup>/min]

$$Q = \frac{a_p \cdot a_e \cdot v_f}{1000}$$

Coppia  $M_c$  [Nm]

$$M_c = \frac{P_c \cdot 30 \cdot 10^3}{\pi \cdot n}$$

$P_c$  = forza di taglio [kW]

$v_c$  = velocità di taglio [m/min]

$a_p$  = profondità di taglio [mm]

$a_e$  = larghezza di taglio [mm]

$\pi$  = Pi





## FRESA SUPER F-UT NX



### RAMPA

Angolo di rampa fino a 45°  
Ottima asportazione truciolo!

### FORATURA

Ottime caratteristiche di foratura da 2xD  
Non c'è più bisogno di utensili pilota!  
Ideale per i pre-fori di alesatura.

### CAVA

Alto avanzamento per lavorazioni a tuffo e case  
Elevata asportazione del truciolo e del diam.  
sottodimensionamento per cave di precisione  
Ottima ripetibilità garantita dallo smusso di rinforzato del tagliente.

### SGROSSATURA

Adatta anche per lavorazione su macchine meno rigide dato il basso assorbimento di potenza.  
Incremento della velocità di taglio fino al 100% per lavorazione di acciaio.  
Elevata asportazione del truciolo

### FINITURA

Profili con elevata qualità delle superfici  
Incremento vita utensili fino al 100%  
Elevati parametri di lavorazione anche per la lavorazione di acciai legati e bonificati

# Fresatura HPC

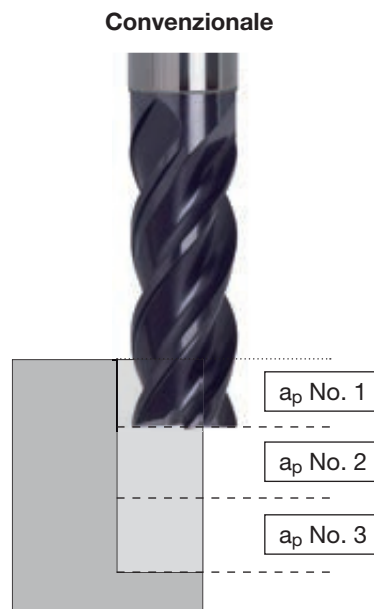
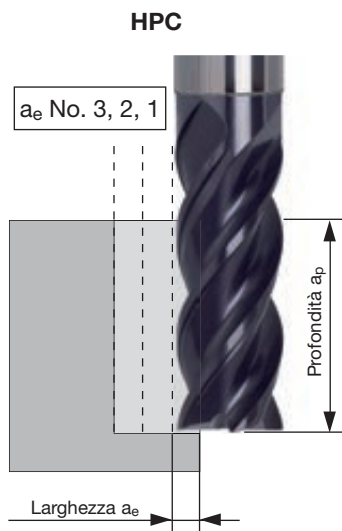
**High Performance Cutting (HPC)** è un processo di fresatura che aumenta avanzamento e velocità e generalmente opera su profondità di fresatura più vaste, rispetto ai soliti processi di fresatura.

**Pro:**

- Meno stress sull'utensile e sulla macchina, grazie alla minore larghezza di taglio
- Temperatura più bassa durante la fresatura
- Possibile utilizzo dell'intera lunghezza di taglio
- Vita utensile più duratura

**Contro:**

- Controllo dinamico della macchina utensile necessario per la fresatura di profili complessi



| ae   | fattore fz | fattore v <sub>c</sub> | Q in % |
|------|------------|------------------------|--------|
| 100% | 1,00       | 1,00                   | 100    |
| 50%  | 1,00       | 1,20                   | 59     |
| 40%  | 1,08       | 1,25                   | 54     |
| 30%  | 1,20       | 1,30                   | 45     |
| 20%  | 1,48       | 1,35                   | 39     |
| 10%  | 2,00       | 1,50                   | 27     |

**Osservazione:**

Le basi di tutti i parametri di taglio convertiti nella fresatura HPC sono quelli per la fresatura di cave con la SuperF-UT

**Esempio:**

Fresa: SuperF-UT N Ø12, Kat.-Nr. 54551  
 Materiale: 42CrMo4  
 Parametri di taglio „HPC Base“:  
 v<sub>c</sub> = 135 m/min  
 fz = 0,065 mm/Z

**Formola per utilizzo in HPC:**

Parametri di taglio HPC calcolati con ae al 10 % del diam:  
 v<sub>c</sub> = 135 m/min x 1,5 = 203 m/min  
 fz = 0,065 mm/Z x 2 = 0,13 mm/Z



# Fresa F-UT tipo HPC per fresatura universale



Condizioni stabili:  
 - buona refrigerazione  
 - potenza sufficiente  
 - scarico truciolo breve

Condizioni instabili:  
 - refrigerazione standard  
 - potenza media  
 - scarico trucioli da medio a lungo

| Tabella di conversione per fresatura HPC |            |            |        |
|--|------------|------------|--------|
| ae                                       | fattore fz | fattore Vc | Q in % |
| 100%                                     | 1,00       | 1,00       | 100    |
| 50%                                      | 1,00       | 1,20       | 59     |
| 40%                                      | 1,08       | 1,25       | 54     |
| 30%                                      | 1,20       | 1,30       | 45     |
| 20%                                      | 1,48       | 1,35       | 39     |
| 10%                                      | 2,00       | 1,50       | 27     |

| Materiali  | Durezza / Res. alla trazione   | RF 100 consiglia | Impiego              | Vc [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|------------------|----------------------|------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                  |                      |            | 3                        | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati</b><br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9  | fino a 850 N/mm <sup>2</sup>   | N                | condizioni stabili   | 180        | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                | N-F              | condizioni instabili | 180        | 0,013                    | 0,025 | 0,032 | 0,042 | 0,049 | 0,063 | 0,070 | 0,105 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20<br>1.0601 C60, 1.1221 C60E, 1.7043 38Cr4<br>1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7   | 850-1.200 N/mm <sup>2</sup>    | N                | condizioni stabili   | 160        | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                | N-F              | condizioni instabili | 160        | 0,013                    | 0,025 | 0,032 | 0,042 | 0,049 | 0,063 | 0,070 | 0,105 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035<br>41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6,<br>1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3<br>acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-1.400 N/mm <sup>2</sup>    | N                | condizioni stabili   | 135        | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                | N-F              | condizioni instabili | 135        | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>H Acciai temprati</b><br>Acciai per utensili, acciaio bonificato, acciaio per molle,<br>acciaio ad alta velocità, acciai temprati, etc.<br>Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2   | fino a 54 HRC                  | N                | condizioni stabili   | 70         | 0,012                    | 0,025 | 0,030 | 0,040 | 0,045 | 0,060 | 0,070 | 0,100 |
|  |                                | N-F              | condizioni instabili | 70         | 0,008                    | 0,018 | 0,021 | 0,028 | 0,032 | 0,042 | 0,049 | 0,070 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F  | fino a 750 N/mm <sup>2</sup>   | VA-X             | condizioni stabili   | 120        | 0,015                    | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,130 |
|  |                                | VA-XF            | condizioni instabili | 120        | 0,011                    | 0,021 | 0,028 | 0,035 | 0,042 | 0,049 | 0,063 | 0,091 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420   | 750-850 N/mm <sup>2</sup>      | VA-X             | condizioni stabili   | 80         | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                | VA-XF            | condizioni instabili | 80         | 0,011                    | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>M Acciai inossidabili</b><br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317  | oltre 850 N/mm <sup>2</sup>    | VA-X             | condizioni stabili   | 70         | 0,012                    | 0,025 | 0,030 | 0,040 | 0,045 | 0,060 | 0,070 | 0,100 |
|  |                                | VA-XF            | condizioni instabili | 70         | 0,008                    | 0,018 | 0,021 | 0,028 | 0,032 | 0,042 | 0,049 | 0,070 |
| <b>S Leghe speciali (a base Nikel "Ni")</b><br>Nimonic, Inconel, Monel, Hastelloy  | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 30         | 0,010                    | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,060 |
|  |                                | N-F              | condizioni instabili | 30         | 0,007                    | 0,011 | 0,014 | 0,018 | 0,021 | 0,028 | 0,035 | 0,042 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5   | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 60         | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                | N-F              | condizioni instabili | 60         | 0,011                    | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)  | fino a 240 HB 30               | N                | condizioni stabili   | 160        | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|  |                                | N-F              | condizioni instabili | 160        | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)  | oltre 240 HB 30                | N                | condizioni stabili   | 140        | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                | N-F              | condizioni instabili | 140        | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Alluminio, leghe alu per lav. plastiche, leghe di alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5   | fino a 3% Si                   | Al               | condizioni stabili   | 500        | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|  |                                | Al-F             | condizioni instabili | 500        | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg   | oltre 3% Si                    | Al               | stabile Verhältnisse | 230        | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                | Al-F             | condizioni instabili | 230        | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Leghe di magnesio</b><br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3  | -                              | Al               | condizioni stabili   | 180        | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                | Al-F             | condizioni instabili | 180        | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo)</b><br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPB, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPB, 2.1170 CuPb5Sn5,<br>2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10                | fino a 850 N/mm <sup>2</sup>   | Al               | condizioni stabili   | 250        | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                | Al-F             | condizioni instabili | 250        | 0,011                    | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |



$$a_p = 1 \times D - 3 \times D$$

$$a_e = 0,1 \times D - 0,5 \times D$$

# Fresa F-UT tipo NX per fresatura universale



Raffreddamento periferico raccomandato per un'ottimale evacuazione del truciolo e durata utensile maggiore.

## TUFFO E CAVA

| Materiali  | Durezza / Res. alla trazione   | Prof.cava (ap max.) | Cava max. angolo in ° | Vel. taglio v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|---------------------|-----------------------|------------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                     |                       |                                    | 4                        | 6     | 8     | 10    | 12    | 14    | 16    | 20    |
| <b>P Acc. da costruzione, automatici bonifica e cementaz no legati</b><br>1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6             | fino a 850 N/mm <sup>2</sup>   | 1xD                 | 45°                   | 270                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,050 | 0,055 | 0,060 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 | 850-1.200 N/mm <sup>2</sup>    | 1xD                 | 45°                   | 240                                | 0,010                    | 0,015 | 0,020 | 0,030 | 0,035 | 0,040 | 0,045 | 0,050 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 | 850-1.400 N/mm <sup>2</sup>    | 1xD                 | 30°                   | 200                                | 0,007                    | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,035 | 0,040 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9   | fino a 750 N/mm <sup>2</sup>   | 1xD                 | 10°                   | 60                                 | 0,007                    | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,035 | 0,040 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2  | 750-950 N/mm <sup>2</sup>      | 0,5xD               | 5°                    | 50                                 | 0,005                    | 0,008 | 0,012 | 0,018 | 0,023 | 0,026 | 0,030 | 0,035 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4                                  | fino a 1.300 N/mm <sup>2</sup> | 0,5xD               | 10°                   | 45                                 | 0,005                    | 0,008 | 0,012 | 0,018 | 0,023 | 0,026 | 0,030 | 0,035 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)                 | oltre 240 HB                   | 1xD                 | 45°                   | 150                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,050 | 0,055 | 0,060 |
| <b>N Alluminio, leghe Alu per lav.plastiche, leghe Alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si            | fino a 3% Si                   | 1xD                 | 30°                   | 180                                | 0,010                    | 0,015 | 0,020 | 0,030 | 0,035 | 0,040 | 0,045 | 0,050 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9   | oltre 3% Si                    | 1xD                 | 45°                   | 140                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,050 | 0,055 | 0,060 |

## CAVE

| Materiali  | Durezza / Res. alla trazione   | Prof. taglio (ap max.) | Larg. taglio (ae max.) | Vel. taglio v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|------------------------|------------------------|------------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                        |                        |                                    | 4                        | 6     | 8     | 10    | 12    | 14    | 16    | 20    |
| <b>P Acc. da costruzione, automatici bonifica e cementaz no legati</b><br>1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6             | fino a 850 N/mm <sup>2</sup>   | 1xD                    | 1xD                    | 270                                | 0,015                    | 0,025 | 0,035 | 0,050 | 0,055 | 0,060 | 0,080 | 0,100 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 | 850-1.200 N/mm <sup>2</sup>    | 1xD                    | 1xD                    | 240                                | 0,015                    | 0,025 | 0,035 | 0,050 | 0,055 | 0,060 | 0,080 | 0,100 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 | 850-1.400 N/mm <sup>2</sup>    | 1xD                    | 1xD                    | 200                                | 0,015                    | 0,025 | 0,030 | 0,045 | 0,050 | 0,055 | 0,070 | 0,085 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9   | fino a 750 N/mm <sup>2</sup>   | 1xD                    | 1xD                    | 120                                | 0,015                    | 0,020 | 0,030 | 0,045 | 0,055 | 0,060 | 0,065 | 0,075 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2  | 750-950 N/mm <sup>2</sup>      | 1xD                    | 1xD                    | 80                                 | 0,015                    | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4                                  | fino a 1.300 N/mm <sup>2</sup> | 1xD                    | 1xD                    | 60                                 | 0,015                    | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)                 | oltre 240 HB                   | 1xD                    | 1xD                    | 160                                | 0,015                    | 0,025 | 0,035 | 0,050 | 0,055 | 0,060 | 0,080 | 0,100 |
| <b>N Alluminio, leghe Alu per lav.plastiche, leghe Alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si            | fino a 3% Si                   | 1xD                    | 1xD                    | 500                                | 0,025                    | 0,030 | 0,040 | 0,065 | 0,080 | 0,085 | 0,095 | 0,110 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9   | oltre 3% Si                    | 1xD                    | 1xD                    | 340                                | 0,015                    | 0,020 | 0,030 | 0,055 | 0,065 | 0,070 | 0,080 | 0,100 |

\* per lavorazioni HSC la vel. di taglio può essere aumentata del 50%, l'avanzamento può essere ridotto in base tutte richieste della superficie.  
\*\* per fresatura trocoidale e imachining con ae = 0.1-0.2xd la Vel. taglio e l'avanzamento possono essere aumentati del 50 %.

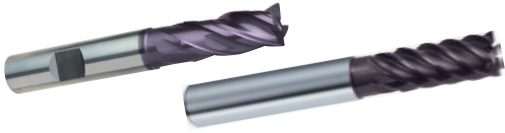
## HPC-SGROSSATURA E HSC-FINITURA

| Materiali  | Durezza / Res. alla trazione   | Prof. taglio (ap max.) | Larg. taglio (ae max.) | Vel. taglio v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|------------------------|------------------------|------------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                        |                        |                                    | 4                        | 6     | 8     | 10    | 12    | 14    | 16    | 20    |
| <b>P Acc. da costruzione, automatici bonifica e cementaz no legati</b><br>1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6             | fino a 850 N/mm <sup>2</sup>   | 2xD                    | 0.4xD                  | 350                                | 0,020                    | 0,030 | 0,045 | 0,060 | 0,075 | 0,080 | 0,090 | 0,110 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 | 850-1.200 N/mm <sup>2</sup>    | 2xD                    | 0.4xD                  | 290                                | 0,020                    | 0,030 | 0,045 | 0,060 | 0,075 | 0,080 | 0,090 | 0,110 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 | 850-1.400 N/mm <sup>2</sup>    | 2xD                    | 0.3xD                  | 240                                | 0,015                    | 0,025 | 0,030 | 0,050 | 0,065 | 0,075 | 0,085 | 0,100 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9   | fino a 750 N/mm <sup>2</sup>   | 2xD                    | 0.3xD                  | 140                                | 0,020                    | 0,025 | 0,035 | 0,055 | 0,065 | 0,070 | 0,080 | 0,090 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2  | 750-950 N/mm <sup>2</sup>      | 2xD                    | 0.25xD                 | 120                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,065 | 0,075 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4                                  | fino a 1.300 N/mm <sup>2</sup> | 2xD                    | 0.4xD                  | 120                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,065 | 0,075 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)                 | oltre 240 HB                   | 2xD                    | 0.4xD                  | 180                                | 0,020                    | 0,030 | 0,045 | 0,060 | 0,075 | 0,080 | 0,090 | 0,110 |
| <b>N Alluminio, leghe Alu per lav.plastiche, leghe Alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si            | fino a 3% Si                   | 2xD                    | 0.5xD                  | 600                                | 0,025                    | 0,040 | 0,060 | 0,080 | 0,100 | 0,110 | 0,120 | 0,150 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9   | oltre 3% Si                    | 2xD                    | 0.4xD                  | 420                                | 0,020                    | 0,030 | 0,045 | 0,060 | 0,075 | 0,080 | 0,090 | 0,110 |

## FORATURA

| Materiali  | Durezza / Res. alla trazione | Prof. foratura (ap max.) | entstpanen ab 1xD | Vel. taglio v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|------------------------------|--------------------------|-------------------|------------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                              |                          |                   |                                    | 4                        | 6     | 8     | 10    | 12    | 14    | 16    | 20    |
| <b>P Acc. da costruzione, automatici bonifica e cementaz no legati</b><br>1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6             | fino a 850 N/mm <sup>2</sup> | 2xD                      | Ja                | 270                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,045 | 0,050 | 0,060 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 | 850-1.200 N/mm <sup>2</sup>  | 2xD                      | Ja                | 240                                | 0,010                    | 0,015 | 0,020 | 0,035 | 0,040 | 0,040 | 0,045 | 0,050 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 | 850-1.400 N/mm <sup>2</sup>  | 1xD                      | -                 | 200                                | 0,005                    | 0,010 | 0,015 | 0,025 | 0,030 | 0,030 | 0,035 | 0,040 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)                 | oltre 240 HB                 | 2xD                      | Ja                | 150                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,045 | 0,050 | 0,060 |
| <b>N Alluminio, leghe Alu per lav.plastiche, leghe Alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si            | fino a 3% Si                 | 1xD                      | -                 | 180                                | 0,010                    | 0,015 | 0,020 | 0,035 | 0,040 | 0,040 | 0,045 | 0,050 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9   | oltre 3% Si                  | 1xD                      | -                 | 140                                | 0,015                    | 0,020 | 0,030 | 0,040 | 0,045 | 0,045 | 0,050 | 0,060 |

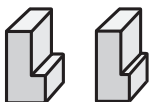
# F-UT Frese di finitura / Frese di superfinitura



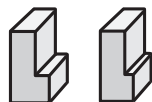
Condizioni stabili:  
 - buona refrigerazione  
 - potenza sufficiente  
 - scarico truciolo breve

\* Frese #54207, #54227 per super finitura in acciai temprati > 54 HRC

| Materiali  | Durezza / Res. alla trazione   | RF 100 consiglia-ta | Impiego              | v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|---------------------|----------------------|------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                     |                      |                        | 3                        | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati</b><br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9  | fino a 850 N/mm <sup>2</sup>   | N / FS              | condizioni stabili   | 280                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20<br>1.0601 C60, 1.1221 C60E, 1.7043 38Cr4<br>1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7   | 850-1.200 N/mm <sup>2</sup>    | N / FS              | condizioni stabili   | 220                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3<br>acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-1.400 N/mm <sup>2</sup>    | N / FS              | condizioni stabili   | 200                    | 0,015                    | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,130 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>H Acciai temprati</b><br>Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc.<br>Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2  | fino a 54 HRC                  | N / FS              | condizioni stabili   | 150                    | 0,015                    | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,130 |
|  |                                |                     | - / H*               | condizioni instabili   | 110                      | 0,007 | 0,017 | 0,024 | 0,030 | 0,036 | 0,045 | 0,057 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F  | fino a 750 N/mm <sup>2</sup>   | VA-X / FS           | condizioni stabili   | 180                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>M Acciai inossidabili</b><br>1.4301 X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420  | 750-850 N/mm <sup>2</sup>      | VA-X / FS           | condizioni stabili   | 140                    | 0,015                    | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,130 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>M Acciai inossidabili</b><br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317  | oltre 850 N/mm <sup>2</sup>    | VA-X / FS           | condizioni stabili   | 120                    | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>S Leghe speciali (a base Nikel "Ni")</b><br>Nimonic, Inconel, Monel, Hastelloy  | fino a 1.300 N/mm <sup>2</sup> | N / FS              | condizioni stabili   | 45                     | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5   | fino a 1.300 N/mm <sup>2</sup> | N / FS              | condizioni stabili   | 130                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)  | fino a 240 HB 30               | N / FS              | condizioni stabili   | 220                    | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)  | oltre 240 HB 30                | N / FS              | condizioni stabili   | 200                    | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>N Alluminio, leghe alu per lav. plastiche, leghe di alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5   | fino a 3% Si                   | Al / FS             | condizioni stabili   | 1000                   | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg   | oltre 3% Si                    | Al / FS             | condizioni stabili   | 350                    | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>N Leghe di magnesio</b><br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3  | -                              | Al / FS             | condizioni stabili   | 280                    | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |
| <b>N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo)</b><br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5,<br>2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10          | fino a 850 N/mm <sup>2</sup>   | N / FS              | condizioni stabili   | 400                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                     | condizioni instabili | -                      |                          |       |       |       |       |       |       |       |

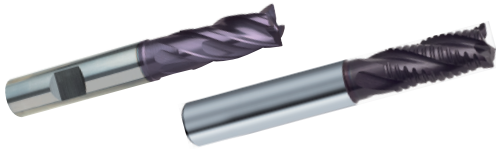


Frese di finitura:  
 $a_p = 1 \times D - 2 \times D$   
 $a_e = 0,1 \times D - 0,3 \times D$



Frese di superfinitura:  
 $a_p = 1 \times D - 3 \times D$   
 $a_e = 0,05 \times D - 0,1 \times D$

# F-UT Frese di sgrossatura



Condizioni stabili:  
 - buona refrigerazione  
 - potenza sufficiente  
 - scarico truciolo breve

Condizioni instabili:  
 - refrigerazione standard  
 - potenza media  
 - scarico trucioli da medio a lungo

| Materiali   | Durezza / Res. alla trazione   | RF 100 consiglia | Impiego              | v <sub>c</sub> [m/min] | fz [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|---|--------------------------------|------------------|----------------------|------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|   |                                |                  |                      |                        | 3                        | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati</b><br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9                                       | fino a 850 N/mm <sup>2</sup>   | N                | condizioni stabili   | 200                    | 0,020                    | 0,040 | 0,055 | 0,070 | 0,085 | 0,100 | 0,120 | 0,170 |
|   |                                | N-F              | condizioni instabili | 200                    | 0,014                    | 0,028 | 0,039 | 0,049 | 0,060 | 0,070 | 0,084 | 0,119 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20<br>1.0601 C60, 1.1221 C60E, 1.7043 38Cr4<br>1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7  | 850-1.200 N/mm <sup>2</sup>    | N                | condizioni stabili   | 180                    | 0,020                    | 0,040 | 0,055 | 0,070 | 0,085 | 0,100 | 0,120 | 0,170 |
|   |                                | N-F              | condizioni instabili | 180                    | 0,014                    | 0,028 | 0,039 | 0,049 | 0,060 | 0,070 | 0,084 | 0,119 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-1.400 N/mm <sup>2</sup>    | N                | condizioni stabili   | 160                    | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|   |                                | N-F              | condizioni instabili | 160                    | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>H Acciai temprati</b><br>Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc.<br>Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2   | fino a 54 HRC                  | N                | condizioni stabili   | 110                    | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|   |                                | N-F              | condizioni instabili | 110                    | 0,011                    | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F   | fino a 750 N/mm <sup>2</sup>   | VA-X             | condizioni stabili   | 140                    | 0,018                    | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|   |                                | VA-XF            | condizioni instabili | 140                    | 0,013                    | 0,025 | 0,032 | 0,042 | 0,049 | 0,063 | 0,070 | 0,105 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420  | 750-850 N/mm <sup>2</sup>      | VA-X             | condizioni stabili   | 120                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|   |                                | VA-XF            | condizioni instabili | 120                    | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>M Acciai inossidabili</b><br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317   | oltre 850 N/mm <sup>2</sup>    | VA-X             | condizioni stabili   | 100                    | 0,015                    | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|   |                                | VA-XF            | condizioni instabili | 100                    | 0,011                    | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>S Leghe speciali (a base Nikel "Ni")</b><br>Nimonic, Inconel, Monel, Hastelloy   | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 35                     | 0,010                    | 0,020 | 0,030 | 0,035 | 0,040 | 0,055 | 0,065 | 0,080 |
|   |                                | N-F              | condizioni instabili | 35                     | 0,007                    | 0,014 | 0,021 | 0,025 | 0,028 | 0,039 | 0,046 | 0,056 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5  | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 90                     | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|   |                                | N-F              | condizioni instabili | 90                     | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)   | fino a 240 HB 30               | N                | condizioni stabili   | 180                    | 0,020                    | 0,040 | 0,055 | 0,070 | 0,085 | 0,100 | 0,120 | 0,170 |
|   |                                | N-F              | condizioni instabili | 180                    | 0,014                    | 0,028 | 0,039 | 0,049 | 0,060 | 0,070 | 0,084 | 0,119 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)   | oltre 240 HB 30                | N                | condizioni stabili   | 160                    | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|   |                                | N-F              | condizioni instabili | 160                    | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>N Alluminio, leghe alu per lav. plastiche, leghe di alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5  | fino a 3% Si                   | Al               | condizioni stabili   | 600                    | 0,020                    | 0,040 | 0,055 | 0,070 | 0,085 | 0,100 | 0,120 | 0,170 |
|   |                                | Al-F             | condizioni instabili | 600                    | 0,014                    | 0,028 | 0,039 | 0,049 | 0,060 | 0,070 | 0,084 | 0,119 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg  | oltre 3% Si                    | Al               | condizioni stabili   | 280                    | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|   |                                | Al-F             | condizioni instabili | 280                    | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>N Leghe di magnesio</b><br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3   | -                              | Al               | condizioni stabili   | 220                    | 0,020                    | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|   |                                | Al-F             | condizioni instabili | 220                    | 0,014                    | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo)</b><br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5,<br>2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10       | fino a 850 N/mm <sup>2</sup>   | Al               | condizioni stabili   | 300                    | 0,016                    | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|   |                                | Al-F             | condizioni instabili | 300                    | 0,011                    | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |



$$a_p \leq 1 \times D \quad a_p = 1 \times D - 2 \times D$$

$$a_e = 0,5 - 0,9 \times D \quad f_z = 70\%$$

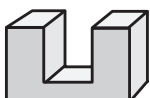
# F-UT Frese per cave



Condizioni stabili:  
 - buona refrigerazione  
 - potenza sufficiente  
 - scarico truciolo breve

Condizioni instabili:  
 - refrigerazione standard  
 - potenza media  
 - scarico trucioli da medio a lungo

| Materiali  | Durezza / Res. alla trazione   | RF 100 consiglia | Impiego              | v <sub>c</sub> [m/min] | z [mm/z] con Ø nominale |       |       |       |       |       |       |       |
|--|--------------------------------|------------------|----------------------|------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|
|  |                                |                  |                      |                        | 3                       | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati</b><br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3<br>acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | fino a 850 N/mm <sup>2</sup>   | N-3              | condizioni stabili   | 180                    | 0,018                   | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                  | condizioni instabili | 180                    | 0,013                   | 0,025 | 0,032 | 0,042 | 0,049 | 0,063 | 0,070 | 0,105 |
| <b>P Acciai automatici, acc. da cementazione legati, acc. nitrurati</b><br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20<br>1.0601 C60, 1.1221 C60E, 1.7043 38Cr4<br>1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7   | 850-1.200 N/mm <sup>2</sup>    | N-3              | condizioni stabili   | 160                    | 0,018                   | 0,035 | 0,045 | 0,060 | 0,070 | 0,090 | 0,100 | 0,150 |
|  |                                |                  | condizioni instabili | 160                    | 0,013                   | 0,025 | 0,032 | 0,042 | 0,049 | 0,063 | 0,070 | 0,105 |
| <b>P Acciai da bonifica legati, acc. utensili ed acc. super rapidi</b><br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3<br>acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4                           | 850-1.400 N/mm <sup>2</sup>    | N-3              | condizioni stabili   | 135                    | 0,016                   | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                  | condizioni instabili | 135                    | 0,011                   | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>H Acciai temprati</b><br>Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc.<br>Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2  | fino a 54 HRC                  | N-3              | condizioni stabili   | 70                     | 0,012                   | 0,025 | 0,030 | 0,040 | 0,045 | 0,060 | 0,070 | 0,100 |
|  |                                |                  | condizioni instabili | 70                     | 0,008                   | 0,018 | 0,021 | 0,028 | 0,032 | 0,042 | 0,049 | 0,070 |
| <b>M Acciai inossidabili</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F  | fino a 750 N/mm <sup>2</sup>   | VA-X             | condizioni stabili   | 120                    | 0,015                   | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,130 |
|  |                                |                  | condizioni instabili | 120                    | 0,011                   | 0,021 | 0,028 | 0,035 | 0,042 | 0,049 | 0,063 | 0,091 |
| <b>M Acciai inossidabili</b><br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420   | 750-850 N/mm <sup>2</sup>      | VA-X             | condizioni stabili   | 80                     | 0,015                   | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                |                  | condizioni instabili | 80                     | 0,011                   | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>M Acciai inossidabili</b><br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317  | oltre 850 N/mm <sup>2</sup>    | VA-X             | condizioni stabili   | 70                     | 0,012                   | 0,025 | 0,030 | 0,040 | 0,045 | 0,060 | 0,070 | 0,100 |
|  |                                |                  | condizioni instabili | 70                     | 0,008                   | 0,018 | 0,021 | 0,028 | 0,032 | 0,042 | 0,049 | 0,070 |
| <b>S Leghe speciali (a base Nikel "Ni")</b><br>Nimonic, Inconel, Monel, Hastelloy  | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 30                     | 0,010                   | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,060 |
|  |                                |                  | condizioni instabili | 30                     | 0,007                   | 0,011 | 0,014 | 0,018 | 0,021 | 0,028 | 0,035 | 0,042 |
| <b>Ti Leghe di titanio ("Ti")</b><br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5   | fino a 1.300 N/mm <sup>2</sup> | Ti               | condizioni stabili   | 60                     | 0,015                   | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                |                  | condizioni instabili | 60                     | 0,011                   | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)  | fino a 240 HB 30               | N                | condizioni stabili   | 160                    | 0,020                   | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|  |                                |                  | condizioni instabili | 160                    | 0,014                   | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale</b><br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)  | oltre 240 HB 30                | N                | condizioni stabili   | 140                    | 0,016                   | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                  | condizioni instabili | 140                    | 0,011                   | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Alluminio, leghe alu per lav. plastiche, leghe di alu</b><br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5   | fino a 3% Si                   | Al-3             | condizioni stabili   | 500                    | 0,020                   | 0,040 | 0,050 | 0,065 | 0,080 | 0,095 | 0,110 | 0,160 |
|  |                                |                  | condizioni instabili | 500                    | 0,014                   | 0,028 | 0,035 | 0,046 | 0,056 | 0,067 | 0,077 | 0,112 |
| <b>N Leghe alu-ghisa</b><br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg   | oltre 3% Si                    | Al-3             | condizioni stabili   | 230                    | 0,016                   | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                  | condizioni instabili | 230                    | 0,011                   | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Leghe di magnesio</b><br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3  | -                              | Al-3             | condizioni stabili   | 180                    | 0,016                   | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,095 | 0,140 |
|  |                                |                  | condizioni instabili | 180                    | 0,011                   | 0,021 | 0,028 | 0,039 | 0,046 | 0,056 | 0,067 | 0,098 |
| <b>N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo)</b><br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5,<br>2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10                                    | fino a 850 N/mm <sup>2</sup>   | Al-3             | condizioni stabili   | 250                    | 0,015                   | 0,025 | 0,035 | 0,045 | 0,050 | 0,065 | 0,080 | 0,120 |
|  |                                |                  | condizioni instabili | 250                    | 0,011                   | 0,018 | 0,025 | 0,032 | 0,035 | 0,046 | 0,056 | 0,084 |



$$a_p = 0,5 \times D - 1 \times D \quad a_p = 1 \times D - 2 \times D$$

$$a_e = 1 \times D \quad f_z = 70\%$$

## Frese SuperF-UT

### Frese SuperF-UT NX



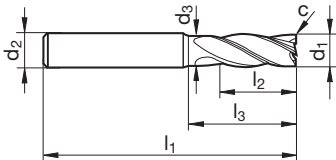
Catalogo n° 54590



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Parametri di lav.  
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- geometria frontale e delle scanalature adattata per valori di taglio alti e asportazione del truciolo molto buona
- è possibile angolo di immersione estremamente inclinato fino a 45°
- lunga vita utensile grazie al rivestimento molto forte
- grande sicurezza del processo con riduzione simultanea dei tempi di lavoro fino a 1400 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,040         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,050         | 4 | <b>5,000</b>  |
| 5,700        | 6,000       | 5,400    | 57,000   | 13,000   | 20,000   | 0,060         | 4 | <b>5,700</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,060         | 4 | <b>6,000</b>  |
| 7,700        | 8,000       | 7,200    | 63,000   | 19,000   | 26,000   | 0,080         | 4 | <b>7,700</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,080         | 4 | <b>8,000</b>  |
| 9,700        | 10,000      | 9,200    | 72,000   | 22,000   | 31,000   | 0,100         | 4 | <b>9,700</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,100         | 4 | <b>10,000</b> |
| 11,700       | 12,000      | 10,900   | 83,000   | 26,000   | 35,500   | 0,120         | 4 | <b>11,700</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,120         | 4 | <b>12,000</b> |
| 13,700       | 14,000      | 12,900   | 83,000   | 26,000   | 35,500   | 0,140         | 4 | <b>13,700</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000   | 0,140         | 4 | <b>14,000</b> |
| 15,600       | 16,000      | 14,800   | 92,000   | 32,000   | 41,400   | 0,160         | 4 | <b>15,600</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,160         | 4 | <b>16,000</b> |
| 19,500       | 20,000      | 18,500   | 104,000  | 38,000   | 51,300   | 0,200         | 4 | <b>19,500</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,200         | 4 | <b>20,000</b> |



## Frese SuperF-UT

### Frese SuperF-UT NX



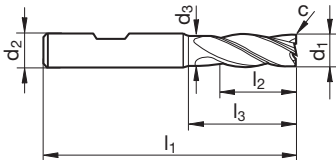
Catalogo n° 54591



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| P | M | K | N | S | H |
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Parametri di lav.  
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517

- geometria frontale e delle scanalature adattata per valori di taglio alti e asportazione del truciolo molto buona
- è possibile angolo di immersione estremamente inclinato fino a 45°
- lunga vita utensile grazie al rivestimento molto forte
- grande sicurezza del processo con riduzione simultanea dei tempi di lavoro fino a 1400 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,040         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,050         | 4 | <b>5,000</b>  |
| 5,700        | 6,000       | 5,400    | 57,000   | 13,000   | 20,000   | 0,060         | 4 | <b>5,700</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,060         | 4 | <b>6,000</b>  |
| 7,700        | 8,000       | 7,200    | 63,000   | 19,000   | 26,000   | 0,080         | 4 | <b>7,700</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,080         | 4 | <b>8,000</b>  |
| 9,700        | 10,000      | 9,200    | 72,000   | 22,000   | 31,000   | 0,100         | 4 | <b>9,700</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,100         | 4 | <b>10,000</b> |
| 11,700       | 12,000      | 10,900   | 83,000   | 26,000   | 35,500   | 0,120         | 4 | <b>11,700</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,120         | 4 | <b>12,000</b> |
| 13,700       | 14,000      | 12,900   | 83,000   | 26,000   | 35,500   | 0,140         | 4 | <b>13,700</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000   | 0,140         | 4 | <b>14,000</b> |
| 15,600       | 16,000      | 14,800   | 92,000   | 32,000   | 41,400   | 0,160         | 4 | <b>15,600</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,160         | 4 | <b>16,000</b> |
| 19,500       | 20,000      | 18,500   | 104,000  | 38,000   | 51,300   | 0,200         | 4 | <b>19,500</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,200         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



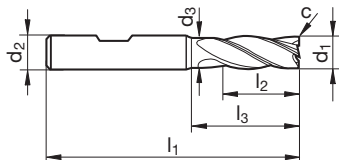
Catalogo n° 64550



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|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

Parametri di lav.  
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- uso universale
- esecuzione corta stabile
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000    | 6,000    | 5,500    | 54,000   | 10,000   | 17,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 58,000   | 12,000   | 21,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 66,000   | 14,000   | 24,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 73,000   | 16,000   | 26,000   | 0,200         | 4 | <b>12,000</b> |
| 14,000   | 14,000   | 13,200   | 75,000   | 18,000   | 28,000   | 0,250         | 4 | <b>14,000</b> |
| 16,000   | 16,000   | 15,000   | 82,000   | 22,000   | 32,000   | 0,350         | 4 | <b>16,000</b> |
| 18,000   | 18,000   | 17,000   | 84,000   | 24,000   | 34,000   | 0,400         | 4 | <b>18,000</b> |
| 20,000   | 20,000   | 19,000   | 92,000   | 26,000   | 40,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



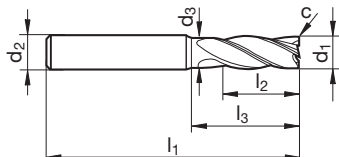
Catalogo n° 54551



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- uso universale
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000    | 6,000    | 3,700    | 57,000   | 11,000   | 18,000   | 0,100         | 4 | <b>4,000</b>  |
| 5,000    | 6,000    | 4,700    | 57,000   | 13,000   | 18,000   | 0,100         | 4 | <b>5,000</b>  |
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000   | 0,200         | 4 | <b>12,000</b> |
| 14,000   | 14,000   | 13,200   | 83,000   | 26,000   | 36,000   | 0,250         | 4 | <b>14,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000   | 0,350         | 4 | <b>16,000</b> |
| 18,000   | 18,000   | 17,000   | 92,000   | 32,000   | 42,000   | 0,400         | 4 | <b>18,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



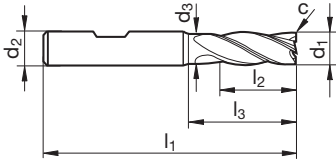
Catalogo n° 64551



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   |   |   |

Parametri di lav. ind. a pag. 513-517

- uso universale
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000    | 6,000    | 3,700    | 57,000   | 11,000   | 18,000   | 0,100         | 4 | <b>4,000</b>  |
| 5,000    | 6,000    | 4,700    | 57,000   | 13,000   | 18,000   | 0,100         | 4 | <b>5,000</b>  |
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000   | 0,200         | 4 | <b>12,000</b> |
| 14,000   | 14,000   | 13,200   | 83,000   | 26,000   | 36,000   | 0,250         | 4 | <b>14,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000   | 0,350         | 4 | <b>16,000</b> |
| 18,000   | 18,000   | 17,000   | 92,000   | 32,000   | 42,000   | 0,400         | 4 | <b>18,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000   | 0,450         | 4 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 121,000  | 45,000   | 63,000   | 0,600         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



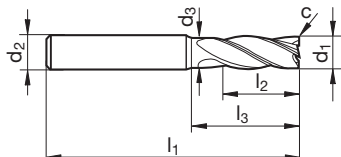
Catalogo n° 54562



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- uso universale
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000    | 6,000    | 5,500    | 65,000   | 18,000   | 28,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 75,000   | 24,000   | 38,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 80,000   | 30,000   | 38,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 93,000   | 36,000   | 46,000   | 0,200         | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 108,000  | 48,000   | 58,000   | 0,350         | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 126,000  | 60,000   | 74,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



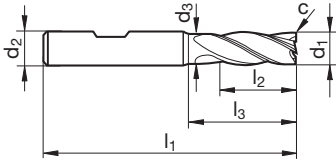
Catalogo n° 54563



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● |   |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- uso universale
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000    | 6,000    | 5,500    | 65,000   | 18,000   | 28,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 75,000   | 24,000   | 38,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 80,000   | 30,000   | 38,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 93,000   | 36,000   | 46,000   | 0,200         | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 108,000  | 48,000   | 58,000   | 0,350         | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 126,000  | 60,000   | 74,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N



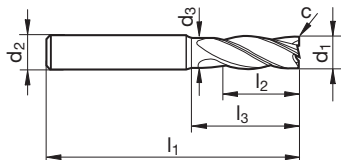
Catalogo n° 54552



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- uso universale
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 10,000   | 10,000   | 9,200    | 100,000  | 40,000   | 48,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 150,000  | 45,000   | 58,000   | 0,200         | 4 | <b>12,000</b> |
| 14,000   | 14,000   | 13,200   | 150,000  | 45,000   | 58,000   | 0,250         | 4 | <b>14,000</b> |
| 16,000   | 16,000   | 15,000   | 150,000  | 65,000   | 78,000   | 0,350         | 4 | <b>16,000</b> |
| 18,000   | 18,000   | 17,000   | 150,000  | 65,000   | 78,000   | 0,400         | 4 | <b>18,000</b> |
| 20,000   | 20,000   | 19,000   | 150,000  | 65,000   | 78,000   | 0,450         | 4 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 150,000  | 75,000   | 92,000   | 0,600         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N-F



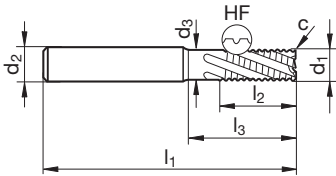
Catalogo n° 54566



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   | ○ |   |

Parametri di lav.  
ind. a pag. 513-  
517

- fino a 48 HRC così come leghe al titanio e al nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 µm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 4 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 4 | <b>25,000</b> |



## Frese SuperF-UT

### Frese SuperF-UT N-F



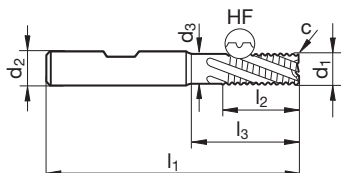
Catalogo n° 54567



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   | ○ |   |

Parametri di lav.  
ind. a pag. 513-  
517

- fino a 48 HRC così come leghe al titanio e al nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 µm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 4 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N-3



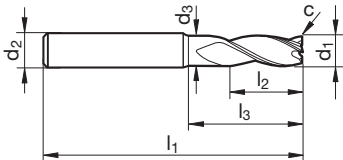
Catalogo n° 54564



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- 3 taglienti con ingombro dei trucioli ingrandito
- per la produzione di linguette
- fino a 1400 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 3,000    | 6,000    | 2,700    | 57,000   | 8,000    | 15,000         | 0,050   | 3 | <b>3,000</b>  |
| 3,500    | 6,000    | 3,200    | 57,000   | 10,000   | 15,000         | 0,050   | 3 | <b>3,500</b>  |
| 3,700    | 6,000    | 3,400    | 57,000   | 11,000   | 15,000         | 0,050   | 3 | <b>3,700</b>  |
| 4,000    | 6,000    | 3,700    | 57,000   | 11,000   | 18,000         | 0,050   | 3 | <b>4,000</b>  |
| 4,500    | 6,000    | 4,200    | 57,000   | 11,000   | 18,000         | 0,050   | 3 | <b>4,500</b>  |
| 4,700    | 6,000    | 4,400    | 57,000   | 13,000   | 18,000         | 0,050   | 3 | <b>4,700</b>  |
| 5,000    | 6,000    | 4,700    | 57,000   | 13,000   | 18,000         | 0,050   | 3 | <b>5,000</b>  |
| 5,500    | 6,000    | 5,200    | 57,000   | 13,000   | 19,300         | 0,050   | 3 | <b>5,500</b>  |
| 5,700    | 6,000    | 5,400    | 57,000   | 13,000   | 19,500         | 0,050   | 3 | <b>5,700</b>  |
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,050   | 3 | <b>6,000</b>  |
| 6,500    | 8,000    | 6,000    | 63,000   | 16,000   | 24,300         | 0,100   | 3 | <b>6,500</b>  |
| 7,000    | 8,000    | 6,500    | 63,000   | 16,000   | 24,700         | 0,100   | 3 | <b>7,000</b>  |
| 7,500    | 8,000    | 7,000    | 63,000   | 19,000   | 25,100         | 0,100   | 3 | <b>7,500</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,100   | 3 | <b>8,000</b>  |
| 8,500    | 10,000   | 8,000    | 72,000   | 19,000   | 29,300         | 0,100   | 3 | <b>8,500</b>  |
| 9,000    | 10,000   | 8,500    | 72,000   | 19,000   | 29,700         | 0,100   | 3 | <b>9,000</b>  |
| 9,500    | 10,000   | 9,000    | 72,000   | 22,000   | 30,100         | 0,100   | 3 | <b>9,500</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,100   | 3 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,100   | 3 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,150   | 3 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,150   | 3 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N-3



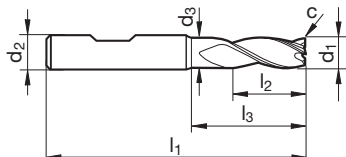
Catalogo n° 54565



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- 3 taglianti con ingombro dei trucioli ingrandito
- per la produzione di linguette
- fino a 1400 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliante al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 3,000    | 6,000    | 2,700    | 57,000   | 8,000    | 15,000         | 0,050   | 3 | <b>3,000</b>  |
| 3,500    | 6,000    | 3,200    | 57,000   | 10,000   | 15,000         | 0,050   | 3 | <b>3,500</b>  |
| 3,700    | 6,000    | 3,400    | 57,000   | 11,000   | 15,000         | 0,060   | 3 | <b>3,700</b>  |
| 4,000    | 6,000    | 3,700    | 57,000   | 11,000   | 18,000         | 0,060   | 3 | <b>4,000</b>  |
| 4,500    | 6,000    | 4,200    | 57,000   | 11,000   | 18,000         | 0,070   | 3 | <b>4,500</b>  |
| 4,700    | 6,000    | 4,400    | 57,000   | 13,000   | 18,000         | 0,070   | 3 | <b>4,700</b>  |
| 5,000    | 6,000    | 4,700    | 57,000   | 13,000   | 18,000         | 0,080   | 3 | <b>5,000</b>  |
| 5,500    | 6,000    | 5,200    | 57,000   | 13,000   | 20,000         | 0,080   | 3 | <b>5,500</b>  |
| 5,700    | 6,000    | 5,400    | 57,000   | 13,000   | 20,000         | 0,090   | 3 | <b>5,700</b>  |
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,090   | 3 | <b>6,000</b>  |
| 6,500    | 8,000    | 6,000    | 63,000   | 16,000   | 26,000         | 0,100   | 3 | <b>6,500</b>  |
| 7,000    | 8,000    | 6,500    | 63,000   | 16,000   | 26,000         | 0,110   | 3 | <b>7,000</b>  |
| 7,500    | 8,000    | 7,000    | 63,000   | 19,000   | 26,000         | 0,110   | 3 | <b>7,500</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,120   | 3 | <b>8,000</b>  |
| 8,500    | 10,000   | 8,000    | 72,000   | 19,000   | 31,000         | 0,130   | 3 | <b>8,500</b>  |
| 9,000    | 10,000   | 8,500    | 72,000   | 19,000   | 31,000         | 0,140   | 3 | <b>9,000</b>  |
| 9,500    | 10,000   | 9,000    | 72,000   | 22,000   | 31,000         | 0,140   | 3 | <b>9,500</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,150   | 3 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,180   | 3 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,190   | 3 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,240   | 3 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N-5



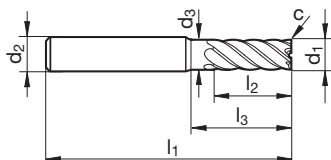
Catalogo n° 54579



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 513-  
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- divisione diseguale
- misura corta, vedi F-UT FS con 6 denti
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000    | 6,000    | 3,700    | 65,000   | 12,000   | 26,000   | 0,050         | 5 | <b>4,000</b>  |
| 5,000    | 6,000    | 4,700    | 65,000   | 15,000   | 26,000   | 0,050         | 5 | <b>5,000</b>  |
| 6,000    | 6,000    | 5,500    | 65,000   | 18,000   | 28,000   | 0,050         | 5 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 75,000   | 24,000   | 38,000   | 0,100         | 5 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 80,000   | 30,000   | 38,000   | 0,100         | 5 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 93,000   | 36,000   | 46,000   | 0,100         | 5 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 108,000  | 48,000   | 58,000   | 0,150         | 5 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 126,000  | 60,000   | 74,000   | 0,150         | 5 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT N-5



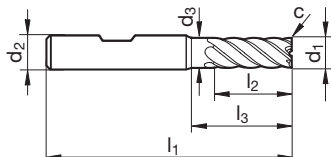
Catalogo n° 54580



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

Parametri di lav.  
ind. a pag. 513-  
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- divisione diseguale
- misura corta, vedi F-UT FS con 6 denti
- fino a 1600 N/mm<sup>2</sup>
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000    | 6,000    | 3,700    | 65,000   | 12,000   | 26,000   | 0,050         | 5 | <b>4,000</b>  |
| 5,000    | 6,000    | 4,700    | 65,000   | 15,000   | 26,000   | 0,050         | 5 | <b>5,000</b>  |
| 6,000    | 6,000    | 5,500    | 65,000   | 18,000   | 28,000   | 0,050         | 5 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 75,000   | 24,000   | 38,000   | 0,100         | 5 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 80,000   | 30,000   | 38,000   | 0,100         | 5 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 93,000   | 36,000   | 46,000   | 0,100         | 5 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 108,000  | 48,000   | 58,000   | 0,150         | 5 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 126,000  | 60,000   | 74,000   | 0,150         | 5 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Ti



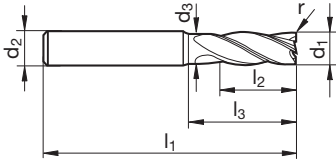
Catalogo n° 54560



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   | ● |   |

Parametri di lav.  
ind. a pag. 513-  
517

- esecuzione spigolo tagliente ottimizzata per leghe al titanio ad alta resistenza e materiali speciali
- può anche essere applicato come SuperF-UT Tipo N con raggio
- con raggi definiti
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r     | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|-------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,500 | 4 | <b>6,005</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,800 | 4 | <b>6,008</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 1,000 | 4 | <b>6,010</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 1,500 | 4 | <b>6,015</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 2,000 | 4 | <b>6,020</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,500 | 4 | <b>8,005</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,800 | 4 | <b>8,008</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 1,000 | 4 | <b>8,010</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 1,500 | 4 | <b>8,015</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 2,000 | 4 | <b>8,020</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,500 | 4 | <b>10,005</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,800 | 4 | <b>10,008</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 1,000 | 4 | <b>10,010</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 1,500 | 4 | <b>10,015</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 2,000 | 4 | <b>10,020</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,500 | 4 | <b>12,005</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,800 | 4 | <b>12,008</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 1,000 | 4 | <b>12,010</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 1,500 | 4 | <b>12,015</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 2,000 | 4 | <b>12,020</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 2,500 | 4 | <b>12,025</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 3,000 | 4 | <b>12,030</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 4,000 | 4 | <b>12,040</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500 | 4 | <b>16,005</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,800 | 4 | <b>16,008</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 1,000 | 4 | <b>16,010</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 1,500 | 4 | <b>16,015</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 2,000 | 4 | <b>16,020</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 2,500 | 4 | <b>16,025</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 3,000 | 4 | <b>16,030</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 4,000 | 4 | <b>16,040</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 1,000 | 4 | <b>20,010</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 2,000 | 4 | <b>20,020</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 4,000 | 4 | <b>20,040</b> |

## Frese SuperF-UT

### Frese SuperF-UT Ti



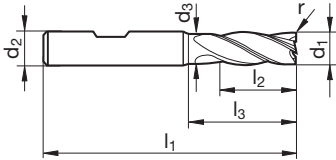
Catalogo n° 54561



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ |   | ● |   |

Parametri di lav.  
ind. a pag. 513-  
517

- esecuzione spigolo tagliente ottimizzata per leghe al titanio ad alta resistenza e materiali speciali
- può anche essere applicato come SuperF-UT Tipo N con raggio
- con raggi definiti
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r     | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|-------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,500 | 4 | <b>6,005</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,800 | 4 | <b>6,008</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 1,000 | 4 | <b>6,010</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 1,500 | 4 | <b>6,015</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 2,000 | 4 | <b>6,020</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,500 | 4 | <b>8,005</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,800 | 4 | <b>8,008</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 1,000 | 4 | <b>8,010</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 1,500 | 4 | <b>8,015</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 2,000 | 4 | <b>8,020</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,500 | 4 | <b>10,005</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,800 | 4 | <b>10,008</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 1,000 | 4 | <b>10,010</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 1,500 | 4 | <b>10,015</b> |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 2,000 | 4 | <b>10,020</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,500 | 4 | <b>12,005</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,800 | 4 | <b>12,008</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 1,000 | 4 | <b>12,010</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 1,500 | 4 | <b>12,015</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 2,000 | 4 | <b>12,020</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 2,500 | 4 | <b>12,025</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 3,000 | 4 | <b>12,030</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 4,000 | 4 | <b>12,040</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500 | 4 | <b>16,005</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,800 | 4 | <b>16,008</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 1,000 | 4 | <b>16,010</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 1,500 | 4 | <b>16,015</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 2,000 | 4 | <b>16,020</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 2,500 | 4 | <b>16,025</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 3,000 | 4 | <b>16,030</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 4,000 | 4 | <b>16,040</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 1,000 | 4 | <b>20,010</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 2,000 | 4 | <b>20,020</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 4,000 | 4 | <b>20,040</b> |

## Frese SuperF-UT

## Frese VA-X Super-UT



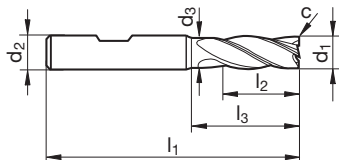
Catalogo n° 54576



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- esecuzione corta stabile
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000        | 6,000       | 3,700    | 54,000   | 8,000    | 15,000   | 0,150         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 54,000   | 9,000    | 15,000   | 0,150         | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 54,000   | 10,000   | 17,000   | 0,200         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 58,000   | 12,000   | 21,000   | 0,250         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 66,000   | 14,000   | 24,000   | 0,300         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 73,000   | 16,000   | 26,000   | 0,350         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 82,000   | 22,000   | 32,000   | 0,500         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 92,000   | 26,000   | 40,000   | 0,600         | 4 | <b>20,000</b> |



## Frese SuperF-UT

### Frese VA-X Super-UT



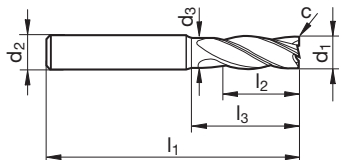
Catalogo n° 54558



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav.  
ind. a pag. 513-  
517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 3,000        | 6,000       | 2,700    | 57,000   | 8,000    | 15,000   | 0,100         | 4 | <b>3,000</b>  |
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,150         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,150         | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,200         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,250         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,300         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,350         | 4 | <b>12,000</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000   | 0,400         | 4 | <b>14,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500         | 4 | <b>16,000</b> |
| 18,000       | 18,000      | 17,000   | 92,000   | 32,000   | 42,000   | 0,600         | 4 | <b>18,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,600         | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000   | 0,750         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese VA-X Super-UT



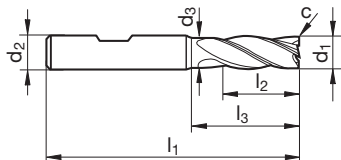
Catalogo n° 54559



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 3,000        | 6,000       | 2,700    | 57,000   | 8,000    | 15,000   | 0,100         | 4 | <b>3,000</b>  |
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,150         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,150         | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,200         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,250         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,300         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,350         | 4 | <b>12,000</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000   | 0,400         | 4 | <b>14,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500         | 4 | <b>16,000</b> |
| 18,000       | 18,000      | 17,000   | 92,000   | 32,000   | 42,000   | 0,600         | 4 | <b>18,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,600         | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000   | 0,750         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA-X IK



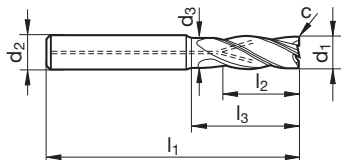
Catalogo n° 54574



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,200         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,250         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,300         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,350         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,600         | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000   | 0,750         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA-X IK



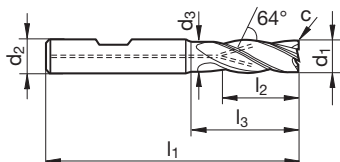
Catalogo n° 54575



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,200         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,250         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,300         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,350         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,500         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,600         | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000   | 0,750         | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA-XF



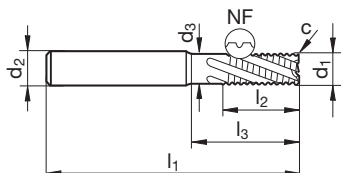
Catalogo n° 54568



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3  $\mu\text{m}$
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>12,000</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>14,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>16,000</b> |
| 18,000       | 18,000      | 17,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>18,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA-XF



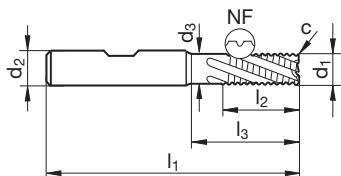
Catalogo n° 54569



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3  $\mu\text{m}$
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>12,000</b> |
| 14,000       | 14,000      | 13,200   | 83,000   | 26,000   | 36,000         | 0,500   | 4 | <b>14,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>16,000</b> |
| 18,000       | 20,000      | 17,000   | 92,000   | 32,000   | 42,000         | 0,500   | 4 | <b>18,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 4 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 4 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA



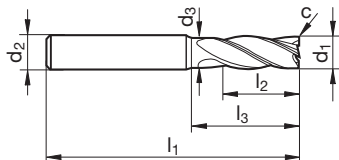
Catalogo n° 54556



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

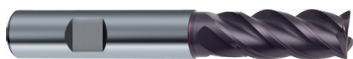
- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,100         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,100         | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,200         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,350         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT VA



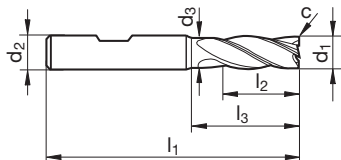
Catalogo n° 64557



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ |   | ○ |   |   |

Parametri di lav.  
ind. a pag. 513-  
517

- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000   | 0,100         | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000   | 0,100         | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,200         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,350         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,450         | 4 | <b>20,000</b> |



## Frese SuperF-UT

### Frese SuperF-UT VA-IK



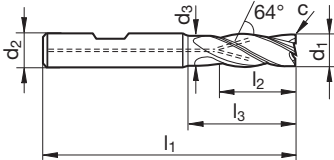
Catalogo n° 64567



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ |   | ○ |   |   |

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



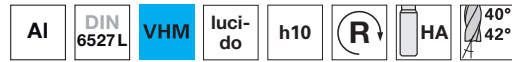
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|---------------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000   | 0,150         | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000   | 0,150         | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000   | 0,200         | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000   | 0,200         | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000   | 0,350         | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000   | 0,450         | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Alluminio

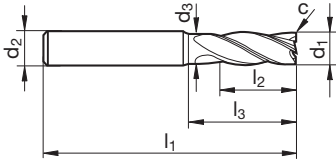


Catalogo n° 74554



Parametri di lav. ind. a pag. 513-517

- alluminio e leghe di alluminio così come metalli NE
- qualità di superficie notevole con operazioni di lappatura
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



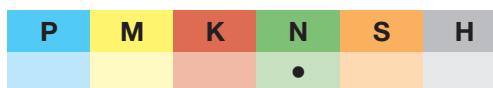
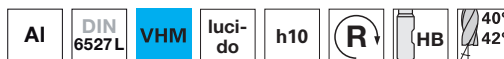
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000         | 0,100   | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000         | 0,100   | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,150   | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,150   | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,200   | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,200   | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,350   | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,450   | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Alluminio

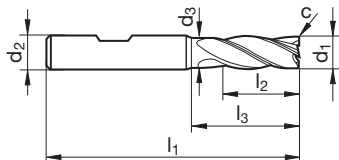


Catalogo n° 74555



Parametri di lav. ind. a pag. 513-517

- alluminio e leghe di alluminio così come metalli NE
- qualità di superficie notevole con operazioni di lappatura
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



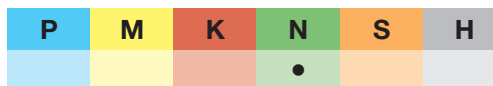
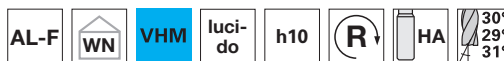
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000         | 0,100   | 4 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000         | 0,100   | 4 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,150   | 4 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,150   | 4 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,200   | 4 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,200   | 4 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,350   | 4 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,450   | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Al-F

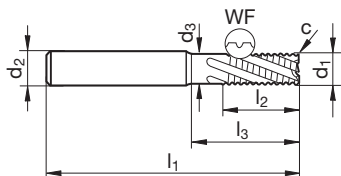


Catalogo n° 54570



Parametri di lav. ind. a pag. 513-517

- 3 taglienti con ingombro dei trucioli ingrandito
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 µm
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 3 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 3 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 3 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 3 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 3 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 3 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 3 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Al-F



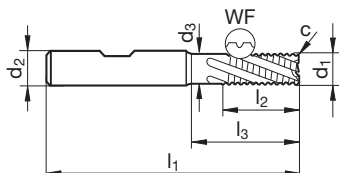
Catalogo n° 54571



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   |   | • |   |   |

Parametri di lav. ind. a pag. 513-517

- 3 taglienti con ingombro dei trucioli ingrandito
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 µm
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



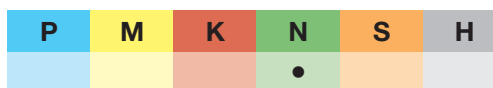
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,300   | 3 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,300   | 3 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,300   | 3 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,500   | 3 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,500   | 3 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,500   | 3 | <b>20,000</b> |
| 25,000       | 25,000      | 23,500   | 121,000  | 45,000   | 63,000         | 0,600   | 3 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Al-3

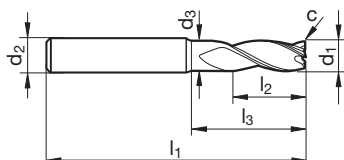


Catalogo n° 74552



Parametri di lav.  
ind. a pag. 513-  
517

- 3 taglienti con ingombro dei trucioli ingrandito
- finitura speculare per asportazione del truciolo ottimale
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



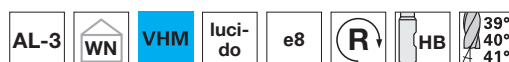
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 3,000        | 6,000       | 2,700    | 57,000   | 8,000    | 15,000         | 0,030   | 3 | <b>3,000</b>  |
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000         | 0,040   | 3 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000         | 0,050   | 3 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,060   | 3 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,080   | 3 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,100   | 3 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,120   | 3 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,160   | 3 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,200   | 3 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT Al-3

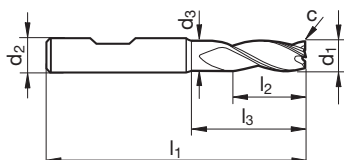


Catalogo n° 74553



Parametri di lav.  
ind. a pag. 513-  
517

- 3 taglienti con ingombro dei trucioli ingrandito
- finitura speculare per asportazione del truciolo ottimale
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------------|---------|---|---------------|
| 3,000        | 6,000       | 2,700    | 57,000   | 8,000    | 15,000         | 0,030   | 3 | <b>3,000</b>  |
| 4,000        | 6,000       | 3,700    | 57,000   | 11,000   | 18,000         | 0,040   | 3 | <b>4,000</b>  |
| 5,000        | 6,000       | 4,700    | 57,000   | 13,000   | 18,000         | 0,050   | 3 | <b>5,000</b>  |
| 6,000        | 6,000       | 5,500    | 57,000   | 13,000   | 20,000         | 0,060   | 3 | <b>6,000</b>  |
| 8,000        | 8,000       | 7,500    | 63,000   | 19,000   | 26,000         | 0,080   | 3 | <b>8,000</b>  |
| 10,000       | 10,000      | 9,200    | 72,000   | 22,000   | 30,000         | 0,100   | 3 | <b>10,000</b> |
| 12,000       | 12,000      | 11,200   | 83,000   | 26,000   | 36,000         | 0,120   | 3 | <b>12,000</b> |
| 16,000       | 16,000      | 15,000   | 92,000   | 32,000   | 42,000         | 0,160   | 3 | <b>16,000</b> |
| 20,000       | 20,000      | 19,000   | 104,000  | 38,000   | 52,000         | 0,200   | 3 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT H



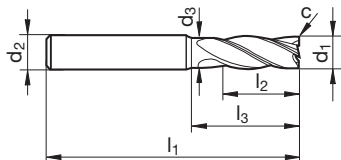
Catalogo n° 54572



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   | • |

Parametri di lav.  
ind. a pag. 513-  
517

- sgrossatura fino a 1xD di materiali fino a 54 HRC
- lappatura fino a 2,5xD di materiali fino a 63 HRC
- lunga vita utensile grazie al rivestimento molto forte
- particolarmente stabile grazie a punta rinforzata
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,150   | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,150   | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,200   | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,200   | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,350   | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,450   | 4 | <b>20,000</b> |



## Frese SuperF-UT

### Frese SuperF-UT H



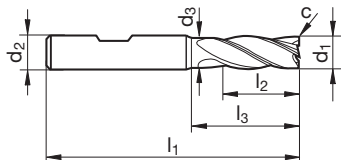
Catalogo n° 54573



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   | • |

Parametri di lav.  
ind. a pag. 513-  
517

- sgrossatura fino a 1xD di materiali fino a 54 HRC
- lappatura fino a 2,5xD di materiali fino a 63 HRC
- lunga vita utensile grazie al rivestimento molto forte
- particolarmente stabile grazie a punta rinforzata
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm x 45° | c<br>mm | Z | Codice        |
|----------|----------|----------|----------|----------|----------------|---------|---|---------------|
| 6,000    | 6,000    | 5,500    | 57,000   | 13,000   | 20,000         | 0,150   | 4 | <b>6,000</b>  |
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000         | 0,150   | 4 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000         | 0,200   | 4 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000         | 0,200   | 4 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000         | 0,350   | 4 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000         | 0,450   | 4 | <b>20,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT FS



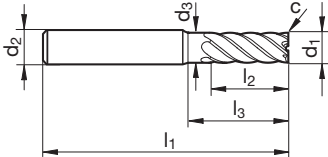
Catalogo n° 64558



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

Parametri di lav. ind. a pag. 513-517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- per superfinitura fino a 50 HRC con qualità di superficie notevole
- misura lunga, vedi F-UT N-5 con 5 denti
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000   | 0,100         | 6 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000   | 0,100         | 6 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000   | 0,100         | 6 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000   | 0,150         | 6 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000   | 0,150         | 6 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 121,000  | 45,000   | 63,000   | 0,200         | 6 | <b>25,000</b> |

## Frese SuperF-UT

### Frese SuperF-UT FS



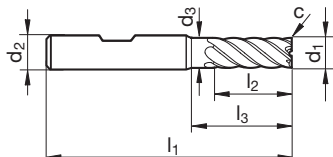
Catalogo n° 64559



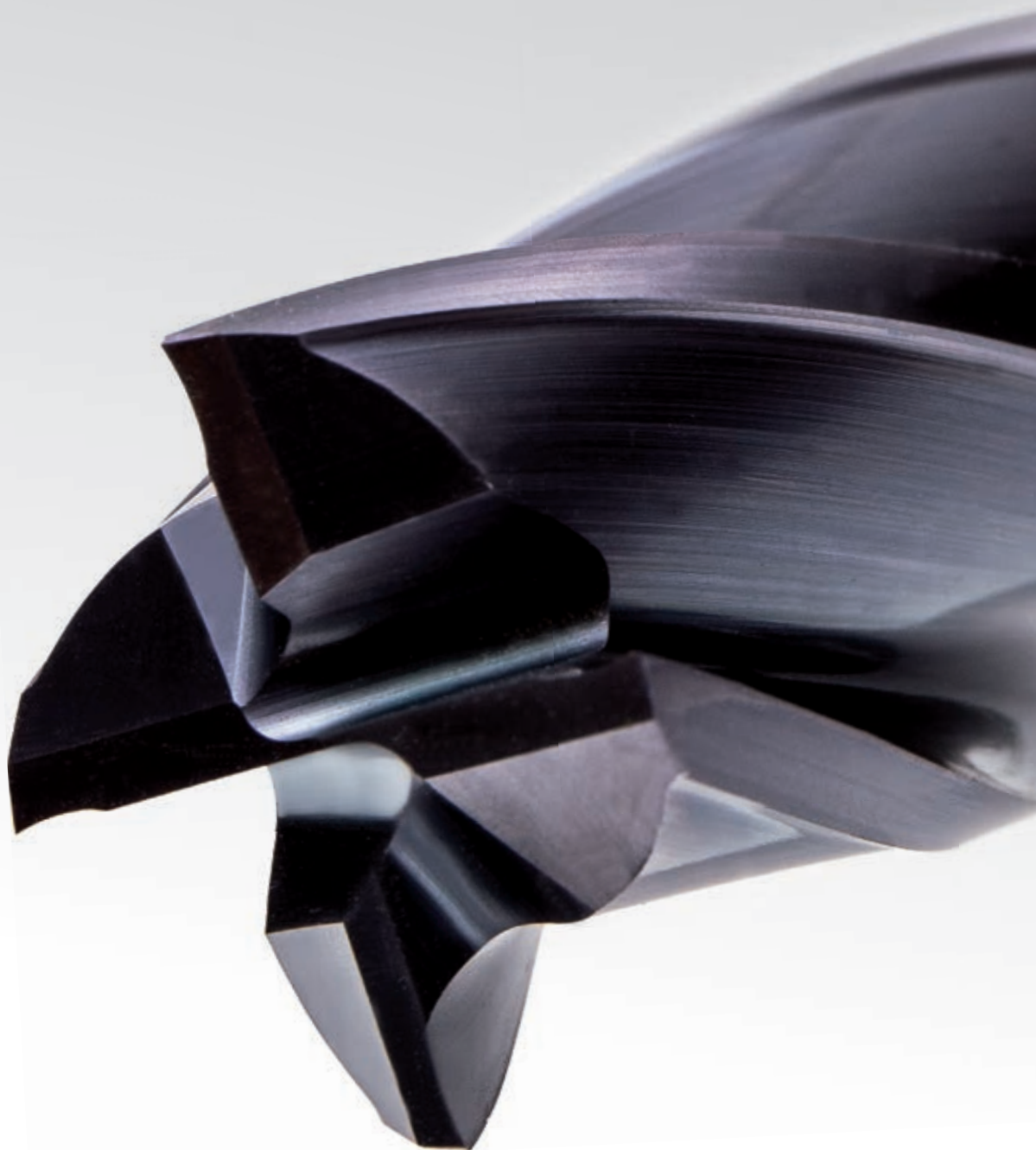
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

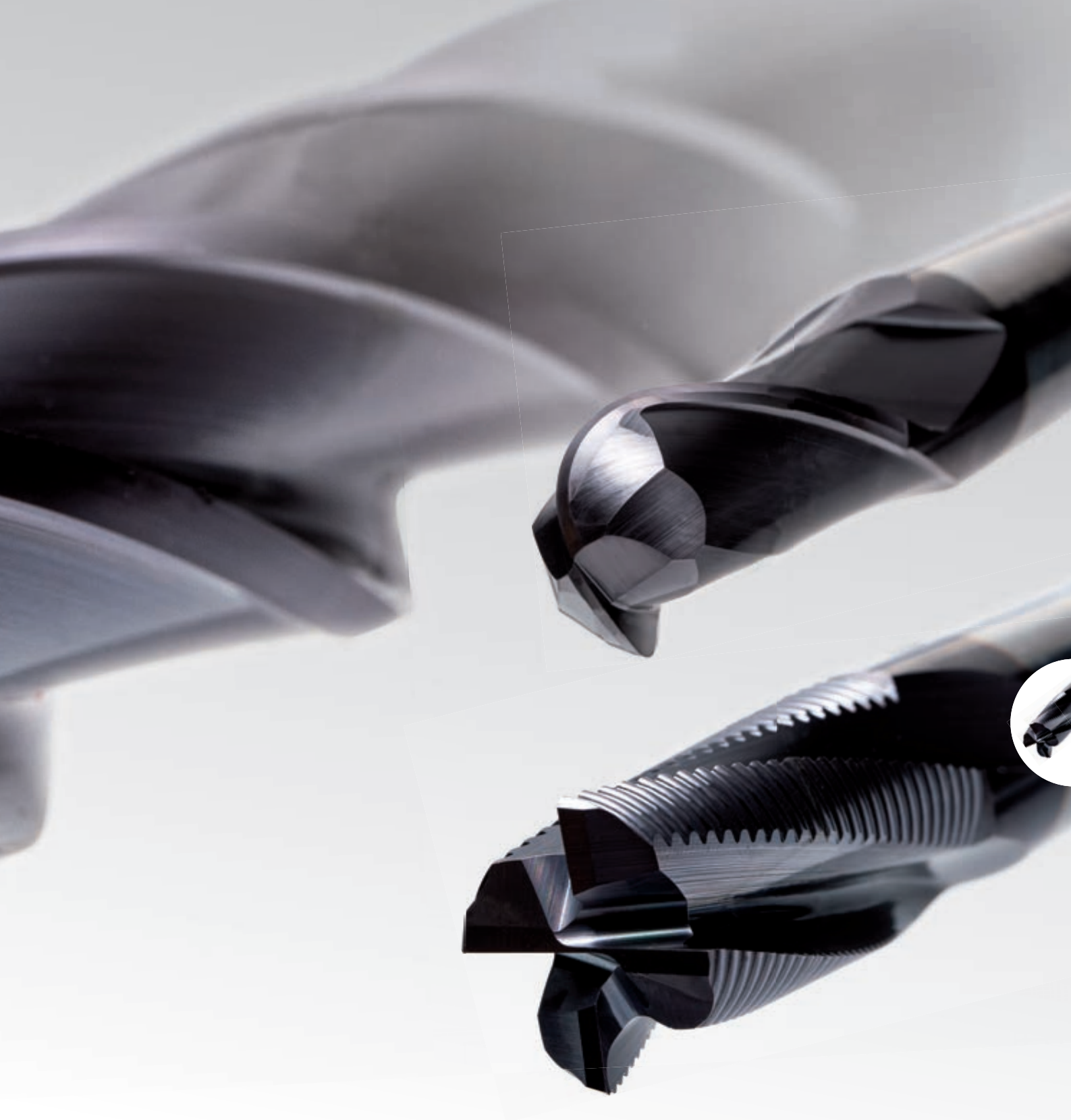
Parametri di lav. ind. a pag. 513-517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- per superfinitura fino a 50 HRC con qualità di superficie notevole
- misura lunga, vedi F-UT N-5 con 5 denti
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|---|---------------|
| 8,000    | 8,000    | 7,500    | 63,000   | 19,000   | 26,000   | 0,300         | 6 | <b>8,000</b>  |
| 10,000   | 10,000   | 9,200    | 72,000   | 22,000   | 30,000   | 0,300         | 6 | <b>10,000</b> |
| 12,000   | 12,000   | 11,200   | 83,000   | 26,000   | 36,000   | 0,500         | 6 | <b>12,000</b> |
| 16,000   | 16,000   | 15,000   | 92,000   | 32,000   | 42,000   | 0,500         | 6 | <b>16,000</b> |
| 20,000   | 20,000   | 19,000   | 104,000  | 38,000   | 52,000   | 0,500         | 6 | <b>20,000</b> |
| 25,000   | 25,000   | 23,500   | 121,000  | 45,000   | 63,000   | 0,600         | 6 | <b>25,000</b> |





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## UTENSILI A FRESARE



## CODICI ISO

|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



## LEGENDA DEI PITTOGRAMMI

|                      |                      |             |                 |             |            |           |            |           |           |
|----------------------|----------------------|-------------|-----------------|-------------|------------|-----------|------------|-----------|-----------|
| MATERIALE TAGLIANTE  | <b>VHM</b>           | <b>M42</b>  | <b>HSS-E-PM</b> |             |            |           |            |           |           |
|                      | Int. in metallo duro |             |                 |             |            |           |            |           |           |
| TRATT. DI SUPERFICIE | lucido               | TiAlN       | TiAl-SiN        | Al-TiN      | AlTiN nano | Al-TiN+   |            |           |           |
| TOLLERANZA SUL Ø     | e8                   | e8/h10      | h8              | h10         | m8         | js9       | k10        | js12      | k12       |
| DIREZIONE DI TAGLIO  | <br>a destra         |             |                 |             |            |           |            |           |           |
| FORMA DEL CODOLO     |                      |             |                 |             |            |           |            |           |           |
| ANGOLI DELL'ELICA    |                      |             |                 |             |            |           |            |           |           |
| NORMA                | DIN 6527K            | DIN 6527L   | DIN 6528        | DIN 327     | DIN 844K   | DIN 844L  |            |           |           |
|                      | Norma di fabbrica    |             |                 |             |            |           |            |           |           |
| TIPO                 | <b>W</b>             | <b>N</b>    | <b>NH</b>       | <b>H</b>    | <b>NF</b>  | <b>WR</b> | <b>NRf</b> | <b>HR</b> | <b>NR</b> |
|                      | Super AF-60          | Super AF-90 | Super AF-120    | Super AD-90 |            |           |            |           |           |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elica ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|

### Frese frontali alluminio

|  |  |  |  |  |  |   |    |    |              |        |               |                |       |     |
|--|--|--|--|--|--|---|----|----|--------------|--------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | W | HB | 45 | Metallo duro | lucido | DIN 6527K     | 3,000 - 20,000 | 74204 | 584 |
|  |  |  |  |  |  | W | HB | 45 | Metallo duro | lucido | DIN 6527L     | 3,000 - 20,000 | 74202 | 585 |
|  |  |  |  |  |  | W | HA | 45 | Metallo duro | lucido | Norma di fab. | 5,000 - 16,000 | 74206 | 586 |
|  |  |  |  |  |  | W | HA | 45 | Metallo duro | lucido | Norma di fab. | 6,000 - 20,000 | 74479 | 587 |

### Frese frontali (a 2 taglienti)

|  |  |  |  |  |  |   |    |    |              |        |               |                |       |     |
|--|--|--|--|--|--|---|----|----|--------------|--------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | lucido | DIN 6527K     | 2,000 - 20,000 | 74520 | 588 |
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527K     | 2,000 - 20,000 | 54520 | 589 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | TiAIN  | DIN 6527L     | 2,000 - 20,000 | 54519 | 590 |
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | lucido | DIN 6527L     | 2,000 - 20,000 | 74521 | 591 |
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527L     | 2,000 - 20,000 | 54521 | 592 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | lucido | Norma di fab. | 3,000 - 20,000 | 74404 | 593 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | TiAIN  | Norma di fab. | 5,000 - 20,000 | 54404 | 594 |

### Mini frese frontali (a 3 taglienti)

|  |  |  |  |  |  |    |       |    |              |       |               |                |       |     |
|--|--|--|--|--|--|----|-------|----|--------------|-------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | N  | HA/HB | 30 | Metallo duro | TiAIN | Norma di fab. | 0,300 - 20,000 | 64080 | 595 |
|  |  |  |  |  |  | NH | HA/HB | 45 | Metallo duro | TiAIN | Norma di fab. | 1,000 - 10,000 | 64180 | 596 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

### Frese frontali (a 3 taglienti)

|  |   |   |   |   |   |   |    |    |              |        |               |                |       |     |
|--|---|---|---|---|---|---|----|----|--------------|--------|---------------|----------------|-------|-----|
|  | • | • | • | • | • | N | HB | 30 | Metallo duro | lucido | DIN 6527K     | 2,000 - 20,000 | 74522 | 597 |
|  | • | • | • | ○ | • | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527K     | 2,000 - 20,000 | 64522 | 598 |
|  | • | • | • | ○ | • | N | HA | 30 | Metallo duro | TiAIN  | DIN 6527L     | 2,000 - 20,000 | 54523 | 599 |
|  | • | • | • | • | • | N | HB | 30 | Metallo duro | lucido | DIN 6527L     | 2,000 - 20,000 | 74523 | 600 |
|  | • | • | • | ○ | • | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527L     | 2,000 - 20,000 | 64523 | 601 |
|  | • | ○ | ○ | • | • | N | HA | 30 | Metallo duro | lucido | Norma di fab. | 3,000 - 20,000 | 74424 | 602 |
|  | • | • | ○ | • | • | N | HA | 30 | Metallo duro | TiAIN  | Norma di fab. | 3,000 - 20,000 | 54424 | 603 |

### Frese frontali (a 3 taglienti) NH

|  |   |   |   |   |   |    |    |    |              |        |           |                |       |     |
|--|---|---|---|---|---|----|----|----|--------------|--------|-----------|----------------|-------|-----|
|  | • | • | • | ○ | • | NH | HB | 45 | Metallo duro | TiAIN  | DIN 6527K | 3,000 - 20,000 | 64570 | 604 |
|  | • | • | • | • | • | NH | HA | 45 | Metallo duro | lucido | DIN 6527L | 3,000 - 20,000 | 74478 | 605 |
|  | • | • | • | ○ | • | NH | HA | 45 | Metallo duro | TiAIN  | DIN 6527L | 1,000 - 20,000 | 64478 | 606 |
|  | • | • | • | ○ | • | NH | HB | 45 | Metallo duro | TiAIN  | DIN 6527L | 3,000 - 20,000 | 64571 | 607 |

### Frese frontali (a 4 taglienti)

|  |   |   |   |   |   |   |    |    |              |        |           |                |       |     |
|--|---|---|---|---|---|---|----|----|--------------|--------|-----------|----------------|-------|-----|
|  | • | • | ○ | • | • | N | HA | 30 | Metallo duro | TiAIN  | DIN 6527L | 2,000 - 20,000 | 54524 | 608 |
|  | • | • | • | • | • | N | HB | 30 | Metallo duro | lucido | DIN 6527L | 3,000 - 20,000 | 74525 | 609 |



| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elica ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|

### Frese frontali (a 4 taglienti)



|   |   |   |   |   |   |   |    |    |              |       |           |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|
| • | ○ | • | ○ | ○ | ○ | N | HB | 30 | Metallo duro | TiAIN | DIN 6527L | 2,000 - 20,000 | 64525 | 610 |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|



|   |   |   |   |   |   |   |    |    |              |       |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | ○ | • | ○ | ○ | ○ | N | HA | 30 | Metallo duro | TiAIN | Norma di fab. | 3,000 - 20,000 | 54444 | 611 |
|---|---|---|---|---|---|---|----|----|--------------|-------|---------------|----------------|-------|-----|

### Frese frontali con spigolo raggiato



|   |   |   |   |   |   |   |    |    |              |       |           |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | N | HA | 30 | Metallo duro | TiAIN | DIN 6527L | 6,000 - 16,000 | 54522 | 612 |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|



|   |   |   |   |   |   |   |    |    |              |       |           |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | N | HA | 30 | Metallo duro | TiAIN | DIN 6527L | 6,000 - 20,000 | 54526 | 613 |
|---|---|---|---|---|---|---|----|----|--------------|-------|-----------|----------------|-------|-----|



|   |   |   |   |   |   |    |    |    |              |       |           |                |       |     |
|---|---|---|---|---|---|----|----|----|--------------|-------|-----------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | NH | HA | 45 | Metallo duro | TiAIN | DIN 6527L | 6,000 - 20,000 | 54206 | 614 |
|---|---|---|---|---|---|----|----|----|--------------|-------|-----------|----------------|-------|-----|

### Frese frontali per finitura, taglienti multipli



|   |   |   |   |   |   |    |    |    |              |       |               |                |       |     |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | NH | HA | 45 | Metallo duro | TiAIN | Norma di fab. | 3,000 - 20,000 | 54205 | 615 |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |    |    |    |              |       |               |                |       |     |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | NH | HB | 45 | Metallo duro | TiAIN | Norma di fab. | 6,000 - 20,000 | 54201 | 616 |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |    |    |    |              |       |               |                |       |     |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | NH | HA | 45 | Metallo duro | TiAIN | Norma di fab. | 6,000 - 20,000 | 54225 | 617 |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |    |    |    |              |       |               |                |       |     |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | NH | HB | 45 | Metallo duro | TiAIN | Norma di fab. | 6,000 - 20,000 | 54221 | 618 |
|---|---|---|---|---|---|----|----|----|--------------|-------|---------------|----------------|-------|-----|

### Frese per materiali duri, taglienti multipli



|   |   |   |   |   |   |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | H | HA | 55 | Metallo duro | TiAISIN | Norma di fab. | 3,000 - 20,000 | 54207 | 619 |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | ○ | H | HA | 55 | Metallo duro | TiAISIN | Norma di fab. | 6,000 - 20,000 | 54227 | 620 |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

## Frese a sgrossare

|  |  |  |  |  |  |     |    |    |              |         |           |                |       |     |
|--|--|--|--|--|--|-----|----|----|--------------|---------|-----------|----------------|-------|-----|
|  |  |  |  |  |  | NF  | HB | 30 | Metallo duro | TiAIN   | DIN 6527L | 6,000 - 25,000 | 54496 | 621 |
|  |  |  |  |  |  | NF  | HB | 45 | Metallo duro | TiAIN   | DIN 6527L | 6,000 - 25,000 | 54497 | 622 |
|  |  |  |  |  |  | WR  | HB | 30 | Metallo duro | lucido  | DIN 6527L | 6,000 - 20,000 | 74203 | 623 |
|  |  |  |  |  |  | WR  | HB | 30 | Metallo duro | lucido  | DIN 6527L | 6,000 - 20,000 | 74303 | 624 |
|  |  |  |  |  |  | NRf | HB | 30 | Metallo duro | TiAIN   | DIN 6527L | 6,000 - 20,000 | 64495 | 625 |
|  |  |  |  |  |  | HR  | HB | 20 | Metallo duro | TiAISiN | DIN 6527L | 6,000 - 20,000 | 64497 | 626 |

## Frese a raggio

|  |  |  |  |  |  |   |    |    |              |        |               |                |       |     |
|--|--|--|--|--|--|---|----|----|--------------|--------|---------------|----------------|-------|-----|
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | lucido | DIN 6527L     | 3,000 - 20,000 | 74543 | 627 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | TiAIN  | DIN 6527L     | 0,500 - 20,000 | 54541 | 628 |
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527L     | 1,000 - 20,000 | 64542 | 629 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | lucido | Norma di fab. | 3,000 - 12,000 | 74545 | 630 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | TiAIN  | Norma di fab. | 3,000 - 12,000 | 64545 | 631 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | lucido | DIN 6528      | 4,000 - 16,000 | 74531 | 632 |
|  |  |  |  |  |  | N | HA | 30 | Metallo duro | TiAIN  | DIN 6528      | 4,000 - 20,000 | 54531 | 633 |
|  |  |  |  |  |  | N | HB | 30 | Metallo duro | TiAIN  | DIN 6527L     | 3,000 - 20,000 | 64532 | 634 |

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

### Frese a raggio



|   |   |   |   |   |  |   |    |    |              |       |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | ○ |  | N | HA | 30 | Metallo duro | TiAlN | Norma di fab. | 3,000 - 12,000 | 64535 | 635 |
|---|---|---|---|---|--|---|----|----|--------------|-------|---------------|----------------|-------|-----|

### Frese per copiatori con affilatura torica



|   |   |   |   |   |  |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | H | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 3,000 - 16,000 | 54304 | 636 |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | • | H | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 6,000 - 16,000 | 54305 | 637 |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |  |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | N | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 2,000 - 12,000 | 54302 | 638 |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |  |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | N | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 2,000 - 12,000 | 54303 | 639 |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|

### Frese a raggio per copiatori



|   |   |   |   |   |   |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | • | H | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 0,500 - 16,000 | 54306 | 640 |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • | • | H | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 3,000 - 16,000 | 54307 | 641 |
|---|---|---|---|---|---|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |  |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | N | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 2,000 - 12,000 | 54300 | 642 |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|



|   |   |   |   |   |  |   |    |    |              |         |               |                |       |     |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | N | HA | 30 | Metallo duro | TiAlSiN | Norma di fab. | 2,000 - 12,000 | 54301 | 643 |
|---|---|---|---|---|--|---|----|----|--------------|---------|---------------|----------------|-------|-----|

### Fresa pilota



|   |   |   |   |   |   |   |    |    |              |        |           |                |       |     |
|---|---|---|---|---|---|---|----|----|--------------|--------|-----------|----------------|-------|-----|
| • | • | • | ○ | • | • | N | HA | 30 | Metallo duro | AlTiN+ | DIN 6527L | 1,400 - 12,000 | 54700 | 644 |
|---|---|---|---|---|---|---|----|----|--------------|--------|-----------|----------------|-------|-----|

### Fresa frontali a 60° per sbavatura



|   |   |   |   |   |  |            |    |   |              |       |               |                |       |     |
|---|---|---|---|---|--|------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | ○ | • |  | SuperAF-60 | HA | 0 | Metallo duro | AlTiN | Norma di fab. | 4,000 - 12,000 | 53393 | 645 |
|---|---|---|---|---|--|------------|----|---|--------------|-------|---------------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

### Fresa frontali a 60° per sbavatura



|   |   |   |   |   |   |            |    |   |              |       |               |                |       |     |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAF-60 | HB | 0 | Metallo duro | AlTiN | Norma di fab. | 6,000 - 12,000 | 53394 | 646 |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|

### Fresa frontali a 90° per sbavatura



|   |   |   |   |   |   |            |    |   |              |       |               |                |       |     |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAF-90 | HA | 0 | Metallo duro | AlTiN | Norma di fab. | 4,000 - 12,000 | 53395 | 647 |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |            |    |   |              |       |               |                |       |     |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAF-90 | HB | 0 | Metallo duro | AlTiN | Norma di fab. | 4,000 - 12,000 | 53396 | 648 |
|---|---|---|---|---|---|------------|----|---|--------------|-------|---------------|----------------|-------|-----|

### Fresa frontali a 120° per sbavatura



|   |   |   |   |   |   |             |    |   |              |       |               |                |       |     |
|---|---|---|---|---|---|-------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAF-120 | HA | 0 | Metallo duro | AlTiN | Norma di fab. | 4,000 - 12,000 | 53397 | 649 |
|---|---|---|---|---|---|-------------|----|---|--------------|-------|---------------|----------------|-------|-----|



|   |   |   |   |   |   |             |    |   |              |       |               |                |       |     |
|---|---|---|---|---|---|-------------|----|---|--------------|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAF-120 | HB | 0 | Metallo duro | AlTiN | Norma di fab. | 6,000 - 12,000 | 53398 | 650 |
|---|---|---|---|---|---|-------------|----|---|--------------|-------|---------------|----------------|-------|-----|

### Sbavatori a 90° ad avanzamento ed estrazione



|   |   |   |   |   |   |            |    |   |              |            |               |                |       |     |
|---|---|---|---|---|---|------------|----|---|--------------|------------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | SuperAD-90 | HA | 0 | Metallo duro | AlTiN nano | Norma di fab. | 3,000 - 12,000 | 52365 | 651 |
|---|---|---|---|---|---|------------|----|---|--------------|------------|---------------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elic. ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|

### Frese frontali (a 2 taglienti)

|  |  |   |   |    |     |        |          |                |              |     |
|--|--|---|---|----|-----|--------|----------|----------------|--------------|-----|
|  |  | N | B | 30 | M42 | lucido | DIN 327  | 1,000 - 25,000 | <b>74231</b> | 652 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 327  | 1,000 - 20,000 | <b>64640</b> | 653 |
|  |  | N | B | 30 | M42 | lucido | DIN 844K | 3,000 - 20,000 | <b>74243</b> | 654 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 844K | 3,000 - 20,000 | <b>64670</b> | 655 |
|  |  | N | B | 30 | M42 | lucido | DIN 844L | 3,000 - 20,000 | <b>74244</b> | 656 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 844L | 4,000 - 20,000 | <b>64671</b> | 657 |

### Frese frontali (a 3 taglienti)

|  |  |   |   |    |     |        |          |                |              |     |
|--|--|---|---|----|-----|--------|----------|----------------|--------------|-----|
|  |  | N | B | 30 | M42 | lucido | DIN 327  | 2,800 - 25,000 | <b>74280</b> | 658 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 327  | 2,800 - 25,000 | <b>64604</b> | 659 |
|  |  | N | B | 30 | M42 | lucido | DIN 844K | 3,000 - 20,000 | <b>74282</b> | 660 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 844K | 3,000 - 20,000 | <b>64641</b> | 661 |
|  |  | N | B | 30 | M42 | lucido | DIN 844L | 3,000 - 20,000 | <b>74294</b> | 663 |
|  |  | N | B | 30 | M42 | TiAIN  | DIN 844L | 4,000 - 18,000 | <b>54294</b> | 662 |

### Mini frese frontali (a 3 taglienti)

|  |  |   |  |    |     |       |               |                |              |     |
|--|--|---|--|----|-----|-------|---------------|----------------|--------------|-----|
|  |  | N |  | 30 | M42 | TiAIN | Norma di fab. | 3,000 - 10,000 | <b>54080</b> | 664 |
|--|--|---|--|----|-----|-------|---------------|----------------|--------------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elicico ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|------------------|---------------------|------------|-------|-------|-------------|--------|

### Mini frese frontali (a 3 taglienti)



|   |   |   |   |   |  |   |  |    |     |       |               |                |       |     |
|---|---|---|---|---|--|---|--|----|-----|-------|---------------|----------------|-------|-----|
| ○ | ● | ● | ● | ○ |  | N |  | 30 | M42 | TiAIN | Norma di fab. | 3,000 - 10,000 | 54180 | 665 |
|---|---|---|---|---|--|---|--|----|-----|-------|---------------|----------------|-------|-----|

### Frese universali, taglienti multipli



|   |   |   |   |  |  |   |   |    |     |        |          |                |       |     |
|---|---|---|---|--|--|---|---|----|-----|--------|----------|----------------|-------|-----|
| ● | ● | ○ | ○ |  |  | N | B | 30 | M42 | lucido | DIN 844K | 2,000 - 25,000 | 74617 | 666 |
|---|---|---|---|--|--|---|---|----|-----|--------|----------|----------------|-------|-----|



|   |   |   |   |  |  |   |   |    |     |       |          |                |       |     |
|---|---|---|---|--|--|---|---|----|-----|-------|----------|----------------|-------|-----|
| ● | ● | ● | ○ |  |  | N | B | 30 | M42 | TiAIN | DIN 844K | 3,000 - 25,000 | 64667 | 667 |
|---|---|---|---|--|--|---|---|----|-----|-------|----------|----------------|-------|-----|



|   |   |   |   |  |  |   |   |    |     |        |          |                |       |     |
|---|---|---|---|--|--|---|---|----|-----|--------|----------|----------------|-------|-----|
| ● | ○ | ● | ○ |  |  | N | B | 30 | M42 | lucido | DIN 844L | 3,000 - 25,000 | 74847 | 668 |
|---|---|---|---|--|--|---|---|----|-----|--------|----------|----------------|-------|-----|



|   |   |   |   |  |  |   |   |    |     |       |          |                |       |     |
|---|---|---|---|--|--|---|---|----|-----|-------|----------|----------------|-------|-----|
| ● | ● | ● | ○ |  |  | N | B | 30 | M42 | TiAIN | DIN 844L | 3,000 - 32,000 | 54847 | 669 |
|---|---|---|---|--|--|---|---|----|-----|-------|----------|----------------|-------|-----|



|   |   |  |  |  |  |   |   |    |     |        |               |                |       |     |
|---|---|--|--|--|--|---|---|----|-----|--------|---------------|----------------|-------|-----|
| ● | ○ |  |  |  |  | N | B | 30 | M42 | lucido | Norma di fab. | 6,000 - 20,000 | 74800 | 670 |
|---|---|--|--|--|--|---|---|----|-----|--------|---------------|----------------|-------|-----|

### Frese di semifinitura



|   |   |   |  |  |  |    |   |    |     |       |          |                |       |     |
|---|---|---|--|--|--|----|---|----|-----|-------|----------|----------------|-------|-----|
| ● | ● | ● |  |  |  | NF | B | 30 | M42 | TiAIN | DIN 844K | 6,000 - 25,000 | 54815 | 671 |
|---|---|---|--|--|--|----|---|----|-----|-------|----------|----------------|-------|-----|

### Frese a sgrossare (3 taglienti)



|   |   |   |  |  |  |     |   |    |          |        |          |                |       |     |
|---|---|---|--|--|--|-----|---|----|----------|--------|----------|----------------|-------|-----|
| ● | ● | ● |  |  |  | NRf | B | 30 | HSS-E-PM | lucido | DIN 844K | 6,000 - 20,000 | 74825 | 672 |
|---|---|---|--|--|--|-----|---|----|----------|--------|----------|----------------|-------|-----|



|   |   |   |  |  |  |     |   |    |          |       |          |                |       |     |
|---|---|---|--|--|--|-----|---|----|----------|-------|----------|----------------|-------|-----|
| ● | ● | ● |  |  |  | NRf | B | 30 | HSS-E-PM | TiAIN | DIN 844K | 6,000 - 20,000 | 54825 | 673 |
|---|---|---|--|--|--|-----|---|----|----------|-------|----------|----------------|-------|-----|

### Frese a sgrossare (4 taglienti)



|   |   |   |  |  |  |    |   |    |     |        |          |                |       |     |
|---|---|---|--|--|--|----|---|----|-----|--------|----------|----------------|-------|-----|
| ● | ● | ● |  |  |  | NR | B | 30 | M42 | lucido | DIN 844K | 6,000 - 30,000 | 74816 | 674 |
|---|---|---|--|--|--|----|---|----|-----|--------|----------|----------------|-------|-----|



|   |   |   |  |  |  |    |   |    |     |       |          |                |       |     |
|---|---|---|--|--|--|----|---|----|-----|-------|----------|----------------|-------|-----|
| ● | ● | ● |  |  |  | NR | B | 30 | M42 | TiAIN | DIN 844K | 6,000 - 32,000 | 54816 | 675 |
|---|---|---|--|--|--|----|---|----|-----|-------|----------|----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Forma dell'attacco | Angolo elic. ° | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|--------------------|----------------|---------------------|------------|-------|-------|-------------|--------|

### Frese a sgrossare (4 taglienti)



|   |   |   |   |   |   |     |   |    |          |        |          |                |       |     |
|---|---|---|---|---|---|-----|---|----|----------|--------|----------|----------------|-------|-----|
| • | • | • | • | • | • | NRf | B | 30 | HSS-E-PM | lucido | DIN 844K | 6,000 - 25,000 | 74845 | 676 |
|---|---|---|---|---|---|-----|---|----|----------|--------|----------|----------------|-------|-----|



|   |   |   |   |   |   |     |   |    |          |       |          |                |       |     |
|---|---|---|---|---|---|-----|---|----|----------|-------|----------|----------------|-------|-----|
| • | • | • | • | • | • | NRf | B | 30 | HSS-E-PM | TiAIN | DIN 844K | 6,000 - 25,000 | 54845 | 677 |
|---|---|---|---|---|---|-----|---|----|----------|-------|----------|----------------|-------|-----|



|   |   |   |   |   |   |    |   |    |     |        |          |                |       |     |
|---|---|---|---|---|---|----|---|----|-----|--------|----------|----------------|-------|-----|
| • | • | • | • | • | • | NR | B | 30 | M42 | lucido | DIN 844L | 6,000 - 25,000 | 74836 | 678 |
|---|---|---|---|---|---|----|---|----|-----|--------|----------|----------------|-------|-----|



|   |   |   |   |   |   |    |   |    |     |       |          |                |       |     |
|---|---|---|---|---|---|----|---|----|-----|-------|----------|----------------|-------|-----|
| • | • | • | • | • | • | NR | B | 30 | M42 | TiAIN | DIN 844L | 6,000 - 25,000 | 54836 | 679 |
|---|---|---|---|---|---|----|---|----|-----|-------|----------|----------------|-------|-----|

### Frese a raggio



|   |   |   |   |   |   |   |   |    |     |       |         |                |       |     |
|---|---|---|---|---|---|---|---|----|-----|-------|---------|----------------|-------|-----|
| • | • | • | • | • | • | N | B | 30 | M42 | TiAIN | DIN 327 | 2,000 - 20,000 | 54275 | 680 |
|---|---|---|---|---|---|---|---|----|-----|-------|---------|----------------|-------|-----|

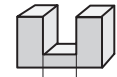


|   |   |   |   |   |   |   |   |    |     |       |               |                |       |     |
|---|---|---|---|---|---|---|---|----|-----|-------|---------------|----------------|-------|-----|
| • | • | • | • | • | • | N | B | 30 | M42 | TiAIN | Norma di fab. | 3,000 - 20,000 | 54276 | 681 |
|---|---|---|---|---|---|---|---|----|-----|-------|---------------|----------------|-------|-----|

# Parametri di lavoro indicativi per frese frontali in M.D.I.

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



$$a_e = 1,0 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

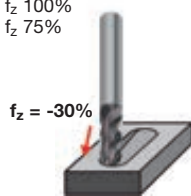
### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a  $1 \times D$ . Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

$a_p$  = profondità di taglio  $0,5 \times D = f_z$  100%

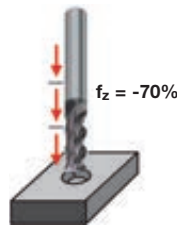
$a_p$  = profondità di taglio  $1,0 \times D = f_z$  75%



### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a  $0,5 \times D$ .



olio da taglio, attivo ■  
 emulsione ■  
 solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■            |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■            |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■            |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | □            |

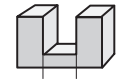




# Parametri di lavoro indicativi per frese frontali in M.D.I.

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



$$a_e = 1,0 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a  $1 \times D$ . Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

$a_p$  = profondità di taglio  $0,5 \times D = f_z$  100%

$a_p$  = profondità di taglio  $1,0 \times D = f_z$  75%

### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a  $0,5 \times D$ .



olio da taglio, attivo ■  
 emulsione ■  
 solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                           | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                            | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                        | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                            | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione                                   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile                                       | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati austenitici martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■            |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                              | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe                                      | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe                                    | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica              | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si > 10 % Si                | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■            |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto a truciolo lungo                | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■            |
| Bronzi a truciolo corto                                  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo                                  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti                            | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche                                   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                           | Kevlar  |  | -                        | □            |
| Mat. plast. a fibre di vetro/C rinforzate                | GFK/CFK   |  | -                        | □            |

## Frese per cave

Catalogo n°

|                |                |               |                |               |       |               |       |               |       |
|----------------|----------------|---------------|----------------|---------------|-------|---------------|-------|---------------|-------|
| 54521<br>54519 | 54523<br>64523 | 64478         | 64570<br>64571 | 74404         | 74424 | 54404         | 54424 | 64080         | 64180 |
| <b>M.D.I.</b>  |                | <b>M.D.I.</b> |                | <b>M.D.I.</b> |       | <b>M.D.I.</b> |       | <b>M.D.I.</b> |       |
| 6527 L         |                | 6527 L        | 6527 K/L       | Stock std.    |       | Stock std.    |       | Stock std.    |       |
| N              |                | NH            |                | N             |       | N             |       | N             |       |
| 592/590        | 599/601        | 606           | 604/607        | 593           | 602   | 594           | 603   | 595           | 596   |

Mat. de tagl.

Norma

Tipo

Pagina

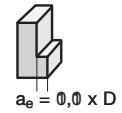


| V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|
| 105                     | N                  | 105                     | N                  | 50                      | J                  | 80                      | J                  | 95                      | M                  | 105                     | N                  |
| 99                      | M                  | 99                      | M                  | 45                      | H                  | 75                      | I                  | 90                      | L                  | 100                     | M                  |
| 105                     | M                  | 105                     | M                  | 50                      | H                  | 80                      | I                  | 95                      | L                  | 105                     | M                  |
| 77                      | N                  | 77                      | N                  | 35                      | I                  | 60                      | J                  | 70                      | M                  | 75                      | N                  |
| 105                     | M                  | 105                     | M                  | 50                      | H                  | 80                      | I                  | 95                      | L                  | 105                     | M                  |
| 94                      | M                  | 94                      | M                  | 40                      | H                  | 70                      | I                  | 85                      | L                  | 95                      | M                  |
| 77                      | N                  | 77                      | N                  | 35                      | I                  | 60                      | J                  | 70                      | M                  | 75                      | N                  |
| 94                      | N                  | 94                      | N                  | 40                      | I                  | 70                      | J                  | 85                      | M                  | 95                      | N                  |
| 77                      | N                  | 77                      | N                  | 35                      | I                  | 60                      | J                  |                         |                    |                         |                    |
| 110                     | M                  | 110                     | M                  | 45                      | H                  | 75                      | I                  | 100                     | L                  | 110                     | M                  |
| 94                      | M                  | 94                      | M                  | 40                      | H                  | 70                      | I                  | 85                      | L                  | 95                      | M                  |
| 66                      | N                  | 66                      | N                  | 30                      | I                  | 50                      | J                  |                         |                    |                         |                    |
| 105                     | M                  | 105                     | M                  | 50                      | H                  | 80                      | I                  | 95                      | L                  | 105                     | M                  |
| 94                      | L                  | 94                      | L                  | 40                      | H                  | 70                      | H                  |                         |                    |                         |                    |
| 94                      | M                  | 94                      | M                  | 40                      | H                  | 70                      | I                  | 85                      | L                  | 95                      | M                  |
| 77                      | L                  | 77                      | L                  | 35                      | H                  | 60                      | H                  | 70                      | K                  | 75                      | L                  |
| 55                      | N                  | 55                      | N                  | 38                      | I                  | 45                      | J                  | 50                      | M                  | 55                      | N                  |
| 55                      | L                  | 55                      | L                  |                         |                    |                         |                    |                         |                    |                         |                    |
| 55                      | L                  | 55                      | L                  |                         |                    |                         |                    |                         |                    |                         |                    |
| 55                      | N                  | 55                      | N                  |                         |                    |                         |                    | 50                      | M                  | 55                      | N                  |
| 50                      | L                  | 50                      | L                  |                         |                    |                         |                    | 45                      | K                  | 50                      | L                  |
| 44                      | M                  | 44                      | M                  |                         |                    |                         |                    | 40                      | L                  | 45                      | M                  |
| 132                     | M                  | 132                     | M                  | 60                      | H                  | 105                     | I                  | 120                     | L                  | 130                     | M                  |
| 121                     | L                  | 121                     | L                  | 55                      | H                  | 95                      | H                  | 110                     | K                  | 120                     | L                  |
| 110                     | M                  | 110                     | M                  | 55                      | H                  | 90                      | I                  | 100                     | L                  | 110                     | M                  |
| 99                      | L                  | 99                      | L                  | 45                      | H                  | 75                      | H                  | 90                      | K                  | 100                     | L                  |
| 66                      | L                  | 66                      | L                  |                         |                    |                         |                    | 60                      | K                  | 65                      | L                  |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
|                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 33                      | L                  | 33                      | L                  |                         |                    |                         |                    |                         |                    | 35                      | L                  |
| 55                      | L                  | 55                      | L                  | 40                      | H                  | 65                      | H                  | 50                      | K                  | 55                      | L                  |
| 44                      | L                  | 44                      | L                  | 20                      | H                  | 35                      | H                  | 40                      | K                  | 45                      | L                  |
| 495                     | O                  | 495                     | O                  |                         |                    |                         |                    | 330                     | Q                  | 330                     | Q                  |
| 605                     | O                  | 605                     | O                  |                         |                    |                         |                    | 400                     | Q                  | 400                     | Q                  |
| 242                     | N                  | 242                     | N                  |                         |                    |                         |                    | 160                     | P                  | 245                     | N                  |
| 198                     | O                  | 198                     | O                  |                         |                    |                         |                    | 130                     | Q                  | 200                     | O                  |
| 275                     | P                  | 275                     | P                  |                         |                    |                         |                    | 185                     | R                  | 185                     | R                  |
| 132                     | O                  | 132                     | O                  |                         |                    |                         |                    | 90                      | Q                  | 130                     | O                  |
| 110                     | O                  | 110                     | O                  |                         |                    |                         |                    | 80                      | Q                  | 110                     | O                  |
| 99                      | N                  | 99                      | N                  |                         |                    |                         |                    | 70                      | P                  | 75                      | P                  |
| 110                     | N                  | 110                     | N                  |                         |                    |                         |                    | 80                      | P                  | 110                     | N                  |
| 88                      | M                  | 88                      | M                  |                         |                    |                         |                    | 70                      | O                  | 90                      | M                  |
| 88                      | N                  | 88                      | N                  |                         |                    |                         |                    | 70                      | P                  | 70                      | P                  |
| 77                      | L                  | 77                      | L                  |                         |                    |                         |                    | 60                      | N                  | 60                      | N                  |
| 132                     | L                  | 132                     | L                  |                         |                    |                         |                    | 90                      | N                  | 90                      | N                  |
| 121                     | L                  | 121                     | L                  |                         |                    |                         |                    | 80                      | N                  | 80                      | N                  |

# Parametri di lavoro indicativi per frese frontali in M.D.I.

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a  $1 \times D$ . Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

$a_p$  = profondità di taglio  $0,5 \times D = f_z$  100%  
 $a_p$  = profondità di taglio  $1,0 \times D = f_z$  75%

### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a  $0,5 \times D$ .



olio da taglio, attivo ■  
 emulsione ■  
 solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■            |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■            |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■            |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | □            |

## Frese di finitura

Catalogo n°

Mat. de tagl.

Norma

Tipo

Pagina

| 74525         | 54526         | 64525<br>54524 | 74424             | 54444             | 74204         | 74202         | 74206             | 74479             |
|---------------|---------------|----------------|-------------------|-------------------|---------------|---------------|-------------------|-------------------|
| <b>M.D.I.</b> | <b>M.D.I.</b> | <b>M.D.I.</b>  | <b>M.D.I.</b>     | <b>M.D.I.</b>     | <b>M.D.I.</b> |               | <b>M.D.I.</b>     | <b>M.D.I.</b>     |
| <b>6527 L</b> | <b>6527 L</b> |                | <b>Stock std.</b> | <b>Stock std.</b> | <b>6527 K</b> | <b>6527 L</b> | <b>Stock std.</b> | <b>Stock std.</b> |
| <b>N</b>      | <b>N</b>      |                | <b>N</b>          | <b>N</b>          | <b>W</b>      |               | <b>W</b>          | <b>W</b>          |
| 609           | 613           | 610/608        | 602               | 611               | 584           | 585           | 586               | 587               |



| V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|
| 116                     | S                  | 193                     | S                  | 76                      | N                  | 127                     | O                  |                         |                    |                         |                    |                         |                    |
| 106                     | R                  | 176                     | S                  | 70                      | M                  | 116                     | N                  |                         |                    |                         |                    |                         |                    |
| 116                     | R                  | 193                     | S                  | 76                      | M                  | 127                     | N                  |                         |                    |                         |                    |                         |                    |
| 86                      | Q                  | 143                     | R                  | 60                      | L                  | 99                      | M                  |                         |                    |                         |                    |                         |                    |
| 116                     | R                  | 193                     | S                  | 76                      | M                  | 127                     | N                  |                         |                    |                         |                    |                         |                    |
| 106                     | R                  | 176                     | S                  | 66                      | M                  | 110                     | N                  |                         |                    |                         |                    |                         |                    |
| 86                      | Q                  | 143                     | R                  | 57                      | L                  | 94                      | M                  |                         |                    |                         |                    |                         |                    |
| 103                     | Q                  | 171                     | R                  | 66                      | L                  | 110                     | M                  |                         |                    |                         |                    |                         |                    |
| 86                      | P                  | 143                     | Q                  | 57                      | L                  | 94                      | L                  |                         |                    |                         |                    |                         |                    |
| 129                     | R                  | 215                     | S                  | 73                      | M                  | 121                     | N                  |                         |                    |                         |                    |                         |                    |
| 103                     | R                  | 171                     | S                  | 66                      | M                  | 110                     | N                  |                         |                    |                         |                    |                         |                    |
| 76                      | Q                  | 127                     | R                  | 50                      | L                  | 83                      | M                  |                         |                    |                         |                    |                         |                    |
| 116                     | R                  | 193                     | S                  | 76                      | M                  | 127                     | N                  |                         |                    |                         |                    |                         |                    |
| 106                     | P                  | 176                     | Q                  | 66                      | L                  | 110                     | L                  |                         |                    |                         |                    |                         |                    |
| 103                     | R                  | 171                     | S                  | 66                      | M                  | 110                     | N                  |                         |                    |                         |                    |                         |                    |
| 86                      | P                  | 143                     | Q                  | 57                      | L                  | 94                      | L                  |                         |                    |                         |                    |                         |                    |
| 66                      | Q                  | 110                     | R                  | 43                      | L                  | 72                      | M                  |                         |                    |                         |                    |                         |                    |
| 66                      | P                  | 110                     | Q                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 39                      | N                  | 55                      | O                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 66                      | Q                  | 110                     | R                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 57                      | P                  | 94                      | Q                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 53                      | Q                  | 88                      | R                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 139                     | R                  | 231                     | S                  | 99                      | M                  | 165                     | N                  |                         |                    |                         |                    |                         |                    |
| 139                     | Q                  | 231                     | R                  | 90                      | L                  | 149                     | M                  |                         |                    |                         |                    |                         |                    |
| 126                     | R                  | 209                     | S                  | 83                      | M                  | 138                     | N                  |                         |                    |                         |                    |                         |                    |
| 106                     | Q                  | 176                     | R                  | 70                      | L                  | 116                     | M                  |                         |                    |                         |                    |                         |                    |
| 73                      | O                  | 121                     | P                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 40                      | P                  | 66                      | Q                  |                         |                    |                         |                    |                         |                    |                         |                    |                         |                    |
| 66                      | P                  | 110                     | Q                  | 43                      | L                  | 72                      | L                  |                         |                    |                         |                    |                         |                    |
| 53                      | O                  | 88                      | P                  | 33                      | K                  | 55                      | L                  |                         |                    |                         |                    |                         |                    |
| 561                     | T                  | 935                     | T                  | 330                     | P                  | 550                     | Q                  | 418                     | U                  | 330                     | P                  | 523                     | U                  |
| 528                     | S                  | 880                     | T                  | 396                     | O                  | 660                     | P                  | 506                     | T                  | 396                     | O                  | 633                     | T                  |
| 274                     | S                  | 457                     | S                  | 165                     | N                  | 275                     | O                  | 203                     | T                  | 165                     | N                  | 253                     | T                  |
| 225                     | S                  | 374                     | T                  | 132                     | O                  | 220                     | P                  | 165                     | T                  | 132                     | P                  | 207                     | T                  |
| 317                     | T                  | 528                     | T                  | 198                     | P                  | 330                     | Q                  | 241                     | U                  | 198                     | U                  | 302                     | U                  |
| 146                     | S                  | 242                     | T                  | 99                      | O                  | 165                     | P                  | 115                     | T                  | 99                      | P                  | 143                     | T                  |
| 132                     | S                  | 220                     | S                  | 80                      | N                  | 132                     | O                  | 102                     | T                  | 80                      | N                  | 127                     | T                  |
| 106                     | S                  | 176                     | S                  | 66                      | N                  | 110                     | O                  | 95                      | T                  | 66                      | N                  | 119                     | T                  |
| 132                     | S                  | 220                     | S                  | 80                      | N                  | 132                     | O                  | 102                     | T                  | 80                      | N                  | 127                     | T                  |
| 99                      | R                  | 165                     | S                  |                         |                    |                         |                    | 90                      | S                  |                         |                    | 112                     | S                  |
| 99                      | R                  | 165                     | S                  |                         |                    |                         |                    | 90                      | S                  |                         |                    | 112                     | S                  |
| 86                      | Q                  | 143                     | R                  |                         |                    |                         |                    | 76                      | S                  |                         |                    | 95                      | S                  |
| 146                     | Q                  | 242                     | R                  |                         |                    |                         |                    | 115                     | S                  |                         |                    | 143                     | S                  |
| 132                     | Q                  | 220                     | R                  |                         |                    |                         |                    | 102                     | S                  |                         |                    | 127                     | S                  |

# Parametri di lavoro indicativi per frese frontali per Metallo Duro

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       | Avanzamento<br>f (mm/dente) |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------------------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     |                             | U     | V     | W     |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014                       | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019                       | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028                       | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039                       | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053                       | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065                       | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079                       | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095                       | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110                       | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165                       | 0,170 | 0,180 | 0,190 |

a<sub>e</sub> = larghezza di taglio  
a<sub>p</sub> = profondità di taglio



a<sub>e</sub> = 0,6 x D

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

a<sub>p</sub> = profondità di taglio 0,5 x D = f<sub>z</sub> 100%

a<sub>p</sub> = profondità di taglio 1,0 x D = f<sub>z</sub> 75%

### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0.5 x D.



olio da taglio, attivo ■  
emulsione ■  
solo refrigerazione ad aria □

| Gruppo materiale                            | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|---|---|--|--------------------------|--------------|
| Acciai da costruzione generici              | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500) | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici                           | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati               | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                   | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati           | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati               | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione                      | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile                          | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4                                    | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi                               | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle                            | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati                             | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati              | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9  | ≤850   |                          | ■            |
| austenitici                                 | <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)  | ≤850   |                          | ■            |
| martensitisch                               | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2   | ≤850   |                          | ■            |
| Ghisa                                       | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                 | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura                                  | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV                             | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI                             | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali                              | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe                         | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1                                       | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe                       | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si             | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | ■            |
| > 10 % Si                                   | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | ■            |
| Leghe al magnesio                           | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato                           | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto                    | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2   | ≤600   |                          | ■            |
| a truciolo lungo                            | <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600   |                          | ■            |
| Bronzi a truciolo corto                     | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo                     | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti               | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche                      | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche              | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate               | GFK/CFK   |  | -                        | □            |



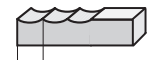
# Parametri di lavoro indicativi per frese frontali/a raggio per Metallo Duro

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Q utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

a<sub>e</sub> = larghezza di taglio  
a<sub>p</sub> = profondità di taglio



$$a_e = 0,02x-D, 0,05 x D$$



$$a_e = 0,02 - 0,05 x D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

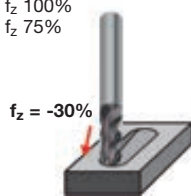
## Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

a<sub>p</sub> = profondità di taglio 0,5 x D = f<sub>z</sub> 100%

a<sub>p</sub> = profondità di taglio 1,0 x D = f<sub>z</sub> 75%

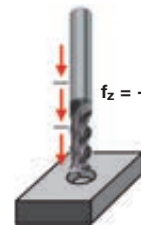


$$f_z = -30\%$$

## Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0.5 x D.



$$f_z = -70\%$$

olio da taglio, attivo ■  
emulsione ■  
solo refrigerazione ad aria □

| Gruppo materiale                            | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|---|---|--|--------------------------|--------------|
| Acciai da costruzione generici              | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500) | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici                           | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati               | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                   | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati           | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati               | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione                      | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile                          | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4                                    | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi                               | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle                            | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati                             | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati              | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9  | ≤850   |                          | ■            |
| austenitici                                 | <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)  | ≤850   |                          | ■            |
| martensitisch                               | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2   | ≤850   |                          | ■            |
| Ghisa                                       | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                 | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura                                  | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV                             | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI                             | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali                              | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe                         | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1                                       | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe                       | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si             | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | ■            |
| > 10 % Si                                   | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | ■            |
| Leghe al magnesio                           | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato                           | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto                    | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2   | ≤600   |                          | ■            |
| a truciolo lungo                            | <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600   |                          | ■            |
| Bronzi a truciolo corto                     | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo                     | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti               | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche                      | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche              | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate               | GFK/CFK   |  | -                        | □            |

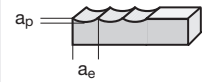




## Parametri di lavoro indicativi per frese a raggio per Metallo Duro

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       | Avanzamento<br>f (mm/dente) |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------------------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     |                             | U     | V     | W     |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014                       | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019                       | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028                       | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039                       | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053                       | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065                       | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079                       | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095                       | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110                       | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165                       | 0,170 | 0,180 | 0,190 |

a<sub>e</sub> = larghezza di taglio  
a<sub>p</sub> = profondità di taglio



$$a_e = 1,0 \times D$$

Le nuove condizioni europee in accordo con le norme DIN EN per acciaio e ghisa sono applicate per tutti i nostri esempi di materiale.

olio da taglio, attivo ■  
emulsione ■  
solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■ ■          |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■ ■          |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■ ■          |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■ ■          |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■ ■          |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■ ■          |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■ ■          |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■ ■          |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■ ■          |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■ ■          |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■ ■          |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■ ■          |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■ ■          |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | □            |

# Lavorazione HSC

Catalogo n°  
Mat. de tagl.  
Norma  
Tipo  
Pagina

54300  
54301

M.D.I.

Stock std.

N

642/643



54302  
54303

M.D.I.

Stock std.

N

638/639

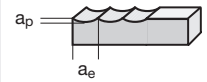


| 54300 / 54301        |                      |         |         |         |         |         |         | 54302 / 54303        |                      |         |         |         |         |         |  |
|----------------------|----------------------|---------|---------|---------|---------|---------|---------|----------------------|----------------------|---------|---------|---------|---------|---------|--|
| Ø                    | 2/3                  | 4       | 6       | 8       | 10      | 12      |         | Ø                    | 4                    | 6       | 8       | 10      | 12      |         |  |
| <b>sgrossatura</b>   |                      |         |         |         |         |         |         | <b>sgrossatura</b>   |                      |         |         |         |         |         |  |
| eff. Ø *             | -                    | 1,74    | 2,99    | 4,21    | 5,27    | 6,63    |         | eff. Ø *             | -                    | -       | -       | -       | -       |         |  |
| a <sub>p</sub> mm    | 0,10                 | 0,20    | 0,40    | 0,60    | 0,75    | 1,00    |         | a <sub>p</sub> mm    | 0,20                 | 0,40    | 0,60    | 0,75    | 1,00    |         |  |
| a <sub>e</sub> mm    | 0,15                 | 0,30    | 0,50    | 0,75    | 1,00    | 1,50    |         | a <sub>e</sub> mm    | 0,30                 | 0,50    | 0,75    | 1,00    | 1,50    |         |  |
| <b>finitura</b>      |                      |         |         |         |         |         |         | <b>finitura</b>      |                      |         |         |         |         |         |  |
| eff. Ø *             | -                    | 1,25    | 1,81    | 2,24    | 2,66    | 3,07    |         | eff. Ø *             | -                    | -       | -       | -       | -       |         |  |
| a <sub>p</sub> mm    | 0,07                 | 0,10    | 0,14    | 0,16    | 0,18    | 0,20    |         | a <sub>p</sub> mm    | 0,10                 | 0,14    | 0,16    | 0,18    | 0,20    |         |  |
| a <sub>e</sub> mm    | 0,05                 | 0,07    | 0,10    | 0,15    | 0,20    | 0,25    |         | a <sub>e</sub> mm    | 0,07                 | 0,10    | 0,15    | 0,20    | 0,25    |         |  |
| V <sub>c</sub> m/min | V <sub>c</sub> m/min | fz (mm) | fz (mm) | fz (mm) | fz (mm) | fz (mm) | fz (mm) | V <sub>c</sub> m/min | V <sub>c</sub> m/min | fz (mm) | fz (mm) | fz (mm) | fz (mm) | fz (mm) |  |
| 225                  | 310                  | 0,03    | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     | 225                  | 310                  | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     |  |
| 170                  | 240                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 170                  | 240                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 170                  | 240                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 170                  | 240                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 190                  | 240                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 190                  | 240                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 190                  | 240                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 190                  | 240                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 105                  | 140                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 105                  | 140                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 225                  | 310                  | 0,03    | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     | 225                  | 310                  | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 105                  | 140                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 105                  | 140                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 105                  | 140                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 105                  | 140                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 150                  | 190                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 150                  | 190                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 105                  | 140                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 105                  | 140                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 80                   | 125                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    | 80                   | 125                  |         |         |         |         |         |  |
| 80                   | 125                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    | 80                   | 125                  |         |         |         |         |         |  |
| 300                  | 450                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,13    | 300                  | 450                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,13    |  |
| 225                  | 310                  | 0,03    | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     | 225                  | 310                  | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     |  |
| 105                  | 140                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 105                  | 140                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 80                   | 125                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    | 80                   | 125                  | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    |  |
| 300                  | 400                  | 0,06    | 0,06    | 0,1     | 0,15    | 0,2     | 0,25    | 300                  | 400                  | 0,06    | 0,1     | 0,15    | 0,2     | 0,25    |  |
| 300                  | 400                  | 0,05    | 0,05    | 0,08    | 0,1     | 0,15    | 0,2     | 300                  | 400                  | 0,05    | 0,08    | 0,1     | 0,15    | 0,2     |  |
| 225                  | 325                  | 0,05    | 0,05    | 0,08    | 0,1     | 0,12    | 0,15    | 225                  | 325                  | 0,05    | 0,08    | 0,1     | 0,12    | 0,15    |  |
| 225                  | 275                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    | 225                  | 275                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    |  |
| 65                   | 80                   | 0,02    | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    | 65                   | 80                   | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    |  |
| 80                   | 125                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     | 80                   | 125                  | 0,02    | 0,04    | 0,05    | 0,08    | 0,1     |  |
| 75                   | 100                  | 0,02    | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    | 75                   | 100                  | 0,02    | 0,04    | 0,05    | 0,06    | 0,08    |  |
| 375                  | 500                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,15    | 375                  | 500                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,15    |  |
| 500                  | 900                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,15    | 500                  | 900                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,15    |  |
| 300                  | 450                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,13    | 300                  | 450                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,13    |  |
| 225                  | 310                  | 0,03    | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     | 225                  | 310                  | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     |  |
| 225                  | 310                  | 0,03    | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     | 225                  | 310                  | 0,03    | 0,05    | 0,06    | 0,08    | 0,1     |  |
| 300                  | 350                  | 0,05    | 0,05    | 0,08    | 0,12    | 0,15    | 0,2     | 300                  | 350                  | 0,05    | 0,08    | 0,12    | 0,15    | 0,2     |  |
| 225                  | 300                  | 0,04    | 0,04    | 0,06    | 0,1     | 0,12    | 0,15    | 225                  | 300                  | 0,04    | 0,06    | 0,1     | 0,12    | 0,15    |  |
| 225                  | 325                  | 0,05    | 0,05    | 0,08    | 0,1     | 0,12    | 0,15    | 225                  | 325                  | 0,05    | 0,08    | 0,1     | 0,12    | 0,15    |  |
| 225                  | 275                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    | 225                  | 275                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    |  |
| 225                  | 275                  | 0,04    | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    | 225                  | 275                  | 0,04    | 0,06    | 0,08    | 0,1     | 0,12    |  |
| 150                  | 225                  | 0,03    | 0,03    | 0,05    | 0,08    | 0,1     | 0,12    | 150                  | 225                  | 0,03    | 0,05    | 0,08    | 0,1     | 0,12    |  |

## Parametri di lavoro indicativi per frese a raggio per Metallo Duro

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



$$a_e = 1,0 \times D$$

Le nuove condizioni europee in accordo con le norme DIN EN per acciaio e ghisa sono applicate per tutti i nostri esempi di materiale.

olio da taglio, attivo ■  
 emulsione ■  
 solo refrigerazione ad aria □

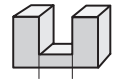
| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                           | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                            | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                        | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                            | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■ ■          |
| Acciai da nitrurazione                                   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■ ■          |
| Acciai da utensile                                       | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■ ■          |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■ ■          |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■ ■          |
| Acciai inossidabili, solforati austenitici martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■ ■          |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                              | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■ ■          |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe                                      | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■ ■          |
| Alluminio e sue leghe                                    | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica              | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si > 10 % Si                | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■ ■          |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■ ■          |
| Ottone, a truciolo corto a truciolo lungo                | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■ ■          |
| Bronzi a truciolo corto                                  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■ ■          |
| Bronzi a truciolo lungo                                  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■ ■          |
| Mat. plastiche termoindurenti                            | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche                                   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                           | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                            | GFK/CFK   |  | -                        | □            |



# Parametri di lavoro indicativi per frese per acciaio ad alto velocità

| Serie d'avanzamento |              |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H            | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Ø utensile mm       | <b>2,00</b>  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | <b>3,00</b>  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | <b>5,00</b>  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | <b>6,00</b>  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | <b>8,00</b>  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | <b>10,00</b> | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | <b>12,00</b> | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | <b>16,00</b> | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | <b>20,00</b> | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
|                     | <b>25,00</b> | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



$$a_e = 1,0 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a  $1 \times D$ . Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

$a_p$  = profondità di taglio  $0,5 \times D = f_z$  100%

$a_p$  = profondità di taglio  $1,0 \times D = f_z$  75%

### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a  $0,5 \times D$ .



- olio da taglio, attivo ■
- emulsione ■
- solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■            |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■            |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■            |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■            |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■            |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■            |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■            |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si<br>> 10 % Si                   | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■            |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■            |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■            |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■            |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■            |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | □            |

## Frese per cave

|               |                |                |                         |                |                |       |       |       |       |       |          |       |       |       |       |
|---------------|----------------|----------------|-------------------------|----------------|----------------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| Catalogo n°   | 74231<br>74280 | 74243<br>74282 | 54275<br>64640<br>64604 | 64670<br>64641 | 54080<br>54180 | 74244 | 74294 | 64671 | 54294 | 54276 | 54825    | 54845 | 74816 | 54816 |       |
| Mat. de tagl. | M42            |                | M42                     |                |                | M42   |       | M42   |       |       | HSS-E-PM |       | M42   |       | M42   |
| Norma         | 327 D          | 844 K          | 327 D                   | 844 K          | Stock          | 844 L |       | 844 L |       |       | 844 K    |       | 844 K |       | 844 K |
| Tipo          | N              |                | N                       |                |                | N     |       | N     |       |       | NRf      |       | NR    |       | NR    |
| Pagina        | 652/658        | 654/660        | 680/653/659             | 655/661        | 664/665        | 656   | 663   | 657   | 662   | 681   | 673      | 677   | 674   | 675   |       |

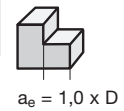
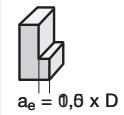


| V <sub>c</sub><br>m/min | Codice<br>d'avanz. | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|--------------------|-------------------------|-------------------------|--------------------|-------------------------|--------------------|
| 28                      | M                  | 61                 | M                       | 22                 | K                  | 49                      | K                  | 90                      | O                  | 34                 | M                       | 61                      | N                  |                         |                    |
| 25                      | L                  | 55                 | L                       | 20                 | K                  | 44                      | K                  | 80                      | N                  | 30                 | K                       | 55                      | L                  |                         |                    |
| 25                      | L                  | 55                 | L                       | 20                 | K                  | 44                      | K                  | 80                      | N                  | 30                 | K                       | 55                      | L                  |                         |                    |
| 22                      | M                  | 50                 | M                       | 18                 | K                  | 40                      | K                  | 75                      | M                  | 28                 | J                       | 50                      | K                  |                         |                    |
| 28                      | L                  | 61                 | L                       | 22                 | K                  | 49                      | K                  | 90                      | N                  | 34                 | K                       | 61                      | L                  |                         |                    |
| 26                      | L                  | 55                 | L                       | 21                 | K                  | 44                      | K                  | 80                      | N                  | 30                 | K                       | 55                      | L                  |                         |                    |
| 22                      | M                  | 50                 | M                       | 18                 | K                  | 40                      | K                  | 75                      | M                  | 28                 | J                       | 50                      | K                  |                         |                    |
| 22                      | M                  | 50                 | M                       | 18                 | K                  | 40                      | K                  | 75                      | M                  | 28                 | J                       | 50                      | K                  |                         |                    |
| 17                      | M                  | 39                 | M                       | 14                 | K                  | 31                      | K                  | 60                      | L                  | 22                 | I                       | 39                      | J                  |                         |                    |
| 28                      | L                  | 61                 | L                       | 22                 | K                  | 49                      | K                  | 90                      | N                  | 34                 | K                       | 61                      | L                  |                         |                    |
| 22                      | L                  | 50                 | L                       | 18                 | K                  | 40                      | K                  | 75                      | N                  | 28                 | K                       | 50                      | L                  |                         |                    |
| 17                      | M                  | 39                 | M                       | 14                 | K                  | 31                      | K                  | 60                      | M                  | 22                 | J                       | 39                      | K                  |                         |                    |
| 22                      | L                  | 50                 | L                       | 18                 | K                  | 40                      | K                  | 75                      | N                  | 28                 | K                       | 50                      | L                  |                         |                    |
| 17                      | L                  | 39                 | L                       | 14                 | K                  | 31                      | K                  | 60                      | L                  | 22                 | I                       | 39                      | J                  |                         |                    |
| 28                      | L                  | 61                 | L                       | 22                 | K                  | 49                      | K                  | 90                      | N                  | 34                 | K                       | 61                      | L                  |                         |                    |
| 11                      | L                  | 28                 | L                       | 9                  | K                  | 22                      | K                  | 40                      | L                  | 15                 | I                       | 28                      | J                  |                         |                    |
| 11                      | M                  | 28                 | M                       | 9                  | K                  | 22                      | K                  | 40                      | M                  | 15                 | J                       | 28                      | K                  |                         |                    |
| 11                      | L                  | 22                 | L                       |                    |                    |                         |                    | 33                      | L                  |                    |                         | 22                      | J                  |                         |                    |
| 18                      | M                  | 42                 | M                       |                    |                    |                         |                    | 65                      | M                  | 23                 | J                       | 42                      | K                  |                         |                    |
| 14                      | L                  | 39                 | L                       |                    |                    |                         |                    | 60                      | L                  | 21                 | I                       | 39                      | J                  |                         |                    |
| 14                      | L                  | 39                 | L                       |                    |                    |                         |                    | 60                      | M                  | 21                 | J                       | 39                      | K                  |                         |                    |
| 20                      | L                  | 50                 | L                       | 16                 | K                  | 40                      | K                  | 75                      | N                  | 28                 | K                       | 50                      | L                  |                         |                    |
| 14                      | L                  | 42                 | L                       | 11                 | K                  | 34                      | K                  | 65                      | M                  |                    |                         | 42                      | K                  |                         |                    |
| 20                      | L                  | 50                 | L                       | 16                 | K                  | 40                      | K                  | 75                      | N                  | 28                 | K                       | 50                      | L                  |                         |                    |
| 14                      | L                  | 42                 | L                       | 11                 | K                  | 34                      | K                  | 65                      | M                  |                    |                         | 42                      | K                  |                         |                    |
| 11                      | L                  | 31                 | L                       |                    |                    |                         |                    | 45                      | K                  |                    |                         | 31                      | I                  |                         |                    |
| 5                       | L                  | 9                  | L                       |                    |                    |                         |                    | 14                      | L                  |                    |                         | 9                       | J                  |                         |                    |
| 11                      | L                  | 25                 | L                       |                    |                    |                         |                    | 36                      | L                  | 13                 | I                       | 25                      | J                  |                         |                    |
| 7                       | L                  | 11                 | L                       |                    |                    |                         |                    | 17                      | K                  |                    |                         | 11                      | I                  |                         |                    |
| 154                     | N                  | 220                | N                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 110                     | N                  | 198                | N                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 88                      | M                  | 132                | M                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 44                      | N                  | 121                | N                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 66                      | O                  | 143                | O                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 61                      | N                  | 99                 | N                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 61                      | N                  | 99                 | N                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 39                      | M                  | 94                 | M                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 39                      | M                  | 94                 | M                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 33                      | L                  | 72                 | L                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 33                      | M                  | 72                 | M                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |
| 17                      | L                  | 44                 | L                       |                    |                    |                         |                    |                         |                    |                    |                         |                         |                    |                         |                    |

# Parametri di lavoro indicativi per frese per acciaio ad alto velocità

| Serie d'avanzamento |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Codice lettera      | H     | I     | J     | K     | L     | M     | N     | O     | P     | Q     | R     | S     | T     | U     | V     | W     |       |
| Q utensile mm       | 2,00  | 0,001 | 0,001 | 0,001 | 0,002 | 0,002 | 0,004 | 0,005 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 |
|                     | 3,00  | 0,002 | 0,002 | 0,003 | 0,003 | 0,004 | 0,007 | 0,010 | 0,010 | 0,010 | 0,015 | 0,016 | 0,013 | 0,019 | 0,022 | 0,024 | 0,030 |
|                     | 5,00  | 0,005 | 0,006 | 0,007 | 0,009 | 0,010 | 0,014 | 0,020 | 0,020 | 0,022 | 0,025 | 0,026 | 0,026 | 0,028 | 0,030 | 0,032 | 0,038 |
|                     | 6,00  | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,017 | 0,024 | 0,025 | 0,027 | 0,031 | 0,029 | 0,033 | 0,039 | 0,036 | 0,041 | 0,047 |
|                     | 8,00  | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 | 0,024 | 0,032 | 0,032 | 0,035 | 0,042 | 0,042 | 0,047 | 0,053 | 0,052 | 0,058 | 0,064 |
|                     | 10,00 | 0,013 | 0,015 | 0,018 | 0,021 | 0,025 | 0,030 | 0,038 | 0,039 | 0,044 | 0,050 | 0,053 | 0,059 | 0,065 | 0,066 | 0,073 | 0,080 |
|                     | 12,00 | 0,010 | 0,018 | 0,022 | 0,026 | 0,030 | 0,036 | 0,046 | 0,048 | 0,052 | 0,059 | 0,063 | 0,072 | 0,079 | 0,085 | 0,090 | 0,100 |
|                     | 16,00 | 0,020 | 0,023 | 0,027 | 0,032 | 0,038 | 0,045 | 0,054 | 0,058 | 0,063 | 0,071 | 0,079 | 0,088 | 0,095 | 0,100 | 0,110 | 0,120 |
|                     | 20,00 | 0,023 | 0,028 | 0,033 | 0,038 | 0,045 | 0,057 | 0,066 | 0,073 | 0,080 | 0,090 | 0,097 | 0,100 | 0,110 | 0,120 | 0,130 | 0,140 |
| 25,00               | 0,030 | 0,035 | 0,040 | 0,045 | 0,055 | 0,065 | 0,075 | 0,100 | 0,120 | 0,130 | 0,140 | 0,150 | 0,165 | 0,170 | 0,180 | 0,190 |       |

$a_e$  = larghezza di taglio  
 $a_p$  = profondità di taglio



I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

### Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a  $1 \times D$ . Questo viene applicato anche per la transizione in lavorazione radiale.

### Scanalatura

$a_p$  = profondità di taglio  $0,5 \times D = f_z$  100%  
 $a_p$  = profondità di taglio  $1,0 \times D = f_z$  75%

### Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a  $0,5 \times D$ .



olio da taglio, attivo ■  
 emulsione ■  
 solo refrigerazione ad aria □

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante |
|--|---|--|--------------------------|--------------|
| Acciai da costruzione generici                           | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | ■            |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | ■            |
| Acciai da bonifica non legati                            | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | ■            |
| Acciai da bonifica legati                                | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | ■            |
| Acciai da cementazione non legati                        | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | ■            |
| Acciai da cementazione legati                            | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | ■ ■          |
| Acciai da nitrurazione                                   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | ■ ■          |
| Acciai da utensile                                       | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | ■ ■          |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | ■            |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | ■ ■          |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | ■ ■          |
| Acciai inossidabili, solforati austenitici martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | ■ ■ ■        |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | ■ □          |
| Ghisa sferoidale e temprata                              | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | ■ ■          |
| Ghisa dura   | -   |  | ≤350 HB                  | ■            |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | ■ □          |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | ■ □          |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | ■            |
| Titanio e sue leghe                                      | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | ■ ■          |
| Alluminio e sue leghe                                    | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | ■            |
| Leghe di alluminio per lavorazione plastica              | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | ■            |
| Leghe ghisa alluminio ≤ 10 % Si > 10 % Si                | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | ■ ■          |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | □            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | ■ ■          |
| Ottone, a truciolo corto a truciolo lungo                | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | ■ ■ ■        |
| Bronzi a truciolo corto                                  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | ■ ■          |
| Bronzi a truciolo lungo                                  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | ■ ■          |
| Mat. plastiche termoindurenti                            | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | □            |
| Materie termoplastiche                                   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | ■ □          |
| Mat. plast. a fibre aramidiche                           | Kevlar  |  | -                        | □            |
| a fibre di vetro/C rinforzate                            | GFK/CFK   |  | -                        | □            |



## Frese di finitura

## Frese di sgrossatura

Catalogo n°

Mat. de tagl.

Norma

Tipo

Pagina

|  | 74617 | 74847 | 64667 | 54847 | 74800      | 74825    | 74845 | 54825    | 54845 | 74816   | 74836   | 54816   | 54836 | 54815 |
|--|-------|-------|-------|-------|------------|----------|-------|----------|-------|---------|---------|---------|-------|-------|
|  | M42   | M42   | M42   |       | M42        | HSS-E-PM |       | HSS-E-PM |       | M42     | M42     | M42     |       |       |
|  | 844K  | 844 L | 844 K | 844 L | Stock std. | 844 K    |       | 844 K    |       | 844 K/L | 844 K/L | 844 K/L |       |       |
|  | N     | N     | N     |       | N          | NRf      |       | NRf      |       | NR      | NR      | NF      |       |       |
|  | 666   | 668   | 667   | 669   | 670        | 672      | 676   | 673      | 677   | 674/678 | 674/678 | 675/679 | 671   |       |



| V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. | V <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|--------------------|
| 28                      | M                  | 31                      | N                  | 68                      | O                  | 19                      | L                  | 57                      | O                  | 102                     | P                  | 38                      | N                  | 68                      | O                  |
| 24                      | L                  | 27                      | M                  | 61                      | N                  | 16                      | K                  | 51                      | N                  | 92                      | O                  | 33                      | L                  | 61                      | M                  |
| 24                      | L                  | 27                      | M                  | 61                      | N                  | 16                      | K                  | 51                      | N                  | 92                      | O                  | 33                      | L                  | 61                      | M                  |
| 22                      | K                  | 25                      | L                  | 55                      | M                  | 15                      | K                  | 46                      | M                  | 83                      | N                  | 31                      | L                  | 55                      | L                  |
| 28                      | L                  | 31                      | M                  | 68                      | N                  | 19                      | K                  | 57                      | N                  | 102                     | O                  | 38                      | L                  | 68                      | M                  |
| 25                      | L                  | 28                      | M                  | 61                      | N                  | 17                      | K                  | 51                      | N                  | 92                      | O                  | 33                      | L                  | 61                      | M                  |
| 22                      | K                  | 25                      | L                  | 55                      | M                  | 15                      | K                  | 46                      | M                  | 83                      | N                  | 31                      | L                  | 55                      | L                  |
| 22                      | K                  | 25                      | L                  | 55                      | M                  | 15                      | K                  | 46                      | M                  | 83                      | N                  | 31                      | L                  | 55                      | L                  |
| 17                      | J                  | 19                      | L                  | 43                      | L                  | 11                      | K                  | 36                      | L                  | 65                      | M                  | 24                      | K                  | 43                      | L                  |
| 28                      | L                  | 31                      | M                  | 68                      | N                  | 19                      | K                  | 57                      | N                  | 102                     | O                  | 38                      | L                  | 68                      | M                  |
| 22                      | L                  | 25                      | M                  | 55                      | N                  | 15                      | K                  | 46                      | N                  | 83                      | O                  | 31                      | L                  | 55                      | M                  |
| 17                      | K                  | 19                      | L                  | 43                      | M                  | 11                      | K                  | 36                      | M                  | 65                      | N                  | 24                      | L                  | 43                      | L                  |
| 22                      | L                  | 25                      | M                  | 55                      | N                  | 15                      | K                  | 46                      | N                  | 83                      | O                  | 31                      | L                  | 55                      | M                  |
| 17                      | J                  | 19                      | L                  | 43                      | L                  | 11                      | K                  | 36                      | L                  | 65                      | M                  | 24                      | K                  | 43                      | L                  |
| 28                      | L                  | 31                      | M                  | 68                      | N                  | 19                      | K                  | 57                      | N                  | 102                     | O                  | 38                      | L                  | 68                      | M                  |
| 11                      | J                  | 13                      | L                  | 31                      | L                  | 8                       | K                  | 26                      | L                  | 47                      | M                  | 17                      | K                  | 31                      | L                  |
| 11                      | K                  | 13                      | L                  | 31                      | M                  | 8                       | K                  | 26                      | M                  | 47                      | N                  | 17                      | L                  | 31                      | L                  |
|                         |                    | 13                      | L                  | 25                      | L                  |                         |                    | 20                      | L                  | 37                      | M                  | 14                      | K                  | 25                      | L                  |

|    |   |    |   |    |   |    |   |    |   |    |   |    |   |    |   |
|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|
| 18 | K | 20 | L | 47 | M | 13 | K | 39 | M | 70 | N | 26 | L | 47 | L |
| 13 | J | 15 | L | 43 | L | 9  | K | 36 | L | 65 | M | 24 | K | 43 | L |
| 13 | K | 15 | L | 43 | M | 9  | K | 36 | M | 65 | N | 24 | L | 43 | L |
| 20 | L | 22 | M | 55 | N |    |   | 46 | N | 83 | O | 31 | L | 55 | M |
|    |   | 15 | L | 47 | M |    |   | 39 | M | 70 | N | 26 | L | 47 | L |
| 20 | L | 22 | M | 55 | N |    |   | 46 | N | 83 | O | 31 | L | 55 | M |
|    |   | 15 | L | 47 | M |    |   | 39 | M | 70 | N | 26 | L | 47 | L |
| 11 | I | 13 | K | 35 | L |    |   | 29 | L | 52 | L | 19 | K | 35 | K |

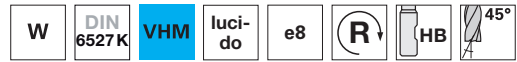
|     |   |     |   |     |   |  |  |    |   |    |   |    |   |    |   |
|-----|---|-----|---|-----|---|--|--|----|---|----|---|----|---|----|---|
|     |   | 5   | L | 10  | L |  |  | 9  | L | 16 | M | 6  | K | 10 | L |
| 11  | J | 13  | L | 27  | L |  |  | 22 | L | 40 | M | 15 | K | 27 | L |
|     |   | 8   | K | 13  | L |  |  | 10 | L | 19 | L | 7  | K | 13 | K |
| 155 | O | 170 | P | 242 | Q |  |  |    |   |    |   |    |   |    |   |
| 110 | N | 121 | O | 218 | P |  |  |    |   |    |   |    |   |    |   |
| 90  | M | 97  | N | 146 | O |  |  |    |   |    |   |    |   |    |   |
| 40  | N | 49  | O | 134 | P |  |  |    |   |    |   |    |   |    |   |
| 65  | O | 73  | P | 158 | Q |  |  |    |   |    |   |    |   |    |   |
| 62  | N | 68  | O | 109 | P |  |  |    |   |    |   |    |   |    |   |
| 62  | M | 68  | N | 109 | O |  |  |    |   |    |   |    |   |    |   |
| 40  | M | 43  | N | 104 | O |  |  |    |   |    |   |    |   |    |   |
| 40  | M | 43  | N | 104 | O |  |  |    |   |    |   |    |   |    |   |
| 33  | L | 37  | M | 80  | N |  |  |    |   |    |   |    |   |    |   |
| 33  | L | 37  | M | 80  | N |  |  |    |   |    |   |    |   |    |   |
| 17  | K | 19  | L | 49  | M |  |  |    |   |    |   |    |   |    |   |

## Frese in MD

### Frese frontali alluminio

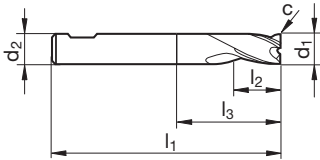


Catalogo n° 74204



Parametri di lav.  
ind. a pag. 570

- extra corto
- tagliente al centro



| d1 e8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|-------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000       | 6,000       | 50,000   | 4,000    | 8,400    | 0,030         | 2 | 3,000  |
| 4,000       | 6,000       | 54,000   | 5,000    | 10,400   | 0,030         | 2 | 4,000  |
| 5,000       | 6,000       | 54,000   | 6,000    | 12,400   | 0,030         | 2 | 5,000  |
| 6,000       | 6,000       | 54,000   | 7,000    | 18,000   | 0,030         | 2 | 6,000  |
| 8,000       | 8,000       | 58,000   | 9,000    | 22,000   | 0,050         | 2 | 8,000  |
| 10,000      | 10,000      | 66,000   | 11,000   | 26,000   | 0,050         | 2 | 10,000 |
| 12,000      | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 2 | 12,000 |
| 14,000      | 14,000      | 75,000   | 14,000   | 30,000   | 0,100         | 2 | 14,000 |
| 16,000      | 16,000      | 82,000   | 16,000   | 34,000   | 0,100         | 2 | 16,000 |
| 18,000      | 18,000      | 84,000   | 18,000   | 36,000   | 0,100         | 2 | 18,000 |
| 20,000      | 20,000      | 92,000   | 20,000   | 42,000   | 0,100         | 2 | 20,000 |

## Frese in MD

### Frese frontali alluminio

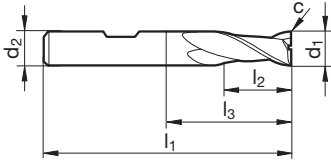


Catalogo n° 74202

|   |           |     |        |    |   |    |     |
|---|-----------|-----|--------|----|---|----|-----|
| W | DIN 6527L | VHM | lucido | e8 | R | HB | 45° |
| P | M         | K   | N      | S  | H |    |     |

Parametri di lav.  
ind. a pag. 570

• tagliente al centro



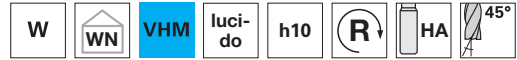
| d1 e8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|-------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000       | 6,000       | 57,000   | 7,000    | 11,400   | 0,030         | 2 | 3,000  |
| 4,000       | 6,000       | 57,000   | 8,000    | 13,900   | 0,030         | 2 | 4,000  |
| 5,000       | 6,000       | 57,000   | 10,000   | 16,900   | 0,030         | 2 | 5,000  |
| 6,000       | 6,000       | 57,000   | 10,000   | 21,000   | 0,030         | 2 | 6,000  |
| 8,000       | 8,000       | 63,000   | 16,000   | 27,000   | 0,050         | 2 | 8,000  |
| 10,000      | 10,000      | 72,000   | 19,000   | 32,000   | 0,050         | 2 | 10,000 |
| 12,000      | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 2 | 12,000 |
| 14,000      | 14,000      | 83,000   | 22,000   | 38,000   | 0,100         | 2 | 14,000 |
| 16,000      | 16,000      | 92,000   | 26,000   | 44,000   | 0,100         | 2 | 16,000 |
| 18,000      | 18,000      | 92,000   | 26,000   | 44,000   | 0,100         | 2 | 18,000 |
| 20,000      | 20,000      | 104,000  | 32,000   | 54,000   | 0,100         | 2 | 20,000 |

## Frese in MD

### Frese frontali alluminio

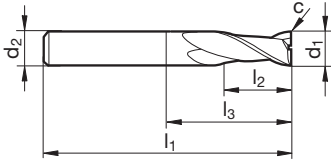


Catalogo n° 74206



Parametri di lav.  
ind. a pag. 570

- extra lungo
- tagliente al centro



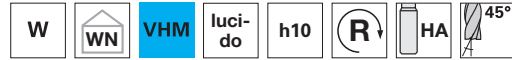
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 0,030         | 2 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,030         | 2 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,050         | 2 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,050         | 2 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 2 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,100         | 2 | 16,000 |

## Frese in MD

### Frese frontali alluminio

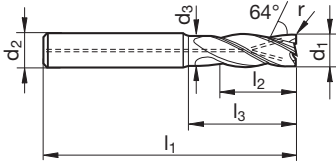


Catalogo n° 74479



Parametri di lav.  
ind. a pag. 570

- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- tagliente al centro



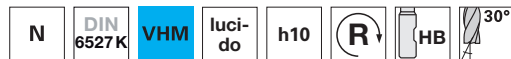
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 1,000         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 1,000         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 1,500         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 1,500         | 3 | 12,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 2,000         | 3 | 16,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 2,500         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



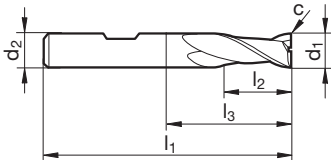
Catalogo n° 74520



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|---|---|---|---|---|---|
| P | M | K | N | S | H |
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Parametri di lav.  
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 50,000   | 3,000    | 6,400    | 0,025         | 2 | 2,000  |
| 2,500        | 6,000       | 50,000   | 3,000    | 6,400    | 0,050         | 2 | 2,500  |
| 3,000        | 6,000       | 50,000   | 4,000    | 8,900    | 0,050         | 2 | 3,000  |
| 3,500        | 6,000       | 50,000   | 4,000    | 9,000    | 0,050         | 2 | 3,500  |
| 4,000        | 6,000       | 54,000   | 5,000    | 10,400   | 0,050         | 2 | 4,000  |
| 4,500        | 6,000       | 54,000   | 5,000    | 11,500   | 0,050         | 2 | 4,500  |
| 5,000        | 6,000       | 54,000   | 6,000    | 12,900   | 0,050         | 2 | 5,000  |
| 5,500        | 6,000       | 54,000   | 7,000    | 14,400   | 0,050         | 2 | 5,500  |
| 6,000        | 6,000       | 54,000   | 7,000    | 18,000   | 0,050         | 2 | 6,000  |
| 6,500        | 8,000       | 58,000   | 8,000    | 17,400   | 0,100         | 2 | 6,500  |
| 7,000        | 8,000       | 58,000   | 8,000    | 17,400   | 0,100         | 2 | 7,000  |
| 7,500        | 8,000       | 58,000   | 9,000    | 18,400   | 0,100         | 2 | 7,500  |
| 8,000        | 8,000       | 58,000   | 9,000    | 22,000   | 0,100         | 2 | 8,000  |
| 8,500        | 10,000      | 66,000   | 10,000   | 21,400   | 0,100         | 2 | 8,500  |
| 9,000        | 10,000      | 66,000   | 10,000   | 21,400   | 0,100         | 2 | 9,000  |
| 9,500        | 10,000      | 66,000   | 11,000   | 22,400   | 0,100         | 2 | 9,500  |
| 10,000       | 10,000      | 66,000   | 11,000   | 26,000   | 0,100         | 2 | 10,000 |
| 11,000       | 12,000      | 73,000   | 12,000   | 25,400   | 0,100         | 2 | 11,000 |
| 12,000       | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 2 | 12,000 |
| 13,000       | 14,000      | 75,000   | 14,000   | 29,400   | 0,150         | 2 | 13,000 |
| 14,000       | 14,000      | 75,000   | 14,000   | 30,000   | 0,150         | 2 | 14,000 |
| 15,000       | 16,000      | 82,000   | 16,000   | 33,400   | 0,150         | 2 | 15,000 |
| 16,000       | 16,000      | 82,000   | 16,000   | 34,000   | 0,150         | 2 | 16,000 |
| 18,000       | 18,000      | 84,000   | 18,000   | 36,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 92,000   | 20,000   | 42,000   | 0,150         | 2 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



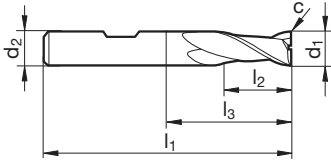
Catalogo n° 54520



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 50,000   | 3,000    | 7,400    | 0,025         | 2 | 2,000  |
| 3,000        | 6,000       | 50,000   | 4,000    | 8,400    | 0,050         | 2 | 3,000  |
| 4,000        | 6,000       | 54,000   | 5,000    | 10,400   | 0,050         | 2 | 4,000  |
| 5,000        | 6,000       | 54,000   | 6,000    | 12,400   | 0,050         | 2 | 5,000  |
| 6,000        | 6,000       | 54,000   | 7,000    | 18,000   | 0,050         | 2 | 6,000  |
| 8,000        | 8,000       | 58,000   | 9,000    | 22,000   | 0,100         | 2 | 8,000  |
| 10,000       | 10,000      | 66,000   | 11,000   | 26,000   | 0,100         | 2 | 10,000 |
| 12,000       | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 75,000   | 14,000   | 30,000   | 0,150         | 2 | 14,000 |
| 16,000       | 16,000      | 82,000   | 16,000   | 34,000   | 0,150         | 2 | 16,000 |
| 18,000       | 18,000      | 84,000   | 18,000   | 36,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 92,000   | 20,000   | 42,000   | 0,150         | 2 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



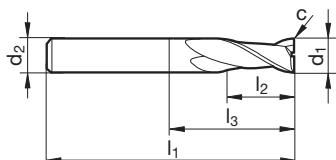
Catalogo n° 54519



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 568

- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 9,400    | 0,025         | 2 | 2,000  |
| 2,800        | 6,000       | 57,000   | 7,000    | 11,900   | 0,050         | 2 | 2,800  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,900   | 0,050         | 2 | 3,000  |
| 3,800        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 2 | 3,800  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 2 | 4,000  |
| 4,800        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 4,800  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 5,000  |
| 5,750        | 6,000       | 57,000   | 10,000   | 18,400   | 0,050         | 2 | 5,750  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 2 | 6,000  |
| 6,750        | 8,000       | 63,000   | 13,000   | 22,400   | 0,100         | 2 | 6,750  |
| 7,000        | 8,000       | 63,000   | 13,000   | 22,400   | 0,100         | 2 | 7,000  |
| 7,750        | 8,000       | 63,000   | 16,000   | 25,400   | 0,100         | 2 | 7,750  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 2 | 8,000  |
| 8,700        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 8,700  |
| 9,000        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 9,000  |
| 9,700        | 10,000      | 72,000   | 19,000   | 30,400   | 0,100         | 2 | 9,700  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 2 | 10,000 |
| 11,700       | 12,000      | 83,000   | 22,000   | 35,400   | 0,100         | 2 | 11,700 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 2 | 14,000 |
| 15,700       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 15,700 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 2 | 20,000 |

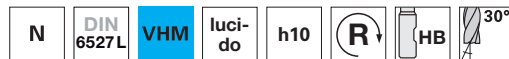


## Frese in MD

### Frese frontali (a 2 taglienti)



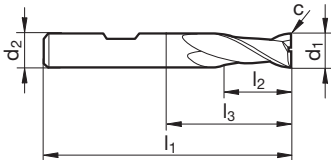
Catalogo n° 74521



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|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 566

- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 9,400    | 0,025         | 2 | 2,000  |
| 2,500        | 6,000       | 57,000   | 7,000    | 10,400   | 0,050         | 2 | 2,500  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,900   | 0,050         | 2 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 12,400   | 0,050         | 2 | 3,500  |
| 3,800        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 2 | 3,800  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 2 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 14,900   | 0,050         | 2 | 4,500  |
| 4,800        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 4,800  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 5,000  |
| 5,750        | 6,000       | 57,000   | 10,000   | 18,400   | 0,050         | 2 | 5,750  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 2 | 6,000  |
| 6,750        | 8,000       | 63,000   | 13,000   | 22,400   | 0,100         | 2 | 6,750  |
| 7,000        | 8,000       | 63,000   | 13,000   | 22,400   | 0,100         | 2 | 7,000  |
| 7,750        | 8,000       | 63,000   | 16,000   | 25,400   | 0,100         | 2 | 7,750  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 2 | 8,000  |
| 8,700        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 8,700  |
| 9,000        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 9,000  |
| 9,700        | 10,000      | 72,000   | 19,000   | 30,400   | 0,100         | 2 | 9,700  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 2 | 10,000 |
| 11,700       | 12,000      | 83,000   | 22,000   | 35,400   | 0,100         | 2 | 11,700 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 2 | 14,000 |
| 15,700       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 15,700 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 2 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



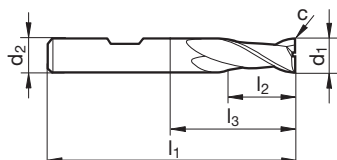
Catalogo n° 54521



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|---|---|---|---|---|---|
| P | M | K | N | S | H |
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Parametri di lav.  
ind. a pag. 568

- tagliente al centro
- uso universale



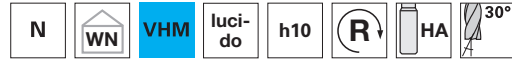
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 10,400   | 0,025         | 2 | 2,000  |
| 2,800        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 2 | 2,800  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 2 | 3,000  |
| 3,800        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 2 | 3,800  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 2 | 4,000  |
| 4,800        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 4,800  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 2 | 5,000  |
| 5,750        | 6,000       | 57,000   | 10,000   | 17,900   | 0,050         | 2 | 5,750  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 2 | 6,000  |
| 6,750        | 8,000       | 63,000   | 13,000   | 21,900   | 0,100         | 2 | 6,750  |
| 7,000        | 8,000       | 63,000   | 13,000   | 21,900   | 0,100         | 2 | 7,000  |
| 7,750        | 8,000       | 63,000   | 16,000   | 25,900   | 0,100         | 2 | 7,750  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 2 | 8,000  |
| 8,700        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 8,700  |
| 9,000        | 10,000      | 72,000   | 16,000   | 27,400   | 0,100         | 2 | 9,000  |
| 9,700        | 10,000      | 72,000   | 19,000   | 31,400   | 0,100         | 2 | 9,700  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 2 | 10,000 |
| 11,700       | 12,000      | 83,000   | 22,000   | 36,400   | 0,100         | 2 | 11,700 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 2 | 14,000 |
| 15,700       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 15,700 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 2 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



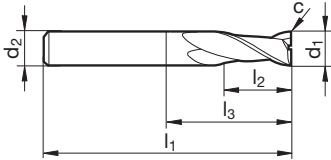
Catalogo n° 74404



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 28,000   | 0,050         | 2 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 33,000   | 0,050         | 2 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 37,000   | 0,050         | 2 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 41,000   | 0,050         | 2 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 53,000   | 0,100         | 2 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 50,000   | 0,100         | 2 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 58,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 150,000  | 45,000   | 63,000   | 0,150         | 2 | 14,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 85,000   | 0,150         | 2 | 16,000 |
| 18,000       | 18,000      | 150,000  | 65,000   | 85,000   | 0,150         | 2 | 18,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 2 | 20,000 |

## Frese in MD

### Frese frontali (a 2 taglienti)



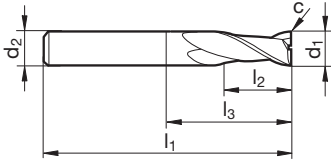
Catalogo n° 54404



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 5,000        | 5,000       | 75,000   | 30,000   | 41,000   | 0,050         | 2 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 42,000   | 0,050         | 2 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 53,000   | 0,100         | 2 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 50,000   | 0,100         | 2 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 58,000   | 0,100         | 2 | 12,000 |
| 14,000       | 14,000      | 150,000  | 45,000   | 64,000   | 0,150         | 2 | 14,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 86,000   | 0,150         | 2 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 89,000   | 0,150         | 2 | 20,000 |

## Frese in MD

### Mini frese frontali (a 3 taglienti)

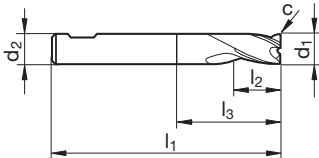


Catalogo n° 64080



Parametri di lav.  
ind. a pag. 568

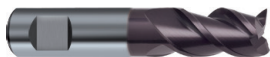
- extra corto
- tagliente al centro
- Fresa One-Way ottimale



| d1 e8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|-------------|-------------|----------|----------|----------|---------------|---|--------|
| 0,300       | 3,000       | 38,000   | 1,000    | 3,400    |               | 3 | 0,300  |
| 0,400       | 3,000       | 38,000   | 1,000    | 3,400    |               | 3 | 0,400  |
| 0,500       | 3,000       | 38,000   | 1,500    | 3,400    | 0,025         | 3 | 0,500  |
| 0,600       | 3,000       | 38,000   | 1,500    | 3,400    | 0,025         | 3 | 0,600  |
| 0,800       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 0,800  |
| 1,000       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,000  |
| 1,200       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,200  |
| 1,500       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,500  |
| 1,800       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,800  |
| 2,000       | 6,000       | 38,000   | 4,000    | 7,400    | 0,025         | 3 | 2,000  |
| 2,500       | 6,000       | 38,000   | 5,000    | 8,400    | 0,050         | 3 | 2,500  |
| 3,000       | 6,000       | 38,000   | 5,000    | 8,400    | 0,050         | 3 | 3,000  |
| 3,500       | 6,000       | 38,000   | 6,000    | 9,400    | 0,050         | 3 | 3,500  |
| 4,000       | 6,000       | 38,000   | 7,000    | 10,400   | 0,050         | 3 | 4,000  |
| 4,500       | 6,000       | 38,000   | 8,000    | 12,400   | 0,050         | 3 | 4,500  |
| 5,000       | 6,000       | 38,000   | 8,000    | 12,400   | 0,050         | 3 | 5,000  |
| 5,500       | 6,000       | 38,000   | 8,000    | 12,400   | 0,050         | 3 | 5,500  |
| 5,750       | 6,000       | 38,000   | 8,000    | 12,400   | 0,050         | 3 | 5,750  |
| 6,000       | 6,000       | 38,000   | 8,000    | 14,000   | 0,050         | 3 | 6,000  |
| 6,750       | 8,000       | 42,000   | 10,000   | 15,400   | 0,100         | 3 | 6,750  |
| 7,000       | 8,000       | 42,000   | 10,000   | 16,400   | 0,100         | 3 | 7,000  |
| 7,750       | 8,000       | 42,000   | 10,000   | 16,400   | 0,100         | 3 | 7,750  |
| 8,000       | 8,000       | 43,000   | 11,000   | 19,000   | 0,100         | 3 | 8,000  |
| 8,700       | 10,000      | 48,000   | 11,000   | 17,400   | 0,100         | 3 | 8,700  |
| 9,000       | 10,000      | 48,000   | 11,000   | 17,400   | 0,100         | 3 | 9,000  |
| 9,700       | 10,000      | 48,000   | 11,000   | 17,400   | 0,100         | 3 | 9,700  |
| 10,000      | 10,000      | 50,000   | 13,000   | 23,000   | 0,100         | 3 | 10,000 |
| 12,000      | 12,000      | 55,000   | 15,000   | 24,500   | 0,100         | 3 | 12,000 |
| 14,000      | 14,000      | 58,000   | 15,000   | 28,000   | 0,150         | 3 | 14,000 |
| 16,000      | 16,000      | 62,000   | 18,000   | 29,000   | 0,150         | 3 | 16,000 |
| 18,000      | 18,000      | 70,000   | 20,000   | 37,000   | 0,150         | 3 | 18,000 |
| 20,000      | 20,000      | 75,000   | 22,000   | 41,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Mini frese frontali (a 3 taglienti)



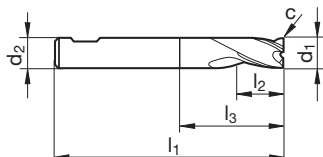
Catalogo n° 64180



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   | • |   |   | • |   |

Parametri di lav.  
ind. a pag. 568

- esecuzione stabile
- tagliente al centro
- Fresa One-Way ottimale



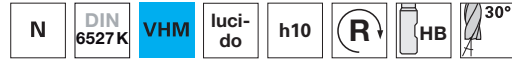
| d1 e8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|-------------|-------------|----------|----------|----------|---------------|---|--------|
| 1,000       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,000  |
| 1,200       | 3,000       | 38,000   | 2,000    | 3,900    | 0,025         | 3 | 1,200  |
| 1,500       | 3,000       | 38,000   | 3,000    | 4,900    | 0,025         | 3 | 1,500  |
| 1,800       | 3,000       | 38,000   | 3,000    | 4,900    | 0,025         | 3 | 1,800  |
| 2,000       | 6,000       | 45,000   | 4,000    | 7,400    | 0,025         | 3 | 2,000  |
| 2,500       | 6,000       | 45,000   | 5,000    | 8,400    | 0,050         | 3 | 2,500  |
| 3,000       | 6,000       | 45,000   | 6,000    | 9,400    | 0,050         | 3 | 3,000  |
| 3,500       | 6,000       | 45,000   | 6,000    | 9,400    | 0,050         | 3 | 3,500  |
| 4,000       | 6,000       | 45,000   | 7,000    | 10,400   | 0,050         | 3 | 4,000  |
| 4,500       | 6,000       | 45,000   | 8,000    | 12,400   | 0,050         | 3 | 4,500  |
| 5,000       | 6,000       | 45,000   | 8,000    | 12,400   | 0,050         | 3 | 5,000  |
| 5,500       | 6,000       | 45,000   | 8,000    | 12,400   | 0,050         | 3 | 5,500  |
| 5,750       | 6,000       | 45,000   | 10,000   | 15,000   | 0,050         | 3 | 5,750  |
| 6,000       | 6,000       | 45,000   | 10,000   | 15,000   | 0,050         | 3 | 6,000  |
| 6,750       | 8,000       | 55,000   | 10,000   | 15,400   | 0,100         | 3 | 6,750  |
| 7,000       | 8,000       | 55,000   | 12,000   | 18,400   | 0,100         | 3 | 7,000  |
| 7,750       | 8,000       | 55,000   | 12,000   | 18,400   | 0,100         | 3 | 7,750  |
| 8,000       | 8,000       | 55,000   | 13,000   | 19,000   | 0,100         | 3 | 8,000  |
| 8,700       | 10,000      | 55,000   | 14,000   | 20,400   | 0,100         | 3 | 8,700  |
| 9,000       | 10,000      | 55,000   | 14,000   | 20,400   | 0,100         | 3 | 9,000  |
| 9,700       | 10,000      | 55,000   | 16,000   | 23,400   | 0,100         | 3 | 9,700  |
| 10,000      | 10,000      | 55,000   | 16,000   | 25,000   | 0,100         | 3 | 10,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



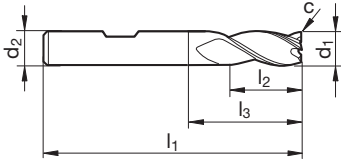
Catalogo n° 74522



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 50,000   | 3,000    | 7,400    | 0,025         | 3 | 2,000  |
| 3,000        | 6,000       | 50,000   | 4,000    | 8,400    | 0,050         | 3 | 3,000  |
| 4,000        | 6,000       | 54,000   | 5,000    | 10,400   | 0,050         | 3 | 4,000  |
| 5,000        | 6,000       | 54,000   | 6,000    | 12,400   | 0,050         | 3 | 5,000  |
| 5,500        | 6,000       | 54,000   | 7,000    | 14,900   | 0,050         | 3 | 5,500  |
| 6,000        | 6,000       | 54,000   | 7,000    | 18,000   | 0,050         | 3 | 6,000  |
| 7,000        | 8,000       | 58,000   | 8,000    | 16,900   | 0,100         | 3 | 7,000  |
| 8,000        | 8,000       | 58,000   | 9,000    | 22,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 66,000   | 11,000   | 26,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 75,000   | 14,000   | 30,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 82,000   | 16,000   | 34,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 84,000   | 18,000   | 36,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 92,000   | 20,000   | 42,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



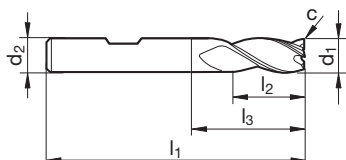
Catalogo n° 64522



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 50,000   | 3,000    | 7,400    | 0,025         | 3 | 2,000  |
| 3,000        | 6,000       | 50,000   | 4,000    | 8,400    | 0,050         | 3 | 3,000  |
| 4,000        | 6,000       | 54,000   | 5,000    | 10,400   | 0,050         | 3 | 4,000  |
| 5,000        | 6,000       | 54,000   | 6,000    | 12,400   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 54,000   | 7,000    | 18,000   | 0,050         | 3 | 6,000  |
| 7,000        | 8,000       | 58,000   | 8,000    | 16,900   | 0,100         | 3 | 7,000  |
| 8,000        | 8,000       | 58,000   | 9,000    | 22,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 66,000   | 11,000   | 26,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 75,000   | 14,000   | 30,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 82,000   | 16,000   | 34,000   | 0,150         | 3 | 16,000 |
| 20,000       | 20,000      | 92,000   | 20,000   | 42,000   | 0,150         | 3 | 20,000 |



## Frese in MD

### Frese frontali (a 3 taglienti)



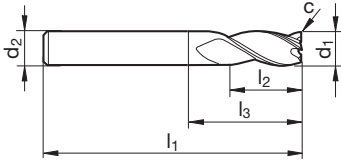
Catalogo n° 54523



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 568

- tagliente al centro
- uso universale



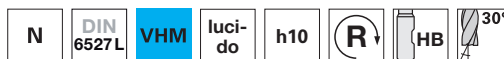
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 10,400   | 0,025         | 3 | 2,000  |
| 2,500        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 2,500  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



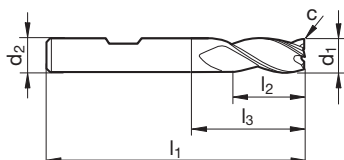
Catalogo n° 74523



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 566

- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 10,400   | 0,025         | 3 | 2,000  |
| 2,500        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 2,500  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



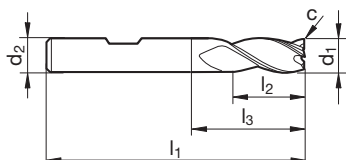
Catalogo n° 64523



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • | • |

Parametri di lav.  
ind. a pag. 568

- tagliente al centro
- uso universale



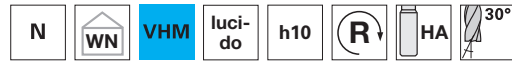
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 6,000    | 9,400    | 0,025         | 3 | 2,000  |
| 2,500        | 6,000       | 57,000   | 7,000    | 10,400   | 0,050         | 3 | 2,500  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,900   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 12,400   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 14,900   | 0,050         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



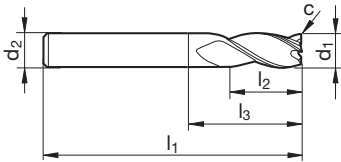
Catalogo n° 74424



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 0,050         | 3 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 0,050         | 3 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 3 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 3 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti)



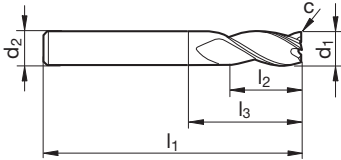
Catalogo n° 54424



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 0,050         | 3 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 0,050         | 3 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 3 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 3 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti) NH



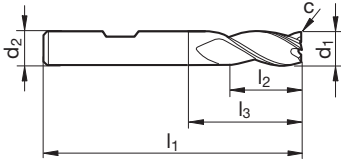
Catalogo n° 64570



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● |   | ○ |   |

Parametri di lav.  
ind. a pag. 568

- Fresa ad alto rendimento universale
- extra corto
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 50,000   | 4,000    | 7,900    | 0,050         | 3 | 3,000  |
| 4,000        | 6,000       | 54,000   | 5,000    | 8,900    | 0,050         | 3 | 4,000  |
| 5,000        | 6,000       | 54,000   | 6,000    | 11,400   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 54,000   | 7,000    | 18,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 58,000   | 9,000    | 22,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 66,000   | 11,000   | 26,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 73,000   | 12,000   | 28,000   | 0,100         | 3 | 12,000 |
| 16,000       | 16,000      | 82,000   | 16,000   | 34,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 84,000   | 18,000   | 36,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 92,000   | 20,000   | 42,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti) NH



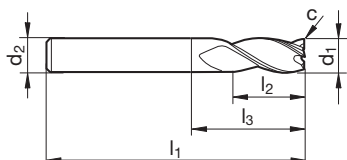
Catalogo n° 74478



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 566

- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 11,400   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 13,900   | 0,050         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 3 taglienti) NH



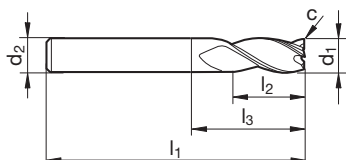
Catalogo n° 64478



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● |   | ○ |   |

Parametri di lav.  
ind. a pag. 568

- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 1,000        | 3,000       | 38,000   | 2,000    | 3,400    | 0,020         | 3 | 1,000  |
| 1,500        | 3,000       | 38,000   | 3,000    | 5,900    | 0,020         | 3 | 1,500  |
| 2,000        | 6,000       | 57,000   | 6,000    | 8,900    | 0,030         | 3 | 2,000  |
| 2,500        | 6,000       | 57,000   | 7,000    | 9,900    | 0,040         | 3 | 2,500  |
| 3,000        | 6,000       | 57,000   | 7,000    | 10,900   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 10,900   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 11,900   | 0,060         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 13,400   | 0,070         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 15,400   | 0,080         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,090         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,120         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,150         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,180         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,210         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,190         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,220         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,240         | 3 | 20,000 |



## Frese in MD

### Frese frontali (a 3 taglienti) NH



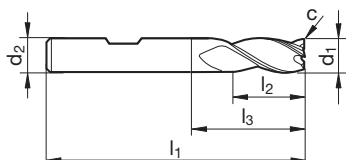
Catalogo n° 64571



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ○ | ○ |

Parametri di lav.  
ind. a pag. 568

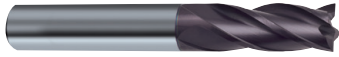
- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 57,000   | 7,000    | 10,900   | 0,050         | 3 | 3,000  |
| 3,500        | 6,000       | 57,000   | 7,000    | 10,900   | 0,050         | 3 | 3,500  |
| 4,000        | 6,000       | 57,000   | 8,000    | 11,900   | 0,050         | 3 | 4,000  |
| 4,500        | 6,000       | 57,000   | 8,000    | 13,400   | 0,050         | 3 | 4,500  |
| 5,000        | 6,000       | 57,000   | 10,000   | 15,400   | 0,050         | 3 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,050         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,100         | 3 | 8,000  |
| 9,000        | 10,000      | 72,000   | 16,000   | 25,400   | 0,100         | 3 | 9,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,100         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,100         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,150         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,150         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,150         | 3 | 20,000 |

## Frese in MD

### Frese frontali (a 4 taglienti)



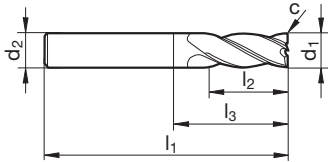
Catalogo n° 54524



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● |   | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 570

- tagliente al centro
- uso universale



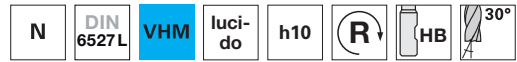
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 7,000    | 11,400   | 0,025         | 4 | 2,000  |
| 3,000        | 6,000       | 57,000   | 8,000    | 12,900   | 0,050         | 4 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 16,900   | 0,050         | 4 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 19,900   | 0,050         | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 4 | 20,000 |

## Frese in MD

### Frese frontali (a 4 taglienti)



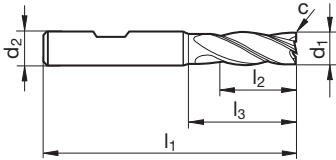
Catalogo n° 74525



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 570

- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 57,000   | 8,000    | 12,900   | 0,050         | 4 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 16,900   | 0,050         | 4 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 19,900   | 0,050         | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 4 | 20,000 |

## Frese in MD

### Frese frontali (a 4 taglienti)



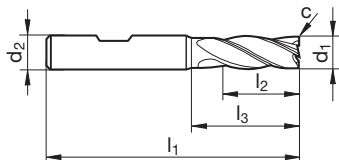
Catalogo n° 64525



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● |   |   |   |

Parametri di lav.  
ind. a pag. 570

- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 2,000        | 6,000       | 57,000   | 7,000    | 9,900    | 0,025         | 4 | 2,000  |
| 3,000        | 6,000       | 57,000   | 8,000    | 12,400   | 0,050         | 4 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 15,900   | 0,050         | 4 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 19,400   | 0,050         | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 4 | 6,000  |
| 7,000        | 8,000       | 63,000   | 16,000   | 23,900   | 0,100         | 4 | 7,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 4 | 20,000 |

## Frese in MD

### Frese frontali (a 4 taglienti)



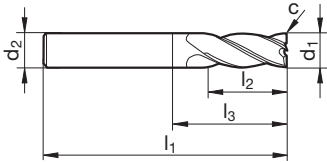
Catalogo n° 54444



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 570

- extra lungo
- tagliente al centro
- uso universale



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 0,050         | 4 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 0,050         | 4 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 0,050         | 4 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 4 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 4 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 4 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 4 | 12,000 |
| 14,000       | 14,000      | 150,000  | 45,000   | 105,000  | 0,150         | 4 | 14,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 4 | 16,000 |
| 18,000       | 18,000      | 150,000  | 65,000   | 102,000  | 0,150         | 4 | 18,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 4 | 20,000 |

## Frese in MD

### Frese frontali con spigolo raggiato



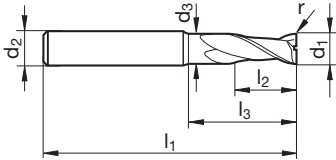
Catalogo n° 54522



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 566

- rettifica della spoglia
- tagliente al centro



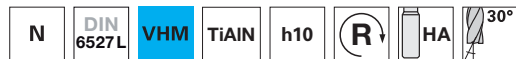
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r     | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|-------|---|---------------|
| 6,000        | 6,000       | 5,700    | 57,000   | 10,000   | 21,000   | 0,500 | 2 | <b>6,005</b>  |
| 6,000        | 6,000       | 5,700    | 57,000   | 10,000   | 21,000   | 1,000 | 2 | <b>6,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 16,000   | 27,000   | 0,500 | 2 | <b>8,005</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 16,000   | 27,000   | 1,000 | 2 | <b>8,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 16,000   | 27,000   | 1,500 | 2 | <b>8,015</b>  |
| 10,000       | 10,000      | 9,500    | 72,000   | 19,000   | 32,000   | 0,500 | 2 | <b>10,005</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 19,000   | 32,000   | 1,000 | 2 | <b>10,010</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 19,000   | 32,000   | 1,500 | 2 | <b>10,015</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 19,000   | 32,000   | 2,000 | 2 | <b>10,020</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 22,000   | 38,000   | 0,500 | 2 | <b>12,005</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 22,000   | 38,000   | 1,000 | 2 | <b>12,010</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 22,000   | 38,000   | 2,000 | 2 | <b>12,020</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 26,000   | 44,000   | 1,000 | 2 | <b>16,010</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 26,000   | 44,000   | 2,000 | 2 | <b>16,020</b> |

## Frese in MD

### Frese frontali con spigolo raggiato



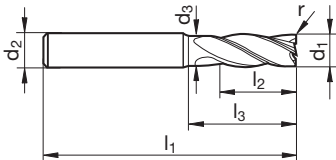
Catalogo n° 54526



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | • |   |

Parametri di lav.  
ind. a pag. 570

- rettifica della spoglia
- tagliente al centro



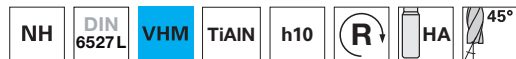
| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r     | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|-------|---|---------------|
| 6,000        | 6,000       | 5,700    | 57,000   | 13,000   | 21,000   | 0,500 | 4 | <b>6,005</b>  |
| 6,000        | 6,000       | 5,700    | 57,000   | 13,000   | 21,000   | 1,000 | 4 | <b>6,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 27,000   | 0,500 | 4 | <b>8,005</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 27,000   | 1,000 | 4 | <b>8,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 27,000   | 1,500 | 4 | <b>8,015</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 27,000   | 2,000 | 4 | <b>8,020</b>  |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 32,000   | 0,500 | 4 | <b>10,005</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 32,000   | 0,800 | 4 | <b>10,008</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 32,000   | 1,000 | 4 | <b>10,010</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 32,000   | 1,500 | 4 | <b>10,015</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 32,000   | 2,000 | 4 | <b>10,020</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 38,000   | 0,500 | 4 | <b>12,005</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 38,000   | 0,800 | 4 | <b>12,008</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 38,000   | 1,000 | 4 | <b>12,010</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 38,000   | 1,500 | 4 | <b>12,015</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 38,000   | 2,000 | 4 | <b>12,020</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 32,000   | 44,000   | 1,000 | 4 | <b>16,010</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 32,000   | 44,000   | 2,000 | 4 | <b>16,020</b> |
| 20,000       | 20,000      | 19,500   | 104,000  | 38,000   | 54,000   | 1,000 | 4 | <b>20,010</b> |
| 20,000       | 20,000      | 19,500   | 104,000  | 38,000   | 54,000   | 2,000 | 4 | <b>20,020</b> |

## Frese in MD

### Frese frontali con spigolo raggiato



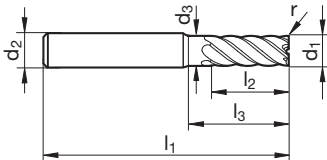
Catalogo n° 54206



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|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 574

- qualità di superficie notevole con operazioni di lappatura
- rettifica della spoglia
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r     | Z | Codice        |
|--------------|-------------|----------|----------|----------|----------|-------|---|---------------|
| 6,000        | 6,000       | 5,700    | 57,000   | 13,000   | 20,000   | 0,500 | 6 | <b>6,005</b>  |
| 6,000        | 6,000       | 5,700    | 57,000   | 13,000   | 20,000   | 1,000 | 6 | <b>6,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 26,000   | 0,500 | 6 | <b>8,005</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 26,000   | 1,000 | 6 | <b>8,010</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 26,000   | 1,500 | 6 | <b>8,015</b>  |
| 8,000        | 8,000       | 7,700    | 63,000   | 19,000   | 26,000   | 2,000 | 6 | <b>8,020</b>  |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 30,000   | 0,500 | 6 | <b>10,005</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 30,000   | 0,800 | 6 | <b>10,008</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 30,000   | 1,000 | 6 | <b>10,010</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 30,000   | 1,500 | 6 | <b>10,015</b> |
| 10,000       | 10,000      | 9,500    | 72,000   | 22,000   | 30,000   | 2,000 | 6 | <b>10,020</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 36,000   | 0,500 | 6 | <b>12,005</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 36,000   | 0,800 | 6 | <b>12,008</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 36,000   | 1,000 | 6 | <b>12,010</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 36,000   | 1,500 | 6 | <b>12,015</b> |
| 12,000       | 12,000      | 11,500   | 83,000   | 26,000   | 36,000   | 2,000 | 6 | <b>12,020</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 32,000   | 42,000   | 1,000 | 6 | <b>16,010</b> |
| 16,000       | 16,000      | 15,500   | 92,000   | 32,000   | 42,000   | 2,000 | 6 | <b>16,020</b> |
| 20,000       | 20,000      | 19,500   | 104,000  | 38,000   | 52,000   | 1,000 | 8 | <b>20,010</b> |
| 20,000       | 20,000      | 19,500   | 104,000  | 38,000   | 52,000   | 2,000 | 8 | <b>20,020</b> |



## Frese in MD

### Frese frontali per finitura, taglienti multipli



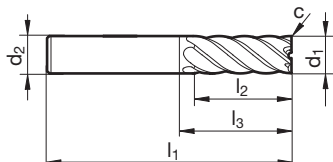
Catalogo n° 54205



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 57,000   | 8,000    | 11,400   | 0,050         | 6 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 15,900   | 0,050         | 6 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 17,900   | 0,050         | 6 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 6 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 6 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 6 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 8 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese frontali per finitura, taglienti multipli



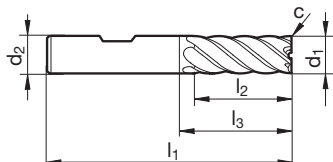
Catalogo n° 54201



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 6 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 6 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 6 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 8 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese frontali per finitura, taglienti multipli



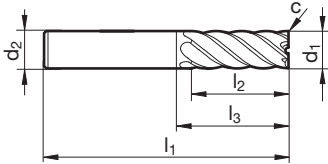
Catalogo n° 54225



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 6 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 6 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese frontali per finitura, taglienti multipli



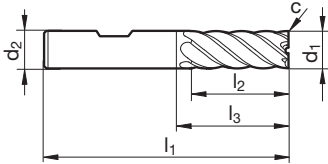
Catalogo n° 54221



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ | ● | ○ |

Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 6 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 6 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese per materiali duri, taglienti multipli



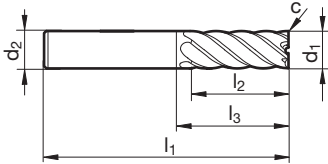
Catalogo n° 54207



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
|   |   | • |   |   | • |

Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto per superfinitura su materiali fino a 62 HRC e superiore



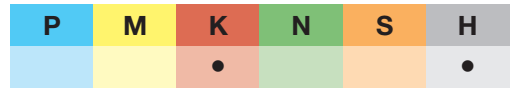
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 3,000        | 6,000       | 57,000   | 8,000    | 11,400   | 0,050         | 6 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 15,900   | 0,050         | 6 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 17,900   | 0,050         | 6 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,100         | 6 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 0,150         | 6 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,150         | 6 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 0,150         | 8 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese per materiali duri, taglienti multipli

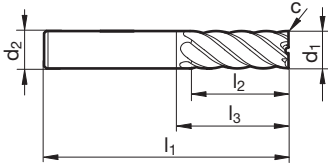


Catalogo n° 54227



Parametri di lav.  
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto per superfinitura su materiali fino a 62 HRC e superiore



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 0,050         | 6 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 0,100         | 6 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 0,100         | 6 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 0,100         | 6 | 12,000 |
| 16,000       | 16,000      | 150,000  | 65,000   | 102,000  | 0,150         | 6 | 16,000 |
| 20,000       | 20,000      | 150,000  | 65,000   | 100,000  | 0,150         | 8 | 20,000 |

## Frese in MD

### Frese a sgrossare



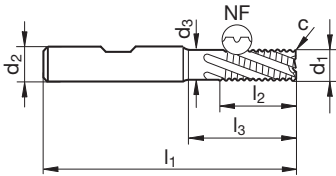
Catalogo n° 54496



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 572

- per scanalatura e sgrossatura
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 20,000   | 0,300         | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 26,000   | 0,300         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 30,000   | 0,300         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 36,000   | 0,500         | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 36,000   | 0,500         | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 42,000   | 0,500         | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 42,000   | 0,500         | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 52,000   | 0,500         | 4 | 20,000 |
| 25,000       | 25,000      | 121,000  | 45,000   | 63,000   | 0,600         | 5 | 25,000 |

## Frese in MD

### Frese a sgrossare



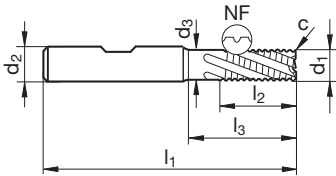
Catalogo n° 54497



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 572

- per fratura a sgrossare e a finire
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 20,000   | 0,300         | 5 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 26,000   | 0,300         | 5 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 30,000   | 0,300         | 5 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 36,000   | 0,500         | 5 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 36,000   | 0,500         | 5 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 42,000   | 0,500         | 6 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 42,000   | 0,500         | 6 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 52,000   | 0,500         | 6 | 20,000 |
| 25,000       | 25,000      | 121,000  | 45,000   | 63,000   | 0,600         | 6 | 25,000 |

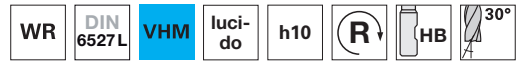


## Frese in MD

### Frese a sgrossare

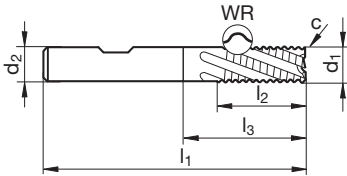


Catalogo n° 74203



Parametri di lav.  
ind. a pag. 572

- alta capacità di truciolatura con alluminio e metallo NE attraverso dentatura zigrinata di sgrossatura grossolana
- tagliente al centro



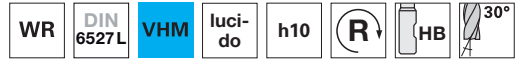
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,300         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,300         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,300         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,500         | 3 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 0,500         | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,500         | 3 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 0,500         | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,500         | 3 | 20,000 |

## Frese in MD

### Frese a sgrossare

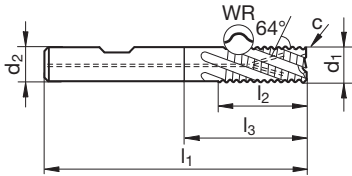


Catalogo n° 74303



Parametri di lav.  
ind. a pag. 572

- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- alta capacità di truciolatura con alluminio e metallo NE attraverso dentatura zigrinata di sgrossatura grossolana
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 0,300         | 3 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 0,300         | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 0,300         | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 0,500         | 3 | 12,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 0,500         | 3 | 16,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 0,500         | 3 | 20,000 |

## Frese in MD

### Frese a sgrossare



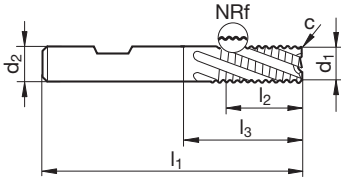
Catalogo n° 64495



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 572

- dentatura zigrinata di sgrossatura fine
- tagliente al centro



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 20,000   | 0,300         | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 26,000   | 0,300         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 30,000   | 0,300         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 36,000   | 0,500         | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 36,000   | 0,500         | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 42,000   | 0,500         | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 42,000   | 0,500         | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 52,000   | 0,500         | 4 | 20,000 |

## Frese in MD

### Frese a sgrossare



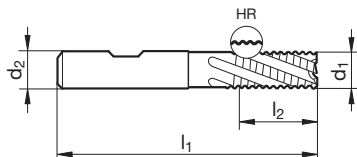
Catalogo n° 64497



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   | • |

Parametri di lav.  
ind. a pag. 572

- dentatura zigrinata di sgrossatura fine
- profilo divisione truciolo
- tagliente al centro
- per materiali difficili da lavorare con 3 ° di angolo di spoglia
- specifica per fresatura su acciaio con resistenza alla trazione, ghisa, ghisa grigia, temprati fino a 56 HRC



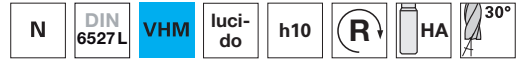
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|--------------|-------------|----------|----------|----------|---------------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 0,300         | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 0,300         | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 0,300         | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 0,500         | 4 | 12,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 0,500         | 4 | 16,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 0,500         | 4 | 20,000 |

## Frese in MD

### Frese a raggio



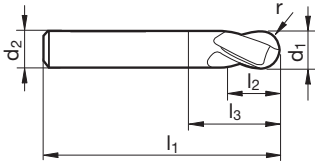
Catalogo n° 74543



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 574

- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 3,000        | 6,000       | 57,000   | 7,000    | 11,400   | 1,500   | 2 | 3,000  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,900   | 2,000   | 2 | 4,000  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 2,500   | 2 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 3,000   | 2 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 4,000   | 2 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 5,000   | 2 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 6,000   | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 7,000   | 2 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 8,000   | 2 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 9,000   | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 10,000  | 2 | 20,000 |

## Frese in MD

### Frese a raggio



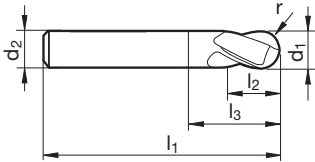
Catalogo n° 54541



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 0,500        | 3,000       | 38,000   | 1,000    | 2,100    | 0,250   | 2 | 0,500  |
| 0,800        | 3,000       | 38,000   | 1,000    | 2,100    | 0,400   | 2 | 0,800  |
| 1,000        | 3,000       | 38,000   | 2,000    | 3,900    | 0,500   | 2 | 1,000  |
| 1,500        | 3,000       | 38,000   | 3,000    | 6,400    | 0,750   | 2 | 1,500  |
| 2,000        | 6,000       | 57,000   | 6,000    | 9,400    | 1,000   | 2 | 2,000  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,900   | 1,500   | 2 | 3,000  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,400   | 2,000   | 2 | 4,000  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 2,500   | 2 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 3,000   | 2 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 4,000   | 2 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 5,000   | 2 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 6,000   | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 7,000   | 2 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 8,000   | 2 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 9,000   | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 10,000  | 2 | 20,000 |

## Frese in MD

### Frese a raggio



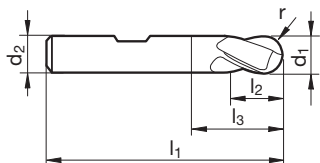
Catalogo n° 64542



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

- tagliente al centro
- raggio



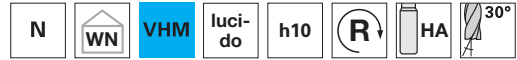
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 1,000        | 3,000       | 38,000   | 2,000    | 3,900    | 0,500   | 2 | 1,000  |
| 1,500        | 3,000       | 38,000   | 3,000    | 6,400    | 0,750   | 2 | 1,500  |
| 2,000        | 6,000       | 57,000   | 6,000    | 9,400    | 1,000   | 2 | 2,000  |
| 3,000        | 6,000       | 57,000   | 7,000    | 11,900   | 1,500   | 2 | 3,000  |
| 4,000        | 6,000       | 57,000   | 8,000    | 13,400   | 2,000   | 2 | 4,000  |
| 5,000        | 6,000       | 57,000   | 10,000   | 16,900   | 2,500   | 2 | 5,000  |
| 6,000        | 6,000       | 57,000   | 10,000   | 21,000   | 3,000   | 2 | 6,000  |
| 8,000        | 8,000       | 63,000   | 16,000   | 27,000   | 4,000   | 2 | 8,000  |
| 10,000       | 10,000      | 72,000   | 19,000   | 32,000   | 5,000   | 2 | 10,000 |
| 12,000       | 12,000      | 83,000   | 22,000   | 38,000   | 6,000   | 2 | 12,000 |
| 14,000       | 14,000      | 83,000   | 22,000   | 38,000   | 7,000   | 2 | 14,000 |
| 16,000       | 16,000      | 92,000   | 26,000   | 44,000   | 8,000   | 2 | 16,000 |
| 18,000       | 18,000      | 92,000   | 26,000   | 44,000   | 9,000   | 2 | 18,000 |
| 20,000       | 20,000      | 104,000  | 32,000   | 54,000   | 10,000  | 2 | 20,000 |

## Frese in MD

### Frese a raggio



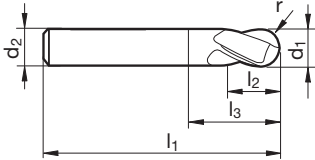
Catalogo n° 74545



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 1,500   | 2 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 2,000   | 2 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 2,500   | 2 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 3,000   | 2 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 4,000   | 2 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 5,000   | 2 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 6,000   | 2 | 12,000 |



## Frese in MD

### Frese a raggio



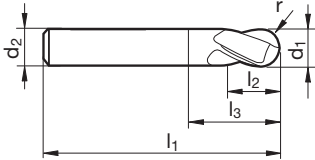
Catalogo n° 64545



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



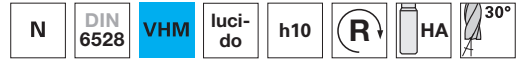
| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 1,500   | 2 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 2,000   | 2 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 2,500   | 2 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 3,000   | 2 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 4,000   | 2 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 5,000   | 2 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 6,000   | 2 | 12,000 |

## Frese in MD

### Frese a raggio



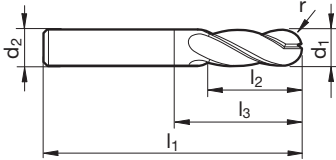
Catalogo n° 74531



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 574

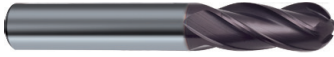
- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 4,000        | 4,000       | 50,000   | 11,000   | 22,000   | 2,000   | 4 | 4,000  |
| 5,000        | 5,000       | 50,000   | 13,000   | 22,000   | 2,500   | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 3,000   | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 4,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 5,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 6,000   | 4 | 12,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 8,000   | 4 | 16,000 |

## Frese in MD

### Frese a raggio



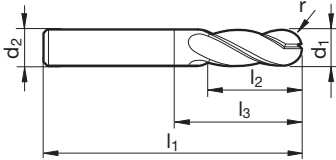
Catalogo n° 54531



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

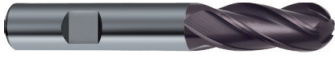
- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 4,000        | 4,000       | 50,000   | 11,000   | 22,000   | 2,000   | 4 | 4,000  |
| 5,000        | 5,000       | 50,000   | 13,000   | 22,000   | 2,500   | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 3,000   | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 4,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 5,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 6,000   | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 7,000   | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 8,000   | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 9,000   | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 10,000  | 4 | 20,000 |

## Frese in MD

### Frese a raggio



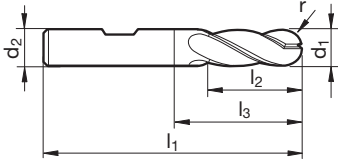
Catalogo n° 64532



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 3,000        | 6,000       | 57,000   | 8,000    | 11,400   | 1,500   | 4 | 3,000  |
| 4,000        | 6,000       | 57,000   | 11,000   | 14,400   | 2,000   | 4 | 4,000  |
| 5,000        | 6,000       | 57,000   | 13,000   | 17,400   | 2,500   | 4 | 5,000  |
| 6,000        | 6,000       | 57,000   | 13,000   | 21,000   | 3,000   | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 19,000   | 27,000   | 4,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 32,000   | 5,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 38,000   | 6,000   | 4 | 12,000 |
| 14,000       | 14,000      | 83,000   | 26,000   | 38,000   | 7,000   | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 44,000   | 8,000   | 4 | 16,000 |
| 18,000       | 18,000      | 92,000   | 32,000   | 44,000   | 9,000   | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 54,000   | 10,000  | 4 | 20,000 |

## Frese in MD

### Frese a raggio



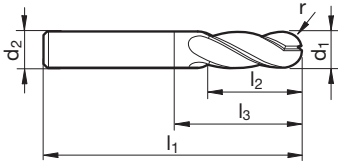
Catalogo n° 64535



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ | ○ |   |

Parametri di lav.  
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



| d1 h10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | r<br>mm | Z | Codice |
|--------------|-------------|----------|----------|----------|---------|---|--------|
| 3,000        | 3,000       | 75,000   | 20,000   | 47,000   | 1,500   | 4 | 3,000  |
| 4,000        | 4,000       | 75,000   | 25,000   | 47,000   | 2,000   | 4 | 4,000  |
| 5,000        | 5,000       | 75,000   | 30,000   | 47,000   | 2,500   | 4 | 5,000  |
| 6,000        | 6,000       | 75,000   | 30,000   | 39,000   | 3,000   | 4 | 6,000  |
| 8,000        | 8,000       | 100,000  | 40,000   | 64,000   | 4,000   | 4 | 8,000  |
| 10,000       | 10,000      | 100,000  | 40,000   | 60,000   | 5,000   | 4 | 10,000 |
| 12,000       | 12,000      | 150,000  | 45,000   | 105,000  | 6,000   | 4 | 12,000 |

## Frese in MD

### Frese per copiatori con affilatura torica



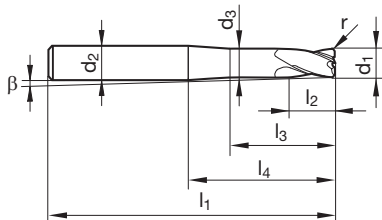
Catalogo n° 54304



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | ○ | • |

Parametri di lav.  
ind. a pag. 578

- corto
- tagliente al centro
- per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | β<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------|---|--------|
| 3,000       | 6,000       | 2,800    | 57,000   | 5,000    | 9,400    | 21,000   | 0,500   | 4,200  | 4 | 3,000  |
| 4,000       | 6,000       | 3,800    | 57,000   | 6,000    | 13,400   | 21,000   | 0,500   | 2,800  | 4 | 4,000  |
| 5,000       | 6,000       | 4,800    | 57,000   | 8,000    | 15,900   | 21,000   | 0,500   | 1,400  | 4 | 5,000  |
| 6,000       | 6,000       | 5,700    | 57,000   | 9,000    | 21,000   | 21,000   | 1,000   |        | 4 | 6,000  |
| 8,000       | 8,000       | 7,700    | 63,000   | 12,000   | 27,000   | 27,000   | 1,000   |        | 4 | 8,000  |
| 10,000      | 10,000      | 9,500    | 72,000   | 15,000   | 32,000   | 32,000   | 1,500   |        | 4 | 10,000 |
| 12,000      | 12,000      | 11,500   | 83,000   | 18,000   | 38,000   | 38,000   | 1,500   |        | 4 | 12,000 |
| 16,000      | 16,000      | 15,500   | 92,000   | 24,000   | 44,000   | 44,000   | 2,000   |        | 4 | 16,000 |

## Frese in MD

### Frese per copiatori con affilatura torica



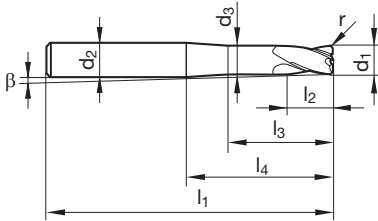
Catalogo n° 54305



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | • | • |

Parametri di lav.  
ind. a pag. 578

- lungo
- tagliente al centro
- con raggio di azione extra lungo per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | $\beta$<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------------|---|--------|
| 6,000       | 6,000       | 5,700    | 75,000   | 9,000    | 38,000   | 39,000   | 1,000   |              | 4 | 6,000  |
| 8,000       | 8,000       | 7,700    | 100,000  | 12,000   | 63,000   | 64,000   | 1,000   |              | 4 | 8,000  |
| 10,000      | 10,000      | 9,500    | 100,000  | 15,000   | 58,000   | 60,000   | 1,500   |              | 4 | 10,000 |
| 12,000      | 12,000      | 11,500   | 150,000  | 18,000   | 103,000  | 105,000  | 1,500   |              | 4 | 12,000 |
| 16,000      | 16,000      | 15,500   | 150,000  | 24,000   | 100,000  | 102,000  | 2,000   |              | 4 | 16,000 |

## Frese in MD

### Frese per copiatori con affilatura torica



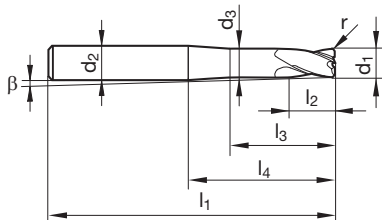
Catalogo n° 54302



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 576

- per sgrossatura, finitura e superfinitura in condizioni HSC in pressofusione e stampi
- tagliente al centro
- adatto per materiale da 40 a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | $\beta$<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------------|---|--------|
| 2,000       | 6,000       | 1,800    | 57,000   | 3,000    | 6,200    | 20,000   | 0,500   | 5,900        | 2 | 2,000  |
| 3,000       | 6,000       | 2,800    | 57,000   | 3,500    | 8,400    | 20,000   | 0,500   | 4,400        | 2 | 3,000  |
| 4,000       | 6,000       | 3,800    | 57,000   | 4,000    | 9,400    | 20,000   | 1,000   | 3,100        | 2 | 4,000  |
| 6,000       | 6,000       | 5,600    | 57,000   | 6,000    | 19,000   | 21,000   | 2,000   |              | 2 | 6,000  |
| 8,000       | 8,000       | 7,600    | 63,000   | 7,000    | 25,000   | 27,000   | 2,000   |              | 2 | 8,000  |
| 10,000      | 10,000      | 9,600    | 72,000   | 8,000    | 28,000   | 32,000   | 3,000   |              | 2 | 10,000 |
| 12,000      | 12,000      | 11,500   | 83,000   | 10,000   | 33,000   | 38,000   | 4,000   |              | 2 | 12,000 |



## Frese in MD

### Frese per copiatori con affilatura torica



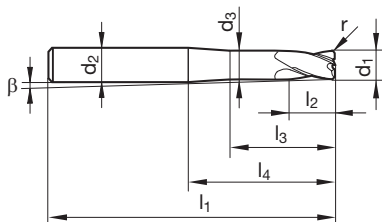
Catalogo n° 54303



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 576

- con raggio di azione extra lungo per sgrossatura, lappatura e superfinitura a condizioni HSC nell'industria dello stampo e formatura
- tagliente al centro
- adatto per materiale da 40 a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | β<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------|---|--------|
| 2,000       | 6,000       | 1,800    | 80,000   | 3,000    | 8,000    | 40,000   | 0,500   | 2,900  | 2 | 2,000  |
| 3,000       | 6,000       | 2,800    | 80,000   | 3,500    | 12,000   | 40,000   | 0,500   | 2,200  | 2 | 3,000  |
| 4,000       | 6,000       | 3,800    | 80,000   | 4,000    | 20,000   | 40,000   | 1,000   | 1,500  | 2 | 4,000  |
| 6,000       | 8,000       | 5,600    | 100,000  | 6,000    | 59,000   | 60,000   | 2,000   | 1,000  | 2 | 6,000  |
| 8,000       | 10,000      | 7,600    | 120,000  | 7,000    | 74,000   | 75,000   | 2,000   | 0,800  | 2 | 8,000  |
| 10,000      | 12,000      | 9,600    | 120,000  | 8,000    | 68,000   | 70,000   | 3,000   | 0,900  | 2 | 10,000 |
| 12,000      | 16,000      | 11,500   | 150,000  | 10,000   | 95,800   | 100,000  | 4,000   | 1,200  | 2 | 12,000 |

## Frese in MD

### Frese a raggio per copiatori



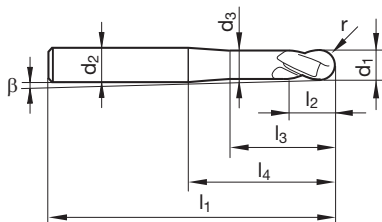
Catalogo n° 54306



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | • | • |

Parametri di lav.  
ind. a pag. 578

- corto
- tagliente al centro
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | β<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------|---|--------|
| 0,500       | 3,000       | 0,400    | 38,000   | 0,750    | 2,600    | 10,000   | 0,250   | 7,400  | 2 | 0,500  |
| 0,800       | 3,000       | 0,700    | 38,000   | 1,200    | 3,500    | 10,000   | 0,400   | 6,600  | 2 | 0,800  |
| 1,000       | 3,000       | 0,900    | 38,000   | 1,500    | 4,000    | 10,000   | 0,500   | 6,100  | 2 | 1,000  |
| 1,500       | 3,000       | 1,400    | 38,000   | 2,250    | 5,500    | 10,000   | 0,750   | 4,700  | 2 | 1,500  |
| 2,000       | 6,000       | 1,900    | 57,000   | 3,000    | 9,400    | 21,000   | 1,000   | 5,800  | 2 | 2,000  |
| 3,000       | 6,000       | 2,700    | 57,000   | 5,000    | 11,600   | 21,000   | 1,500   | 4,400  | 2 | 3,000  |
| 4,000       | 6,000       | 3,700    | 57,000   | 6,000    | 14,500   | 21,000   | 2,000   | 3,100  | 2 | 4,000  |
| 5,000       | 6,000       | 4,700    | 57,000   | 8,000    | 17,300   | 21,000   | 2,500   | 1,600  | 2 | 5,000  |
| 6,000       | 6,000       | 5,700    | 57,000   | 9,000    | 20,000   | 21,000   | 3,000   |        | 2 | 6,000  |
| 8,000       | 8,000       | 7,700    | 63,000   | 12,000   | 26,000   | 27,000   | 4,000   |        | 2 | 8,000  |
| 10,000      | 10,000      | 9,500    | 72,000   | 15,000   | 30,000   | 32,000   | 5,000   |        | 2 | 10,000 |
| 12,000      | 12,000      | 11,500   | 83,000   | 18,000   | 36,000   | 38,000   | 6,000   |        | 2 | 12,000 |
| 16,000      | 16,000      | 15,500   | 92,000   | 24,000   | 42,000   | 44,000   | 8,000   |        | 2 | 16,000 |

## Frese in MD

### Frese a raggio per copiatori



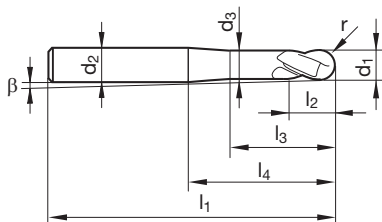
Catalogo n° 54307



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   | • | • |

Parametri di lav.  
ind. a pag. 578

- lungo
- tagliente al centro
- con raggio di azione extra lungo per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | $\beta$<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------------|---|--------|
| 3,000       | 6,000       | 2,700    | 75,000   | 5,000    | 20,000   | 39,000   | 1,500   | 2,300        | 2 | 3,000  |
| 4,000       | 6,000       | 3,700    | 75,000   | 6,000    | 20,000   | 39,000   | 2,000   | 1,600        | 2 | 4,000  |
| 5,000       | 6,000       | 4,700    | 75,000   | 8,000    | 20,000   | 39,000   | 2,500   | 0,800        | 2 | 5,000  |
| 6,000       | 6,000       | 5,700    | 75,000   | 9,000    | 38,000   | 39,000   | 3,000   |              | 2 | 6,000  |
| 8,000       | 8,000       | 7,700    | 100,000  | 12,000   | 63,000   | 64,000   | 4,000   |              | 2 | 8,000  |
| 10,000      | 10,000      | 9,500    | 100,000  | 15,000   | 58,000   | 60,000   | 5,000   |              | 2 | 10,000 |
| 12,000      | 12,000      | 11,500   | 150,000  | 18,000   | 103,000  | 105,000  | 6,000   |              | 2 | 12,000 |
| 16,000      | 16,000      | 15,500   | 150,000  | 24,000   | 100,000  | 102,000  | 8,000   |              | 2 | 16,000 |

## Frese in MD

### Frese a raggio per copiatori



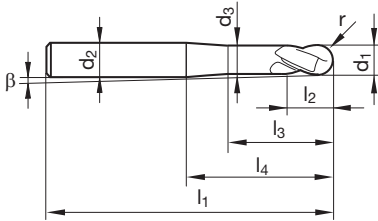
Catalogo n° 54300



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 576

- corto
- tagliente al centro
- per la lavorazione di acciai duri fino a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | β<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------|---|--------|
| 2,000       | 6,000       | 1,800    | 57,000   | 3,000    | 6,200    | 20,000   | 1,000   | 6,100  | 2 | 2,000  |
| 3,000       | 6,000       | 2,800    | 57,000   | 3,500    | 8,400    | 20,000   | 1,500   | 4,700  | 2 | 3,000  |
| 4,000       | 6,000       | 3,800    | 57,000   | 4,000    | 9,400    | 20,000   | 2,000   | 3,200  | 2 | 4,000  |
| 6,000       | 6,000       | 5,600    | 57,000   | 6,000    | 19,000   | 21,000   | 3,000   |        | 2 | 6,000  |
| 8,000       | 8,000       | 7,600    | 63,000   | 7,000    | 25,000   | 27,000   | 4,000   |        | 2 | 8,000  |
| 10,000      | 10,000      | 9,600    | 72,000   | 8,000    | 28,000   | 32,000   | 5,000   |        | 2 | 10,000 |
| 12,000      | 12,000      | 11,500   | 83,000   | 10,000   | 33,000   | 38,000   | 6,000   |        | 2 | 12,000 |

## Frese in MD

### Frese a raggio per copiatori



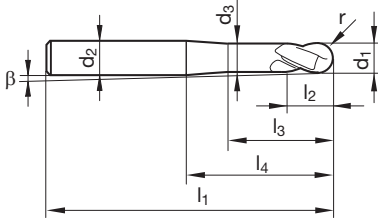
Catalogo n° 54301



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 576

- lungo
- tagliente al centro
- con raggio di azione extra lungo per sgrossatura, lappatura e superfinitura a condizioni HSC nell'industria dello stampo e formatura
- lunga vita utensile grazie al rivestimento molto forte



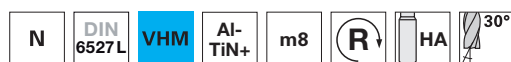
| d1 h8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | r<br>mm | β<br>° | Z | Codice |
|-------------|-------------|----------|----------|----------|----------|----------|---------|--------|---|--------|
| 2,000       | 6,000       | 1,800    | 80,000   | 3,000    | 8,000    | 40,000   | 1,000   | 3,000  | 2 | 2,000  |
| 3,000       | 6,000       | 2,800    | 80,000   | 3,500    | 12,000   | 40,000   | 1,500   | 2,300  | 2 | 3,000  |
| 4,000       | 6,000       | 3,800    | 80,000   | 4,000    | 20,000   | 40,000   | 2,000   | 1,600  | 2 | 4,000  |
| 6,000       | 8,000       | 5,600    | 100,000  | 6,000    | 59,000   | 60,000   | 3,000   | 1,100  | 2 | 6,000  |
| 8,000       | 10,000      | 7,600    | 120,000  | 7,000    | 74,000   | 75,000   | 4,000   | 0,900  | 2 | 8,000  |
| 10,000      | 12,000      | 9,600    | 120,000  | 8,000    | 68,000   | 70,000   | 5,000   | 0,900  | 2 | 10,000 |
| 12,000      | 16,000      | 11,500   | 150,000  | 10,000   | 95,800   | 100,000  | 6,000   | 1,300  | 2 | 12,000 |

## Frese in MD

### Fresa pilota

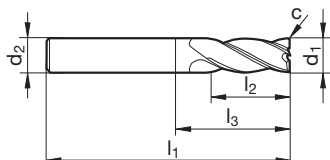


Catalogo n° 54700



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

- per fresare e foratura pilota
- adatto anche in combinazione con punte a cannone o punte per fori profondi, tipo SUPERV-T o SUPERV-NX
- tagliente al centro



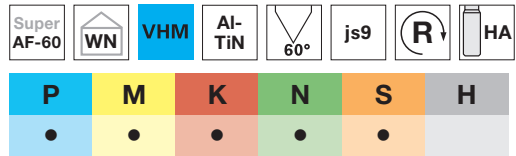
| d1 m8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | Codice |
|-------------|-------------|----------|----------|----------|---------------|---|--------|
| 1,400       | 3,000       | 38,000   | 3,000    | 5,900    | 0,010         | 4 | 1,400  |
| 1,500       | 3,000       | 38,000   | 4,000    | 6,900    | 0,020         | 4 | 1,500  |
| 1,800       | 3,000       | 38,000   | 6,000    | 8,900    | 0,020         | 4 | 1,800  |
| 2,000       | 3,000       | 38,000   | 6,500    | 9,400    | 0,020         | 4 | 2,000  |
| 2,100       | 3,000       | 38,000   | 6,500    | 9,900    | 0,020         | 4 | 2,100  |
| 2,300       | 3,000       | 38,000   | 6,500    | 9,900    | 0,020         | 4 | 2,300  |
| 2,500       | 3,000       | 38,000   | 6,500    | 9,900    | 0,030         | 4 | 2,500  |
| 2,800       | 3,000       | 38,000   | 6,500    | 10,000   | 0,030         | 4 | 2,800  |
| 3,000       | 6,000       | 57,000   | 8,000    | 12,400   | 0,030         | 4 | 3,000  |
| 3,500       | 6,000       | 57,000   | 10,000   | 14,900   | 0,040         | 4 | 3,500  |
| 4,000       | 6,000       | 57,000   | 11,000   | 15,900   | 0,040         | 4 | 4,000  |
| 4,500       | 6,000       | 57,000   | 11,000   | 17,400   | 0,050         | 4 | 4,500  |
| 5,000       | 6,000       | 57,000   | 13,000   | 19,400   | 0,050         | 4 | 5,000  |
| 5,500       | 6,000       | 57,000   | 13,000   | 20,400   | 0,060         | 4 | 5,500  |
| 6,000       | 8,000       | 63,000   | 13,000   | 20,400   | 0,060         | 4 | 6,000  |
| 6,500       | 8,000       | 63,000   | 13,000   | 20,900   | 0,070         | 4 | 6,500  |
| 7,000       | 8,000       | 63,000   | 16,000   | 23,900   | 0,070         | 4 | 7,000  |
| 7,500       | 8,000       | 63,000   | 16,000   | 23,900   | 0,080         | 4 | 7,500  |
| 8,000       | 10,000      | 72,000   | 19,000   | 26,900   | 0,080         | 4 | 8,000  |
| 8,500       | 10,000      | 72,000   | 19,000   | 28,400   | 0,090         | 4 | 8,500  |
| 9,000       | 10,000      | 72,000   | 19,000   | 28,400   | 0,090         | 4 | 9,000  |
| 10,000      | 12,000      | 83,000   | 22,000   | 31,400   | 0,100         | 4 | 10,000 |
| 11,000      | 12,000      | 83,000   | 26,000   | 36,400   | 0,110         | 4 | 11,000 |
| 12,000      | 14,000      | 83,000   | 26,000   | 37,400   | 0,120         | 4 | 12,000 |

## Utensili di sbavatura e smussatura

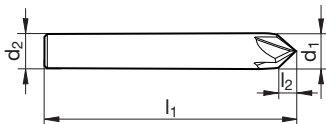
### Fresa frontali a 60° per sbavatura



Catalogo n° 53393



- Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



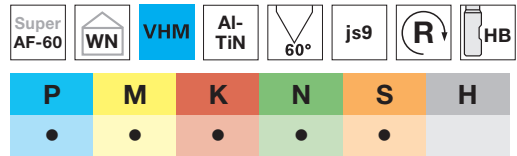
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 3,500    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 5,200    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 7,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 8,700    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 10,400   | 4 | 12,000 |

## Utensili di sbavatura e smussatura

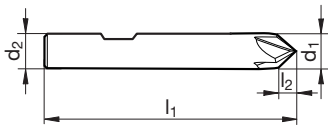
### Fresa frontali a 60° per sbavatura



Catalogo n° 53394



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 5,200    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 7,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 8,700    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 10,400   | 4 | 12,000 |



## Utensili di sbavatura e smussatura

### Fresa frontali a 90° per sbavatura

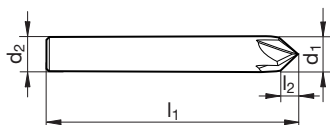


Catalogo n° 53395



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



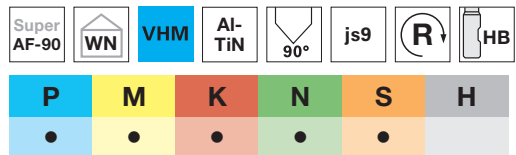
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 2,000    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 3,000    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 4,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 5,000    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 6,000    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

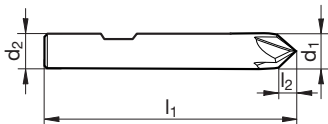
### Fresa frontali a 90° per sbavatura



Catalogo n° 53396



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



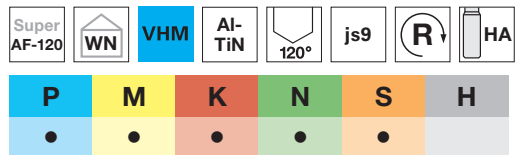
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 2,000    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 3,000    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 4,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 5,000    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 6,000    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

### Fresa frontali a 120° per sbavatura



Catalogo n° 53397



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



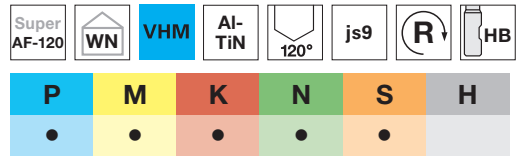
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 1,200    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 1,800    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 2,400    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 2,900    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 3,500    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

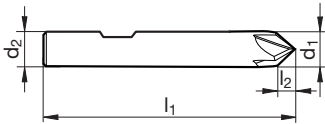
### Fresa frontali a 120° per sbavatura



Catalogo n° 53398



- Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 1,800    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 2,400    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 2,900    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 3,500    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

### Sbavatori a 90° ad avanzamento ed estrazione

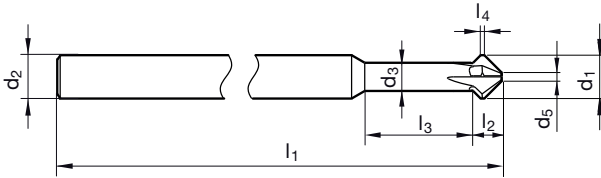


Catalogo n° 52365



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   |   |   |   |

- Utensile per sbavatura e smussatura per la lavorazione in entrata e uscita dal foro con un angolo di smusso 90°
- per impiego in mandrini ad espansione idraulica e per calettamento
- con codolo a DIN 6535



| d1<br>mm | d2 h6<br>mm | d3<br>mm | d5<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|----------|----------|----------|---|--------|
| 3,000    | 4,000       | 2,200    | 0,600    | 75,000   | 2,10     | 9,300    | 0,500    | 4 | 3,000  |
| 4,000    | 4,000       | 2,900    | 0,800    | 75,000   | 2,70     | 12,300   | 0,500    | 4 | 4,000  |
| 5,000    | 5,000       | 3,900    | 1,000    | 75,000   | 3,00     | 15,000   | 0,500    | 4 | 5,000  |
| 6,000    | 6,000       | 3,900    | 1,200    | 100,000  | 3,90     | 14,300   | 0,500    | 4 | 6,000  |
| 8,000    | 6,000       | 6,000    | 1,600    | 100,000  | 4,70     |          | 0,500    | 4 | 8,000  |
| 10,000   | 6,000       | 6,000    | 2,000    | 100,000  | 6,50     |          | 0,500    | 4 | 10,000 |
| 12,000   | 6,000       | 6,000    | 2,400    | 100,000  | 8,30     |          | 0,500    | 4 | 12,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



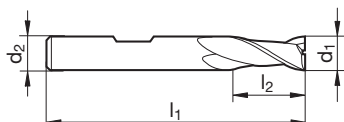
Catalogo n° 74231



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 1,000    | h10           | 6,000    | 47,000   | 2,000    | 2 | 1,000  |
| 1,500    | h10           | 6,000    | 47,000   | 3,000    | 2 | 1,500  |
| 2,000    | e8            | 6,000    | 48,000   | 4,000    | 2 | 2,000  |
| 2,500    | e8            | 6,000    | 49,000   | 5,000    | 2 | 2,500  |
| 3,000    | e8            | 6,000    | 49,000   | 5,000    | 2 | 3,000  |
| 3,500    | h10           | 6,000    | 50,000   | 6,000    | 2 | 3,500  |
| 4,000    | e8            | 6,000    | 51,000   | 7,000    | 2 | 4,000  |
| 4,500    | h10           | 6,000    | 51,000   | 7,000    | 2 | 4,500  |
| 5,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 5,000  |
| 5,500    | h10           | 6,000    | 52,000   | 8,000    | 2 | 5,500  |
| 6,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 6,000  |
| 7,000    | e8            | 10,000   | 60,000   | 10,000   | 2 | 7,000  |
| 8,000    | e8            | 10,000   | 61,000   | 11,000   | 2 | 8,000  |
| 9,000    | h10           | 10,000   | 61,000   | 11,000   | 2 | 9,000  |
| 10,000   | e8            | 10,000   | 63,000   | 13,000   | 2 | 10,000 |
| 12,000   | e8            | 12,000   | 73,000   | 16,000   | 2 | 12,000 |
| 14,000   | e8            | 12,000   | 73,000   | 16,000   | 2 | 14,000 |
| 16,000   | e8            | 16,000   | 79,000   | 19,000   | 2 | 16,000 |
| 18,000   | e8            | 16,000   | 79,000   | 19,000   | 2 | 18,000 |
| 20,000   | e8            | 20,000   | 88,000   | 22,000   | 2 | 20,000 |
| 25,000   | e8            | 25,000   | 102,000  | 26,000   | 2 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



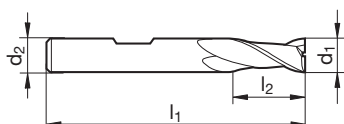
Catalogo n° 64640



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



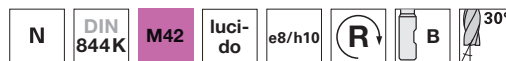
| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 1,000    | h10           | 6,000    | 47,000   | 2,000    | 2 | 1,000  |
| 1,500    | h10           | 6,000    | 47,000   | 3,000    | 2 | 1,500  |
| 2,000    | e8            | 6,000    | 48,000   | 4,000    | 2 | 2,000  |
| 2,500    | e8            | 6,000    | 49,000   | 5,000    | 2 | 2,500  |
| 3,000    | e8            | 6,000    | 49,000   | 5,000    | 2 | 3,000  |
| 3,500    | h10           | 6,000    | 50,000   | 6,000    | 2 | 3,500  |
| 4,000    | e8            | 6,000    | 51,000   | 7,000    | 2 | 4,000  |
| 4,500    | h10           | 6,000    | 51,000   | 7,000    | 2 | 4,500  |
| 5,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 5,000  |
| 5,500    | h10           | 6,000    | 52,000   | 8,000    | 2 | 5,500  |
| 6,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 6,000  |
| 7,000    | e8            | 10,000   | 60,000   | 10,000   | 2 | 7,000  |
| 8,000    | e8            | 10,000   | 61,000   | 11,000   | 2 | 8,000  |
| 9,000    | h10           | 10,000   | 61,000   | 11,000   | 2 | 9,000  |
| 10,000   | e8            | 10,000   | 63,000   | 13,000   | 2 | 10,000 |
| 12,000   | e8            | 12,000   | 73,000   | 16,000   | 2 | 12,000 |
| 14,000   | e8            | 12,000   | 73,000   | 16,000   | 2 | 14,000 |
| 16,000   | e8            | 16,000   | 79,000   | 19,000   | 2 | 16,000 |
| 18,000   | e8            | 16,000   | 79,000   | 19,000   | 2 | 18,000 |
| 20,000   | e8            | 20,000   | 88,000   | 22,000   | 2 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



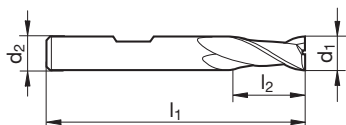
Catalogo n° 74243



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 3,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 3,000  |
| 3,500    | h10           | 6,000    | 54,000   | 10,000   | 2 | 3,500  |
| 4,000    | e8            | 6,000    | 55,000   | 11,000   | 2 | 4,000  |
| 4,500    | h10           | 6,000    | 55,000   | 11,000   | 2 | 4,500  |
| 5,000    | e8            | 6,000    | 57,000   | 13,000   | 2 | 5,000  |
| 5,500    | h10           | 6,000    | 57,000   | 13,000   | 2 | 5,500  |
| 6,000    | e8            | 6,000    | 57,000   | 13,000   | 2 | 6,000  |
| 7,000    | e8            | 10,000   | 66,000   | 16,000   | 2 | 7,000  |
| 8,000    | e8            | 10,000   | 69,000   | 19,000   | 2 | 8,000  |
| 10,000   | e8            | 10,000   | 72,000   | 22,000   | 2 | 10,000 |
| 12,000   | e8            | 12,000   | 83,000   | 26,000   | 2 | 12,000 |
| 14,000   | e8            | 12,000   | 83,000   | 26,000   | 2 | 14,000 |
| 16,000   | e8            | 16,000   | 92,000   | 32,000   | 2 | 16,000 |
| 18,000   | e8            | 16,000   | 92,000   | 32,000   | 2 | 18,000 |
| 20,000   | e8            | 20,000   | 104,000  | 38,000   | 2 | 20,000 |



## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



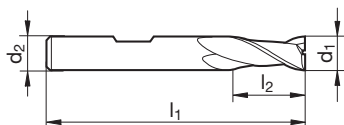
Catalogo n° 64670



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



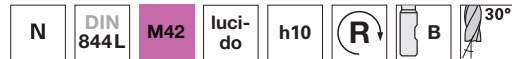
| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 3,000    | e8            | 6,000    | 52,000   | 8,000    | 2 | 3,000  |
| 4,000    | e8            | 6,000    | 55,000   | 11,000   | 2 | 4,000  |
| 5,000    | e8            | 6,000    | 57,000   | 13,000   | 2 | 5,000  |
| 6,000    | e8            | 6,000    | 57,000   | 13,000   | 2 | 6,000  |
| 8,000    | e8            | 10,000   | 69,000   | 19,000   | 2 | 8,000  |
| 10,000   | e8            | 10,000   | 72,000   | 22,000   | 2 | 10,000 |
| 12,000   | e8            | 12,000   | 83,000   | 26,000   | 2 | 12,000 |
| 16,000   | e8            | 16,000   | 92,000   | 32,000   | 2 | 16,000 |
| 18,000   | e8            | 16,000   | 92,000   | 32,000   | 2 | 18,000 |
| 20,000   | e8            | 20,000   | 104,000  | 38,000   | 2 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



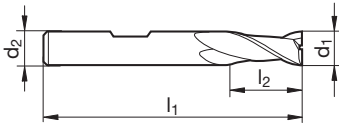
Catalogo n° 74244



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 3,000    | h10           | 6,000    | 56,000   | 12,000   | 2 | 3,000  |
| 4,000    | h10           | 6,000    | 63,000   | 19,000   | 2 | 4,000  |
| 5,000    | h10           | 6,000    | 68,000   | 24,000   | 2 | 5,000  |
| 6,000    | h10           | 6,000    | 68,000   | 24,000   | 2 | 6,000  |
| 8,000    | h10           | 10,000   | 88,000   | 38,000   | 2 | 8,000  |
| 10,000   | h10           | 10,000   | 95,000   | 45,000   | 2 | 10,000 |
| 12,000   | h10           | 12,000   | 110,000  | 53,000   | 2 | 12,000 |
| 14,000   | h10           | 12,000   | 110,000  | 53,000   | 2 | 14,000 |
| 16,000   | h10           | 16,000   | 123,000  | 63,000   | 2 | 16,000 |
| 18,000   | h10           | 16,000   | 123,000  | 63,000   | 2 | 18,000 |
| 20,000   | h10           | 20,000   | 141,000  | 75,000   | 2 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 2 taglienti)



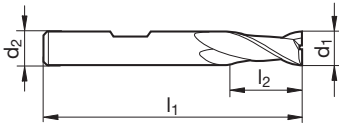
Catalogo n° 64671



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • |   |   |   |

Parametri di lav.  
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



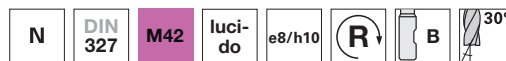
| d1<br>mm | Tolleranza d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|---------------|----------|----------|----------|---|--------|
| 4,000    | h10           | 6,000    | 63,000   | 19,000   | 2 | 4,000  |
| 5,000    | h10           | 6,000    | 68,000   | 24,000   | 2 | 5,000  |
| 6,000    | h10           | 6,000    | 68,000   | 24,000   | 2 | 6,000  |
| 8,000    | h10           | 10,000   | 88,000   | 38,000   | 2 | 8,000  |
| 10,000   | h10           | 10,000   | 95,000   | 45,000   | 2 | 10,000 |
| 12,000   | h10           | 12,000   | 110,000  | 53,000   | 2 | 12,000 |
| 14,000   | h10           | 12,000   | 110,000  | 53,000   | 2 | 14,000 |
| 16,000   | h10           | 16,000   | 123,000  | 63,000   | 2 | 16,000 |
| 18,000   | h10           | 16,000   | 123,000  | 63,000   | 2 | 18,000 |
| 20,000   | h10           | 20,000   | 141,000  | 75,000   | 2 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



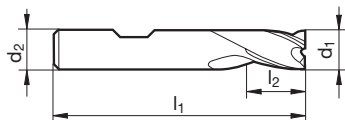
Catalogo n° 74280



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 2,800    | h10 | 6,000    | 49,000   | 5,000    | 3 | 2,800  |
| 3,000    | e8  | 6,000    | 49,000   | 5,000    | 3 | 3,000  |
| 3,800    | h10 | 6,000    | 51,000   | 7,000    | 3 | 3,800  |
| 4,000    | e8  | 6,000    | 51,000   | 7,000    | 3 | 4,000  |
| 4,800    | h10 | 6,000    | 52,000   | 8,000    | 3 | 4,800  |
| 5,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 5,000  |
| 5,750    | h10 | 6,000    | 52,000   | 8,000    | 3 | 5,750  |
| 6,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 6,000  |
| 6,750    | h10 | 10,000   | 60,000   | 10,000   | 3 | 6,750  |
| 7,000    | e8  | 10,000   | 60,000   | 10,000   | 3 | 7,000  |
| 7,750    | h10 | 10,000   | 61,000   | 11,000   | 3 | 7,750  |
| 8,000    | e8  | 10,000   | 61,000   | 11,000   | 3 | 8,000  |
| 9,700    | h10 | 10,000   | 63,000   | 13,000   | 3 | 9,700  |
| 10,000   | e8  | 10,000   | 63,000   | 13,000   | 3 | 10,000 |
| 11,700   | h10 | 12,000   | 70,000   | 13,000   | 3 | 11,700 |
| 12,000   | e8  | 12,000   | 73,000   | 16,000   | 3 | 12,000 |
| 13,700   | h10 | 12,000   | 73,000   | 16,000   | 3 | 13,700 |
| 14,000   | e8  | 12,000   | 73,000   | 16,000   | 3 | 14,000 |
| 15,700   | h10 | 16,000   | 79,000   | 19,000   | 3 | 15,700 |
| 16,000   | e8  | 16,000   | 79,000   | 19,000   | 3 | 16,000 |
| 18,000   | e8  | 16,000   | 79,000   | 19,000   | 3 | 18,000 |
| 20,000   | e8  | 20,000   | 88,000   | 22,000   | 3 | 20,000 |
| 25,000   | e8  | 25,000   | 102,000  | 26,000   | 3 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



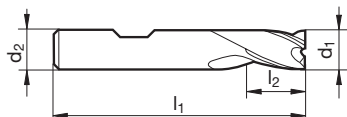
Catalogo n° 64604



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 580

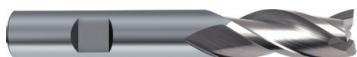
- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 2,800    | h10 | 6,000    | 49,000   | 5,000    | 3 | 2,800  |
| 3,000    | e8  | 6,000    | 49,000   | 5,000    | 3 | 3,000  |
| 3,800    | h10 | 6,000    | 51,000   | 7,000    | 3 | 3,800  |
| 4,000    | e8  | 6,000    | 51,000   | 7,000    | 3 | 4,000  |
| 4,800    | h10 | 6,000    | 52,000   | 8,000    | 3 | 4,800  |
| 5,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 5,000  |
| 5,750    | h10 | 6,000    | 52,000   | 8,000    | 3 | 5,750  |
| 6,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 6,000  |
| 7,000    | e8  | 10,000   | 60,000   | 10,000   | 3 | 7,000  |
| 7,750    | h10 | 10,000   | 61,000   | 11,000   | 3 | 7,750  |
| 8,000    | e8  | 10,000   | 61,000   | 11,000   | 3 | 8,000  |
| 9,700    | h10 | 10,000   | 63,000   | 13,000   | 3 | 9,700  |
| 10,000   | e8  | 10,000   | 63,000   | 13,000   | 3 | 10,000 |
| 11,700   | h10 | 12,000   | 70,000   | 13,000   | 3 | 11,700 |
| 12,000   | e8  | 12,000   | 73,000   | 16,000   | 3 | 12,000 |
| 14,000   | e8  | 12,000   | 73,000   | 16,000   | 3 | 14,000 |
| 16,000   | e8  | 16,000   | 79,000   | 19,000   | 3 | 16,000 |
| 18,000   | e8  | 16,000   | 79,000   | 19,000   | 3 | 18,000 |
| 20,000   | e8  | 20,000   | 88,000   | 22,000   | 3 | 20,000 |
| 25,000   | e8  | 25,000   | 102,000  | 26,000   | 3 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



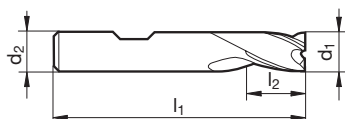
Catalogo n° 74282



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 3,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 3,000  |
| 4,000    | e8  | 6,000    | 55,000   | 11,000   | 3 | 4,000  |
| 5,000    | e8  | 6,000    | 57,000   | 13,000   | 3 | 5,000  |
| 5,750    | h10 | 6,000    | 57,000   | 13,000   | 3 | 5,750  |
| 6,000    | e8  | 6,000    | 57,000   | 13,000   | 3 | 6,000  |
| 6,750    | h10 | 10,000   | 66,000   | 16,000   | 3 | 6,750  |
| 7,000    | e8  | 10,000   | 66,000   | 16,000   | 3 | 7,000  |
| 7,750    | h10 | 10,000   | 69,000   | 19,000   | 3 | 7,750  |
| 8,000    | e8  | 10,000   | 69,000   | 19,000   | 3 | 8,000  |
| 9,700    | h10 | 10,000   | 72,000   | 22,000   | 3 | 9,700  |
| 10,000   | e8  | 10,000   | 72,000   | 22,000   | 3 | 10,000 |
| 11,700   | h10 | 12,000   | 79,000   | 22,000   | 3 | 11,700 |
| 12,000   | e8  | 12,000   | 83,000   | 26,000   | 3 | 12,000 |
| 13,700   | h10 | 12,000   | 83,000   | 26,000   | 3 | 13,700 |
| 14,000   | e8  | 12,000   | 83,000   | 26,000   | 3 | 14,000 |
| 15,700   | h10 | 16,000   | 92,000   | 32,000   | 3 | 15,700 |
| 16,000   | e8  | 16,000   | 92,000   | 32,000   | 3 | 16,000 |
| 18,000   | e8  | 16,000   | 92,000   | 32,000   | 3 | 18,000 |
| 20,000   | e8  | 20,000   | 104,000  | 38,000   | 3 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



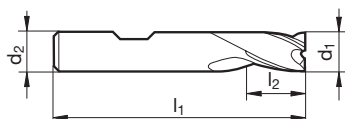
Catalogo n° 64641



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 3,000    | e8  | 6,000    | 52,000   | 8,000    | 3 | 3,000  |
| 4,000    | e8  | 6,000    | 55,000   | 11,000   | 3 | 4,000  |
| 4,800    | h10 | 6,000    | 57,000   | 13,000   | 3 | 4,800  |
| 5,000    | e8  | 6,000    | 57,000   | 13,000   | 3 | 5,000  |
| 6,000    | e8  | 6,000    | 57,000   | 13,000   | 3 | 6,000  |
| 7,000    | e8  | 10,000   | 66,000   | 16,000   | 3 | 7,000  |
| 8,000    | e8  | 10,000   | 69,000   | 19,000   | 3 | 8,000  |
| 10,000   | e8  | 10,000   | 72,000   | 22,000   | 3 | 10,000 |
| 12,000   | e8  | 12,000   | 83,000   | 26,000   | 3 | 12,000 |
| 14,000   | e8  | 12,000   | 83,000   | 26,000   | 3 | 14,000 |
| 16,000   | e8  | 16,000   | 92,000   | 32,000   | 3 | 16,000 |
| 18,000   | e8  | 16,000   | 92,000   | 32,000   | 3 | 18,000 |
| 20,000   | e8  | 20,000   | 104,000  | 38,000   | 3 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



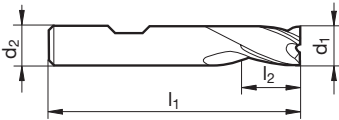
Catalogo n° 54294



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1<br>mm | d1 | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|----|----------|----------|----------|---|--------|
| 4,000    | e8 | 6,000    | 63,000   | 19,000   | 3 | 4,000  |
| 5,000    | e8 | 6,000    | 68,000   | 24,000   | 3 | 5,000  |
| 6,000    | e8 | 6,000    | 68,000   | 24,000   | 3 | 6,000  |
| 8,000    | e8 | 10,000   | 88,000   | 38,000   | 3 | 8,000  |
| 10,000   | e8 | 10,000   | 95,000   | 45,000   | 3 | 10,000 |
| 12,000   | e8 | 12,000   | 110,000  | 53,000   | 3 | 12,000 |
| 14,000   | e8 | 12,000   | 110,000  | 53,000   | 3 | 14,000 |
| 16,000   | e8 | 16,000   | 123,000  | 63,000   | 3 | 16,000 |
| 18,000   | e8 | 16,000   | 123,000  | 63,000   | 3 | 18,000 |

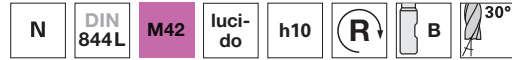


## Frese per acciaio ad alta velocità

### Frese frontali (a 3 taglienti)



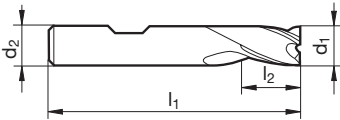
Catalogo n° 74294



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 3,000    | h10 | 6,000    | 56,000   | 12,000   | 3 | 3,000  |
| 4,000    | h10 | 6,000    | 63,000   | 19,000   | 3 | 4,000  |
| 5,000    | h10 | 6,000    | 68,000   | 24,000   | 3 | 5,000  |
| 6,000    | h10 | 6,000    | 68,000   | 24,000   | 3 | 6,000  |
| 8,000    | h10 | 10,000   | 88,000   | 38,000   | 3 | 8,000  |
| 10,000   | h10 | 10,000   | 95,000   | 45,000   | 3 | 10,000 |
| 12,000   | h10 | 12,000   | 110,000  | 53,000   | 3 | 12,000 |
| 14,000   | h10 | 12,000   | 110,000  | 53,000   | 3 | 14,000 |
| 16,000   | h10 | 16,000   | 123,000  | 63,000   | 3 | 16,000 |
| 18,000   | h10 | 16,000   | 123,000  | 63,000   | 3 | 18,000 |
| 20,000   | h10 | 20,000   | 141,000  | 75,000   | 3 | 20,000 |

## Frese per acciaio ad alta velocità

### Mini frese frontali (a 3 taglienti)



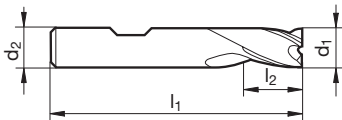
Catalogo n° 54080



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● | ● | ● | ○ | ○ |

Parametri di lav.  
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1 e8<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|-------------|----------|----------|----------|---|--------|
| 3,000       | 6,000    | 36,000   | 5,000    | 3 | 3,000  |
| 4,000       | 6,000    | 38,000   | 7,000    | 3 | 4,000  |
| 5,000       | 6,000    | 39,000   | 8,000    | 3 | 5,000  |
| 6,000       | 6,000    | 39,000   | 8,000    | 3 | 6,000  |
| 8,000       | 8,000    | 43,000   | 11,000   | 3 | 8,000  |
| 10,000      | 10,000   | 50,000   | 13,000   | 3 | 10,000 |

## Frese per acciaio ad alta velocità

### Mini frese frontali (a 3 taglienti)



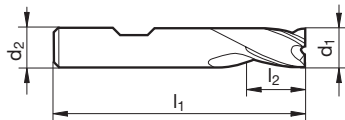
Catalogo n° 54180



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ○ | ● | ● | ● | ○ | ○ |

Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1 e8<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|-------------|----------|----------|----------|---|--------|
| 3,000       | 6,000    | 39,000   | 8,000    | 3 | 3,000  |
| 4,000       | 6,000    | 42,000   | 11,000   | 3 | 4,000  |
| 5,000       | 6,000    | 44,000   | 13,000   | 3 | 5,000  |
| 6,000       | 6,000    | 44,000   | 13,000   | 3 | 6,000  |
| 8,000       | 8,000    | 51,000   | 19,000   | 3 | 8,000  |
| 10,000      | 10,000   | 59,000   | 22,000   | 3 | 10,000 |

## Frese per acciaio ad alta velocità

### Frese universali, taglienti multipli



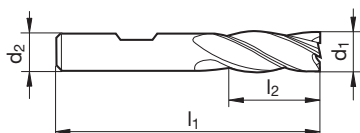
Catalogo n° 74617



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ○ | ○ |   |   |

Parametri di lav.  
ind. a pag. 582

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1 k10<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|----------|----------|----------|---|--------|
| 2,000        | 6,000    | 51,000   | 7,000    | 4 | 2,000  |
| 3,000        | 6,000    | 52,000   | 8,000    | 4 | 3,000  |
| 4,000        | 6,000    | 55,000   | 11,000   | 4 | 4,000  |
| 5,000        | 6,000    | 57,000   | 13,000   | 4 | 5,000  |
| 6,000        | 6,000    | 57,000   | 13,000   | 4 | 6,000  |
| 8,000        | 10,000   | 69,000   | 19,000   | 4 | 8,000  |
| 9,000        | 10,000   | 69,000   | 19,000   | 4 | 9,000  |
| 10,000       | 10,000   | 72,000   | 22,000   | 4 | 10,000 |
| 12,000       | 12,000   | 83,000   | 26,000   | 4 | 12,000 |
| 14,000       | 12,000   | 83,000   | 26,000   | 4 | 14,000 |
| 15,000       | 12,000   | 83,000   | 26,000   | 4 | 15,000 |
| 16,000       | 16,000   | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000   | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000   | 104,000  | 38,000   | 4 | 20,000 |
| 25,000       | 25,000   | 121,000  | 45,000   | 5 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese universali, taglienti multipli



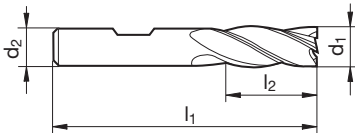
Catalogo n° 64667



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 582

- tagliente al centro
- materiale fino a circa 1200 N/mm<sup>2</sup>



| d1 k10<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|----------|----------|----------|---|--------|
| 3,000        | 6,000    | 52,000   | 8,000    | 4 | 3,000  |
| 4,000        | 6,000    | 55,000   | 11,000   | 4 | 4,000  |
| 5,000        | 6,000    | 57,000   | 13,000   | 4 | 5,000  |
| 6,000        | 6,000    | 57,000   | 13,000   | 4 | 6,000  |
| 7,000        | 10,000   | 66,000   | 16,000   | 4 | 7,000  |
| 8,000        | 10,000   | 69,000   | 19,000   | 4 | 8,000  |
| 9,000        | 10,000   | 69,000   | 19,000   | 4 | 9,000  |
| 10,000       | 10,000   | 72,000   | 22,000   | 4 | 10,000 |
| 11,000       | 12,000   | 79,000   | 22,000   | 4 | 11,000 |
| 12,000       | 12,000   | 83,000   | 26,000   | 4 | 12,000 |
| 13,000       | 12,000   | 83,000   | 26,000   | 4 | 13,000 |
| 14,000       | 12,000   | 83,000   | 26,000   | 4 | 14,000 |
| 15,000       | 12,000   | 83,000   | 26,000   | 4 | 15,000 |
| 16,000       | 16,000   | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000   | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000   | 104,000  | 38,000   | 4 | 20,000 |
| 25,000       | 25,000   | 121,000  | 45,000   | 6 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese universali, taglienti multipli



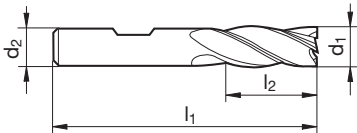
Catalogo n° 74847



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ |   |   |

Parametri di lav.  
ind. a pag. 582

- lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1 k10<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|----------|----------|----------|---|--------|
| 3,000        | 6,000    | 56,000   | 12,000   | 4 | 3,000  |
| 4,000        | 6,000    | 63,000   | 19,000   | 4 | 4,000  |
| 5,000        | 6,000    | 68,000   | 24,000   | 4 | 5,000  |
| 6,000        | 6,000    | 68,000   | 24,000   | 4 | 6,000  |
| 7,000        | 10,000   | 80,000   | 30,000   | 4 | 7,000  |
| 8,000        | 10,000   | 88,000   | 38,000   | 4 | 8,000  |
| 9,000        | 10,000   | 88,000   | 38,000   | 4 | 9,000  |
| 10,000       | 10,000   | 95,000   | 45,000   | 4 | 10,000 |
| 11,000       | 12,000   | 102,000  | 45,000   | 4 | 11,000 |
| 12,000       | 12,000   | 110,000  | 53,000   | 4 | 12,000 |
| 14,000       | 12,000   | 110,000  | 53,000   | 4 | 14,000 |
| 15,000       | 12,000   | 110,000  | 53,000   | 4 | 15,000 |
| 16,000       | 16,000   | 123,000  | 63,000   | 4 | 16,000 |
| 18,000       | 16,000   | 123,000  | 63,000   | 4 | 18,000 |
| 20,000       | 20,000   | 141,000  | 75,000   | 4 | 20,000 |
| 25,000       | 25,000   | 166,000  | 90,000   | 5 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese universali, taglienti multipli



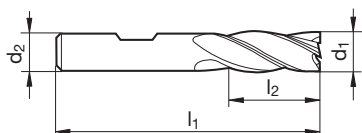
Catalogo n° 54847



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | ○ |   |   |

Parametri di lav.  
ind. a pag. 582

- lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



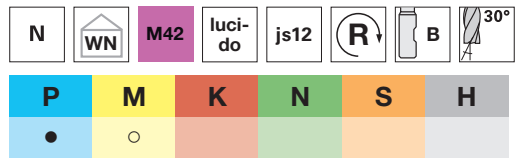
| d1 k10<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|----------|----------|----------|---|--------|
| 3,000        | 6,000    | 56,000   | 12,000   | 4 | 3,000  |
| 4,000        | 6,000    | 63,000   | 19,000   | 4 | 4,000  |
| 5,000        | 6,000    | 68,000   | 24,000   | 4 | 5,000  |
| 6,000        | 6,000    | 68,000   | 24,000   | 4 | 6,000  |
| 7,000        | 10,000   | 80,000   | 30,000   | 4 | 7,000  |
| 8,000        | 10,000   | 88,000   | 38,000   | 4 | 8,000  |
| 10,000       | 10,000   | 95,000   | 45,000   | 4 | 10,000 |
| 12,000       | 12,000   | 110,000  | 53,000   | 4 | 12,000 |
| 16,000       | 16,000   | 123,000  | 63,000   | 4 | 16,000 |
| 20,000       | 20,000   | 141,000  | 75,000   | 4 | 20,000 |
| 25,000       | 25,000   | 166,000  | 90,000   | 6 | 25,000 |
| 32,000       | 32,000   | 186,000  | 106,000  | 6 | 32,000 |

## Frese per acciaio ad alta velocità

### Frese frontali (a 4 taglienti)

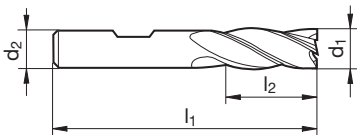


Catalogo n° 74800



Parametri di lav.  
ind. a pag. 582

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1 js12<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|---------------|----------|----------|----------|---|--------|
| 6,000         | 6,000    | 79,000   | 40,000   | 4 | 6,000  |
| 8,000         | 10,000   | 105,000  | 56,000   | 4 | 8,000  |
| 10,000        | 10,000   | 112,000  | 63,000   | 4 | 10,000 |
| 12,000        | 12,000   | 125,000  | 71,000   | 4 | 12,000 |
| 14,000        | 12,000   | 125,000  | 71,000   | 4 | 14,000 |
| 16,000        | 16,000   | 141,000  | 80,000   | 4 | 16,000 |
| 18,000        | 16,000   | 141,000  | 80,000   | 4 | 18,000 |
| 20,000        | 20,000   | 163,000  | 100,000  | 4 | 20,000 |



## Frese per acciaio ad alta velocità

### Frese di semifinitura



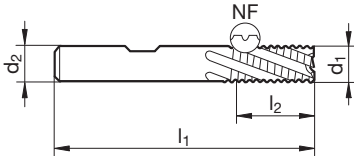
Catalogo n° 54815



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura zigrinata per sgrossatura fine
- tagliente al centro



| d1 k12<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|----------|----------|----------|---|--------|
| 6,000        | 6,000    | 57,000   | 13,000   | 4 | 6,000  |
| 8,000        | 10,000   | 69,000   | 19,000   | 4 | 8,000  |
| 10,000       | 10,000   | 72,000   | 22,000   | 4 | 10,000 |
| 12,000       | 12,000   | 83,000   | 26,000   | 4 | 12,000 |
| 14,000       | 12,000   | 83,000   | 26,000   | 4 | 14,000 |
| 16,000       | 16,000   | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000   | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000   | 104,000  | 38,000   | 4 | 20,000 |
| 25,000       | 25,000   | 121,000  | 45,000   | 4 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (3 taglienti)



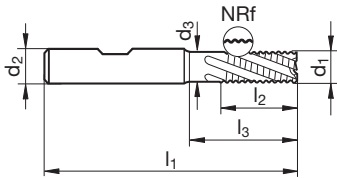
Catalogo n° 74825



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm<sup>2</sup>



| d1 k10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 3 | 6,000  |
| 8,000        | 10,000      | 69,000   | 19,000   | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 3 | 12,000 |
| 14,000       | 12,000      | 83,000   | 26,000   | 3 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 3 | 16,000 |
| 18,000       | 16,000      | 92,000   | 32,000   | 3 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 3 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (3 taglienti)



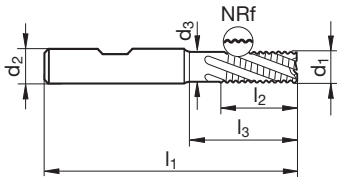
Catalogo n° 54825



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm<sup>2</sup>



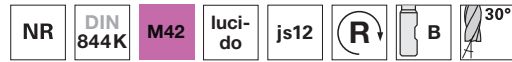
| d1 k10<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 3 | 6,000  |
| 8,000        | 10,000      | 69,000   | 19,000   | 3 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 3 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 3 | 12,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 3 | 16,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 3 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglienti)



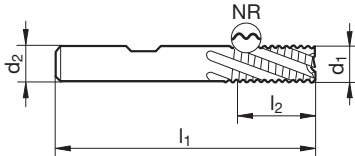
Catalogo n° 74816



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura grossolana per sgrossatura
- tagliente al centro



| d1 js12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|---------------|-------------|----------|----------|---|--------|
| 6,000         | 6,000       | 57,000   | 13,000   | 4 | 6,000  |
| 7,000         | 10,000      | 66,000   | 16,000   | 4 | 7,000  |
| 8,000         | 10,000      | 69,000   | 19,000   | 4 | 8,000  |
| 9,000         | 10,000      | 69,000   | 19,000   | 4 | 9,000  |
| 10,000        | 10,000      | 72,000   | 22,000   | 4 | 10,000 |
| 11,000        | 12,000      | 79,000   | 22,000   | 4 | 11,000 |
| 12,000        | 12,000      | 83,000   | 26,000   | 4 | 12,000 |
| 14,000        | 12,000      | 83,000   | 26,000   | 4 | 14,000 |
| 15,000        | 12,000      | 83,000   | 26,000   | 4 | 15,000 |
| 16,000        | 16,000      | 92,000   | 32,000   | 4 | 16,000 |
| 18,000        | 16,000      | 92,000   | 32,000   | 4 | 18,000 |
| 20,000        | 20,000      | 104,000  | 38,000   | 4 | 20,000 |
| 25,000        | 25,000      | 121,000  | 45,000   | 4 | 25,000 |
| 28,000        | 25,000      | 121,000  | 45,000   | 4 | 28,000 |
| 30,000        | 25,000      | 121,000  | 45,000   | 4 | 30,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglianti)



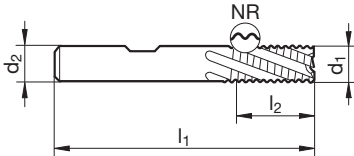
Catalogo n° 54816



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura grossolana per sgrossatura
- tagliente al centro



| d1 k12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 4 | 6,000  |
| 8,000        | 10,000      | 69,000   | 19,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 4 | 12,000 |
| 14,000       | 12,000      | 83,000   | 26,000   | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000      | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 4 | 20,000 |
| 22,000       | 20,000      | 104,000  | 38,000   | 4 | 22,000 |
| 25,000       | 25,000      | 121,000  | 45,000   | 4 | 25,000 |
| 28,000       | 25,000      | 121,000  | 45,000   | 4 | 28,000 |
| 30,000       | 25,000      | 121,000  | 45,000   | 4 | 30,000 |
| 32,000       | 32,000      | 133,000  | 53,000   | 4 | 32,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglienti)



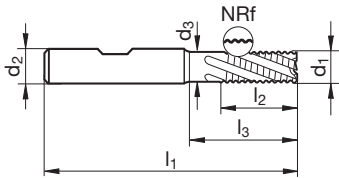
Catalogo n° 74845



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm<sup>2</sup>



| d1 k12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 4 | 6,000  |
| 8,000        | 10,000      | 69,000   | 19,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 4 | 12,000 |
| 14,000       | 12,000      | 83,000   | 26,000   | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000      | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 4 | 20,000 |
| 25,000       | 25,000      | 121,000  | 45,000   | 5 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglienti)



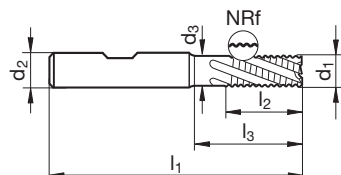
Catalogo n° 54845



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm<sup>2</sup>



| d1 k12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 13,000   | 4 | 6,000  |
| 8,000        | 10,000      | 69,000   | 19,000   | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 22,000   | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 26,000   | 4 | 12,000 |
| 14,000       | 12,000      | 83,000   | 26,000   | 4 | 14,000 |
| 16,000       | 16,000      | 92,000   | 32,000   | 4 | 16,000 |
| 18,000       | 16,000      | 92,000   | 32,000   | 4 | 18,000 |
| 20,000       | 20,000      | 104,000  | 38,000   | 4 | 20,000 |
| 25,000       | 25,000      | 121,000  | 45,000   | 5 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglienti)



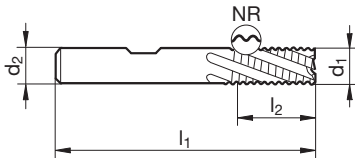
Catalogo n° 74836



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura grossolana per sgrossatura
- lungo
- tagliente al centro



| d1 k12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 68,000   | 24,000   | 4 | 6,000  |
| 8,000        | 10,000      | 88,000   | 38,000   | 4 | 8,000  |
| 10,000       | 10,000      | 95,000   | 45,000   | 4 | 10,000 |
| 12,000       | 12,000      | 110,000  | 53,000   | 4 | 12,000 |
| 16,000       | 16,000      | 123,000  | 63,000   | 4 | 16,000 |
| 18,000       | 16,000      | 123,000  | 63,000   | 4 | 18,000 |
| 20,000       | 20,000      | 141,000  | 75,000   | 4 | 20,000 |
| 25,000       | 25,000      | 166,000  | 90,000   | 4 | 25,000 |



## Frese per acciaio ad alta velocità

### Frese a sgrossare (4 taglienti)



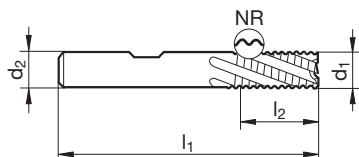
Catalogo n° 54836



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • |   |   |   |

Parametri di lav.  
ind. a pag. 582

- dentatura grossolana per sgrossatura
- lungo
- tagliente al centro



| d1 k12<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 68,000   | 24,000   | 4 | 6,000  |
| 8,000        | 10,000      | 88,000   | 38,000   | 4 | 8,000  |
| 10,000       | 10,000      | 95,000   | 45,000   | 4 | 10,000 |
| 12,000       | 12,000      | 110,000  | 53,000   | 4 | 12,000 |
| 14,000       | 12,000      | 110,000  | 53,000   | 4 | 14,000 |
| 16,000       | 16,000      | 123,000  | 63,000   | 4 | 16,000 |
| 18,000       | 16,000      | 123,000  | 63,000   | 4 | 18,000 |
| 20,000       | 20,000      | 141,000  | 75,000   | 4 | 20,000 |
| 25,000       | 25,000      | 166,000  | 90,000   | 4 | 25,000 |

## Frese per acciaio ad alta velocità

### Frese a raggio



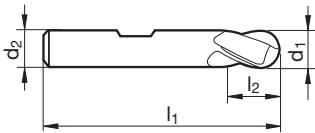
Catalogo n° 54275



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

Parametri di lav.  
ind. a pag. 580

- extra corto
- tagliente al centro
- raggio
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 2,000    | e8  | 6,000    | 48,000   | 4,000    | 2 | 2,000  |
| 3,000    | e8  | 6,000    | 49,000   | 5,000    | 2 | 3,000  |
| 4,000    | e8  | 6,000    | 51,000   | 7,000    | 2 | 4,000  |
| 5,000    | e8  | 6,000    | 52,000   | 8,000    | 2 | 5,000  |
| 6,000    | e8  | 6,000    | 52,000   | 8,000    | 2 | 6,000  |
| 7,000    | e8  | 10,000   | 60,000   | 10,000   | 2 | 7,000  |
| 8,000    | e8  | 10,000   | 61,000   | 11,000   | 2 | 8,000  |
| 10,000   | e8  | 10,000   | 63,000   | 13,000   | 2 | 10,000 |
| 12,000   | e8  | 12,000   | 73,000   | 16,000   | 2 | 12,000 |
| 13,000   | h10 | 12,000   | 73,000   | 16,000   | 2 | 13,000 |
| 14,000   | e8  | 12,000   | 73,000   | 16,000   | 2 | 14,000 |
| 15,000   | h10 | 12,000   | 73,000   | 16,000   | 2 | 15,000 |
| 16,000   | e8  | 16,000   | 79,000   | 19,000   | 2 | 16,000 |
| 20,000   | e8  | 20,000   | 88,000   | 22,000   | 2 | 20,000 |

## Frese per acciaio ad alta velocità

### Frese a raggio



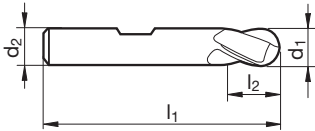
Catalogo n° 54276



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   |   |

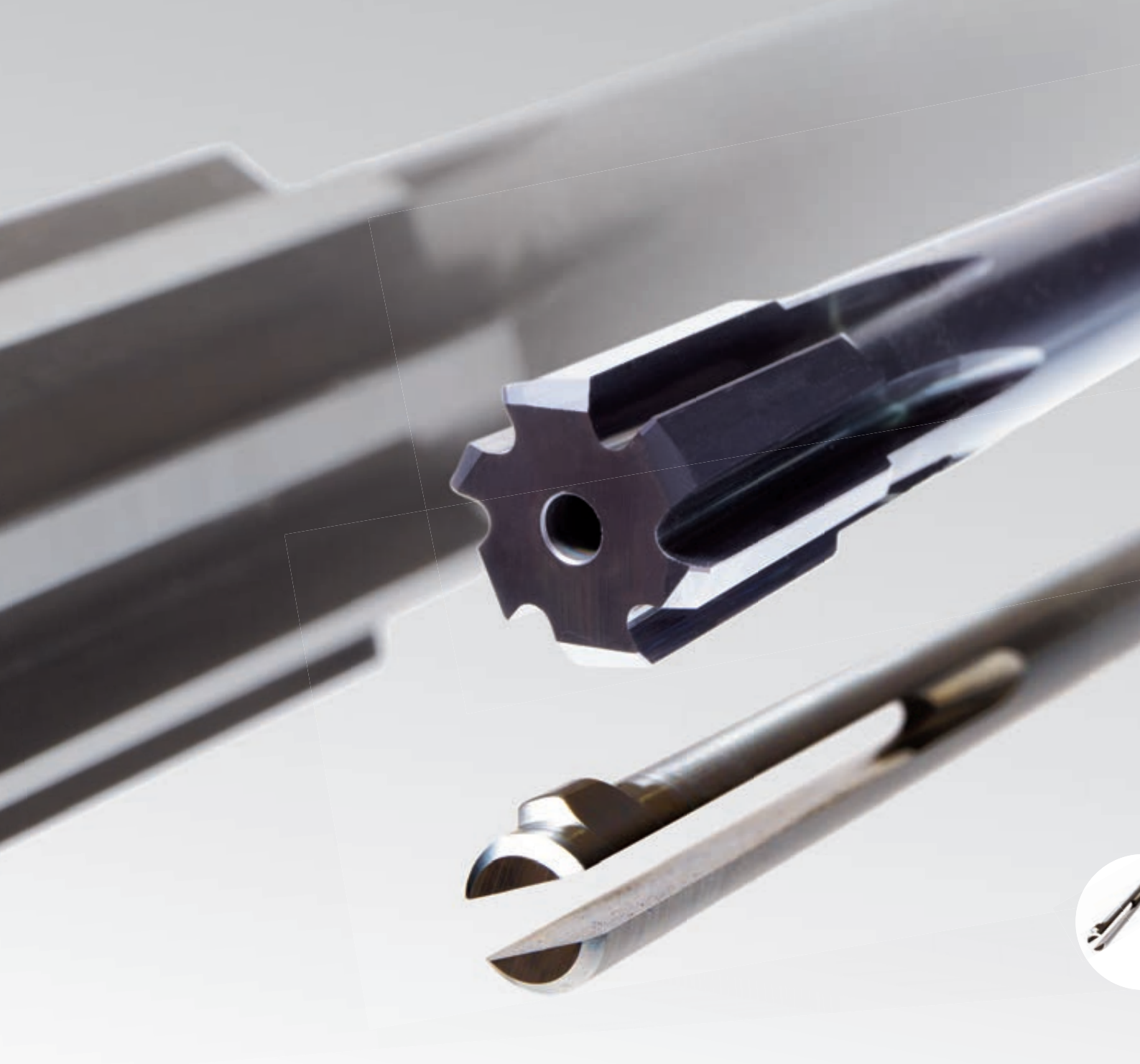
Parametri di lav.  
ind. a pag. 580

- tagliente al centro
- raggio
- materiale fino a circa 1000 N/mm<sup>2</sup>



| d1<br>mm | d1  | d2<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|----------|-----|----------|----------|----------|---|--------|
| 3,000    | h10 | 6,000    | 56,000   | 8,000    | 2 | 3,000  |
| 4,000    | h10 | 6,000    | 63,000   | 11,000   | 2 | 4,000  |
| 5,000    | h10 | 6,000    | 68,000   | 13,000   | 2 | 5,000  |
| 6,000    | h10 | 6,000    | 68,000   | 13,000   | 2 | 6,000  |
| 7,000    | h10 | 10,000   | 80,000   | 16,000   | 2 | 7,000  |
| 8,000    | h10 | 10,000   | 88,000   | 19,000   | 2 | 8,000  |
| 10,000   | h10 | 10,000   | 95,000   | 22,000   | 2 | 10,000 |
| 12,000   | h10 | 12,000   | 110,000  | 26,000   | 2 | 12,000 |
| 14,000   | h10 | 12,000   | 110,000  | 26,000   | 2 | 14,000 |
| 16,000   | h10 | 16,000   | 123,000  | 32,000   | 2 | 16,000 |
| 18,000   | h10 | 16,000   | 123,000  | 32,000   | 2 | 18,000 |
| 20,000   | h10 | 20,000   | 141,000  | 38,000   | 2 | 20,000 |





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UTENSILI PER ALESARE/  
SVASARE



## CODICI ISO

|          |   |
|----------|---|
| <b>P</b> | acciaio, acciaio legato in alta percentuale       |
| <b>M</b> | acciaio inossidabile                              |
| <b>K</b> | ghisa grigia, ghisa sferoidale e ghisa malleabile |
| <b>N</b> | alluminio ed altri metalli non ferrosi            |
| <b>S</b> | leghe speciali, superleghe e leghe di titanio     |
| <b>H</b> | acciaio temprato e ghisa temprata                 |

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



## LEGENDA DEI PITTOGRAMMI

|                      |                      |             |                  |             |              |             |          |         |         |
|----------------------|----------------------|-------------|------------------|-------------|--------------|-------------|----------|---------|---------|
| MATERIALE TAGLIANTE  | <b>VHM</b>           | <b>HM</b>   | <b>HSS-E</b>     | <b>HSS</b>  |              |             |          |         |         |
|                      | Int. in metallo duro |             | Metallo duro     |             |              |             |          |         |         |
| TRATT. DI SUPERFICIE | luci-do              | nitru-rado  | tratt. a vapore  | AlTiN nano  | Al-TiN       | TiN         |          |         |         |
| TOLLERANZA SUL Ø     | H7                   | +0,005      | +0,004<br>+0,005 | js9         |              |             |          |         |         |
| ANGOLO DI SVASATURA  |                      |             |                  |             |              |             |          |         |         |
| DIREZIONE DI TAGLIO  |                      |             |                  |             |              |             |          |         |         |
|                      | a destra             |             |                  |             |              |             |          |         |         |
| FORMA DEL CODOLO     |                      |             |                  |             |              |             |          |         |         |
|                      | Conico Morse         |             |                  |             |              |             |          |         |         |
| ANGOLI DELL'ELICA    |                      |             |                  |             |              |             |          |         |         |
| NORMA                | DIN 9                | DIN 206     | DIN 208          | DIN 212-2   | DIN 212-3    | DIN 311     | DIN 334  | DIN 335 | DIN 373 |
|                      | DIN 2179             | ~DIN 8050   | ~DIN 8051        | ~DIN 8093   |              |             |          |         |         |
|                      | Norma di fabbrica    |             |                  |             |              |             |          |         |         |
| TIPO                 | SuperR-HS-S          | SuperR-HS-D | Super AF-60      | Super AF-90 | Super AF-120 | Super AD-90 | SuperE-U |         |         |
| FORMA                | <b>A</b>             | <b>B</b>    | <b>C</b>         | <b>D</b>    |              |             |          |         |         |

| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

## Alesatori ad alto rendimento VHM

|  |   |   |   |   |   |                 |        |  |              |            |                  |                |              |     |
|--|---|---|---|---|---|-----------------|--------|--|--------------|------------|------------------|----------------|--------------|-----|
|  | • | • | • | • | • | SuperR-<br>HS-S | destra |  | Metallo duro | AlTiN nano | Norma di<br>fab. | 3,000 - 20,000 | <b>72870</b> | 694 |
|  | • | • | • | • | • | SuperR-<br>HS-D | destra |  | Metallo duro | AlTiN nano | Norma di<br>fab. | 3,000 - 20,000 | <b>72871</b> | 695 |
|  | • | • | • | • | • | SuperR-<br>HS-S | destra |  | Metallo duro | AlTiN nano | Norma di<br>fab. | 2,970 - 12,030 | <b>72872</b> | 696 |
|  | • | • | • | • | • | SuperR-<br>HS-D | destra |  | Metallo duro | AlTiN nano | Norma di<br>fab. | 2,970 - 12,030 | <b>72873</b> | 698 |

## Alesatori a macchina NC

|  |   |   |   |   |   |  |        |   |              |        |                  |                |              |     |
|--|---|---|---|---|---|--|--------|---|--------------|--------|------------------|----------------|--------------|-----|
|  | • | • | • | • | • |  | destra | B | Metallo duro | lucido | Norma di<br>fab. | 0,980 - 12,050 | <b>72920</b> | 700 |
|  | • | • | • | • | • |  | destra | B | Metallo duro | lucido | Norma di<br>fab. | 3,000 - 12,000 | <b>72930</b> | 702 |

## Alesatori a macchina in MD

|  |   |   |   |   |   |   |        |   |              |        |           |                 |              |     |
|--|---|---|---|---|---|---|--------|---|--------------|--------|-----------|-----------------|--------------|-----|
|  | • | • | • | • | • | ○ | destra | A | Metallo duro | lucido | ~DIN 8050 | 5,000 - 20,000  | <b>72868</b> | 704 |
|  | • | • | • | • | • | ○ | destra | B | Metallo duro | lucido | ~DIN 8050 | 5,000 - 20,000  | <b>72867</b> | 705 |
|  | • | • | • | • | • | ○ | destra | A | Metallo duro | lucido | ~DIN 8051 | 10,000 - 30,000 | <b>72860</b> | 708 |
|  | • | • | • | • | • | ○ | destra | B | Metallo duro | lucido | ~DIN 8051 | 6,000 - 32,000  | <b>72859</b> | 709 |
|  | • | • | • | • | • | ○ | destra | A | Metallo duro | lucido | ~DIN 8093 | 1,200 - 16,000  | <b>72880</b> | 706 |
|  | • | • | • | • | • | ○ | destra | B | Metallo duro | lucido | ~DIN 8093 | 1,000 - 16,000  | <b>72881</b> | 707 |

| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

### Alesatori a macchina NC

|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
|---|---|---|---|---|--|--|--------|---|-------|--------|-----------|----------------|--------------|-----|
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | • | • | • | ○ |  |  | destra | B | HSS-E | lucido | DIN 212-3 | 1,000 - 12,030 | <b>72900</b> | 710 |
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | • | • | • | ○ |  |  | destra | B | HSS-E | lucido | DIN 212-3 | 1,500 - 20,000 | <b>72910</b> | 712 |

### Alesatori a macchina

|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
|---|---|---|---|---|--|--|--------|---|-------|--------|-----------|----------------|--------------|-----|
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | ○ | • | • | ○ |  |  | destra | A | HSS-E | lucido | DIN 208   | 8,000 - 35,000 | <b>72660</b> | 718 |
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | ○ | • | • | ○ |  |  | destra | B | HSS-E | lucido | DIN 208   | 5,000 - 50,000 | <b>72670</b> | 719 |
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | ○ | • | • | ○ |  |  | destra | A | HSS-E | lucido | DIN 212-2 | 2,200 - 20,000 | <b>72640</b> | 716 |
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | ○ | • | • | ○ |  |  | destra | B | HSS-E | lucido | DIN 212-2 | 2,200 - 20,000 | <b>72650</b> | 717 |
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | ○ | • | • | ○ |  |  | destra | B | HSS-E | lucido | DIN 212-2 | 0,980 - 12,000 | <b>72654</b> | 714 |

### Alesatori a macchina a forte torsione

|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
|---|---|---|---|---|--|--|--------|---|-------|--------|-----------|----------------|--------------|-----|
|   |   |   |   |   |  |  |        |   |       |        |           |                |              |     |
| • | • | • | • | ○ |  |  | destra | C | HSS-E | lucido | DIN 212-2 | 4,000 - 13,000 | <b>72690</b> | 720 |

### Alesatori a macchina per chiodi

|   |   |   |   |   |  |  |        |  |     |           |         |                |              |     |
|---|---|---|---|---|--|--|--------|--|-----|-----------|---------|----------------|--------------|-----|
|   |   |   |   |   |  |  |        |  |     |           |         |                |              |     |
| • | ○ | • | • | ○ |  |  | destra |  | HSS | nitratato | DIN 311 | 9,500 - 37,000 | <b>72680</b> | 721 |

### Alesatori a macchina per spine coniche

|   |   |   |   |   |  |  |        |  |       |        |          |                |              |     |
|---|---|---|---|---|--|--|--------|--|-------|--------|----------|----------------|--------------|-----|
|   |   |   |   |   |  |  |        |  |       |        |          |                |              |     |
| • | • | • | • | ○ |  |  | destra |  | HSS-E | lucido | DIN 2179 | 2,000 - 12,000 | <b>72741</b> | 722 |



| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

## Alesatori a mano cilindrici, per spine coniche



|   |   |   |   |   |   |  |        |   |     |        |       |                |       |     |
|---|---|---|---|---|---|--|--------|---|-----|--------|-------|----------------|-------|-----|
| • | • | • | • | • | • |  | destra | A | HSS | lucido | DIN 9 | 1,000 - 16,000 | 72730 | 723 |
|---|---|---|---|---|---|--|--------|---|-----|--------|-------|----------------|-------|-----|

## Alesatori a mano



|   |   |   |   |   |   |  |        |   |     |        |         |                |       |     |
|---|---|---|---|---|---|--|--------|---|-----|--------|---------|----------------|-------|-----|
| • | • | • | • | • | • |  | destra | A | HSS | lucido | DIN 206 | 2,500 - 34,000 | 72600 | 724 |
|---|---|---|---|---|---|--|--------|---|-----|--------|---------|----------------|-------|-----|



|   |   |   |   |   |   |  |        |   |     |        |         |                |       |     |
|---|---|---|---|---|---|--|--------|---|-----|--------|---------|----------------|-------|-----|
| • | • | • | • | • | • |  | destra | B | HSS | lucido | DIN 206 | 2,000 - 35,000 | 72610 | 725 |
|---|---|---|---|---|---|--|--------|---|-----|--------|---------|----------------|-------|-----|

## Svasatori 60°



|   |   |   |   |   |   |   |        |   |     |     |         |                |       |     |
|---|---|---|---|---|---|---|--------|---|-----|-----|---------|----------------|-------|-----|
| • | • | • | • | • | • | • | destra | C | HSS | TiN | DIN 334 | 6,300 - 25,000 | 62327 | 727 |
|---|---|---|---|---|---|---|--------|---|-----|-----|---------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |   |     |        |         |                |       |     |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|----------------|-------|-----|
| • | • | • | • | • | • | • | destra | C | HSS | lucido | DIN 334 | 6,300 - 25,000 | 72326 | 726 |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|----------------|-------|-----|

## Svasatori 90°



|   |   |   |   |   |   |   |        |   |     |                   |         |                |       |     |
|---|---|---|---|---|---|---|--------|---|-----|-------------------|---------|----------------|-------|-----|
| • | • | • | • | • | • | • | destra | A | HSS | trattati a vapore | DIN 335 | 8,000 - 20,000 | 72345 | 731 |
|---|---|---|---|---|---|---|--------|---|-----|-------------------|---------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |   |     |     |         |                |       |     |
|---|---|---|---|---|---|---|--------|---|-----|-----|---------|----------------|-------|-----|
| • | • | • | • | • | • | • | destra | C | HSS | TiN | DIN 335 | 4,300 - 31,000 | 62347 | 729 |
|---|---|---|---|---|---|---|--------|---|-----|-----|---------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |   |     |        |         |                |       |     |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|----------------|-------|-----|
| • | • | • | • | • | • | • | destra | C | HSS | lucido | DIN 335 | 4,300 - 31,000 | 72346 | 728 |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|----------------|-------|-----|



|   |   |   |   |   |   |   |        |   |     |        |         |                 |       |     |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|-----------------|-------|-----|
| • | • | • | • | • | • | • | destra | D | HSS | lucido | DIN 335 | 15,000 - 80,000 | 72356 | 730 |
|---|---|---|---|---|---|---|--------|---|-----|--------|---------|-----------------|-------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

## Assortimenti di svasatori cilindrici a 90°



|   |   |   |   |   |  |        |   |            |     |         |  |  |              |     |
|---|---|---|---|---|--|--------|---|------------|-----|---------|--|--|--------------|-----|
| ● | ○ | ● | ○ | ○ |  | destra | C | <b>HSS</b> | TiN | DIN 335 |  |  | <b>62399</b> | 733 |
|---|---|---|---|---|--|--------|---|------------|-----|---------|--|--|--------------|-----|



|   |   |   |   |   |  |        |   |            |        |         |  |  |              |     |
|---|---|---|---|---|--|--------|---|------------|--------|---------|--|--|--------------|-----|
| ● | ○ | ● | ○ | ○ |  | destra | C | <b>HSS</b> | lucido | DIN 335 |  |  | <b>72399</b> | 732 |
|---|---|---|---|---|--|--------|---|------------|--------|---------|--|--|--------------|-----|

## Frese per sedi viti con guide, esecuzione fine



|   |   |   |   |   |  |        |  |            |        |         |                |  |              |     |
|---|---|---|---|---|--|--------|--|------------|--------|---------|----------------|--|--------------|-----|
| ● | ○ | ● | ○ | ○ |  | destra |  | <b>HSS</b> | lucido | DIN 373 | 6,000 - 20,000 |  | <b>72304</b> | 734 |
|---|---|---|---|---|--|--------|--|------------|--------|---------|----------------|--|--------------|-----|

## Frese per sedi viti con guide, esecuzione media



|   |   |   |   |   |  |        |  |            |        |         |                |  |              |     |
|---|---|---|---|---|--|--------|--|------------|--------|---------|----------------|--|--------------|-----|
| ● | ○ | ● | ○ | ○ |  | destra |  | <b>HSS</b> | lucido | DIN 373 | 6,000 - 18,000 |  | <b>72305</b> | 735 |
|---|---|---|---|---|--|--------|--|------------|--------|---------|----------------|--|--------------|-----|

## Fresa frontali a 60° per sbavatura



|   |   |   |   |   |  |            |        |                     |       |               |                |  |              |     |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|
| ● | ● | ● | ● | ● |  | SuperAF-60 | destra | <b>Metallo duro</b> | AlTiN | Norma di fab. | 4,000 - 12,000 |  | <b>53393</b> | 736 |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|



|   |   |   |   |   |  |            |        |                     |       |               |                |  |              |     |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|
| ● | ● | ● | ● | ● |  | SuperAF-60 | destra | <b>Metallo duro</b> | AlTiN | Norma di fab. | 6,000 - 12,000 |  | <b>53394</b> | 737 |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|

## Fresa frontali a 90° per sbavatura



|   |   |   |   |   |  |            |        |                     |       |               |                |  |              |     |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|
| ● | ● | ● | ● | ● |  | SuperAF-90 | destra | <b>Metallo duro</b> | AlTiN | Norma di fab. | 4,000 - 12,000 |  | <b>53395</b> | 738 |
|---|---|---|---|---|--|------------|--------|---------------------|-------|---------------|----------------|--|--------------|-----|

| P | M | K | N | S | H | Tipo | Direzione di taglio | Forma | Materiale tagliente | Superficie | Norma | d1/mm | Catalogo n° | Pagina |
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|
|---|---|---|---|---|---|------|---------------------|-------|---------------------|------------|-------|-------|-------------|--------|

### Fresa frontali a 90° per sbavatura



|   |   |   |   |   |  |            |        |  |                     |       |               |                |              |     |
|---|---|---|---|---|--|------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | SuperAF-90 | destra |  | <b>Metallo duro</b> | AlTiN | Norma di fab. | 4,000 - 12,000 | <b>53396</b> | 739 |
|---|---|---|---|---|--|------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|

### Fresa frontali a 120° per sbavatura



|   |   |   |   |   |  |             |        |  |                     |       |               |                |              |     |
|---|---|---|---|---|--|-------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | SuperAF-120 | destra |  | <b>Metallo duro</b> | AlTiN | Norma di fab. | 4,000 - 12,000 | <b>53397</b> | 740 |
|---|---|---|---|---|--|-------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|



|   |   |   |   |   |  |             |        |  |                     |       |               |                |              |     |
|---|---|---|---|---|--|-------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | SuperAF-120 | destra |  | <b>Metallo duro</b> | AlTiN | Norma di fab. | 6,000 - 12,000 | <b>53398</b> | 741 |
|---|---|---|---|---|--|-------------|--------|--|---------------------|-------|---------------|----------------|--------------|-----|

### Sbavatori a 90° ad avanzamento ed estrazione



|   |   |   |   |   |  |            |        |  |                     |            |               |                |              |     |
|---|---|---|---|---|--|------------|--------|--|---------------------|------------|---------------|----------------|--------------|-----|
| • | • | • | • | • |  | SuperAD-90 | destra |  | <b>Metallo duro</b> | AlTiN nano | Norma di fab. | 3,000 - 12,000 | <b>52365</b> | 742 |
|---|---|---|---|---|--|------------|--------|--|---------------------|------------|---------------|----------------|--------------|-----|

### Utensili sbavatori



|   |   |   |   |   |  |          |        |  |                     |        |               |  |              |     |
|---|---|---|---|---|--|----------|--------|--|---------------------|--------|---------------|--|--------------|-----|
| • | • | • | ○ | • |  | SuperE-U | destra |  | <b>Metallo duro</b> | lucido | Norma di fab. |  | <b>52360</b> | 743 |
|---|---|---|---|---|--|----------|--------|--|---------------------|--------|---------------|--|--------------|-----|

## Parametri di lavoro indicativi per utensili per alesare

| Serie d'avanzamento |              |       |       |       |       |       |       |                            |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|----------------------------|
| Codice lettera      | E            | F     | G     | H     | I     | J     |       |                            |
| Ø utensile mm       | <b>3,15</b>  | 0,080 | 0,100 | 0,125 | 0,300 | 0,500 | 0,800 | Avanzamento<br>f (mm/giro) |
|                     | <b>4,00</b>  | 0,100 | 0,125 | 0,160 | 0,300 | 0,500 | 1,000 |                            |
|                     | <b>5,00</b>  | 0,100 | 0,125 | 0,160 | 0,400 | 0,600 | 1,000 |                            |
|                     | <b>6,30</b>  | 0,125 | 0,160 | 0,200 | 0,400 | 0,700 | 1,200 |                            |
|                     | <b>8,00</b>  | 0,160 | 0,200 | 0,250 | 0,600 | 1,000 | 1,800 |                            |
|                     | <b>10,00</b> | 0,200 | 0,250 | 0,315 | 0,600 | 1,200 | 1,800 |                            |
|                     | <b>12,50</b> | 0,200 | 0,250 | 0,315 | 0,800 | 1,200 | 2,000 |                            |
|                     | <b>16,00</b> | 0,250 | 0,315 | 0,400 | 0,800 | 1,400 | 2,200 |                            |
|                     | <b>20,00</b> | 0,315 | 0,400 | 0,500 | 0,800 | 1,400 | 2,200 |                            |

Le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

| Diametro | Sottomisure (valori indicativi) |
|----------|---------------------------------|
| < 6 mm   | 0,1 - 0,2 mm                    |
| < 10 mm  | 0,2 mm                          |
| < 16 mm  | 0,2 - 0,3 mm                    |
| < 25 mm  | 0,3 - 0,4 mm                    |
| > 25 mm  | 0,4 mm                          |

### Impiego del refrigerante:

- olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante
- emulsione
- senza lubrificante
- solo refrigerazione ad aria

| Gruppo materiale   | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|--|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici                                 | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)   | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici  | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati                                  | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                                      | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati                              | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati                                  | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione   | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile   | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4  | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi  | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle   | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati  | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati<br>austenitici<br>martensitisch | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9<br><b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)<br><b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2 | ≤850<br>≤850<br>≤850                           |                          | <input checked="" type="checkbox"/> |
| Ghisa  | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                                    | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura   | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV  | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI  | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali   | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe  | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1   | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe  | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica                    | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si                                | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9<br><b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg   | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio  | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato  | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto<br>a truciolo lungo                   | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2<br><b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5  | ≤600<br>≤600                                   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto  | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn<br><b>2.0790</b> CuNi18Zn19Pb   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo  | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti                                  | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche   | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input type="checkbox"/>            |
| Mat. plast. a fibre aramidiche                                 | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate                                  | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

### Alesatori SuperR-HS

|                |                 |              |
|----------------|-----------------|--------------|
| Catalogo n°    | <b>72870</b>    | <b>72871</b> |
| Mat. da taglio | <b>M.D./K10</b> |              |
| Superficie     | AlTiN nano      |              |
| Norma          | Stock std.      |              |
| Forma          |                 |              |
| a pagina       | 694             | 695          |

|                 |              |
|-----------------|--------------|
| <b>72872</b>    | <b>72873</b> |
| <b>M.D./K10</b> |              |
| AlTiN nano      |              |
| Stock std.      |              |
|                 |              |
| 696             | 698          |

### Alesatori NC

|                 |              |
|-----------------|--------------|
| <b>72920</b>    | <b>72930</b> |
| <b>M.D./K10</b> |              |
| lucida          | lucida       |
| Stock std.      |              |
| <b>B</b>        | <b>B</b>     |
| 700             | 702          |

### Alesatori a macchina

|                 |              |              |              |              |              |
|-----------------|--------------|--------------|--------------|--------------|--------------|
| <b>72868</b>    | <b>72867</b> | <b>72860</b> | <b>72859</b> | <b>72880</b> | <b>72881</b> |
| <b>M.D./K10</b> |              |              |              |              |              |
| lucida          | lucida       | lucida       | lucida       | lucida       | lucida       |
| 8050            | 8050         | 8051         | 8051         | 8093         | 8093         |
| <b>A</b>        | <b>B</b>     | <b>A</b>     | <b>B</b>     | <b>A</b>     | <b>B</b>     |
| 704             | 705          | 708          | 709          | 706          | 707          |



| $v_c$<br>m/min | Codice<br>d'avanz. |     | $v_c$<br>m/min | Codice<br>d'avanz. |     | $v_c$<br>m/min | Codice<br>d'avanz. |   | $v_c$<br>m/min | Codice<br>d'avanz. |   |   |   |   |   |   |   |
|----------------|--------------------|-----|----------------|--------------------|-----|----------------|--------------------|---|----------------|--------------------|---|---|---|---|---|---|---|
| 185            | I-J                | I-J | 185            | I-J                | I-J | 18             | F                  | F | 18             | F                  | F | F | F | F | F | F | F |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 16             | F                  | F | 16             | F                  | F | F | F | F | F | F | F |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 18             | F                  | F | 18             | F                  | F | F | F | F | F | F | F |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 16             | F                  | F | 16             | F                  | F | F | F | F | F | F | F |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 18             | E                  | E | 18             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 16             | F                  | F | 16             | F                  | F | F | F | F | F | F | F |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 14             | E                  | E | 14             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 14             | E                  | E | 14             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 12             | E                  | E | 12             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 18             | E                  | E | 18             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 14             | E                  | E | 14             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 12             | E                  | E | 12             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 14             | E                  | E | 14             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 12             | E                  | E | 12             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 12             | E                  | E | 12             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 10             | E                  | E | 10             | E                  | E | E | E | E | E | E | E |
| 90             | I-J                | I-J | 90             | I-J                | I-J | 10             | E                  | E | 10             | E                  | E | E | E | E | E | E | E |
| 45             | G-H                | G-H | 45             | G-H                | G-H |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 50             | G-H                | G-H | 50             | G-H                | G-H |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 45             | G-H                | G-H | 45             | G-H                | G-H |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 90             | H-I                | H-I | 90             | H-I                | H-I | 8              | E                  | E | 8              | E                  | E | E | E | E | E | E | E |
| 60             | H-I                | H-I | 60             | H-I                | H-I | 6              | E                  | E | 6              | E                  | E | E | E | E | E | E | E |
| 90             | H-I                | H-I | 90             | H-I                | H-I | 6              | E                  | E | 6              | E                  | E | E | E | E | E | E | E |
| 100            | I-J                | I-J | 100            | I-J                | I-J | 20             | E                  | E | 20             | E                  | E | E | E | E | E | E | E |
| 100            | I-J                | I-J | 100            | I-J                | I-J | 18             | E                  | E | 18             | E                  | E | E | E | E | E | E | E |
| 185            | I-J                | I-J | 185            | I-J                | I-J | 20             | E                  | E | 20             | E                  | E | E | E | E | E | E | E |
| 90             | I-J                | I-J | 90             | I-J                | I-J | 18             | E                  | E | 18             | E                  | E | E | E | E | E | E | E |
| 40             | H-I                | H-I | 40             | H-I                | H-I |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 80             | I-J                | I-J | 80             | I-J                | I-J | 16             | E                  | E | 16             | E                  | E | E | E | E | E | E | E |
| 80             | I-J                | I-J | 80             | I-J                | I-J | 16             | E                  | E | 16             | E                  | E | E | E | E | E | E | E |
| 80             | I-J                | I-J | 80             | I-J                | I-J |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 80             | I-J                | I-J | 80             | I-J                | I-J |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 50             | G-H                | G-H | 50             | G-H                | G-H |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 60             | H-I                | H-I | 60             | H-I                | H-I | 10             | E                  | E | 10             | E                  | E | E | E | E | E | E | E |
| 60             | H-I                | H-I | 60             | H-I                | H-I | 10             | E                  | E | 10             | E                  | E | E | E | E | E | E | E |
|                |                    |     |                |                    |     | 30             | G                  | G | 30             | G                  | G | G | G | G | G | G | G |
|                |                    |     |                |                    |     | 30             | G                  | G | 30             | G                  | G | G | G | G | G | G | G |
|                |                    |     |                |                    |     | 40             | F                  | F | 40             | F                  | F | F | F | F | F | F | F |
|                |                    |     |                |                    |     | 30             | F                  | F | 30             | F                  | F | F | F | F | F | F | F |
| 120            | I-J                | I-J | 120            | I-J                | I-J | 25             | F                  | F | 25             | F                  | F | F | F | F | F | F | F |
|                |                    |     |                |                    |     | 25             | F                  | F | 25             | F                  | F | F | F | F | F | F | F |
| 175            | I-J                | I-J | 175            | I-J                | I-J | 35             | F                  | F | 35             | F                  | F | F | F | F | F | F | F |
|                |                    |     |                |                    |     | 30             | F                  | F | 30             | F                  | F | F | F | F | F | F | F |
| 175            | I-J                | I-J | 175            | I-J                | I-J | 35             | F                  | F | 35             | F                  | F | F | F | F | F | F | F |
| 175            | I-J                | I-J | 175            | I-J                | I-J | 30             | F                  | F | 30             | F                  | F | F | F | F | F | F | F |
|                |                    |     |                |                    |     | 30             | F                  | F | 30             | F                  | F | F | F | F | F | F | F |
|                |                    |     |                |                    |     | 25             | F                  | F | 25             | F                  | F | F | F | F | F | F | F |
| 140            | I-J                | I-J | 140            | I-J                | I-J | 20             | G                  | G | 20             | G                  | G | G | G | G | G | G | G |
| 140            | I-J                | I-J | 140            | I-J                | I-J | 20             | G                  | G | 20             | G                  | G | G | G | G | G | G | G |
| 80             | E                  | E   | 80             | E                  | E   |                |                    |   |                |                    |   |   |   |   |   |   |   |
| 80             | E                  | E   | 80             | E                  | E   |                |                    |   |                |                    |   |   |   |   |   |   |   |

## Parametri di lavoro indicativi per utensili per alesare

| Serie d'avanzamento |              |       |       |       |       |       |       |                            |
|---------------------|--------------|-------|-------|-------|-------|-------|-------|----------------------------|
| Codice lettera      | E            | F     | G     | H     | I     | J     |       |                            |
| Ø utensile mm       | <b>3,15</b>  | 0,080 | 0,100 | 0,125 | 0,300 | 0,500 | 0,800 | Avanzamento<br>f (mm/giro) |
|                     | <b>4,00</b>  | 0,100 | 0,125 | 0,160 | 0,300 | 0,500 | 1,000 |                            |
|                     | <b>5,00</b>  | 0,100 | 0,125 | 0,160 | 0,400 | 0,600 | 1,000 |                            |
|                     | <b>6,30</b>  | 0,125 | 0,160 | 0,200 | 0,400 | 0,700 | 1,200 |                            |
|                     | <b>8,00</b>  | 0,160 | 0,200 | 0,250 | 0,600 | 1,000 | 1,800 |                            |
|                     | <b>10,00</b> | 0,200 | 0,250 | 0,315 | 0,600 | 1,200 | 1,800 |                            |
|                     | <b>12,50</b> | 0,200 | 0,250 | 0,315 | 0,800 | 1,200 | 2,000 |                            |
|                     | <b>16,00</b> | 0,250 | 0,315 | 0,400 | 0,800 | 1,400 | 2,200 |                            |
|                     | <b>20,00</b> | 0,315 | 0,400 | 0,500 | 0,800 | 1,400 | 2,200 |                            |

Le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

| Diametro | Sottomisure (valori indicativi) |
|----------|---------------------------------|
| < 6 mm   | 0,1 - 0,2 mm                    |
| < 10 mm  | 0,2 mm                          |
| < 16 mm  | 0,2 - 0,3 mm                    |
| < 25 mm  | 0,3 - 0,4 mm                    |
| > 25 mm  | 0,4 mm                          |

### Impiego del refrigerante:

olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante

emulsione

senza lubrificante

solo refrigerazione ad aria

| Gruppo materiale                            | Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione)<br>Cifre in grassetto = materiale secondo DIN EN  | Resist. a trazione<br>MPa (N/mm <sup>2</sup> ) | Durezza                  | Refrigerante                        |
|---|---|--|--------------------------|-------------------------------------|
| Acciai da costruzione generici              | <b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)<br><b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500) | ≤500<br>>500-850                               |                          | <input checked="" type="checkbox"/> |
| Acciai automatici                           | <b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)<br><b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)   | ≤850<br>850-1000                               |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica non legati               | <b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)<br><b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)<br><b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)  | ≤ 700<br>700-850<br>850-1000                   |                          | <input checked="" type="checkbox"/> |
| Acciai da bonifica legati                   | <b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4<br><b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione non legati           | <b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)  | ≤750   |                          | <input checked="" type="checkbox"/> |
| Acciai da cementazione legati               | <b>1.7043</b> 38Cr4<br><b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5  | 850-≤1000<br>1000-1200                         |                          | <input checked="" type="checkbox"/> |
| Acciai da nitrurazione                      | <b>1.8504</b> 34CrAl6<br><b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7  | ≥850-≤1000<br>>1000-1200                       |                          | <input checked="" type="checkbox"/> |
| Acciai da utensile                          | <b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9<br><b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4                                    | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Acciai rapidi                               | <b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3   | ≥650-1000                                      |                          | <input checked="" type="checkbox"/> |
| Acciai per molle                            | <b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)   |  | ≤330 HB                  | <input checked="" type="checkbox"/> |
| Acciai temprati                             | -   |  | ≤40-48 HRC<br>>48-60 HRC | <input checked="" type="checkbox"/> |
| Acciai inossidabili, solforati              | <b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9  | ≤850   |                          | <input checked="" type="checkbox"/> |
| austenitici                                 | <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)  | ≤850   |                          | <input checked="" type="checkbox"/> |
| martensitisch                               | <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2   | ≤850   |                          | <input checked="" type="checkbox"/> |
| Ghisa                                       | <b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20)<br><b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)  | 850-≤1000<br>1000-1200                         |                          | <input type="checkbox"/>            |
| Ghisa sferoidale e temprata                 | <b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35)<br><b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)  |  | ≤240 HB<br><300 HB       | <input checked="" type="checkbox"/> |
| Ghisa dura                                  | -   |  | ≤350 HB                  | <input checked="" type="checkbox"/> |
| Nuova ghisa GGV                             | <b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)<br><b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo6   |  |                          | <input type="checkbox"/>            |
| Nuova ghisa ADI                             | <b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)<br><b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)  | 800-1000<br>1200-1400                          |                          | <input type="checkbox"/>            |
| Leghe speciali                              | Nimonic, Inconel, Monel, Hastelloy  | ≤1200  |                          | <input checked="" type="checkbox"/> |
| Titanio e sue leghe                         | <b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2<br><b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1                                       | ≤850<br>>850-1200                              |                          | <input checked="" type="checkbox"/> |
| Alluminio e sue leghe                       | <b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1  | ≤400   |                          | <input checked="" type="checkbox"/> |
| Leghe di alluminio per lavorazione plastica | <b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5   | ≤450   |                          | <input checked="" type="checkbox"/> |
| Leghe ghisa alluminio ≤ 10 % Si             | <b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9   | ≤600   |                          | <input checked="" type="checkbox"/> |
| > 10 % Si                                   | <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg  | ≤600   |                          | <input checked="" type="checkbox"/> |
| Leghe al magnesio                           | <b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1   | ≤450   |                          | <input type="checkbox"/>            |
| Rame basso legato                           | <b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb   | ≤400   |                          | <input checked="" type="checkbox"/> |
| Ottone, a truciolo corto                    | <b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2   | ≤600   |                          | <input checked="" type="checkbox"/> |
| a truciolo lungo                            | <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5   | ≤600   |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo corto                     | <b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn   | ≤600<br>>600-850                               |                          | <input checked="" type="checkbox"/> |
| Bronzi a truciolo lungo                     | <b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10<br><b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2   | ≤850<br>>850-1000                              |                          | <input checked="" type="checkbox"/> |
| Mat. plastiche termoindurenti               | Resina epossidica, Resopal, Pertinax, Moltopren   |  | -                        | <input type="checkbox"/>            |
| Materie termoplastiche                      | Plexiglas, Hostalen, Novodur, Makralon  |  | -                        | <input checked="" type="checkbox"/> |
| Mat. plast. a fibre aramidiche              | Kevlar  |  | -                        | <input type="checkbox"/>            |
| a fibre di vetro/C rinforzate               | GFK/CFK   |  | -                        | <input type="checkbox"/>            |

### Alesatori per chiodi

### Alesatori a macchina NC

### Alesatori per spine coniche

### Alesatori a macchina

### Alesatori a forte torsione

|                |              |
|----------------|--------------|
| Catalogo n°    | <b>72680</b> |
| Mat. da taglio | <b>HSS</b>   |
| Superficie     | nitrurata    |
| Norma          | 311          |
| Forma          |              |
| a pagina       | 721          |

|  |              |              |
|--|--------------|--------------|
|  | <b>72900</b> | <b>72910</b> |
|  | <b>HSS-E</b> |              |
|  | lucida       | lucida       |
|  | Stock std.   |              |
|  | <b>B</b>     | <b>B</b>     |
|  | 710          | 712          |

|  |              |
|--|--------------|
|  | <b>72741</b> |
|  | <b>HSS-E</b> |
|  | lucida       |
|  | 2179         |
|  |              |
|  | 722          |

|  |              |              |              |              |              |
|--|--------------|--------------|--------------|--------------|--------------|
|  | <b>72640</b> | <b>72654</b> | <b>72650</b> | <b>72660</b> | <b>72670</b> |
|  | <b>HSS-E</b> |              |              |              |              |
|  | lucida       | lucida       | lucida       | lucida       | lucida       |
|  | 212          | 212          | 212          | 208          | 208          |
|  | <b>A</b>     | <b>B</b>     | <b>B</b>     | <b>A</b>     | <b>B</b>     |
|  | 716          | 714          | 717          | 718          | 719          |

|  |              |
|--|--------------|
|  | <b>72690</b> |
|  | <b>HSS-E</b> |
|  | lucida       |
|  | 212          |
|  |              |
|  | 720          |



| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 14                      | F                  |
| 12                      | F                  |
| 10                      | F                  |
| 10                      | E                  |
| 8                       | E                  |
| 6                       | E                  |
| 12                      | F                  |
| 6                       | E                  |
| 8                       | E                  |
| 12                      | E                  |
| 8                       | E                  |
| 5                       | E                  |
| 4                       | E                  |
| 12                      | E                  |
| 12                      | E                  |
| 10                      | E                  |
| 4                       | E                  |
| 3                       | E                  |
| 18                      | G                  |
| 18                      | G                  |
| 18                      | G                  |
| 18                      | G                  |
| 16                      | F                  |
| 16                      | F                  |
| 20                      | E                  |
| 16                      | F                  |
| 14                      | F                  |
| 10                      | F                  |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |   |
|-------------------------|--------------------|---|
| 16                      | F                  | F |
| 12                      | F                  | F |
| 12                      | F                  | F |
| 10                      | E                  | E |
| 14                      | F                  | F |
| 12                      | E                  | E |
| 10                      | E                  | E |
| 10                      | E                  | E |
| 8                       | E                  | E |
| 16                      | F                  | F |
| 10                      | E                  | E |
| 8                       | E                  | E |
| 10                      | E                  | E |
| 8                       | E                  | E |
| 14                      | F                  | F |
| 10                      | E                  | E |
| 10                      | E                  | E |
| 6                       | F                  | F |
| 6                       | F                  | F |
| 4                       | F                  | F |
| 14                      | E                  | E |
| 12                      | E                  | E |
| 10                      | E                  | E |
| 8                       | E                  | E |
| 8                       | E                  | E |
| 6                       | E                  | E |
| 4                       | E                  | E |
| 18                      | G                  | G |
| 18                      | G                  | G |
| 20                      | F                  | F |
| 18                      | F                  | F |
| 20                      | F                  | F |
| 18                      | F                  | F |
| 16                      | F                  | F |
| 16                      | F                  | F |
| 20                      | F                  | F |
| 18                      | F                  | F |
| 18                      | F                  | F |
| 14                      | F                  | F |
| 12                      | G                  | G |
| 14                      | G                  | G |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | E                  |
| 8                       | E                  |
| 8                       | E                  |
| 8                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 6                       | E                  |
| 8                       | G                  |
| 8                       | G                  |
| 8                       | G                  |
| 8                       | G                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |
| 8                       | F                  |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |   |   |   |   |
|-------------------------|--------------------|---|---|---|---|
| 16                      | F                  | F | F | F | F |
| 12                      | F                  | F | F | F | F |
| 12                      | F                  | F | F | F | F |
| 10                      | E                  | E | E | E | E |
| 14                      | F                  | F | F | F | F |
| 12                      | E                  | E | E | E | E |
| 10                      | E                  | E | E | E | E |
| 10                      | E                  | E | E | E | E |
| 8                       | E                  | E | E | E | E |
| 16                      | F                  | F | F | F | F |
| 10                      | E                  | E | E | E | E |
| 8                       | E                  | E | E | E | E |
| 10                      | E                  | E | E | E | E |
| 8                       | E                  | E | E | E | E |
| 14                      | F                  | F | F | F | F |
| 10                      | E                  | E | E | E | E |
| 10                      | E                  | E | E | E | E |
| 6                       | F                  | F | F | F | F |
| 6                       | F                  | F | F | F | F |
| 4                       | F                  | F | F | F | F |
| 14                      | E                  | E | E | E | E |
| 12                      | E                  | E | E | E | E |
| 12                      | E                  | E | E | E | E |
| 10                      | E                  | E | E | E | E |
| 8                       | E                  | E | E | E | E |
| 8                       | E                  | E | E | E | E |
| 6                       | E                  | E | E | E | E |
| 4                       | E                  | E | E | E | E |
| 18                      | G                  | G | G | G | G |
| 18                      | G                  | G | G | G | G |
| 20                      | F                  | F | F | F | F |
| 18                      | F                  | F | F | F | F |
| 20                      | F                  | F | F | F | F |
| 18                      | F                  | F | F | F | F |
| 16                      | F                  | F | F | F | F |
| 16                      | F                  | F | F | F | F |
| 20                      | F                  | F | F | F | F |
| 18                      | F                  | F | F | F | F |
| 18                      | F                  | F | F | F | F |
| 14                      | F                  | F | F | F | F |
| 12                      | G                  | G | G | G | G |
| 14                      | G                  | G | G | G | G |

| v <sub>c</sub><br>m/min | Codice<br>d'avanz. |
|-------------------------|--------------------|
| 16                      | G                  |
| 12                      | G                  |
| 12                      | G                  |
| 14                      | G                  |
| 12                      | G                  |
| 16                      | G                  |
| 10                      | G                  |
| 5                       | E                  |
| 22                      | G                  |
| 22                      | G                  |
| 20                      | G                  |
| 16                      | G                  |
| 18                      | G                  |
| 12                      | G                  |
| 14                      | G                  |

## Alesatori in metallo duro

### Alesatori ad alto rendimento VHM



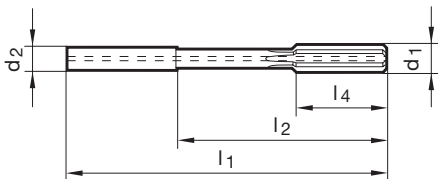
Catalogo n° 72870



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

Parametri di lav. ind. a pag. 690

- con refrigerazione assiale, per la lavorazione di fori ciechi
- per alti valori di taglio e alta qualità di foratura
- dritto, con divisione estremamente diseguale
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 3,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,000  |
| 3,500    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,500  |
| 4,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,000  |
| 4,500    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,500  |
| 5,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,000  |
| 5,500    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,500  |
| 6,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,000  |
| 6,500    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 6,500  |
| 7,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,000  |
| 7,500    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,500  |
| 8,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,000  |
| 8,500    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 8,500  |
| 9,000    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,000  |
| 9,500    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,500  |
| 10,000   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,000 |
| 10,500   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 10,500 |
| 11,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,000 |
| 11,500   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,500 |
| 12,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 12,000 |
| 13,000   | 14,000      | 130,000  | 85,000   | 22,000   | 6 | 13,000 |
| 14,000   | 14,000      | 130,000  | 85,000   | 22,000   | 6 | 14,000 |
| 15,000   | 16,000      | 150,000  | 102,000  | 22,000   | 6 | 15,000 |
| 16,000   | 16,000      | 150,000  | 102,000  | 22,000   | 6 | 16,000 |
| 17,000   | 18,000      | 150,000  | 102,000  | 25,000   | 6 | 17,000 |
| 18,000   | 18,000      | 150,000  | 102,000  | 25,000   | 6 | 18,000 |
| 19,000   | 20,000      | 150,000  | 100,000  | 25,000   | 6 | 19,000 |
| 20,000   | 20,000      | 150,000  | 100,000  | 25,000   | 6 | 20,000 |



## Alesatori in metallo duro

### Alesatori ad alto rendimento VHM



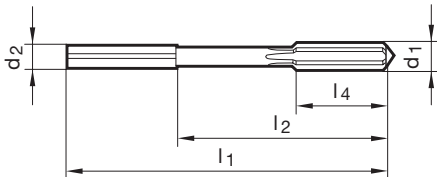
Catalogo n° 72871



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

Parametri di lav.  
ind. a pag. 690

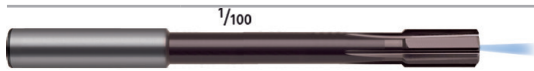
- con scanalature longitudinali sul codolo per alimentazione refrigerante nella lavorazione di fori passanti
- dritto, con divisione estremamente diseguale
- per alti valori di taglio e alta qualità di foratura
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



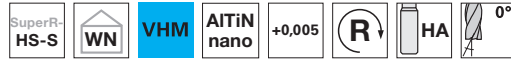
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 3,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,000  |
| 3,500    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,500  |
| 4,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,000  |
| 4,500    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,500  |
| 5,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,000  |
| 5,500    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,500  |
| 6,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,000  |
| 6,500    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 6,500  |
| 7,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,000  |
| 7,500    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,500  |
| 8,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,000  |
| 8,500    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 8,500  |
| 9,000    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,000  |
| 9,500    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,500  |
| 10,000   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,000 |
| 10,500   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 10,500 |
| 11,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,000 |
| 11,500   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,500 |
| 12,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 12,000 |
| 13,000   | 14,000      | 130,000  | 85,000   | 22,000   | 6 | 13,000 |
| 14,000   | 14,000      | 130,000  | 85,000   | 22,000   | 6 | 14,000 |
| 15,000   | 16,000      | 150,000  | 102,000  | 22,000   | 6 | 15,000 |
| 16,000   | 16,000      | 150,000  | 102,000  | 22,000   | 6 | 16,000 |
| 17,000   | 18,000      | 150,000  | 102,000  | 25,000   | 6 | 17,000 |
| 18,000   | 18,000      | 150,000  | 102,000  | 25,000   | 6 | 18,000 |
| 19,000   | 20,000      | 150,000  | 100,000  | 25,000   | 6 | 19,000 |
| 20,000   | 20,000      | 150,000  | 100,000  | 25,000   | 6 | 20,000 |

## Alesatori in metallo duro

### Alesatori ad alto rendimento VHM



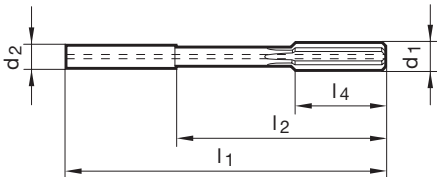
Catalogo n° 72872



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

Parametri di lav. ind. a pag. 690

- con refrigerazione assiale, per la lavorazione di fori ciechi
- per alti valori di taglio e alta qualità di foratura
- dritto, con divisione estremamente diseguale
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 2,970    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,970  |
| 2,980    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,980  |
| 2,990    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,990  |
| 3,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,000  |
| 3,010    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,010  |
| 3,020    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,020  |
| 3,030    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,030  |
| 3,970    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,970  |
| 3,980    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,980  |
| 3,990    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,990  |
| 4,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,000  |
| 4,010    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,010  |
| 4,020    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,020  |
| 4,030    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,030  |
| 4,970    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,970  |
| 4,980    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,980  |
| 4,990    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,990  |
| 5,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,000  |
| 5,010    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,010  |
| 5,020    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,020  |
| 5,030    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,030  |
| 5,970    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,970  |
| 5,980    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,980  |
| 5,990    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,990  |
| 6,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,000  |
| 6,010    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,010  |
| 6,020    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,020  |
| 6,030    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,030  |
| 7,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,000  |
| 7,970    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,970  |
| 7,980    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,980  |
| 7,990    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,990  |
| 8,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,000  |
| 8,010    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,010  |
| 8,020    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,020  |
| 8,030    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,030  |
| 9,000    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,000  |
| 9,970    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,970  |
| 9,980    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,980  |
| 9,990    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,990  |
| 10,000   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,000 |
| 10,010   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,010 |
| 10,020   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,020 |
| 10,030   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,030 |
| 11,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,000 |
| 11,970   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,970 |
| 11,980   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,980 |
| 11,990   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,990 |

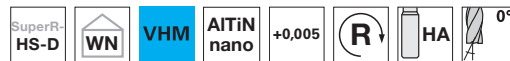
| <b>d1</b><br><b>mm</b> | <b>d2 h6</b><br><b>mm</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> | <b>l4</b><br><b>mm</b> | <b>Z</b> | <b>Codice</b> |
|------------------------|---------------------------|------------------------|------------------------|------------------------|----------|---------------|
| <b>12,000</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,000</b> |
| <b>12,010</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,010</b> |
| <b>12,020</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,020</b> |
| <b>12,030</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,030</b> |

## Alesatori in metallo duro

### Alesatori ad alto rendimento VHM



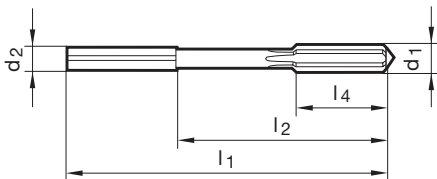
Catalogo n° 72873



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • | • |

Parametri di lav. ind. a pag. 690

- con scanalature longitudinali sul codolo per alimentazione refrigerante nella lavorazione di fori passanti
- dritto, con divisione estremamente diseguale
- per alti valori di taglio e alta qualità di foratura
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo

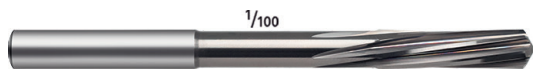


| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 2,970    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,970  |
| 2,980    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,980  |
| 2,990    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 2,990  |
| 3,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,000  |
| 3,010    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,010  |
| 3,020    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,020  |
| 3,030    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,030  |
| 3,970    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,970  |
| 3,980    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,980  |
| 3,990    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 3,990  |
| 4,000    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,000  |
| 4,010    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,010  |
| 4,020    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,020  |
| 4,030    | 4,000       | 68,000   | 40,000   | 12,000   | 4 | 4,030  |
| 4,970    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,970  |
| 4,980    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,980  |
| 4,990    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 4,990  |
| 5,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,000  |
| 5,010    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,010  |
| 5,020    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,020  |
| 5,030    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,030  |
| 5,970    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,970  |
| 5,980    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,980  |
| 5,990    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 5,990  |
| 6,000    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,000  |
| 6,010    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,010  |
| 6,020    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,020  |
| 6,030    | 6,000       | 76,000   | 40,000   | 12,000   | 4 | 6,030  |
| 7,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,000  |
| 7,970    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,970  |
| 7,980    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,980  |
| 7,990    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 7,990  |
| 8,000    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,000  |
| 8,010    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,010  |
| 8,020    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,020  |
| 8,030    | 8,000       | 101,000  | 65,000   | 16,000   | 6 | 8,030  |
| 9,000    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,000  |
| 9,970    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,970  |
| 9,980    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,980  |
| 9,990    | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 9,990  |
| 10,000   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,000 |
| 10,010   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,010 |
| 10,020   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,020 |
| 10,030   | 10,000      | 101,000  | 61,000   | 19,000   | 6 | 10,030 |
| 11,000   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,000 |
| 11,970   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,970 |
| 11,980   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,980 |
| 11,990   | 12,000      | 130,000  | 85,000   | 19,000   | 6 | 11,990 |

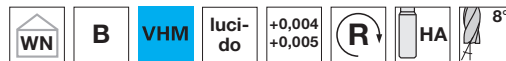
| <b>d1</b><br><b>mm</b> | <b>d2 h6</b><br><b>mm</b> | <b>l1</b><br><b>mm</b> | <b>l2</b><br><b>mm</b> | <b>l4</b><br><b>mm</b> | <b>Z</b> | <b>Codice</b> |
|------------------------|---------------------------|------------------------|------------------------|------------------------|----------|---------------|
| <b>12,000</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,000</b> |
| <b>12,010</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,010</b> |
| <b>12,020</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,020</b> |
| <b>12,030</b>          | 12,000                    | 130,000                | 85,000                 | 19,000                 | 6        | <b>12,030</b> |

## Alesatori in metallo duro

### Alesatori a macchina NC

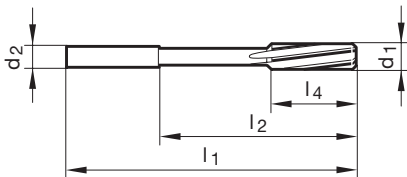


Catalogo n° 72920



Parametri di lav.  
ind. a pag. 690

- $\varnothing > 3,75$  con taglienti molto sfalsati
- $\leq \varnothing 5,50$  mm: 0,00/+0,004
- $> \varnothing 5,50$  mm: 0,00/+0,005
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 0,980    | 4,000       | 50,000   | 22,000   | 6,000    | 3 | 0,980  |
| 0,990    | 4,000       | 50,000   | 22,000   | 6,000    | 3 | 0,990  |
| 1,000    | 4,000       | 50,000   | 22,000   | 6,000    | 3 | 1,000  |
| 1,010    | 4,000       | 50,000   | 22,000   | 6,000    | 3 | 1,010  |
| 1,020    | 4,000       | 50,000   | 22,000   | 6,000    | 3 | 1,020  |
| 1,030    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,030  |
| 1,480    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,480  |
| 1,490    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,490  |
| 1,500    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,500  |
| 1,510    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,510  |
| 1,520    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,520  |
| 1,530    | 4,000       | 50,000   | 22,000   | 9,000    | 3 | 1,530  |
| 1,980    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 1,980  |
| 1,990    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 1,990  |
| 2,000    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 2,000  |
| 2,010    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 2,010  |
| 2,020    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 2,020  |
| 2,030    | 4,000       | 50,000   | 22,000   | 12,000   | 4 | 2,030  |
| 2,480    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,480  |
| 2,490    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,490  |
| 2,500    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,500  |
| 2,510    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,510  |
| 2,520    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,520  |
| 2,530    | 4,000       | 60,000   | 32,000   | 16,000   | 4 | 2,530  |
| 2,970    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 2,970  |
| 2,980    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 2,980  |
| 2,990    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 2,990  |
| 3,000    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 3,000  |
| 3,010    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 3,010  |
| 3,020    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 3,020  |
| 3,030    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 3,030  |
| 3,970    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 3,970  |
| 3,980    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 3,980  |
| 3,990    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 3,990  |
| 4,000    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 4,000  |
| 4,010    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 4,010  |
| 4,020    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 4,020  |
| 4,030    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 4,030  |
| 4,970    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 4,970  |
| 4,980    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 4,980  |
| 4,990    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 4,990  |
| 5,000    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,000  |
| 5,010    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,010  |
| 5,020    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,020  |
| 5,030    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,030  |
| 5,970    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,970  |
| 5,980    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,980  |
| 5,990    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,990  |

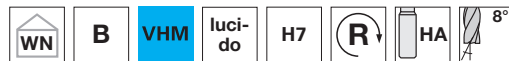
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 6,000    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,010    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,010  |
| 6,020    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,020  |
| 6,030    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,030  |
| 7,000    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,000  |
| 7,970    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,970  |
| 7,980    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,980  |
| 7,990    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,990  |
| 8,000    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,000  |
| 8,010    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,010  |
| 8,020    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,020  |
| 8,030    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,030  |
| 8,040    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,040  |
| 9,000    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,000  |
| 9,970    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,970  |
| 9,980    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,980  |
| 9,990    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,990  |
| 10,000   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,000 |
| 10,010   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,010 |
| 10,020   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,020 |
| 10,030   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,030 |
| 10,040   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,040 |
| 10,050   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,050 |
| 11,970   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 11,970 |
| 11,980   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 11,980 |
| 11,990   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 11,990 |
| 12,000   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,000 |
| 12,010   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,010 |
| 12,020   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,020 |
| 12,030   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,030 |
| 12,040   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,040 |
| 12,050   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,050 |

## Alesatori in metallo duro

### Alesatori a macchina NC

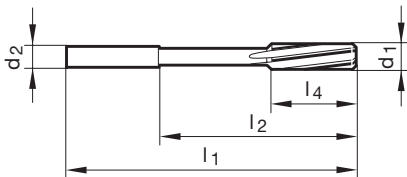


Catalogo n° 72930



Parametri di lav.  
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- $\varnothing > 3,75$  con taglienti molto sfalsati
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 3,000    | 4,000       | 64,000   | 36,000   | 17,000   | 6 | 3,000  |
| 3,100    | 4,000       | 68,000   | 40,000   | 18,000   | 6 | 3,100  |
| 3,200    | 4,000       | 68,000   | 40,000   | 18,000   | 6 | 3,200  |
| 3,300    | 4,000       | 68,000   | 40,000   | 18,000   | 6 | 3,300  |
| 3,400    | 4,000       | 74,000   | 46,000   | 20,000   | 6 | 3,400  |
| 3,500    | 4,000       | 74,000   | 46,000   | 20,000   | 6 | 3,500  |
| 3,600    | 4,000       | 74,000   | 46,000   | 20,000   | 6 | 3,600  |
| 3,700    | 4,000       | 74,000   | 46,000   | 20,000   | 6 | 3,700  |
| 3,800    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 3,800  |
| 3,900    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 3,900  |
| 4,000    | 4,000       | 77,000   | 45,000   | 21,000   | 6 | 4,000  |
| 4,100    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,100  |
| 4,200    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,200  |
| 4,300    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,300  |
| 4,400    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,400  |
| 4,500    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,500  |
| 4,600    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,600  |
| 4,700    | 6,000       | 82,000   | 50,000   | 23,000   | 6 | 4,700  |
| 4,800    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 4,800  |
| 4,900    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 4,900  |
| 5,000    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,000  |
| 5,100    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,100  |
| 5,200    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,200  |
| 5,300    | 6,000       | 93,000   | 59,000   | 26,000   | 6 | 5,300  |
| 5,400    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,400  |
| 5,500    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,500  |
| 5,600    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,600  |
| 5,700    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,700  |
| 5,800    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,800  |
| 5,900    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,900  |
| 6,000    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,100    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,100  |
| 6,200    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,200  |
| 6,300    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,300  |
| 6,400    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,400  |
| 6,500    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,500  |
| 6,600    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,600  |
| 6,700    | 8,000       | 101,000  | 63,000   | 28,000   | 6 | 6,700  |
| 6,800    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 6,800  |
| 6,900    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 6,900  |
| 7,000    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,000  |
| 7,100    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,100  |
| 7,200    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,200  |
| 7,300    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,300  |
| 7,400    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,400  |
| 7,500    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,500  |
| 7,600    | 8,000       | 109,000  | 69,000   | 31,000   | 6 | 7,600  |
| 7,700    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,700  |



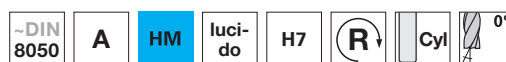
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 7,800    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,800  |
| 7,900    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 7,900  |
| 8,000    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,000  |
| 8,100    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,100  |
| 8,200    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,200  |
| 8,300    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,300  |
| 8,400    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,400  |
| 8,500    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,500  |
| 8,600    | 10,000      | 117,000  | 75,000   | 33,000   | 6 | 8,600  |
| 8,700    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 8,700  |
| 8,800    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 8,800  |
| 8,900    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 8,900  |
| 9,000    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,000  |
| 9,100    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,100  |
| 9,200    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,200  |
| 9,300    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,300  |
| 9,400    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,400  |
| 9,500    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,500  |
| 9,600    | 10,000      | 125,000  | 81,000   | 36,000   | 6 | 9,600  |
| 9,700    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,700  |
| 9,800    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,800  |
| 9,900    | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 9,900  |
| 10,000   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,000 |
| 10,100   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,100 |
| 10,200   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,200 |
| 10,300   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,300 |
| 10,400   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,400 |
| 10,500   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,500 |
| 10,600   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,600 |
| 10,700   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 10,700 |
| 10,800   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 10,800 |
| 10,900   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 10,900 |
| 11,000   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,000 |
| 11,100   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,100 |
| 11,200   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,200 |
| 11,300   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,300 |
| 11,400   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,400 |
| 11,500   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,500 |
| 11,600   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,600 |
| 11,700   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,700 |
| 11,800   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,800 |
| 11,900   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 11,900 |
| 12,000   | 12,000      | 151,000  | 105,000  | 44,000   | 6 | 12,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD



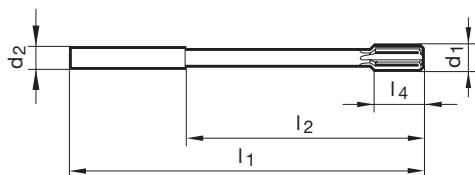
Catalogo n° 72868



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav.  
ind. a pag. 690

- > Ø 9,50 mm: taglienti con riporti in MD
- ≤ Ø 9,50 mm: Int. in MD
- ≤ Ø 9,50 mm con centrino su entrambi i lati
- > Ø 9,50 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC



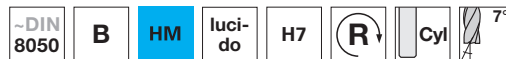
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 5,000    | 5,000       | 86,000   | 52,000   | 12,000   | 6 | 5,000  |
| 6,000    | 5,600       | 93,000   | 57,000   | 12,000   | 6 | 6,000  |
| 7,000    | 7,100       | 109,000  | 69,000   | 16,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 75,000   | 16,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 81,000   | 19,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 87,000   | 12,000   | 6 | 10,000 |
| 12,000   | 10,000      | 151,000  | 105,000  | 12,000   | 6 | 12,000 |
| 14,000   | 12,000      | 160,000  | 110,000  | 16,000   | 6 | 14,000 |
| 15,000   | 12,000      | 162,000  | 112,000  | 16,000   | 6 | 15,000 |
| 16,000   | 12,000      | 170,000  | 120,000  | 19,000   | 6 | 16,000 |
| 20,000   | 16,000      | 195,000  | 137,000  | 19,000   | 6 | 20,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD



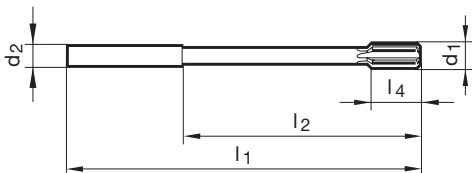
Catalogo n° 72867



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav. ind. a pag. 690

- > Ø 9,50 mm: taglienti con riporti in MD
- ≤ Ø 9,50 mm: Int. in MD
- ≤ Ø 9,50 mm con centrino su entrambi i lati
- > Ø 9,50 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC
- solo per fori passanti



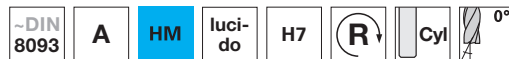
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 5,000    | 5,000       | 86,000   | 52,000   | 12,000   | 6 | 5,000  |
| 6,000    | 5,600       | 93,000   | 57,000   | 12,000   | 6 | 6,000  |
| 7,000    | 7,100       | 109,000  | 69,000   | 16,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 75,000   | 16,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 81,000   | 19,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 87,000   | 12,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 96,000   | 12,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 105,000  | 12,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 105,000  | 12,000   | 6 | 13,000 |
| 14,000   | 12,000      | 160,000  | 110,000  | 16,000   | 6 | 14,000 |
| 15,000   | 12,000      | 162,000  | 112,000  | 16,000   | 6 | 15,000 |
| 16,000   | 12,000      | 170,000  | 120,000  | 19,000   | 6 | 16,000 |
| 18,000   | 14,000      | 182,000  | 130,000  | 19,000   | 6 | 18,000 |
| 20,000   | 16,000      | 195,000  | 137,000  | 19,000   | 6 | 20,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD



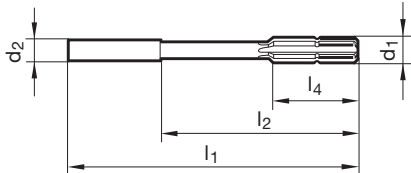
Catalogo n° 72880



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav.  
ind. a pag. 690

- $\geq \varnothing 3,0$  mm con taglienti molto sfalsati
- $\leq \varnothing 9,50$  mm: Int. in MD
- $> \varnothing 9,50$  mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$  mm con centrino su entrambi i lati
- $> \varnothing 9,50$  mm con fori di centraggio su entrambi i lati
- shank  $\varnothing < 10,0$  mm tolerance h9, shank  $\varnothing \geq 10,0$  mm tolerance h6
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC



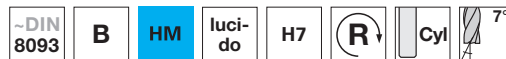
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 1,200    | 1,200       | 38,000   | 16,500   | 7,500    | 3 | 1,200  |
| 1,500    | 1,500       | 40,000   | 18,000   | 8,000    | 3 | 1,500  |
| 1,600    | 1,600       | 43,000   | 20,000   | 9,000    | 3 | 1,600  |
| 2,000    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,000  |
| 2,500    | 2,500       | 57,000   | 29,000   | 14,000   | 4 | 2,500  |
| 3,000    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 3,000  |
| 4,000    | 4,000       | 75,000   | 43,000   | 19,000   | 6 | 4,000  |
| 4,500    | 4,500       | 80,000   | 47,000   | 21,000   | 6 | 4,500  |
| 5,000    | 5,000       | 86,000   | 52,000   | 23,000   | 6 | 5,000  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 7,000    | 7,100       | 109,000  | 69,000   | 31,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 81,000   | 36,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 105,000  | 44,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 105,000  | 44,000   | 6 | 13,000 |
| 14,000   | 12,000      | 160,000  | 110,000  | 47,000   | 6 | 14,000 |
| 16,000   | 12,000      | 170,000  | 120,000  | 52,000   | 6 | 16,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD

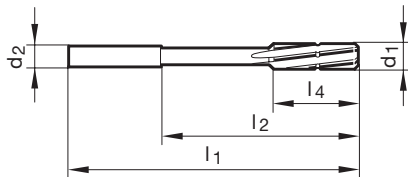


Catalogo n° 72881



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav.  
ind. a pag. 690



- $\geq \varnothing 3,0$  mm con taglienti molto sfalsati
- $\leq \varnothing 9,50$  mm: Int. im MD
- $> \varnothing 9,50$  mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$  mm con centrino su entrambi i lati
- $> \varnothing 9,50$  mm con fori di centraggio su entrambi i lati
- shank  $\varnothing < 10,0$  mm tolerance h9, shank  $\varnothing \geq 10,0$  mm tolerance h6
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC
- solo per fori passanti

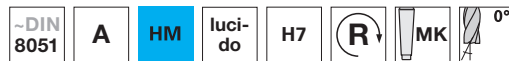
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 1,000    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,000  |
| 1,200    | 1,200       | 38,000   | 16,500   | 7,500    | 3 | 1,200  |
| 1,500    | 1,500       | 40,000   | 18,000   | 8,000    | 3 | 1,500  |
| 2,000    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,000  |
| 2,500    | 2,500       | 57,000   | 29,000   | 14,000   | 4 | 2,500  |
| 3,000    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 3,000  |
| 3,500    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,500  |
| 4,000    | 4,000       | 75,000   | 43,000   | 19,000   | 6 | 4,000  |
| 4,500    | 4,500       | 80,000   | 47,000   | 21,000   | 6 | 4,500  |
| 5,000    | 5,000       | 86,000   | 52,000   | 23,000   | 6 | 5,000  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 7,000    | 7,100       | 109,000  | 69,000   | 31,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 75,000   | 33,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 81,000   | 36,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 87,000   | 38,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 96,000   | 41,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 105,000  | 44,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 105,000  | 44,000   | 6 | 13,000 |
| 14,000   | 12,000      | 160,000  | 110,000  | 47,000   | 6 | 14,000 |
| 16,000   | 12,000      | 170,000  | 120,000  | 52,000   | 6 | 16,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD



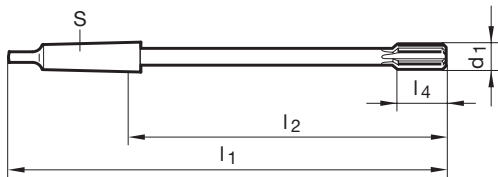
Catalogo n° 72860



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav.  
ind. a pag. 690

- $\leq \varnothing 9,50$  mm: Int. in MD
- $> \varnothing 9,50$  mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$  mm lati taglienti con centrino
- codolo con foro di centraggio
- $> \varnothing 9,50$  mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC



| d1<br>mm | S    | l1<br>mm | l4<br>mm | l4<br>mm | Z | Codice |
|----------|------|----------|----------|----------|---|--------|
| 10,000   | MK-1 | 168,000  | 106,000  | 12,000   | 6 | 10,000 |
| 12,000   | MK-1 | 182,000  | 120,000  | 12,000   | 6 | 12,000 |
| 13,000   | MK-1 | 182,000  | 120,000  | 12,000   | 6 | 13,000 |
| 14,000   | MK-1 | 189,000  | 127,000  | 16,000   | 6 | 14,000 |
| 15,000   | MK-2 | 204,000  | 129,000  | 16,000   | 6 | 15,000 |
| 16,000   | MK-2 | 210,000  | 135,000  | 19,000   | 6 | 16,000 |
| 17,000   | MK-2 | 214,000  | 139,000  | 19,000   | 6 | 17,000 |
| 18,000   | MK-2 | 219,000  | 144,000  | 19,000   | 6 | 18,000 |
| 20,000   | MK-2 | 228,000  | 153,000  | 19,000   | 6 | 20,000 |
| 22,000   | MK-2 | 237,000  | 162,000  | 22,000   | 6 | 22,000 |
| 24,000   | MK-3 | 268,000  | 174,000  | 22,000   | 6 | 24,000 |
| 25,000   | MK-3 | 268,000  | 174,000  | 22,000   | 6 | 25,000 |
| 28,000   | MK-3 | 277,000  | 183,000  | 25,000   | 6 | 28,000 |
| 30,000   | MK-3 | 281,000  | 187,000  | 25,000   | 6 | 30,000 |

## Alesatori in metallo duro

### Alesatori a macchina in MD



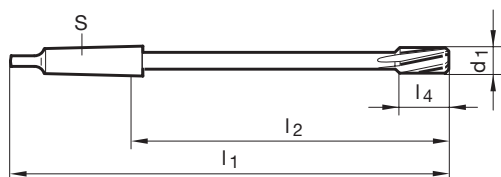
Catalogo n° 72859



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • |   | ○ |

Parametri di lav. ind. a pag. 690

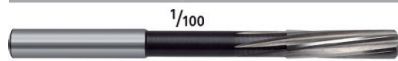
- $\leq \varnothing 9,50$  mm: Int. in MD
- $> \varnothing 9,50$  mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$  mm lati taglienti con centrino
- codolo con foro di centraggio
- $> \varnothing 9,50$  mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm<sup>2</sup> / 44 HRC



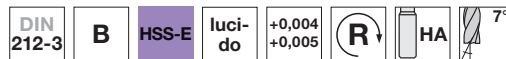
| d1<br>mm | S    | l1<br>mm | l4<br>mm | l4<br>mm | Z | Codice |
|----------|------|----------|----------|----------|---|--------|
| 6,000    | MK-1 | 138,000  | 76,000   | 12,000   | 6 | 6,000  |
| 8,000    | MK-1 | 156,000  | 94,000   | 16,000   | 6 | 8,000  |
| 10,000   | MK-1 | 168,000  | 106,000  | 12,000   | 6 | 10,000 |
| 11,000   | MK-1 | 175,000  | 113,000  | 12,000   | 6 | 11,000 |
| 12,000   | MK-1 | 182,000  | 120,000  | 12,000   | 6 | 12,000 |
| 13,000   | MK-1 | 182,000  | 120,000  | 12,000   | 6 | 13,000 |
| 14,000   | MK-1 | 189,000  | 127,000  | 16,000   | 6 | 14,000 |
| 15,000   | MK-2 | 204,000  | 129,000  | 16,000   | 6 | 15,000 |
| 16,000   | MK-2 | 210,000  | 135,000  | 19,000   | 6 | 16,000 |
| 17,000   | MK-2 | 214,000  | 139,000  | 19,000   | 6 | 17,000 |
| 18,000   | MK-2 | 219,000  | 144,000  | 19,000   | 6 | 18,000 |
| 20,000   | MK-2 | 228,000  | 153,000  | 19,000   | 6 | 20,000 |
| 21,000   | MK-2 | 232,000  | 157,000  | 22,000   | 6 | 21,000 |
| 22,000   | MK-2 | 237,000  | 162,000  | 22,000   | 6 | 22,000 |
| 23,000   | MK-2 | 241,000  | 166,000  | 22,000   | 6 | 23,000 |
| 24,000   | MK-3 | 268,000  | 174,000  | 22,000   | 8 | 24,000 |
| 25,000   | MK-3 | 268,000  | 174,000  | 22,000   | 8 | 25,000 |
| 26,000   | MK-3 | 273,000  | 179,000  | 22,000   | 8 | 26,000 |
| 27,000   | MK-3 | 277,000  | 183,000  | 25,000   | 8 | 27,000 |
| 30,000   | MK-3 | 281,000  | 187,000  | 25,000   | 8 | 30,000 |
| 32,000   | MK-4 | 317,000  | 199,500  | 25,000   | 8 | 32,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina NC



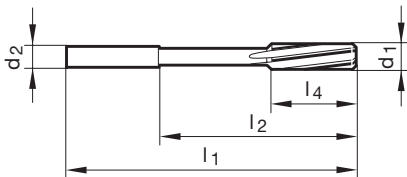
Catalogo n° 72900



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ● | ● | ● | ○ |   |

Parametri di lav. ind. a pag. 692

- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- ≤ Ø 5,50 mm: 0,00/+0,004
- > Ø 5,50 mm: 0,00/+0,005
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 1,000    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,000  |
| 1,010    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,010  |
| 1,020    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,020  |
| 1,030    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,030  |
| 1,500    | 2,000       | 40,000   | 18,000   | 8,000    | 3 | 1,500  |
| 1,510    | 2,000       | 43,000   | 20,000   | 9,000    | 3 | 1,510  |
| 1,520    | 2,000       | 43,000   | 20,000   | 9,000    | 3 | 1,520  |
| 1,530    | 2,000       | 43,000   | 20,000   | 9,000    | 3 | 1,530  |
| 1,970    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 1,970  |
| 1,980    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 1,980  |
| 1,990    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 1,990  |
| 2,000    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,000  |
| 2,010    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,010  |
| 2,020    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,020  |
| 2,030    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,030  |
| 2,470    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,470  |
| 2,480    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,480  |
| 2,490    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,490  |
| 2,500    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,500  |
| 2,510    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,510  |
| 2,520    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,520  |
| 2,530    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,530  |
| 2,970    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,970  |
| 2,980    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,980  |
| 2,990    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,990  |
| 3,000    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 3,000  |
| 3,010    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,010  |
| 3,020    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,020  |
| 3,030    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,030  |
| 3,970    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,970  |
| 3,980    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,980  |
| 3,990    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,990  |
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,000  |
| 4,010    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,010  |
| 4,020    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,020  |
| 4,030    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,030  |
| 4,970    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,970  |
| 4,980    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,980  |
| 4,990    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,990  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,000  |
| 5,010    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,010  |
| 5,020    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,020  |
| 5,030    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,030  |
| 5,970    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,970  |
| 5,980    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,980  |
| 5,990    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,990  |
| 6,000    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,010    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,010  |



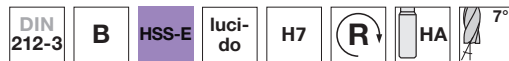
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 6,020    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,020  |
| 6,030    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,030  |
| 7,970    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,970  |
| 7,980    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,980  |
| 7,990    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,990  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,000  |
| 8,010    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,010  |
| 8,020    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,020  |
| 8,030    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,030  |
| 9,000    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,000  |
| 9,010    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,010  |
| 9,020    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,020  |
| 9,030    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,030  |
| 9,970    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,970  |
| 9,980    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,980  |
| 9,990    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,990  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,000 |
| 10,010   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,010 |
| 10,020   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,020 |
| 10,030   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,030 |
| 11,970   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 11,970 |
| 11,980   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 11,980 |
| 11,990   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 11,990 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,000 |
| 12,010   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,010 |
| 12,020   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,020 |
| 12,030   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,030 |

## Alesatori in acciaio HSS

### Alesatori a macchina NC



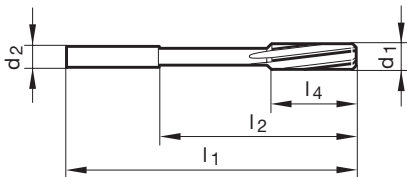
Catalogo n° 72910



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

Parametri di lav.  
ind. a pag. 692

- $\leq \varnothing 3,75$  mm con centrino su entrambi i lati
- $> \varnothing 3,75$  mm con fori di centraggio su entrambi i lati
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 1,500    | 2,000       | 40,000   | 18,000   | 8,000    | 3 | 1,500  |
| 1,600    | 2,000       | 43,000   | 20,000   | 9,000    | 3 | 1,600  |
| 1,700    | 2,000       | 43,000   | 20,000   | 9,000    | 3 | 1,700  |
| 1,800    | 2,000       | 46,000   | 22,000   | 10,000   | 4 | 1,800  |
| 1,900    | 2,000       | 46,000   | 22,000   | 10,000   | 4 | 1,900  |
| 2,000    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,000  |
| 2,100    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,100  |
| 2,200    | 3,000       | 53,000   | 25,000   | 12,000   | 4 | 2,200  |
| 2,300    | 3,000       | 53,000   | 25,000   | 12,000   | 4 | 2,300  |
| 2,400    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,400  |
| 2,500    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,500  |
| 2,600    | 3,000       | 57,000   | 29,000   | 14,000   | 4 | 2,600  |
| 2,700    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,700  |
| 2,800    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,800  |
| 2,900    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,900  |
| 3,000    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 3,000  |
| 3,100    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,100  |
| 3,200    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,200  |
| 3,300    | 4,000       | 65,000   | 37,000   | 16,000   | 6 | 3,300  |
| 3,400    | 4,000       | 70,000   | 42,000   | 18,000   | 6 | 3,400  |
| 3,500    | 4,000       | 70,000   | 42,000   | 18,000   | 6 | 3,500  |
| 3,600    | 4,000       | 70,000   | 42,000   | 18,000   | 6 | 3,600  |
| 3,700    | 4,000       | 70,000   | 42,000   | 18,000   | 6 | 3,700  |
| 3,800    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,800  |
| 3,900    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,900  |
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,000  |
| 4,100    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,100  |
| 4,200    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,200  |
| 4,300    | 5,000       | 80,000   | 52,000   | 21,000   | 6 | 4,300  |
| 4,400    | 5,000       | 80,000   | 52,000   | 21,000   | 6 | 4,400  |
| 4,500    | 5,000       | 80,000   | 52,000   | 21,000   | 6 | 4,500  |
| 4,600    | 5,000       | 80,000   | 52,000   | 21,000   | 6 | 4,600  |
| 4,700    | 5,000       | 80,000   | 52,000   | 21,000   | 6 | 4,700  |
| 4,800    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,800  |
| 4,900    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,900  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,000  |
| 5,100    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,100  |
| 5,200    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,200  |
| 5,300    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,300  |
| 5,400    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,400  |
| 5,500    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,500  |
| 5,600    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,600  |
| 5,700    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,700  |
| 5,800    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,800  |
| 5,900    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 5,900  |
| 6,000    | 6,000       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,100    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,100  |
| 6,200    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,200  |

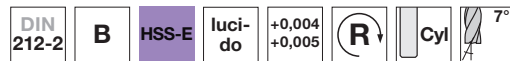
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 6,300    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,300  |
| 6,400    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,400  |
| 6,500    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,500  |
| 6,600    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,600  |
| 6,700    | 6,000       | 101,000  | 65,000   | 28,000   | 6 | 6,700  |
| 6,800    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 6,800  |
| 6,900    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 6,900  |
| 7,000    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,000  |
| 7,100    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,100  |
| 7,200    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,200  |
| 7,300    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,300  |
| 7,400    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,400  |
| 7,500    | 8,000       | 109,000  | 73,000   | 31,000   | 6 | 7,500  |
| 7,600    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,600  |
| 7,700    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,700  |
| 7,800    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,800  |
| 7,900    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,900  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,000  |
| 8,100    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,100  |
| 8,200    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,200  |
| 8,300    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,300  |
| 8,400    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,400  |
| 8,500    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,500  |
| 8,600    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 8,600  |
| 8,700    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 8,700  |
| 8,800    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 8,800  |
| 8,900    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 8,900  |
| 9,000    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,000  |
| 9,100    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,100  |
| 9,200    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,200  |
| 9,300    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,300  |
| 9,400    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,400  |
| 9,500    | 10,000      | 125,000  | 85,000   | 36,000   | 6 | 9,500  |
| 9,600    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,600  |
| 9,700    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,700  |
| 9,800    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,800  |
| 9,900    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,900  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 13,000 |
| 14,000   | 14,000      | 160,000  | 115,000  | 47,000   | 8 | 14,000 |
| 15,000   | 14,000      | 162,000  | 117,000  | 50,000   | 8 | 15,000 |
| 16,000   | 14,000      | 170,000  | 125,000  | 52,000   | 8 | 16,000 |
| 17,000   | 14,000      | 175,000  | 130,000  | 54,000   | 8 | 17,000 |
| 18,000   | 14,000      | 182,000  | 137,000  | 56,000   | 8 | 18,000 |
| 19,000   | 16,000      | 189,000  | 141,000  | 58,000   | 8 | 19,000 |
| 20,000   | 16,000      | 195,000  | 147,000  | 60,000   | 8 | 20,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina



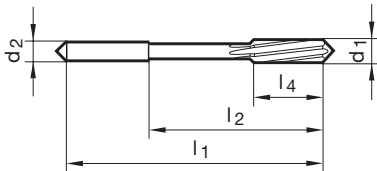
Catalogo n° 72654



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
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Parametri di lav. ind. a pag. 692

- per lavorazione in serie su macchine automatiche
- con imbocco corto,  $\leq \varnothing 3,75$  mm:  $15^\circ$ ,  $> \varnothing 3,75$  mm:  $45^\circ$
- $\varnothing$  in progressione di 0,01 mm
- $\leq \varnothing 3,75$  mm con centrino su entrambi i lati
- $> \varnothing 3,75$  mm con fori di centraggio su entrambi i lati
- tolleranza di costruzione:
  - $\varnothing 0,95 - 5,50$  mm:  $0,00/+0,004$
  - $\varnothing 5,51 - 12,05$  mm:  $0,00/+0,005$
- per resistenza a trazione fino ad un massimo di  $1000 \text{ N/mm}^2$



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 0,980    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 0,980  |
| 0,990    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 0,990  |
| 1,000    | 1,000       | 34,000   | 15,000   | 5,500    | 3 | 1,000  |
| 1,010    | 1,100       | 34,000   | 15,000   | 5,500    | 3 | 1,010  |
| 1,020    | 1,100       | 34,000   | 15,000   | 5,500    | 3 | 1,020  |
| 1,100    | 1,100       | 36,000   | 15,500   | 6,500    | 3 | 1,100  |
| 1,200    | 1,200       | 38,000   | 16,500   | 7,500    | 3 | 1,200  |
| 1,300    | 1,300       | 38,000   | 16,500   | 7,500    | 3 | 1,300  |
| 1,400    | 1,400       | 40,000   | 18,000   | 8,000    | 3 | 1,400  |
| 1,480    | 1,500       | 40,000   | 18,000   | 8,000    | 3 | 1,480  |
| 1,490    | 1,500       | 40,000   | 18,000   | 8,000    | 3 | 1,490  |
| 1,500    | 1,500       | 40,000   | 18,000   | 8,000    | 3 | 1,500  |
| 1,510    | 1,600       | 43,000   | 20,000   | 9,000    | 3 | 1,510  |
| 1,520    | 1,600       | 43,000   | 20,000   | 9,000    | 3 | 1,520  |
| 1,600    | 1,600       | 43,000   | 20,000   | 9,000    | 3 | 1,600  |
| 1,700    | 1,700       | 43,000   | 20,000   | 9,000    | 3 | 1,700  |
| 1,800    | 1,800       | 46,000   | 22,000   | 10,000   | 4 | 1,800  |
| 1,980    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 1,980  |
| 1,990    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 1,990  |
| 2,000    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,000  |
| 2,010    | 2,100       | 49,000   | 24,000   | 11,000   | 4 | 2,010  |
| 2,030    | 2,100       | 49,000   | 24,000   | 11,000   | 4 | 2,030  |
| 2,100    | 2,000       | 49,000   | 24,000   | 11,000   | 4 | 2,100  |
| 2,200    | 2,200       | 53,000   | 25,000   | 12,000   | 4 | 2,200  |
| 2,300    | 2,300       | 53,000   | 25,000   | 12,000   | 4 | 2,300  |
| 2,400    | 2,500       | 57,000   | 29,000   | 14,000   | 4 | 2,400  |
| 2,500    | 2,500       | 57,000   | 29,000   | 14,000   | 4 | 2,500  |
| 2,600    | 2,500       | 57,000   | 29,000   | 14,000   | 4 | 2,600  |
| 2,700    | 2,800       | 61,000   | 33,000   | 15,000   | 6 | 2,700  |
| 2,750    | 2,800       | 61,000   | 33,000   | 15,000   | 6 | 2,750  |
| 2,800    | 2,800       | 61,000   | 33,000   | 15,000   | 6 | 2,800  |
| 2,900    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,900  |
| 2,980    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,980  |
| 2,990    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 2,990  |
| 3,000    | 3,000       | 61,000   | 33,000   | 15,000   | 6 | 3,000  |
| 3,010    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,010  |
| 3,020    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,020  |
| 3,050    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,050  |
| 3,100    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,100  |
| 3,200    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,200  |
| 3,250    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,250  |
| 3,300    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,300  |
| 3,400    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,400  |
| 3,500    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,500  |
| 3,600    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,600  |
| 3,700    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,700  |
| 3,800    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,800  |
| 3,900    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,900  |

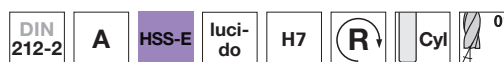
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 3,970    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,970  |
| 3,980    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,980  |
| 3,990    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 3,990  |
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,000  |
| 4,010    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,010  |
| 4,020    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,020  |
| 4,030    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,030  |
| 4,040    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,040  |
| 4,100    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,100  |
| 4,200    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,200  |
| 4,500    | 4,500       | 80,000   | 52,000   | 21,000   | 6 | 4,500  |
| 4,800    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,800  |
| 4,980    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,980  |
| 4,990    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 4,990  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,000  |
| 5,010    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,010  |
| 5,020    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,020  |
| 5,030    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,030  |
| 5,100    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,100  |
| 5,200    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,200  |
| 5,500    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 5,500  |
| 5,800    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 5,800  |
| 5,980    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 5,980  |
| 5,990    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 5,990  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,010    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,010  |
| 6,020    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,020  |
| 6,100    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,100  |
| 6,200    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,200  |
| 6,350    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,350  |
| 6,500    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,500  |
| 7,000    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,000  |
| 7,010    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,010  |
| 7,020    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,020  |
| 7,100    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,100  |
| 7,500    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,500  |
| 7,980    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 7,980  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,000  |
| 8,010    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,010  |
| 8,020    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,020  |
| 8,030    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,030  |
| 8,050    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,050  |
| 8,100    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,100  |
| 8,200    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,200  |
| 8,500    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,500  |
| 8,900    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 8,900  |
| 9,000    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,000  |
| 9,010    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,010  |
| 9,020    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,020  |
| 9,500    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,500  |
| 9,980    | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 9,980  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,000 |
| 10,010   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,010 |
| 10,020   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,020 |
| 10,030   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,030 |
| 10,500   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,500 |
| 11,000   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,000 |
| 11,010   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,010 |
| 11,020   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,020 |
| 11,500   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,500 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina



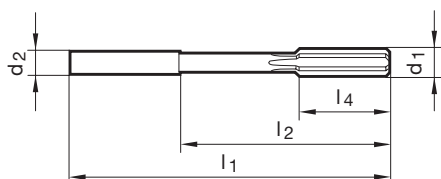
Catalogo n° 72640



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 692

- $\leq \varnothing 3,75$  mm con centrino su entrambi i lati
- $> \varnothing 3,75$  mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>



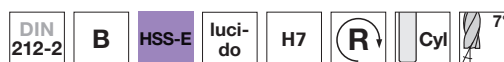
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 2,200    | 2,200       | 53,000   | 25,000   | 12,000   | 4 | 2,200  |
| 2,800    | 2,800       | 61,000   | 33,000   | 15,000   | 6 | 2,800  |
| 3,200    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,200  |
| 3,500    | 3,500       | 70,000   | 42,000   | 18,000   | 6 | 3,500  |
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,000  |
| 4,500    | 4,500       | 80,000   | 52,000   | 21,000   | 6 | 4,500  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,000  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 7,000    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 13,000 |
| 14,000   | 12,500      | 160,000  | 115,000  | 47,000   | 6 | 14,000 |
| 15,000   | 12,500      | 162,000  | 117,000  | 50,000   | 6 | 15,000 |
| 16,000   | 12,500      | 170,000  | 125,000  | 52,000   | 6 | 16,000 |
| 17,000   | 14,000      | 175,000  | 130,000  | 54,000   | 6 | 17,000 |
| 19,000   | 16,000      | 189,000  | 141,000  | 58,000   | 6 | 19,000 |
| 20,000   | 16,000      | 195,000  | 147,000  | 60,000   | 6 | 20,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina



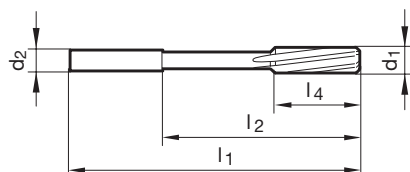
Catalogo n° 72650



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 692

- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>
- solo per fori passanti



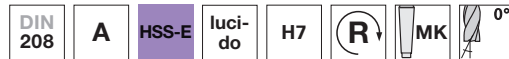
| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 2,200    | 2,200       | 53,000   | 25,000   | 12,000   | 6 | 2,200  |
| 2,800    | 2,800       | 61,000   | 33,000   | 15,000   | 6 | 2,800  |
| 3,200    | 3,200       | 65,000   | 37,000   | 16,000   | 6 | 3,200  |
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 6 | 4,000  |
| 4,500    | 4,500       | 80,000   | 52,000   | 21,000   | 6 | 4,500  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 6 | 5,000  |
| 5,500    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 5,500  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 6 | 6,000  |
| 6,500    | 6,300       | 101,000  | 65,000   | 28,000   | 6 | 6,500  |
| 7,000    | 7,100       | 109,000  | 73,000   | 31,000   | 6 | 7,000  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 6 | 8,000  |
| 9,000    | 9,000       | 125,000  | 85,000   | 36,000   | 6 | 9,000  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 6 | 10,000 |
| 11,000   | 10,000      | 142,000  | 102,000  | 41,000   | 6 | 11,000 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 12,000 |
| 13,000   | 10,000      | 151,000  | 111,000  | 44,000   | 6 | 13,000 |
| 14,000   | 12,500      | 160,000  | 115,000  | 47,000   | 6 | 14,000 |
| 15,000   | 12,500      | 162,000  | 117,000  | 50,000   | 6 | 15,000 |
| 16,000   | 12,500      | 170,000  | 125,000  | 52,000   | 6 | 16,000 |
| 17,000   | 14,000      | 175,000  | 130,000  | 54,000   | 6 | 17,000 |
| 18,000   | 14,000      | 182,000  | 137,000  | 56,000   | 6 | 18,000 |
| 20,000   | 16,000      | 195,000  | 147,000  | 60,000   | 6 | 20,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina



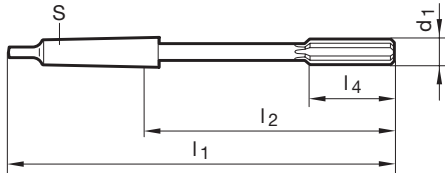
Catalogo n° 72660



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

Parametri di lav. ind. a pag. 692

- Ø 3,00 mm lato tagliente con centrino, codolo con foro di centraggio
- ≤ Ø 4,00 mm a norma di fab.
- > Ø 3,00 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>



| d1<br>mm | S    | l1<br>mm | l2<br>mm | l4<br>mm | Z  | Codice |
|----------|------|----------|----------|----------|----|--------|
| 8,000    | MK-1 | 156,000  | 94,000   | 33,000   | 6  | 8,000  |
| 9,000    | MK-1 | 162,000  | 100,000  | 36,000   | 6  | 9,000  |
| 10,000   | MK-1 | 168,000  | 106,000  | 38,000   | 6  | 10,000 |
| 11,000   | MK-1 | 175,000  | 113,000  | 41,000   | 6  | 11,000 |
| 12,000   | MK-1 | 182,000  | 120,000  | 44,000   | 6  | 12,000 |
| 13,000   | MK-1 | 182,000  | 120,000  | 44,000   | 6  | 13,000 |
| 14,000   | MK-1 | 189,000  | 127,000  | 47,000   | 8  | 14,000 |
| 15,000   | MK-2 | 204,000  | 129,000  | 50,000   | 8  | 15,000 |
| 16,000   | MK-2 | 210,000  | 135,000  | 52,000   | 8  | 16,000 |
| 17,000   | MK-2 | 214,000  | 139,000  | 54,000   | 8  | 17,000 |
| 18,000   | MK-2 | 219,000  | 144,000  | 56,000   | 8  | 18,000 |
| 19,000   | MK-2 | 223,000  | 148,000  | 58,000   | 8  | 19,000 |
| 20,000   | MK-2 | 228,000  | 153,000  | 60,000   | 8  | 20,000 |
| 21,000   | MK-2 | 232,000  | 157,000  | 62,000   | 8  | 21,000 |
| 22,000   | MK-2 | 237,000  | 162,000  | 64,000   | 8  | 22,000 |
| 23,000   | MK-2 | 241,000  | 166,000  | 66,000   | 8  | 23,000 |
| 24,000   | MK-3 | 268,000  | 174,000  | 68,000   | 8  | 24,000 |
| 25,000   | MK-3 | 268,000  | 174,000  | 68,000   | 8  | 25,000 |
| 26,000   | MK-3 | 273,000  | 179,000  | 70,000   | 8  | 26,000 |
| 28,000   | MK-3 | 277,000  | 183,000  | 71,000   | 10 | 28,000 |
| 30,000   | MK-3 | 281,000  | 187,000  | 73,000   | 10 | 30,000 |
| 35,000   | MK-4 | 321,000  | 203,500  | 78,000   | 10 | 35,000 |

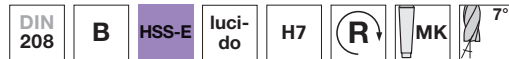


## Alesatori in acciaio HSS

### Alesatori a macchina



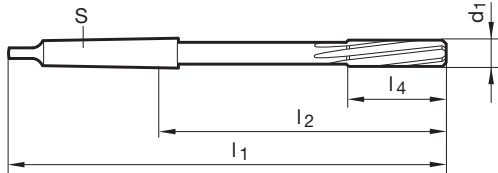
Catalogo n° 72670



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

Parametri di lav.  
ind. a pag. 692

- ≤ Ø 4,00 mm a norma di fab.
- > Ø 3,00 mm con fori di centraggio su entrambi i lati
- Ø 3,00 mm lato tagliente con centrino, codolo con foro di centraggio
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>
- solo per fori passanti



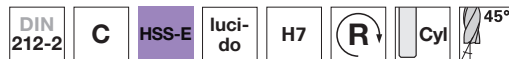
| d1<br>mm | S    | l1<br>mm | l2<br>mm | l4<br>mm | Z  | Codice |
|----------|------|----------|----------|----------|----|--------|
| 5,000    | MK-1 | 133,000  | 71,000   | 23,000   | 6  | 5,000  |
| 6,000    | MK-1 | 138,000  | 76,000   | 26,000   | 6  | 6,000  |
| 7,000    | MK-1 | 150,000  | 88,000   | 31,000   | 6  | 7,000  |
| 8,000    | MK-1 | 156,000  | 94,000   | 33,000   | 6  | 8,000  |
| 9,000    | MK-1 | 162,000  | 100,000  | 36,000   | 6  | 9,000  |
| 10,000   | MK-1 | 168,000  | 106,000  | 38,000   | 6  | 10,000 |
| 11,000   | MK-1 | 175,000  | 113,000  | 41,000   | 6  | 11,000 |
| 12,000   | MK-1 | 182,000  | 120,000  | 44,000   | 6  | 12,000 |
| 13,000   | MK-1 | 182,000  | 120,000  | 44,000   | 6  | 13,000 |
| 14,000   | MK-1 | 189,000  | 127,000  | 47,000   | 8  | 14,000 |
| 15,000   | MK-2 | 204,000  | 129,000  | 50,000   | 8  | 15,000 |
| 16,000   | MK-2 | 210,000  | 135,000  | 52,000   | 8  | 16,000 |
| 17,000   | MK-2 | 214,000  | 139,000  | 54,000   | 8  | 17,000 |
| 18,000   | MK-2 | 219,000  | 144,000  | 56,000   | 8  | 18,000 |
| 19,000   | MK-2 | 223,000  | 148,000  | 58,000   | 8  | 19,000 |
| 20,000   | MK-2 | 228,000  | 153,000  | 60,000   | 8  | 20,000 |
| 21,000   | MK-2 | 232,000  | 157,000  | 62,000   | 8  | 21,000 |
| 22,000   | MK-2 | 237,000  | 162,000  | 64,000   | 8  | 22,000 |
| 23,000   | MK-2 | 241,000  | 166,000  | 66,000   | 8  | 23,000 |
| 24,000   | MK-3 | 268,000  | 174,000  | 68,000   | 8  | 24,000 |
| 25,000   | MK-3 | 268,000  | 174,000  | 68,000   | 8  | 25,000 |
| 26,000   | MK-3 | 273,000  | 179,000  | 70,000   | 8  | 26,000 |
| 27,000   | MK-3 | 277,000  | 183,000  | 71,000   | 10 | 27,000 |
| 28,000   | MK-3 | 277,000  | 183,000  | 71,000   | 10 | 28,000 |
| 29,000   | MK-3 | 281,000  | 187,000  | 73,000   | 10 | 29,000 |
| 30,000   | MK-3 | 281,000  | 187,000  | 73,000   | 10 | 30,000 |
| 31,000   | MK-3 | 285,000  | 191,000  | 75,000   | 10 | 31,000 |
| 32,000   | MK-4 | 317,000  | 199,500  | 77,000   | 10 | 32,000 |
| 33,000   | MK-4 | 317,000  | 199,500  | 77,000   | 10 | 33,000 |
| 34,000   | MK-4 | 321,000  | 203,500  | 78,000   | 10 | 34,000 |
| 35,000   | MK-4 | 321,000  | 203,500  | 78,000   | 10 | 35,000 |
| 38,000   | MK-4 | 329,000  | 211,500  | 81,000   | 10 | 38,000 |
| 40,000   | MK-4 | 329,000  | 211,500  | 81,000   | 10 | 40,000 |
| 44,000   | MK-4 | 336,000  | 218,500  | 83,000   | 12 | 44,000 |
| 45,000   | MK-4 | 336,000  | 218,500  | 83,000   | 12 | 45,000 |
| 50,000   | MK-4 | 344,000  | 226,500  | 86,000   | 12 | 50,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina a forte torsione

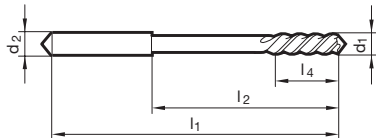


Catalogo n° 72690



Parametri di lav.  
ind. a pag. 692

- con imbocco conico, circa 1/6 della lunghezza del tagliente
- la particolare geometria dell'utensile richiede un aumento del sovrametallo dell'alesatura del foro del 50 fino al 100%
- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- l'avanzamento dovrebbe essere scelto al 50% maggiore come per tutti gli altri alesatori
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>



| d1<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|---|--------|
| 4,000    | 4,000       | 75,000   | 47,000   | 19,000   | 3 | 4,000  |
| 4,500    | 4,500       | 80,000   | 52,000   | 21,000   | 3 | 4,500  |
| 5,000    | 5,000       | 86,000   | 58,000   | 23,000   | 3 | 5,000  |
| 5,500    | 5,600       | 93,000   | 57,000   | 26,000   | 3 | 5,500  |
| 6,000    | 5,600       | 93,000   | 57,000   | 26,000   | 3 | 6,000  |
| 7,000    | 7,100       | 109,000  | 73,000   | 31,000   | 3 | 7,000  |
| 8,000    | 8,000       | 117,000  | 81,000   | 33,000   | 3 | 8,000  |
| 9,000    | 9,000       | 125,000  | 85,000   | 36,000   | 3 | 9,000  |
| 10,000   | 10,000      | 133,000  | 93,000   | 38,000   | 3 | 10,000 |
| 12,000   | 10,000      | 151,000  | 111,000  | 44,000   | 3 | 12,000 |
| 13,000   | 10,000      | 151,000  | 111,000  | 44,000   | 3 | 13,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina per chiodi

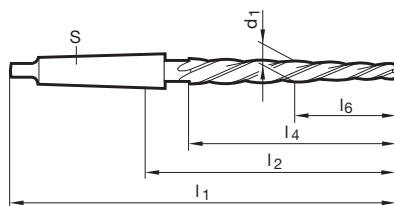


Catalogo n° 72680



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● |   |   |

Parametri di lav.  
ind. a pag. 692



- con imbocco lungo, conico 1:10
- corregge la scentratura del foro delle parti di lamiera ordinate in modo sovrapposto al diametro di foratura desiderato (per esempio per chiodare o collegare a vite)
- tolleranza di costruzione k11
- con fori di centraggio su entrambi i lati
- Area di utilizzo principale:
  - carpenteria metallica, caldaie e container, costruzione navale
  - utensili con alta capacità di truciolatura
  - anche per macchine foratrici a mano lente
  - per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>

| d1<br>mm | S    | l1<br>mm | l2<br>mm | l4<br>mm | l6<br>mm | Z | Codice |
|----------|------|----------|----------|----------|----------|---|--------|
| 9,500    | MK-1 | 166,000  | 104,000  | 90,000   | 27,000   | 4 | 9,500  |
| 10,000   | MK-1 | 171,000  | 109,000  | 95,000   | 30,000   | 4 | 10,000 |
| 12,000   | MK-2 | 199,000  | 124,000  | 105,000  | 39,000   | 4 | 12,000 |
| 13,000   | MK-2 | 199,000  | 124,000  | 105,000  | 39,000   | 4 | 13,000 |
| 15,000   | MK-2 | 219,000  | 144,000  | 125,000  | 45,000   | 5 | 15,000 |
| 17,000   | MK-3 | 251,000  | 157,000  | 135,000  | 51,000   | 5 | 17,000 |
| 19,000   | MK-3 | 261,000  | 167,000  | 145,000  | 58,000   | 5 | 19,000 |
| 20,000   | MK-3 | 271,000  | 177,000  | 155,000  | 62,000   | 5 | 20,000 |
| 21,000   | MK-3 | 271,000  | 177,000  | 155,000  | 62,000   | 5 | 21,000 |
| 23,000   | MK-3 | 281,000  | 187,000  | 165,000  | 66,000   | 5 | 23,000 |
| 25,000   | MK-3 | 296,000  | 202,000  | 180,000  | 72,000   | 5 | 25,000 |
| 36,000   | MK-4 | 364,000  | 246,500  | 220,000  | 88,000   | 5 | 36,000 |
| 37,000   | MK-4 | 364,000  | 246,500  | 220,000  | 88,000   | 5 | 37,000 |

## Alesatori in acciaio HSS

### Alesatori a macchina per spine coniche

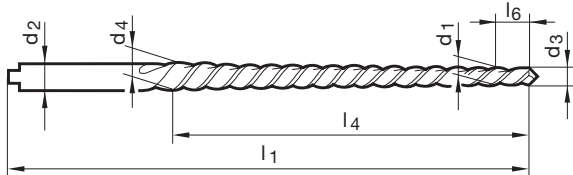


Catalogo n° 72741



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

Parametri di lav.  
ind. a pag. 692



- per lavorazione singola e riparazioni
- conicità 1:50 per l'alesatura di fori per spine coniche a DIN 1, 258, 7977 e 7978
- > Ø 4,00 mm con fori di centraggio su entrambi i lati
- ≤ Ø 4,00 mm con centrino su entrambi i lati
- preforatura: cilindrica
- con dente di trascinamento secondo DIN 1809
- per resistenza a trazione fino ad un massimo di 1000 N/mm<sup>2</sup>

| d1<br>mm | d2<br>mm | d3<br>mm | d4<br>mm | l1<br>mm | l4<br>mm | l6<br>mm | Z | Codice |
|----------|----------|----------|----------|----------|----------|----------|---|--------|
| 2,000    | 3,150    | 1,900    | 2,860    | 86,000   | 48,000   | 5,000    | 3 | 2,000  |
| 2,500    | 3,150    | 2,400    | 3,360    | 86,000   | 48,000   | 5,000    | 3 | 2,500  |
| 3,000    | 4,000    | 2,900    | 4,060    | 100,000  | 58,000   | 5,000    | 3 | 3,000  |
| 4,000    | 5,000    | 3,900    | 5,260    | 112,000  | 68,000   | 5,000    | 3 | 4,000  |
| 5,000    | 6,300    | 4,900    | 6,360    | 122,000  | 73,000   | 5,000    | 3 | 5,000  |
| 6,000    | 8,000    | 5,900    | 8,000    | 160,000  | 105,000  | 5,000    | 3 | 6,000  |
| 6,500    | 8,500    | 6,400    | 8,780    | 188,000  | 119,000  | 5,000    | 3 | 6,500  |
| 8,000    | 10,000   | 7,900    | 10,800   | 207,000  | 145,000  | 5,000    | 3 | 8,000  |
| 10,000   | 12,500   | 9,900    | 13,400   | 245,000  | 175,000  | 5,000    | 3 | 10,000 |
| 12,000   | 16,000   | 11,860   | 16,000   | 290,000  | 210,000  | 7,000    | 3 | 12,000 |

## Alesatori in acciaio HSS

### Alesatori a mano cilindrici, per spine coniche

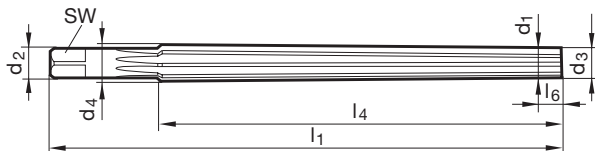


Catalogo n° 72730



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |

- per lavorazione singola e riparazioni
- conicità 1:50 per l'alesatura di fori per spine coniche
- quadro a DIN 10
- Ø 3,50; 4,50; 5,50; 6,50; 7,00; 9,00; 13,00 e 14,00 mm a norma di fabbrica
- preforatura: cilindrica
- per resistenza a trazione fino ad un massimo di 900 N/mm<sup>2</sup>



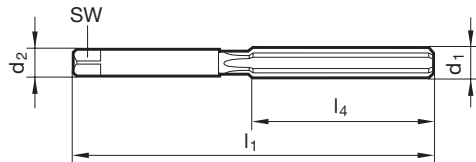
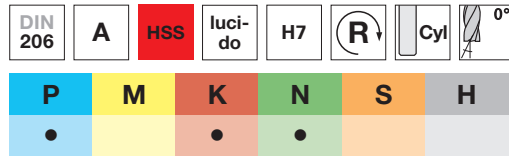
| d1<br>mm | d2<br>mm | d3<br>mm | d4<br>mm | l1<br>mm | l4<br>mm | l6<br>mm | SW<br>mm | Z | Codice |
|----------|----------|----------|----------|----------|----------|----------|----------|---|--------|
| 1,000    | 3,150    | 0,900    | 1,460    | 46,000   | 28,000   | 5,000    | 2,400    | 3 | 1,000  |
| 1,200    | 3,150    | 1,100    | 1,740    | 50,000   | 32,000   | 5,000    | 2,400    | 3 | 1,200  |
| 2,000    | 3,150    | 1,900    | 2,860    | 68,000   | 48,000   | 5,000    | 2,400    | 3 | 2,000  |
| 3,000    | 4,000    | 2,900    | 4,060    | 80,000   | 58,000   | 5,000    | 3,000    | 5 | 3,000  |
| 4,000    | 5,000    | 3,900    | 5,260    | 93,000   | 68,000   | 5,000    | 3,800    | 5 | 4,000  |
| 5,000    | 6,300    | 4,900    | 6,360    | 100,000  | 73,000   | 5,000    | 4,900    | 5 | 5,000  |
| 6,000    | 8,000    | 5,900    | 8,000    | 135,000  | 105,000  | 5,000    | 6,200    | 6 | 6,000  |
| 8,000    | 10,000   | 7,900    | 10,800   | 180,000  | 145,000  | 5,000    | 8,000    | 6 | 8,000  |
| 10,000   | 12,500   | 9,900    | 13,400   | 215,000  | 175,000  | 5,000    | 10,000   | 6 | 10,000 |
| 12,000   | 14,000   | 11,800   | 16,000   | 255,000  | 210,000  | 10,000   | 11,000   | 8 | 12,000 |
| 16,000   | 18,000   | 15,800   | 20,400   | 280,000  | 230,000  | 10,000   | 14,500   | 8 | 16,000 |

## Alesatori in acciaio HSS

### Alesatori a mano



Catalogo n° 72600



- per lavorazione singola e riparazioni
- con imbocco lungo, conico, circa 1/3 della lunghezza del tagliente
- non è adatto per fori ciechi a causa delle lunghezze di taglio
- quadro a DIN 10
- $\leq \varnothing 3,75$  mm con centrino su entrambi i lati
- $> \varnothing 3,75$  mm con fori di centraggio su entrambi i lati
- $\leq 1,75$  mm a norma di fab
- per resistenza a trazione fino ad un massimo di 900 N/mm<sup>2</sup>

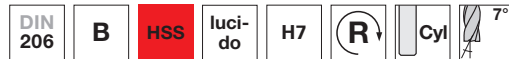
| d1<br>mm | d2<br>mm | l1<br>mm | l4<br>mm | SW<br>mm | Z  | Codice |
|----------|----------|----------|----------|----------|----|--------|
| 2,500    | 2,500    | 58,000   | 29,000   | 2,100    | 4  | 2,500  |
| 3,000    | 3,000    | 62,000   | 31,000   | 2,400    | 6  | 3,000  |
| 4,000    | 4,000    | 76,000   | 38,000   | 3,000    | 6  | 4,000  |
| 4,500    | 4,500    | 81,000   | 41,000   | 3,400    | 6  | 4,500  |
| 5,000    | 5,000    | 87,000   | 44,000   | 3,800    | 6  | 5,000  |
| 5,500    | 5,500    | 93,000   | 47,000   | 4,300    | 6  | 5,500  |
| 6,000    | 6,000    | 93,000   | 47,000   | 4,900    | 6  | 6,000  |
| 8,000    | 8,000    | 115,000  | 58,000   | 6,200    | 6  | 8,000  |
| 9,000    | 9,000    | 124,000  | 62,000   | 7,000    | 6  | 9,000  |
| 10,000   | 10,000   | 133,000  | 66,000   | 8,000    | 6  | 10,000 |
| 11,000   | 11,000   | 142,000  | 71,000   | 9,000    | 6  | 11,000 |
| 12,000   | 12,000   | 152,000  | 76,000   | 9,000    | 6  | 12,000 |
| 13,000   | 13,000   | 152,000  | 76,000   | 10,000   | 6  | 13,000 |
| 14,000   | 14,000   | 163,000  | 81,000   | 11,000   | 8  | 14,000 |
| 15,000   | 15,000   | 163,000  | 81,000   | 12,000   | 8  | 15,000 |
| 16,000   | 16,000   | 175,000  | 87,000   | 12,000   | 8  | 16,000 |
| 17,000   | 17,000   | 175,000  | 87,000   | 13,000   | 8  | 17,000 |
| 18,000   | 18,000   | 188,000  | 93,000   | 14,500   | 8  | 18,000 |
| 19,000   | 19,000   | 188,000  | 93,000   | 14,500   | 8  | 19,000 |
| 20,000   | 20,000   | 201,000  | 100,000  | 16,000   | 8  | 20,000 |
| 25,000   | 25,000   | 231,000  | 115,000  | 20,000   | 8  | 25,000 |
| 28,000   | 28,000   | 247,000  | 124,000  | 22,000   | 10 | 28,000 |
| 32,000   | 32,000   | 265,000  | 133,000  | 24,000   | 10 | 32,000 |
| 34,000   | 34,000   | 284,000  | 142,000  | 26,000   | 10 | 34,000 |

## Alesatori in acciaio HSS

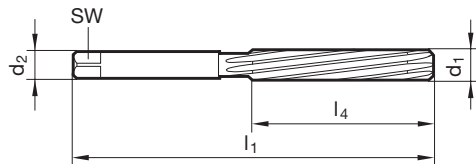
### Alesatori a mano



Catalogo n° 72610



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • |   | • | • |   |   |



- per lavorazione singola e riparazioni
- con imbocco lungo, conico, circa 1/3 della lunghezza del tagliente
- per fori con taglio interrotto, per esempio pezzi divisi, interruzioni di parete, fori trasversali e simili
- quadro a DIN 10
- $\leq \varnothing 3,75$  mm con centrino su entrambi i lati
- $> \varnothing 3,75$  mm con fori di centraggio su entrambi i lati
- $\leq 1,75$  mm a norma di fab
- per resistenza a trazione fino ad un massimo di 900 N/mm<sup>2</sup>

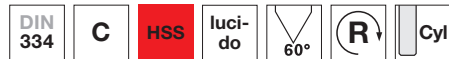
| d1<br>mm | d2<br>mm | l1<br>mm | l4<br>mm | SW<br>mm | Z  | Codice |
|----------|----------|----------|----------|----------|----|--------|
| 2,000    | 2,000    | 50,000   | 25,000   | 1,600    | 4  | 2,000  |
| 2,800    | 2,800    | 62,000   | 31,000   | 2,100    | 6  | 2,800  |
| 3,000    | 3,000    | 62,000   | 31,000   | 2,400    | 6  | 3,000  |
| 4,000    | 4,000    | 76,000   | 38,000   | 3,000    | 6  | 4,000  |
| 4,500    | 4,500    | 81,000   | 41,000   | 3,400    | 6  | 4,500  |
| 5,000    | 5,000    | 87,000   | 44,000   | 3,800    | 6  | 5,000  |
| 6,000    | 6,000    | 93,000   | 47,000   | 4,900    | 6  | 6,000  |
| 7,000    | 7,000    | 107,000  | 54,000   | 5,500    | 6  | 7,000  |
| 8,000    | 8,000    | 115,000  | 58,000   | 6,200    | 6  | 8,000  |
| 9,000    | 9,000    | 124,000  | 62,000   | 7,000    | 6  | 9,000  |
| 10,000   | 10,000   | 133,000  | 66,000   | 8,000    | 6  | 10,000 |
| 12,000   | 12,000   | 152,000  | 76,000   | 9,000    | 6  | 12,000 |
| 13,000   | 13,000   | 152,000  | 76,000   | 10,000   | 6  | 13,000 |
| 14,000   | 14,000   | 163,000  | 81,000   | 11,000   | 8  | 14,000 |
| 15,000   | 15,000   | 163,000  | 81,000   | 12,000   | 8  | 15,000 |
| 16,000   | 16,000   | 175,000  | 87,000   | 12,000   | 8  | 16,000 |
| 18,000   | 18,000   | 188,000  | 93,000   | 14,500   | 8  | 18,000 |
| 19,000   | 19,000   | 188,000  | 93,000   | 14,500   | 8  | 19,000 |
| 20,000   | 20,000   | 201,000  | 100,000  | 16,000   | 8  | 20,000 |
| 22,000   | 22,000   | 215,000  | 107,000  | 18,000   | 8  | 22,000 |
| 24,000   | 24,000   | 231,000  | 115,000  | 18,000   | 8  | 24,000 |
| 25,000   | 25,000   | 231,000  | 115,000  | 20,000   | 8  | 25,000 |
| 28,000   | 28,000   | 247,000  | 124,000  | 22,000   | 10 | 28,000 |
| 30,000   | 30,000   | 247,000  | 124,000  | 24,000   | 10 | 30,000 |
| 32,000   | 32,000   | 265,000  | 133,000  | 24,000   | 10 | 32,000 |
| 34,000   | 34,000   | 284,000  | 142,000  | 26,000   | 10 | 34,000 |
| 35,000   | 35,000   | 284,000  | 142,000  | 29,000   | 10 | 35,000 |

## Svasatori en HSS

### Svasatori 60°

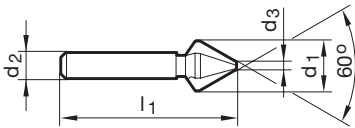


Catalogo n° 72326



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | ○ | • | • | • |   |

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | Z | Codice |
|----------|----------|----------|----------|---|--------|
| 6,300    | 5,000    | 1,600    | 45,000   | 3 | 6,300  |
| 8,000    | 6,000    | 2,000    | 50,000   | 3 | 8,000  |
| 12,500   | 8,000    | 3,200    | 56,000   | 3 | 12,500 |
| 16,000   | 10,000   | 4,000    | 63,000   | 3 | 16,000 |
| 20,000   | 10,000   | 5,000    | 67,000   | 3 | 20,000 |
| 25,000   | 10,000   | 6,300    | 71,000   | 3 | 25,000 |



## Svasatori en HSS

### Svasatori 60°

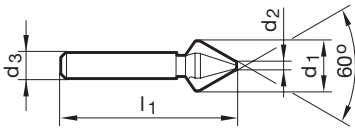


Catalogo n° 62327



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | ○ |   |

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



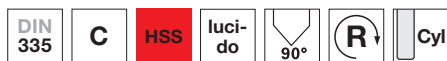
| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | Z | Codice |
|----------|----------|----------|----------|---|--------|
| 6,300    | 5,000    | 1,600    | 45,000   | 3 | 6,300  |
| 8,000    | 6,000    | 2,000    | 50,000   | 3 | 8,000  |
| 12,500   | 8,000    | 3,200    | 56,000   | 3 | 12,500 |
| 25,000   | 10,000   | 6,300    | 71,000   | 3 | 25,000 |

## Svasatori en HSS

### Svasatori 90°

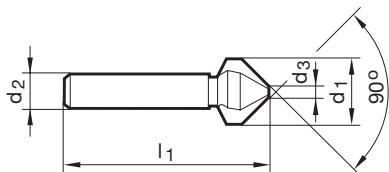


Catalogo n° 72346



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ● |   |

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | Z | Codice |
|----------|----------|----------|----------|---|--------|
| 4,300    | 4,000    | 1,300    | 40,000   | 3 | 4,300  |
| 5,000    | 4,000    | 1,500    | 40,000   | 3 | 5,000  |
| 5,300    | 4,000    | 1,500    | 40,000   | 3 | 5,300  |
| 5,800    | 5,000    | 1,500    | 45,000   | 3 | 5,800  |
| 6,000    | 5,000    | 1,500    | 45,000   | 3 | 6,000  |
| 6,300    | 5,000    | 1,500    | 45,000   | 3 | 6,300  |
| 7,000    | 6,000    | 1,800    | 50,000   | 3 | 7,000  |
| 7,300    | 6,000    | 1,800    | 50,000   | 3 | 7,300  |
| 8,000    | 6,000    | 2,000    | 50,000   | 3 | 8,000  |
| 8,300    | 6,000    | 2,000    | 50,000   | 3 | 8,300  |
| 9,400    | 6,000    | 2,200    | 50,000   | 3 | 9,400  |
| 10,000   | 6,000    | 2,500    | 50,000   | 3 | 10,000 |
| 10,400   | 6,000    | 2,500    | 50,000   | 3 | 10,400 |
| 11,500   | 8,000    | 2,800    | 56,000   | 3 | 11,500 |
| 12,400   | 8,000    | 2,800    | 56,000   | 3 | 12,400 |
| 13,400   | 8,000    | 2,900    | 56,000   | 3 | 13,400 |
| 15,000   | 10,000   | 3,200    | 60,000   | 3 | 15,000 |
| 16,500   | 10,000   | 3,200    | 60,000   | 3 | 16,500 |
| 19,000   | 10,000   | 3,500    | 63,000   | 3 | 19,000 |
| 20,500   | 10,000   | 3,500    | 63,000   | 3 | 20,500 |
| 23,000   | 10,000   | 3,800    | 67,000   | 3 | 23,000 |
| 25,000   | 10,000   | 3,800    | 67,000   | 3 | 25,000 |
| 26,000   | 10,000   | 3,800    | 67,000   | 3 | 26,000 |
| 28,000   | 12,000   | 4,000    | 71,000   | 3 | 28,000 |
| 30,000   | 12,000   | 4,200    | 71,000   | 3 | 30,000 |
| 31,000   | 12,000   | 4,200    | 71,000   | 3 | 31,000 |

## Svasatori en HSS

### Svasatori 90°

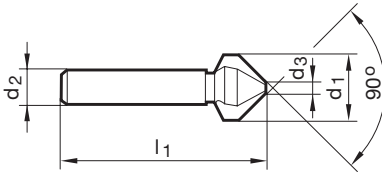


Catalogo n° 62347



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ● |   |

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



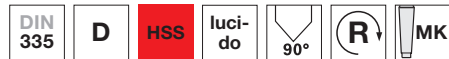
| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | Z | Codice |
|----------|----------|----------|----------|---|--------|
| 4,300    | 4,000    |          | 40,000   | 3 | 4,300  |
| 5,000    | 4,000    | 1,500    | 40,000   | 3 | 5,000  |
| 6,300    | 5,000    | 1,500    | 45,000   | 3 | 6,300  |
| 7,300    | 6,000    | 1,800    | 50,000   | 3 | 7,300  |
| 8,000    | 6,000    | 2,000    | 50,000   | 3 | 8,000  |
| 8,300    | 6,000    | 2,000    | 50,000   | 3 | 8,300  |
| 9,400    | 6,000    | 2,200    | 50,000   | 3 | 9,400  |
| 10,000   | 6,000    | 2,500    | 50,000   | 3 | 10,000 |
| 10,400   | 6,000    | 2,500    | 50,000   | 3 | 10,400 |
| 11,500   | 8,000    | 2,800    | 56,000   | 3 | 11,500 |
| 12,400   | 8,000    | 2,800    | 56,000   | 3 | 12,400 |
| 15,000   | 10,000   | 3,200    | 60,000   | 3 | 15,000 |
| 16,500   | 10,000   | 3,200    | 60,000   | 3 | 16,500 |
| 19,000   | 10,000   | 3,500    | 63,000   | 3 | 19,000 |
| 20,500   | 10,000   | 3,500    | 63,000   | 3 | 20,500 |
| 25,000   | 10,000   | 3,800    | 67,000   | 3 | 25,000 |
| 30,000   | 12,000   | 4,200    | 71,000   | 3 | 30,000 |
| 31,000   | 12,000   | 4,200    | 71,000   | 3 | 31,000 |

## Svasatori en HSS

### Svasatori 90°

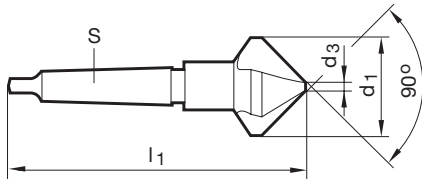


Catalogo n° 72356



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ● |   |

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



| d1<br>mm | S    | d3<br>mm | l1<br>mm | Z | Codice |
|----------|------|----------|----------|---|--------|
| 15,000   | MK-1 | 3,200    | 85,000   | 3 | 15,000 |
| 19,000   | MK-2 | 3,500    | 100,000  | 3 | 19,000 |
| 20,500   | MK-2 | 3,500    | 100,000  | 3 | 20,500 |
| 25,000   | MK-2 | 3,800    | 106,000  | 3 | 25,000 |
| 30,000   | MK-2 | 4,200    | 112,000  | 3 | 30,000 |
| 31,000   | MK-2 | 4,200    | 112,000  | 3 | 31,000 |
| 34,000   | MK-2 | 4,500    | 118,000  | 3 | 34,000 |
| 37,000   | MK-2 | 4,800    | 118,000  | 3 | 37,000 |
| 40,000   | MK-3 | 10,000   | 140,000  | 3 | 40,000 |
| 50,000   | MK-3 | 14,000   | 150,000  | 3 | 50,000 |
| 63,000   | MK-4 | 16,000   | 180,000  | 3 | 63,000 |
| 80,000   | MK-4 | 22,000   | 190,000  | 3 | 80,000 |

## Svasatori en HSS

### Svasatori 90°

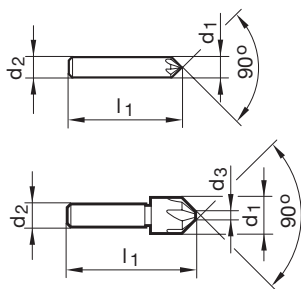


Catalogo n° 72345



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | ○ | • | • | • |   |

- taglienti dritti
- taglienti multipli



| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | Z | Codice |
|----------|----------|----------|----------|---|--------|
| 8,000    | 8,000    |          | 48,000   | 5 | 8,000  |
| 12,500   | 8,000    | 2,000    | 48,000   | 5 | 12,500 |
| 16,000   | 10,000   | 3,200    | 56,000   | 7 | 16,000 |
| 20,000   | 10,000   | 5,000    | 60,000   | 7 | 20,000 |

## Svasatori en HSS

### Assortimenti di svasatori cilindrici a 90°



|            |   |     |             |     |   |     |
|------------|---|-----|-------------|-----|---|-----|
| DIN<br>335 | C | HSS | luci-<br>do | 90° | R | Cyl |
| P          | M | K   | N           | S   | H |     |
| ●          | ○ | ●   | ●           | ○   |   |     |

- kit in cassette, composti da catalogo n° 72346 Ø 6,3 / 8,3 / 10,4 / 12,4 / 16,5 / 20,5 mm
- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti

Catalogo n° 72399

| Codice | d1<br>mm   | Pezzi per set |
|--------|------------|---------------|
| 8,000  | 6,30-20,50 | 6             |

## Svasatori en HSS

### Assortimenti di svasatori cilindrici a 90°



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ○ | ○ |   |

- kit in cassette, composti da catalogo n° 62347 Ø 6,3 / 8,3 / 10,4 / 12,4 / 16,5 / 20,5 mm
- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti

Catalogo n° 62399

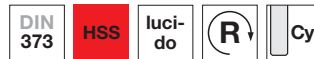
| Codice | d1<br>mm   | Pezzi per set |
|--------|------------|---------------|
| 8,000  | 6,30-20,50 | 6             |

## Svasatori en HSS

### Frese per sedi viti con guide, esecuzione fine

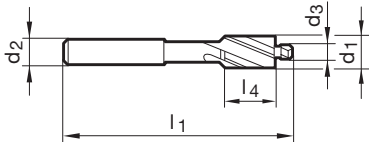


Catalogo n° 72304



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

- con guida fissa
- elica destra



| d1<br>mm      | d2<br>mm | d3<br>mm | l1<br>mm | l4<br>mm | G    | Z | Codice        |
|---------------|----------|----------|----------|----------|------|---|---------------|
| <b>6,000</b>  | 5,000    | 3,200    | 71,000   | 14,000   | M 3  | 3 | <b>6,000</b>  |
| <b>8,000</b>  | 5,000    | 4,300    | 71,000   | 14,000   | M 4  | 3 | <b>8,000</b>  |
| <b>10,000</b> | 8,000    | 5,300    | 80,000   | 18,000   | M 5  | 3 | <b>10,000</b> |
| <b>11,000</b> | 8,000    | 6,400    | 80,000   | 18,000   | M 6  | 3 | <b>11,000</b> |
| <b>15,000</b> | 12,500   | 8,400    | 100,000  | 22,000   | M 8  | 3 | <b>15,000</b> |
| <b>18,000</b> | 12,500   | 10,500   | 100,000  | 22,000   | M 10 | 3 | <b>18,000</b> |
| <b>20,000</b> | 12,500   | 13,000   | 100,000  | 22,000   | M 12 | 3 | <b>20,000</b> |

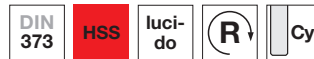


## Svasatori en HSS

### Frese per sedi viti con guide, esecuzione media

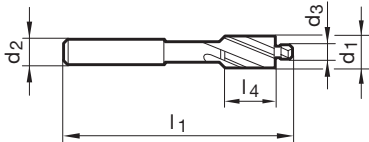


Catalogo n° 72305



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| ● | ○ | ● | ● | ○ |   |

- con guida fissa
- elica destra
- per svasature a DIN 974, parte 1



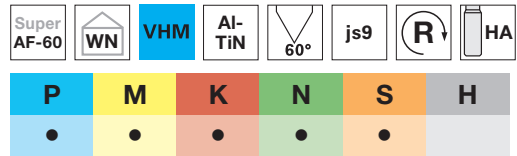
| d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | l6<br>mm | d1   | Z | Codice |
|----------|----------|----------|----------|----------|------|---|--------|
| 6,000    | 5,000    | 3,400    | 71,000   | 14,000   | M 3  | 3 | 6,000  |
| 8,000    | 5,000    | 4,500    | 71,000   | 14,000   | M 4  | 3 | 8,000  |
| 10,000   | 8,000    | 5,500    | 80,000   | 18,000   | M 5  | 3 | 10,000 |
| 11,000   | 8,000    | 6,600    | 80,000   | 18,000   | M 6  | 3 | 11,000 |
| 15,000   | 12,500   | 9,000    | 100,000  | 22,000   | M 8  | 3 | 15,000 |
| 18,000   | 12,500   | 11,000   | 100,000  | 22,000   | M 10 | 3 | 18,000 |

## Utensili di sbavatura e smussatura

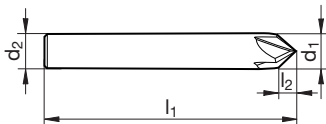
### Fresa frontali a 60° per sbavatura



Catalogo n° 53393



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 3,500    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 5,200    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 7,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 8,700    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 10,400   | 4 | 12,000 |

## Utensili di sbavatura e smussatura

### Fresa frontali a 60° per sbavatura

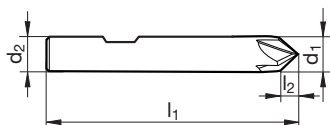


Catalogo n° 53394



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • | • | • | • |   |

• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



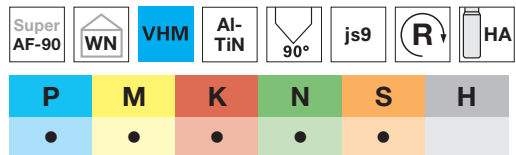
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 5,200    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 7,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 8,700    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 10,400   | 4 | 12,000 |

## Utensili di sbavatura e smussatura

### Fresa frontali a 90° per sbavatura



Catalogo n° 53395



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



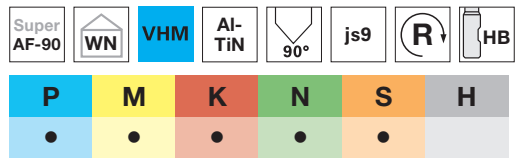
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 2,000    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 3,000    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 4,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 5,000    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 6,000    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

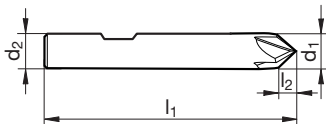
### Fresa frontali a 90° per sbavatura



Catalogo n° 53396



- Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



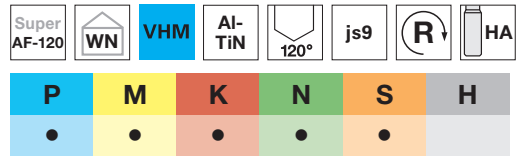
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 2,000    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 3,000    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 4,000    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 5,000    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 6,000    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

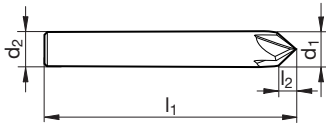
### Fresa frontali a 120° per sbavatura



Catalogo n° 53397



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



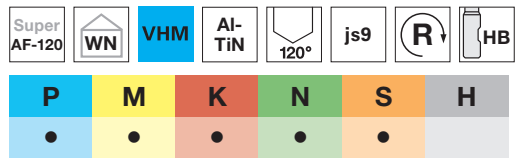
| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 4,000        | 4,000       | 50,000   | 1,200    | 4 | 4,000  |
| 6,000        | 6,000       | 57,000   | 1,800    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 2,400    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 2,900    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 3,500    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

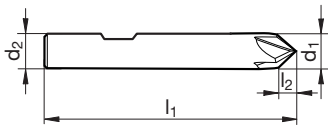
### Fresa frontali a 120° per sbavatura



Catalogo n° 53398



- Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



| d1 js9<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | Z | Codice |
|--------------|-------------|----------|----------|---|--------|
| 6,000        | 6,000       | 57,000   | 1,800    | 4 | 6,000  |
| 8,000        | 8,000       | 63,000   | 2,400    | 4 | 8,000  |
| 10,000       | 10,000      | 72,000   | 2,900    | 4 | 10,000 |
| 12,000       | 12,000      | 83,000   | 3,500    | 4 | 12,000 |

## Utensili di sbavatura e smussatura

### Sbavatori a 90° ad avanzamento ed estrazione

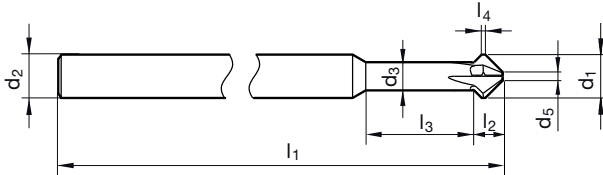


Catalogo n° 52365



|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   |   |   |   |

- Utensile per sbavatura e smussatura per la lavorazione in entrata e uscita dal foro con un angolo di smusso 90°
- per impiego in mandrini ad espansione idraulica e per calettamento
- con codolo a DIN 6535



| d1<br>mm | d2 h6<br>mm | d3<br>mm | d5<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | l4<br>mm | Z | Codice |
|----------|-------------|----------|----------|----------|----------|----------|----------|---|--------|
| 3,000    | 4,000       | 2,200    | 0,600    | 75,000   | 2,10     | 9,300    | 0,500    | 4 | 3,000  |
| 4,000    | 4,000       | 2,900    | 0,800    | 75,000   | 2,70     | 12,300   | 0,500    | 4 | 4,000  |
| 5,000    | 5,000       | 3,900    | 1,000    | 75,000   | 3,00     | 15,000   | 0,500    | 4 | 5,000  |
| 6,000    | 6,000       | 3,900    | 1,200    | 100,000  | 3,90     | 14,300   | 0,500    | 4 | 6,000  |
| 8,000    | 6,000       | 6,000    | 1,600    | 100,000  | 4,70     |          | 0,500    | 4 | 8,000  |
| 10,000   | 6,000       | 6,000    | 2,000    | 100,000  | 6,50     |          | 0,500    | 4 | 10,000 |
| 12,000   | 6,000       | 6,000    | 2,400    | 100,000  | 8,30     |          | 0,500    | 4 | 12,000 |



## Utensili di sbavatura e smussatura

### Utensili sbavatori

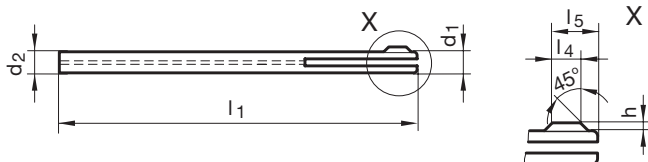


Catalogo n° 52360

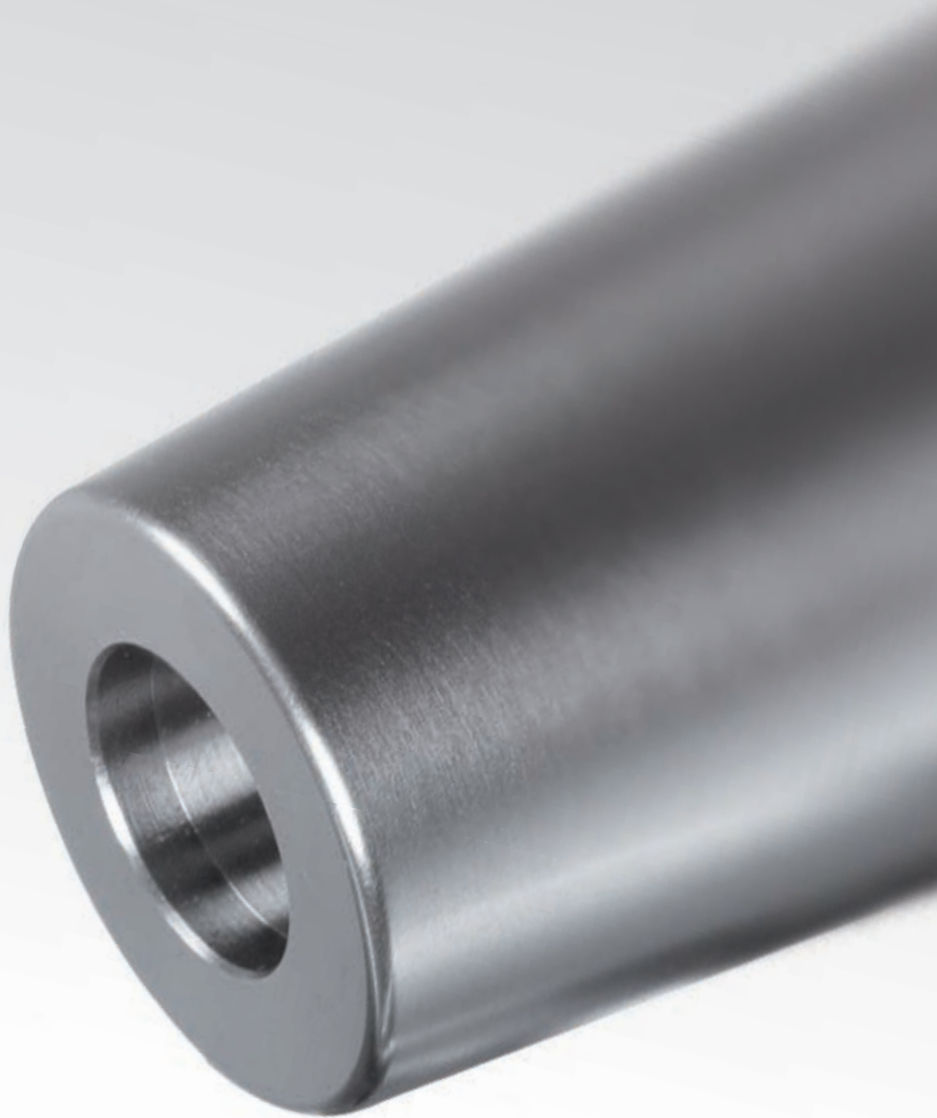


|   |   |   |   |   |   |
|---|---|---|---|---|---|
| P | M | K | N | S | H |
| • | • |   | ○ |   |   |

- sbavatore per la lavorazione di fori in entrata e in uscita così come fori trasversali
- con codolo a DIN 6535
- con codolo cilindrico passante per impiego con pinze di serraggio
- con refrigerazione interna
- uso universale



| Codice | Campo Ø<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l4<br>mm | l5<br>mm | h<br>mm |
|--------|---------------|----------|----------|----------|----------|----------|---------|
| 2,000  | 1,91 -2,15    | 1,900    | 1,900    | 80,000   | 1,000    | 2,050    | 0,350   |
| 2,250  | 2,16 -2,40    | 2,100    | 2,100    | 80,000   | 1,500    | 2,600    | 0,400   |
| 2,500  | 2,41 -2,70    | 2,400    | 2,400    | 80,000   | 1,500    | 2,900    | 0,400   |
| 2,750  | 2,71 -2,90    | 2,600    | 2,600    | 90,000   | 1,500    | 2,950    | 0,450   |
| 3,000  | 2,91 -3,25    | 2,900    | 2,900    | 90,000   | 2,000    | 3,650    | 0,450   |
| 3,500  | 3,26 -3,60    | 3,200    | 3,200    | 90,000   | 2,000    | 3,800    | 0,600   |
| 4,000  | 3,61 -4,25    | 3,600    | 3,600    | 90,000   | 2,000    | 4,100    | 0,700   |
| 4,500  | 4,26 -4,75    | 4,200    | 4,200    | 90,000   | 2,500    | 4,600    | 0,700   |
| 5,000  | 4,76 -5,30    | 4,700    | 4,700    | 100,000  | 2,500    | 4,850    | 0,750   |
| 5,500  | 5,31 -5,80    | 5,200    | 5,200    | 100,000  | 2,500    | 4,850    | 0,750   |
| 6,000  | 5,81 -6,20    | 5,600    | 5,600    | 110,000  | 3,000    | 5,800    | 0,800   |
| 6,500  | 6,21 -6,70    | 6,000    | 6,000    | 110,000  | 3,000    | 5,900    | 0,900   |
| 7,000  | 6,71 -7,10    | 6,500    | 6,500    | 110,000  | 3,000    | 5,850    | 0,850   |
| 7,500  | 7,11 -7,60    | 6,900    | 6,900    | 110,000  | 3,500    | 6,950    | 0,950   |
| 8,000  | 7,61 -8,05    | 7,300    | 7,300    | 110,000  | 3,500    | 7,000    | 1,000   |












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## ATTACCHI UTENSILI

## Attacchi utensili

|  |   | SK<br>DIN 69871   | MAS/BT<br>JIS B6339   | HSK-A<br>DIN 69893  |
|--|---|---|---|---|
| <b>Mandrini ad espansione idraulica</b>                        |    | <b>78213</b> , p. 749   | <b>78221</b> , p. 750   | <b>78299</b> , p. 748   |
| <b>Mandrini di calettamento</b>                                |    | <b>78738</b> , p. 755<br><b>78729</b> con refrigerazione periferica, p. 756   | <b>78739</b> , p. 757   | <b>78736</b> , p. 753<br><b>78755</b> con refrigerazione periferica, p. 754   |
| <b>Attacchi con codolo cilindrico „Weldon“/„Whistle-Notch“</b> |   | <b>78317</b> Weldon, p. 760<br><b>78322</b> Whistle-Notch, p. 761   | <b>78234</b> Weldon, p. 763<br><b>78233</b> Whistle-Notch, p. 762   | <b>78232</b> Weldon, p. 758<br><b>78334</b> Whistle-Notch, p. 759   |
| <b>Mandrini per maschiatura sincrona</b>                       |  | * <b>78326</b> Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767<br>* <b>78340</b> Mandrini di masch. cambio rapido no refrig. interno, p. 769 | * <b>78326</b> Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767<br>* <b>78340</b> Mandrini di masch. cambio rapido no refrig. interno, p. 769 | * <b>78326</b> Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767<br>* <b>78340</b> Mandrini di masch. cambio rapido no refrig. interno, p. 769 |

\* in combinazione con il codolo corrispondente o l'attacco utensile adatto

|  | Mandrini di calettamento   | Mandrini idraulici  | Attacchi cilindrici „Weldon“/<br>„Whistle-Notch“                                    |
|--|--|---|---|
| <b>Mandrino / portautensile gambi cilindrici</b> |   |    |  |
| <b>Proprietà</b>                                 | Massima concentricità, contorno molto sottile senza interferenze, buona rigidità; elevata forza di serraggio, vite di regolazione certificata che assicura la concentricità. | Alta regolazione con massima concentricità; facilità d'uso, flessibilità d'impiego riducendo le boccole con refrigerazione periferica | robusto, mandrino economico per taglio pesante<br>Velocità e precisione             |
| <b>Principali applicazioni</b>                   | Foratura, Lamatura, Fresatura, Alesatura, applicazioni universali e HSC  | Alesatura, Foratura, Lamatura, HSC-applicazione, leggera Fresatura  | sgrossatura, Fresatura, Foratura  |
| <b>Caratteristiche principali</b>                | preciso, sottile, alta forza di serraggio  | facilità d'uso  | facilità d'uso, massima tensione  |
| <b>Circolarità</b>                               | < 3µm  | < 3µm   | < 10µm  |
| <b>da 5xD</b>                                    | < 5µm  | < 5µm   | < 25µm  |
| <b>Serraggio</b>                                 | molto elevato  | molto elevato   | molto sicuro  |
| <b>Rigidità</b>                                  | molto elevato  | elevato   | molto elevato   |
| <b>Smorzamento</b>                               | basso  | molto elevato   | basso   |
| <b>Profilo di ingombro</b>                       | piccolo  | medio   | grosso  |
| <b>Movimentazione</b>                            | bouno  | molto buono / molto flessibile  | buono   |
| <b>Funzionamento</b>                             | Riscaldamento termico  | Idraulico   | Tramite chiave  |

## Mandrini ad espansione idraulica

### Mandrini ad espans. idraulica HSK-A c. maggiore forza di serr.

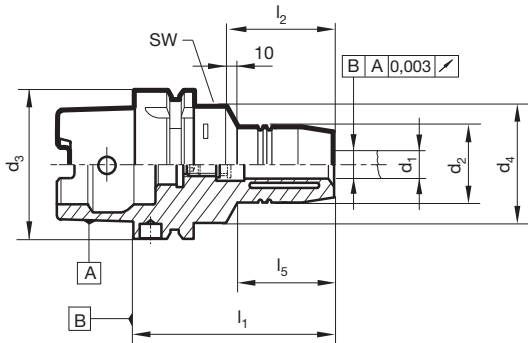


DIN  
69882-7

luci-  
do

Catalogo n° 78299

- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- adatto per utensili con refrigerazione interna
- per tolleranza codolo h6
- sovrallunghezza l1= 150 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- HSK-A a ISO 12164-1 / DIN 69893-1
- Dotazione:
  - compresa la vite di regolazione
  - compresa la chiave di serraggio
  - ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>mm | l5<br>mm | SW<br>mm | kg    | Codice        |
|-----------|----------|----------|----------|----------|----------|----------|----------|-------|---------------|
| HSK-A 63  | 6,000    | 26,000   | 50,000   | 70,000   | 37,000   | 24,000   | 5,0      | 1,000 | <b>6,063</b>  |
| HSK-A 63  | 8,000    | 28,000   | 50,000   | 70,000   | 37,000   | 24,000   | 5,0      | 1,056 | <b>8,063</b>  |
| HSK-A 63  | 10,000   | 30,000   | 50,000   | 80,000   | 41,000   | 35,000   | 5,0      | 1,000 | <b>10,063</b> |
| HSK-A 63  | 12,000   | 32,000   | 50,000   | 85,000   | 46,000   | 40,000   | 5,0      | 1,100 | <b>12,063</b> |
| HSK-A 63  | 14,000   | 34,000   | 50,000   | 85,000   | 46,000   | 40,000   | 5,0      | 1,100 | <b>14,063</b> |
| HSK-A 63  | 16,000   | 38,000   | 50,000   | 90,000   | 49,000   | 46,000   | 5,0      | 1,200 | <b>16,063</b> |
| HSK-A 63  | 18,000   | 40,000   | 50,000   | 90,000   | 49,000   | 47,000   | 5,0      | 1,275 | <b>18,063</b> |
| HSK-A 63  | 20,000   | 42,000   | 50,000   | 90,000   | 51,000   | 48,000   | 5,0      | 1,200 | <b>20,063</b> |
| HSK-A 63  | 25,000   | 57,000   | 63,000   | 120,000  | 57,000   | 59,000   | 6,0      | 2,100 | <b>25,063</b> |
| HSK-A 63  | 32,000   | 64,000   | 75,000   | 125,000  | 61,000   | 63,000   | 6,0      | 2,400 | <b>32,063</b> |
| HSK-A 100 | 6,000    | 26,000   | 50,000   | 75,000   | 37,000   | 26,000   | 5,0      | 2,400 | <b>6,100</b>  |
| HSK-A 100 | 8,000    | 28,000   | 50,000   | 75,000   | 37,000   | 26,000   | 5,0      | 2,400 | <b>8,100</b>  |
| HSK-A 100 | 10,000   | 30,000   | 50,000   | 90,000   | 41,000   | 42,000   | 5,0      | 2,500 | <b>10,100</b> |
| HSK-A 100 | 12,000   | 32,000   | 50,000   | 95,000   | 46,000   | 47,000   | 5,0      | 2,500 | <b>12,100</b> |
| HSK-A 100 | 14,000   | 34,000   | 50,000   | 95,000   | 46,000   | 47,000   | 5,0      | 2,500 | <b>14,100</b> |
| HSK-A 100 | 16,000   | 38,000   | 50,000   | 100,000  | 49,000   | 53,000   | 5,0      | 2,755 | <b>16,100</b> |
| HSK-A 100 | 18,000   | 40,000   | 50,000   | 100,000  | 49,000   | 53,000   | 5,0      | 2,700 | <b>18,100</b> |
| HSK-A 100 | 20,000   | 42,000   | 75,000   | 105,000  | 51,000   | 59,000   | 5,0      | 3,200 | <b>20,100</b> |
| HSK-A 100 | 25,000   | 57,000   | 75,000   | 110,000  | 57,000   | 62,000   | 6,0      | 3,300 | <b>25,100</b> |
| HSK-A 100 | 32,000   | 64,000   | 75,000   | 110,000  | 61,000   | 62,000   | 6,0      | 3,800 | <b>32,100</b> |

## Mandrini ad espansione idraulica

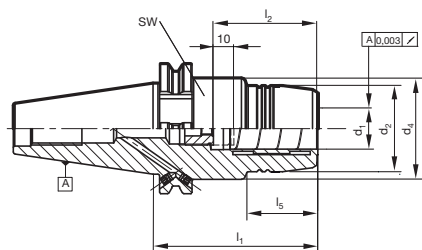
### Mandrini ad espan. idraulica SK, maggiore forza di serraggio



Catalogo n° 78213



- SK a DIN ISO 7388-1 Forma AD/AF
- fori per Forma B chiusi, se forniti con perni filettati
- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- compresa la chiave di serraggio
- ordinare separatamente i perni



| d3    | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>mm | l5<br>mm | SW<br>mm | kg    | Codice        |
|-------|----------|----------|----------|----------|----------|----------|----------|-------|---------------|
| SK 40 | 6,000    | 26,000   | 49,500   | 80,500   | 37,000   | 29,500   | 5,0      | 1,500 | <b>6,040</b>  |
| SK 40 | 8,000    | 28,000   | 49,500   | 80,500   | 37,000   | 30,000   | 5,0      | 1,500 | <b>8,040</b>  |
| SK 40 | 10,000   | 30,000   | 49,500   | 80,500   | 41,000   | 31,000   | 5,0      | 1,396 | <b>10,040</b> |
| SK 40 | 12,000   | 32,000   | 49,500   | 80,500   | 46,000   | 31,500   | 5,0      | 1,500 | <b>12,040</b> |
| SK 40 | 14,000   | 34,000   | 49,500   | 80,500   | 46,000   | 31,500   | 5,0      | 1,500 | <b>14,040</b> |
| SK 40 | 16,000   | 38,000   | 49,500   | 80,500   | 49,000   | 33,000   | 5,0      | 1,500 | <b>16,040</b> |
| SK 40 | 18,000   | 40,000   | 49,500   | 80,500   | 49,000   | 33,000   | 5,0      | 1,500 | <b>18,040</b> |
| SK 40 | 20,000   | 49,500   | 49,500   | 80,500   | 51,000   |          | 5,0      | 1,500 | <b>20,040</b> |
| SK 40 | 20,000   | 42,000   | 49,500   | 80,500   | 51,000   | 34,000   | 5,0      | 1,500 | <b>20,140</b> |
| SK 50 | 12,000   | 32,000   | 49,500   | 80,500   | 46,000   | 31,500   | 5,0      | 3,500 | <b>12,050</b> |
| SK 50 | 20,000   | 42,000   | 49,500   | 80,500   | 51,000   | 34,000   | 5,0      | 4,000 | <b>20,050</b> |
| SK 50 | 32,000   | 72,000   | 72,000   | 81,000   | 61,000   |          | 6,0      | 4,000 | <b>32,050</b> |

## Mandrini ad espansione idraulica

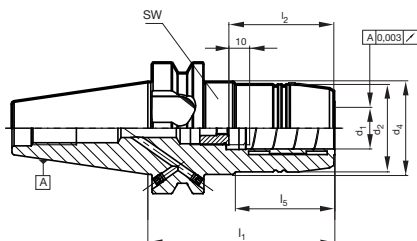
### Mandrini ad espan. idraulica MAS/BT, maggiore forza di serr.



Catalogo n° 78221



- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- MAS/BT a DIN ISO 7388-2 Forma JD/JF (Forma AD/B)
- Dotazione:
  - compresa la vite di regolazione
  - compresa la chiave di serraggio
  - ordinare separatamente i perni



| d3    | Forma | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>mm | l5<br>mm | SW<br>mm | kg    | Codice        |
|-------|-------|----------|----------|----------|----------|----------|----------|----------|-------|---------------|
| BT 40 | JD/JF | 6,000    | 26,000   | 44,500   | 90,000   | 37,000   | 43,000   | 5,0      | 1,500 | <b>6,040</b>  |
| BT 40 | JD/JF | 8,000    | 28,000   | 44,500   | 90,000   | 37,000   | 44,500   | 5,0      | 1,500 | <b>8,040</b>  |
| BT 40 | JD/JF | 10,000   | 30,000   | 44,500   | 90,000   | 41,000   | 44,500   | 5,0      | 1,500 | <b>10,040</b> |
| BT 40 | JD/JF | 12,000   | 32,000   | 44,500   | 90,000   | 46,000   | 44,500   | 5,0      | 1,500 | <b>12,040</b> |
| BT 40 | JD/JF | 14,000   | 34,000   | 44,500   | 90,000   | 46,000   | 44,500   | 5,0      | 1,500 | <b>14,040</b> |
| BT 40 | JD/JF | 16,000   | 38,000   | 44,500   | 90,000   | 49,000   | 47,500   | 5,0      | 1,500 | <b>16,040</b> |
| BT 40 | JD/JF | 18,000   | 40,000   | 44,500   | 90,000   | 49,000   | 47,500   | 5,0      | 1,500 | <b>18,040</b> |
| BT 40 | JD/JF | 20,000   | 49,500   | 49,500   | 72,500   | 51,000   |          | 5,0      | 1,500 | <b>20,040</b> |
| BT 40 | JD/JF | 20,000   | 42,000   | 44,500   | 90,000   | 51,000   | 47,500   | 5,0      | 1,483 | <b>20,140</b> |
| BT 50 | JD/JF | 12,000   | 32,000   | 44,500   | 90,000   | 46,000   | 34,000   | 5,0      | 4,000 | <b>12,050</b> |
| BT 50 | JD/JF | 20,000   | 42,000   | 44,500   | 90,000   | 51,000   | 34,000   | 5,0      | 4,000 | <b>20,050</b> |
| BT 50 | JD/JF | 32,000   | 72,000   | 72,000   | 90,000   | 61,000   |          | 6,0      | 4,000 | <b>32,050</b> |



## Mandrini ad espansione idraulica

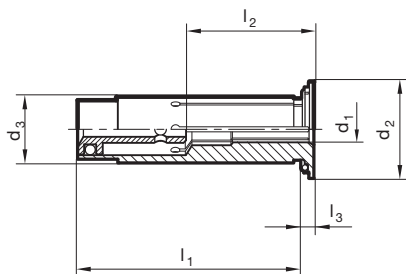
### Bussole rid. per mandrini ad espansione idraulica, no refr perf



Catalogo n° 78368



- per serraggio di codoli con differenti Ø in un solo mandrino ad espansione idraulica
- Ø attacco per tolleranza codolo h6
- chiuse frontalmente, quindi a tenuta stagna fino a 80 bar
- precisione concentricità  $\leq 2 \mu\text{m}$
- con arresto regolabile
- utilizzando bussole di riduzione, il momento torcente trasmissibile consentito può essere aumentato di ca. il 25% rispetto ad un serraggio diretto
- Dotazione:
- incluso l'elemento di arresto



| d3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l3<br>mm | l2<br>mm | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|
| 12,000   | 3,000    | 16,500   | 45,000   | 2,000    | 26,500   | <b>3,012</b>  |
| 12,000   | 4,000    | 16,500   | 45,000   | 2,000    | 26,500   | <b>4,012</b>  |
| 12,000   | 6,000    | 16,500   | 45,000   | 2,000    | 34,500   | <b>6,012</b>  |
| 12,000   | 8,000    | 16,500   | 45,000   | 2,000    | 34,500   | <b>8,012</b>  |
| 20,000   | 3,000    | 24,100   | 50,500   | 2,000    | 28,500   | <b>3,020</b>  |
| 20,000   | 4,000    | 24,100   | 50,500   | 2,000    | 28,500   | <b>4,020</b>  |
| 20,000   | 6,000    | 24,100   | 50,500   | 2,000    | 37,500   | <b>6,020</b>  |
| 20,000   | 8,000    | 24,100   | 50,500   | 2,000    | 37,500   | <b>8,020</b>  |
| 20,000   | 10,000   | 24,100   | 50,500   | 2,000    | 42,500   | <b>10,020</b> |
| 20,000   | 12,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>12,020</b> |
| 20,000   | 14,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>14,020</b> |
| 20,000   | 16,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>16,020</b> |
| 32,000   | 6,000    | 35,500   | 60,500   | 3,000    | 35,500   | <b>6,032</b>  |
| 32,000   | 8,000    | 35,500   | 60,500   | 3,000    | 35,500   | <b>8,032</b>  |
| 32,000   | 10,000   | 35,500   | 60,500   | 3,000    | 40,500   | <b>10,032</b> |
| 32,000   | 12,000   | 35,500   | 60,500   | 3,000    | 42,500   | <b>12,032</b> |
| 32,000   | 14,000   | 35,500   | 60,500   | 3,000    | 42,500   | <b>14,032</b> |
| 32,000   | 16,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>16,032</b> |
| 32,000   | 18,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>18,032</b> |
| 32,000   | 20,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>20,032</b> |
| 32,000   | 25,000   | 35,500   | 60,500   | 3,000    | 58,500   | <b>25,032</b> |

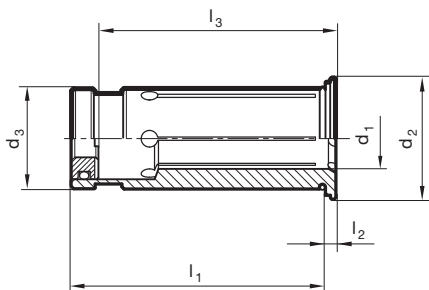
## Mandrini ad espansione idraulica

### Bussole di riduzione per mandrini ad esp. Idraul.



Catalogo n° 78369

- per serraggio di codoli con differenti Ø in un solo mandrino ad espansione idraulica
- Ø attacco per tolleranza codolo h6
- con intagli frontali per il raffreddamento periferico, migliorando così la lubrificazione
- precisione concentricità  $\leq 2 \mu\text{m}$
- con arresto regolabile
- utilizzando bussole di riduzione, il momento torcente trasmissibile consentito può essere aumentato di ca. il 25% rispetto ad un serraggio diretto
- Dotazione:
- incluso l'elemento di arresto



| d3<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l3<br>mm | l2<br>mm | Codice        |
|----------|----------|----------|----------|----------|----------|---------------|
| 12,000   | 3,000    | 16,500   | 45,000   | 2,000    | 26,500   | <b>3,012</b>  |
| 12,000   | 4,000    | 16,500   | 45,000   | 2,000    | 26,500   | <b>4,012</b>  |
| 12,000   | 6,000    | 16,500   | 45,000   | 2,000    | 34,500   | <b>6,012</b>  |
| 12,000   | 8,000    | 16,500   | 45,000   | 2,000    | 34,500   | <b>8,012</b>  |
| 20,000   | 3,000    | 24,100   | 50,500   | 2,000    | 28,500   | <b>3,020</b>  |
| 20,000   | 4,000    | 24,100   | 50,500   | 2,000    | 28,500   | <b>4,020</b>  |
| 20,000   | 6,000    | 24,100   | 50,500   | 2,000    | 37,500   | <b>6,020</b>  |
| 20,000   | 8,000    | 24,100   | 50,500   | 2,000    | 37,500   | <b>8,020</b>  |
| 20,000   | 10,000   | 24,100   | 50,500   | 2,000    | 42,500   | <b>10,020</b> |
| 20,000   | 12,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>12,020</b> |
| 20,000   | 14,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>14,020</b> |
| 20,000   | 16,000   | 24,100   | 50,500   | 2,000    | 47,500   | <b>16,020</b> |
| 32,000   | 6,000    | 35,500   | 60,500   | 3,000    | 35,500   | <b>6,032</b>  |
| 32,000   | 8,000    | 35,500   | 60,500   | 3,000    | 35,500   | <b>8,032</b>  |
| 32,000   | 10,000   | 35,500   | 60,500   | 3,000    | 40,500   | <b>10,032</b> |
| 32,000   | 12,000   | 35,500   | 60,500   | 3,000    | 42,500   | <b>12,032</b> |
| 32,000   | 14,000   | 35,500   | 60,500   | 3,000    | 42,500   | <b>14,032</b> |
| 32,000   | 16,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>16,032</b> |
| 32,000   | 18,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>18,032</b> |
| 32,000   | 20,000   | 35,500   | 60,500   | 3,000    | 50,500   | <b>20,032</b> |
| 32,000   | 25,000   | 35,500   | 60,500   | 3,000    | 58,500   | <b>25,032</b> |

## Mandrini di calettamento

### Mandrini di calettamento HSK-A

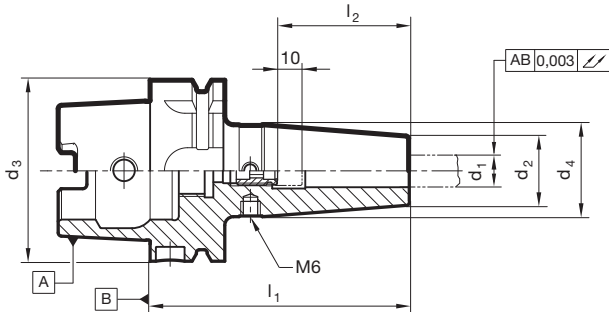


Catalogo n° 78736

DIN  
69882-8

luci-  
do

- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- per tolleranza codolo h6
- sovrallunghezze l1 = 120 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- per refrigerazione tradizionale, ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>± mm | kg    | Codice        |
|-----------|----------|----------|----------|----------|------------|-------|---------------|
| HSK-A 63  | 3,000    | 10,000   | 18,000   | 80,000   | 30,000     | 0,700 | <b>3,063</b>  |
| HSK-A 63  | 4,000    | 10,000   | 18,000   | 80,000   | 35,000     | 0,700 | <b>4,063</b>  |
| HSK-A 63  | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 0,800 | <b>6,063</b>  |
| HSK-A 63  | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 0,800 | <b>8,063</b>  |
| HSK-A 63  | 10,000   | 24,000   | 32,000   | 85,000   | 41,000     | 0,900 | <b>10,063</b> |
| HSK-A 63  | 12,000   | 24,000   | 32,000   | 90,000   | 46,000     | 0,945 | <b>12,063</b> |
| HSK-A 63  | 14,000   | 27,000   | 34,000   | 90,000   | 46,000     | 1,000 | <b>14,063</b> |
| HSK-A 63  | 16,000   | 27,000   | 34,000   | 95,000   | 49,000     | 1,000 | <b>16,063</b> |
| HSK-A 63  | 18,000   | 33,000   | 42,000   | 95,000   | 49,000     | 1,200 | <b>18,063</b> |
| HSK-A 63  | 20,000   | 33,000   | 42,000   | 100,000  | 51,000     | 1,200 | <b>20,063</b> |
| HSK-A 63  | 25,000   | 44,000   | 53,000   | 115,000  | 57,000     | 1,800 | <b>25,063</b> |
| HSK-A 63  | 32,000   | 44,000   | 53,000   | 120,000  | 61,000     | 1,700 | <b>32,063</b> |
| HSK-A 100 | 6,000    | 21,000   | 27,000   | 85,000   | 36,000     | 2,200 | <b>6,100</b>  |
| HSK-A 100 | 8,000    | 21,000   | 27,000   | 85,000   | 36,000     | 2,200 | <b>8,100</b>  |
| HSK-A 100 | 10,000   | 24,000   | 32,000   | 90,000   | 41,000     | 2,300 | <b>10,100</b> |
| HSK-A 100 | 12,000   | 24,000   | 32,000   | 95,000   | 46,000     | 2,300 | <b>12,100</b> |
| HSK-A 100 | 14,000   | 27,000   | 34,000   | 95,000   | 46,000     | 2,300 | <b>14,100</b> |
| HSK-A 100 | 16,000   | 27,000   | 34,000   | 100,000  | 49,000     | 2,300 | <b>16,100</b> |
| HSK-A 100 | 18,000   | 33,000   | 42,000   | 100,000  | 49,000     | 2,500 | <b>18,100</b> |
| HSK-A 100 | 20,000   | 33,000   | 42,000   | 105,000  | 51,000     | 2,500 | <b>20,100</b> |
| HSK-A 100 | 25,000   | 44,000   | 53,000   | 115,000  | 57,000     | 3,000 | <b>25,100</b> |
| HSK-A 100 | 32,000   | 44,000   | 53,000   | 120,000  | 61,000     | 3,000 | <b>32,100</b> |

## Mandrini di calettamento

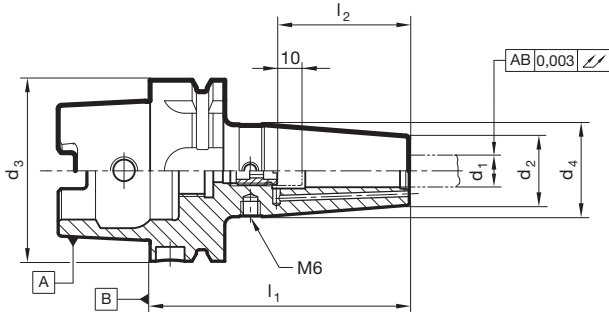
### Mandrini a calettamento HSK-A con raffreddamento periferico



Catalogo n° 78755



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- per tolleranza codolo h6
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- per refrigerazione tradizionale, ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>± mm | kg    | Codice        |
|-----------|----------|----------|----------|----------|------------|-------|---------------|
| HSK-A 63  | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 0,859 | <b>6,063</b>  |
| HSK-A 63  | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 0,800 | <b>8,063</b>  |
| HSK-A 63  | 10,000   | 24,000   | 32,000   | 85,000   | 41,000     | 0,927 | <b>10,063</b> |
| HSK-A 63  | 12,000   | 24,000   | 32,000   | 90,000   | 46,000     | 0,938 | <b>12,063</b> |
| HSK-A 63  | 14,000   | 27,000   | 34,000   | 90,000   | 46,000     | 0,985 | <b>14,063</b> |
| HSK-A 63  | 16,000   | 27,000   | 34,000   | 95,000   | 49,000     | 0,999 | <b>16,063</b> |
| HSK-A 63  | 18,000   | 33,000   | 42,000   | 95,000   | 49,000     | 1,167 | <b>18,063</b> |
| HSK-A 63  | 20,000   | 33,000   | 42,000   | 100,000  | 51,000     | 1,191 | <b>20,063</b> |
| HSK-A 100 | 6,000    | 21,000   | 27,000   | 85,000   | 36,000     | 2,200 | <b>6,100</b>  |
| HSK-A 100 | 8,000    | 21,000   | 27,000   | 85,000   | 36,000     | 2,200 | <b>8,100</b>  |
| HSK-A 100 | 10,000   | 24,000   | 32,000   | 90,000   | 41,000     | 2,300 | <b>10,100</b> |
| HSK-A 100 | 12,000   | 24,000   | 32,000   | 95,000   | 46,000     | 2,300 | <b>12,100</b> |
| HSK-A 100 | 14,000   | 27,000   | 34,000   | 95,000   | 46,000     | 2,300 | <b>14,100</b> |
| HSK-A 100 | 16,000   | 27,000   | 34,000   | 100,000  | 49,000     | 2,300 | <b>16,100</b> |
| HSK-A 100 | 18,000   | 33,000   | 42,000   | 100,000  | 49,000     | 2,500 | <b>18,100</b> |
| HSK-A 100 | 20,000   | 33,000   | 42,000   | 105,000  | 51,000     | 2,500 | <b>20,100</b> |
| HSK-A 100 | 25,000   | 44,000   | 53,000   | 115,000  | 57,000     | 3,000 | <b>25,100</b> |
| HSK-A 100 | 32,000   | 44,000   | 53,000   | 120,000  | 61,000     | 3,000 | <b>32,100</b> |

## Mandrini di calettamento

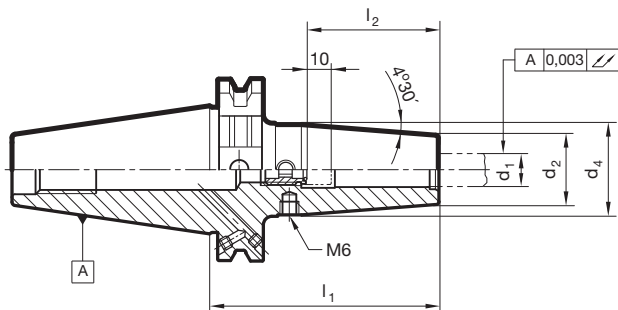
### Mandrini di calettamento SK



Catalogo n° 78738



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- SK a DIN ISO 7388-1 Forma AD/AF
- per tolleranza codolo h6
- sovrallunghezze I1 = 120 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



| d3    | d1<br>mm | d2<br>mm | d4<br>mm | I1<br>mm | I2<br>± mm | kg    | Codice        |
|-------|----------|----------|----------|----------|------------|-------|---------------|
| SK 40 | 3,000    | 10,000   | 18,000   | 80,000   | 30,000     | 0,900 | <b>3,040</b>  |
| SK 40 | 4,000    | 10,000   | 18,000   | 80,000   | 35,000     | 0,900 | <b>4,040</b>  |
| SK 40 | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 1,000 | <b>6,040</b>  |
| SK 40 | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 1,000 | <b>8,040</b>  |
| SK 40 | 10,000   | 24,000   | 32,000   | 80,000   | 41,000     | 1,100 | <b>10,040</b> |
| SK 40 | 12,000   | 24,000   | 32,000   | 81,600   | 46,000     | 1,000 | <b>12,040</b> |
| SK 40 | 14,000   | 27,000   | 34,000   | 81,800   | 46,000     | 1,100 | <b>14,040</b> |
| SK 40 | 16,000   | 27,000   | 34,000   | 82,000   | 49,000     | 1,100 | <b>16,040</b> |
| SK 40 | 18,000   | 33,000   | 42,000   | 82,300   | 49,000     | 1,200 | <b>18,040</b> |
| SK 40 | 20,000   | 33,000   | 42,000   | 82,600   | 51,000     | 1,500 | <b>20,040</b> |
| SK 40 | 25,000   | 44,000   | 53,000   | 103,100  | 57,000     | 1,500 | <b>25,040</b> |
| SK 40 | 32,000   | 44,000   | 53,000   | 100,000  | 61,000     | 1,500 | <b>32,040</b> |
| SK 50 | 3,000    | 10,000   | 18,000   | 80,000   | 30,000     | 2,600 | <b>3,050</b>  |
| SK 50 | 4,000    | 10,000   | 18,000   | 80,000   | 35,000     | 2,600 | <b>4,050</b>  |
| SK 50 | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 2,900 | <b>6,050</b>  |
| SK 50 | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 2,900 | <b>8,050</b>  |
| SK 50 | 10,000   | 24,000   | 32,000   | 80,000   | 41,000     | 2,900 | <b>10,050</b> |
| SK 50 | 12,000   | 24,000   | 32,000   | 81,600   | 46,000     | 2,900 | <b>12,050</b> |
| SK 50 | 14,000   | 27,000   | 34,000   | 81,800   | 46,000     | 3,000 | <b>14,050</b> |
| SK 50 | 16,000   | 27,000   | 34,000   | 82,000   | 49,000     | 3,000 | <b>16,050</b> |
| SK 50 | 18,000   | 33,000   | 42,000   | 82,300   | 49,000     | 3,000 | <b>18,050</b> |
| SK 50 | 20,000   | 33,000   | 42,000   | 82,600   | 51,000     | 3,000 | <b>20,050</b> |
| SK 50 | 25,000   | 44,000   | 53,000   | 103,100  | 57,000     | 3,600 | <b>25,050</b> |
| SK 50 | 32,000   | 44,000   | 53,000   | 100,000  | 61,000     | 3,500 | <b>32,050</b> |

## Mandrini di calettamento

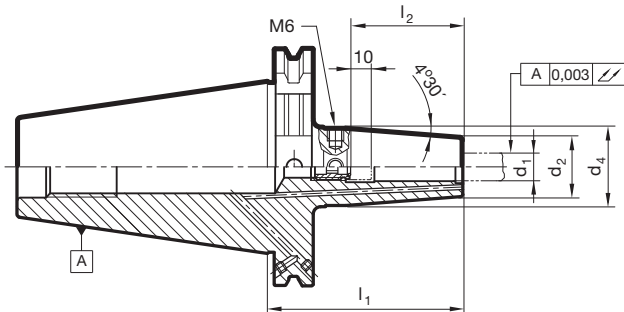
### Mandrini di calettamento ISO



Catalogo n° 78729



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- SK a DIN ISO 7388-1 Forma AD/AF
- per tolleranza codolo h6
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



| d3    | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>± mm | kg    | Codice        |
|-------|----------|----------|----------|----------|------------|-------|---------------|
| SK 40 | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 1,000 | <b>6,040</b>  |
| SK 40 | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 1,019 | <b>8,040</b>  |
| SK 40 | 10,000   | 24,000   | 32,000   | 80,000   | 41,000     | 1,100 | <b>10,040</b> |
| SK 40 | 12,000   | 24,000   | 32,000   | 80,000   | 46,000     | 1,000 | <b>12,040</b> |
| SK 40 | 14,000   | 27,000   | 34,000   | 80,000   | 46,000     | 1,100 | <b>14,040</b> |
| SK 40 | 16,000   | 27,000   | 34,000   | 80,000   | 49,000     | 1,100 | <b>16,040</b> |
| SK 40 | 18,000   | 33,000   | 42,000   | 80,000   | 49,000     | 1,234 | <b>18,040</b> |
| SK 40 | 20,000   | 33,000   | 42,000   | 80,000   | 51,000     | 1,500 | <b>20,040</b> |
| SK 50 | 6,000    | 21,000   | 27,000   | 80,000   | 36,000     | 2,800 | <b>6,050</b>  |
| SK 50 | 8,000    | 21,000   | 27,000   | 80,000   | 36,000     | 2,800 | <b>8,050</b>  |
| SK 50 | 10,000   | 24,000   | 32,000   | 80,000   | 41,000     | 2,800 | <b>10,050</b> |
| SK 50 | 12,000   | 24,000   | 32,000   | 80,000   | 46,000     | 2,800 | <b>12,050</b> |
| SK 50 | 14,000   | 27,000   | 34,000   | 80,000   | 46,000     | 2,800 | <b>14,050</b> |
| SK 50 | 16,000   | 27,000   | 34,000   | 80,000   | 49,000     | 2,800 | <b>16,050</b> |
| SK 50 | 18,000   | 33,000   | 42,000   | 80,000   | 49,000     | 3,000 | <b>18,050</b> |
| SK 50 | 20,000   | 33,000   | 42,000   | 80,000   | 51,000     | 3,000 | <b>20,050</b> |
| SK 50 | 25,000   | 44,000   | 53,000   | 100,000  | 57,000     | 3,500 | <b>25,050</b> |
| SK 50 | 32,000   | 44,000   | 53,000   | 100,000  | 61,000     | 3,300 | <b>32,050</b> |

## Mandrini di calettamento

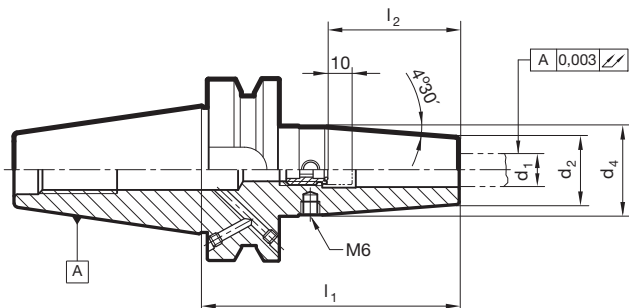
### Mandrini di calettamento MAS/BT



Catalogo n° 78739



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- MAS/BT a DIN ISO 7388-2 Forma JD/JF (Forma AD/B)
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



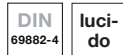
| d3    | Forma | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>± mm | l2<br>mm | kg    | Codice        |
|-------|-------|----------|----------|----------|------------|----------|-------|---------------|
| BT 40 | JD/JF | 3,000    | 10,000   | 18,000   | 85,000     | 30,000   | 1,000 | <b>3,040</b>  |
| BT 40 | JD/JF | 4,000    | 10,000   | 18,000   | 85,000     | 35,000   | 1,000 | <b>4,040</b>  |
| BT 40 | JD/JF | 6,000    | 21,000   | 27,000   | 90,000     | 36,000   | 1,200 | <b>6,040</b>  |
| BT 40 | JD/JF | 8,000    | 21,000   | 27,000   | 90,000     | 36,000   | 1,200 | <b>8,040</b>  |
| BT 40 | JD/JF | 10,000   | 24,000   | 32,000   | 90,000     | 41,000   | 1,300 | <b>10,040</b> |
| BT 40 | JD/JF | 12,000   | 24,000   | 32,000   | 90,000     | 46,000   | 1,300 | <b>12,040</b> |
| BT 40 | JD/JF | 14,000   | 27,000   | 34,000   | 90,000     | 46,000   | 1,400 | <b>14,040</b> |
| BT 40 | JD/JF | 16,000   | 27,000   | 34,000   | 90,000     | 49,000   | 1,400 | <b>16,040</b> |
| BT 40 | JD/JF | 18,000   | 33,000   | 42,000   | 90,000     | 49,000   | 1,400 | <b>18,040</b> |
| BT 40 | JD/JF | 20,000   | 33,000   | 42,000   | 90,000     | 51,000   | 1,700 | <b>20,040</b> |
| BT 40 | JD/JF | 25,000   | 44,000   | 53,000   | 100,000    | 57,000   | 1,800 | <b>25,040</b> |
| BT 40 | JD/JF | 32,000   | 44,000   | 53,000   | 100,000    | 61,000   | 1,700 | <b>32,040</b> |
| BT 50 | JD/JF | 6,000    | 21,000   | 27,000   | 100,000    | 36,000   | 2,900 | <b>6,050</b>  |
| BT 50 | JD/JF | 8,000    | 21,000   | 27,000   | 100,000    | 36,000   | 2,900 | <b>8,050</b>  |
| BT 50 | JD/JF | 10,000   | 24,000   | 32,000   | 100,000    | 41,000   | 2,900 | <b>10,050</b> |
| BT 50 | JD/JF | 12,000   | 24,000   | 32,000   | 100,000    | 46,000   | 2,900 | <b>12,050</b> |
| BT 50 | JD/JF | 14,000   | 27,000   | 34,000   | 100,000    | 46,000   | 3,000 | <b>14,050</b> |
| BT 50 | JD/JF | 16,000   | 27,000   | 34,000   | 100,000    | 49,000   | 3,000 | <b>16,050</b> |
| BT 50 | JD/JF | 18,000   | 33,000   | 42,000   | 100,000    | 49,000   | 1,900 | <b>18,050</b> |
| BT 50 | JD/JF | 20,000   | 33,000   | 42,000   | 100,000    | 51,000   | 1,900 | <b>20,050</b> |
| BT 50 | JD/JF | 25,000   | 44,000   | 53,000   | 110,000    | 57,000   | 2,200 | <b>25,050</b> |
| BT 50 | JD/JF | 32,000   | 44,000   | 53,000   | 110,000    | 61,000   | 2,200 | <b>32,050</b> |

## Attacchi utensili

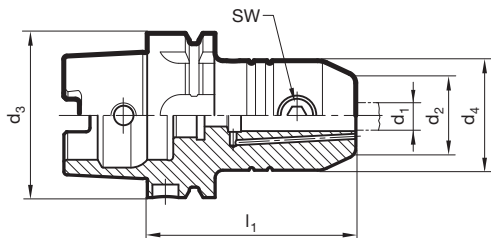
### Attacchi cilindrici Weldon HSK-A



Catalogo n° 78232



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- da supporto d1 = 25 con due viti di serraggio
- con canali refrigeranti per il raffreddamento periferico, migliorando così la lubrificazione
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
  - compresa la vite di serraggio
  - ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | SW<br>± mm | kg    | Codice        |
|-----------|----------|----------|----------|----------|------------|-------|---------------|
| HSK-A 63  | 6,000    | 15,000   | 25,000   | 65,000   | 3,0        | 0,800 | <b>6,063</b>  |
| HSK-A 63  | 8,000    | 20,000   | 28,000   | 65,000   | 4,0        | 0,800 | <b>8,063</b>  |
| HSK-A 63  | 10,000   | 25,000   | 35,000   | 65,000   | 5,0        | 0,900 | <b>10,063</b> |
| HSK-A 63  | 12,000   | 30,000   | 42,000   | 80,000   | 6,0        | 1,200 | <b>12,063</b> |
| HSK-A 63  | 14,000   | 32,000   | 44,000   | 80,000   | 6,0        | 1,200 | <b>14,063</b> |
| HSK-A 63  | 16,000   | 36,000   | 48,000   | 80,000   | 6,0        | 1,300 | <b>16,063</b> |
| HSK-A 63  | 18,000   | 38,000   | 50,000   | 80,000   | 6,0        | 1,400 | <b>18,063</b> |
| HSK-A 63  | 20,000   | 40,000   | 52,000   | 80,000   | 8,0        | 1,400 | <b>20,063</b> |
| HSK-A 63  | 25,000   | 45,000   | 65,000   | 110,000  | 10,0       | 2,400 | <b>25,063</b> |
| HSK-A 63  | 32,000   | 56,000   | 72,000   | 110,000  | 10,0       | 2,700 | <b>32,063</b> |
| HSK-A 100 | 6,000    | 15,000   | 25,000   | 80,000   | 3,0        | 3,000 | <b>6,100</b>  |
| HSK-A 100 | 8,000    | 20,000   | 28,000   | 80,000   | 4,0        | 3,200 | <b>8,100</b>  |
| HSK-A 100 | 10,000   | 25,000   | 35,000   | 80,000   | 5,0        | 3,400 | <b>10,100</b> |
| HSK-A 100 | 12,000   | 30,000   | 42,000   | 80,000   | 6,0        | 3,400 | <b>12,100</b> |
| HSK-A 100 | 14,000   | 32,000   | 44,000   | 80,000   | 6,0        | 3,500 | <b>14,100</b> |
| HSK-A 100 | 16,000   | 36,000   | 48,000   | 100,000  | 6,0        | 3,800 | <b>16,100</b> |
| HSK-A 100 | 18,000   | 38,000   | 50,000   | 100,000  | 6,0        | 3,800 | <b>18,100</b> |
| HSK-A 100 | 20,000   | 40,000   | 52,000   | 100,000  | 8,0        | 3,900 | <b>20,100</b> |
| HSK-A 100 | 25,000   | 45,000   | 65,000   | 100,000  | 10,0       | 3,900 | <b>25,100</b> |
| HSK-A 100 | 32,000   | 56,000   | 72,000   | 100,000  | 10,0       | 4,200 | <b>32,100</b> |
| HSK-A 100 | 40,000   | 60,000   | 80,000   | 110,000  | 10,0       | 4,600 | <b>40,100</b> |



## Attacchi utensili

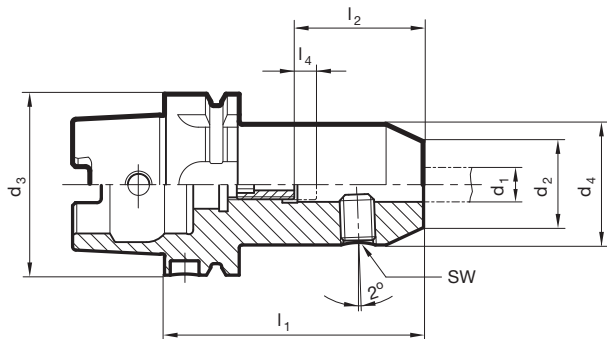
### Attacchi per codolo cilindrico Whistle Notch HSK-A



Catalogo n° 78334



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“ con scanalatura frontale per identificazione
- da supporto d1 = 25 con due viti di serraggio
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | SW<br>mm | kg    | Codice        |
|-----------|----------|----------|----------|----------|----------|----------|----------|-------|---------------|
| HSK-A 63  | 6,000    | 15,000   | 25,000   | 80,000   | 36,000   | 10,000   | 3,0      | 0,860 | <b>6,063</b>  |
| HSK-A 63  | 8,000    | 20,000   | 28,000   | 80,000   | 36,000   | 10,000   | 4,0      | 0,900 | <b>8,063</b>  |
| HSK-A 63  | 10,000   | 25,000   | 35,000   | 80,000   | 40,000   | 10,000   | 5,0      | 1,000 | <b>10,063</b> |
| HSK-A 63  | 12,000   | 30,000   | 42,000   | 90,000   | 45,000   | 10,000   | 6,0      | 1,240 | <b>12,063</b> |
| HSK-A 63  | 14,000   | 32,000   | 44,000   | 90,000   | 45,000   | 10,000   | 6,0      | 1,280 | <b>14,063</b> |
| HSK-A 63  | 16,000   | 36,000   | 48,000   | 100,000  | 48,000   | 10,000   | 6,0      | 1,530 | <b>16,063</b> |
| HSK-A 63  | 18,000   | 38,000   | 50,000   | 100,000  | 48,000   | 10,000   | 6,0      | 1,600 | <b>18,063</b> |
| HSK-A 63  | 20,000   | 40,000   | 52,000   | 100,000  | 50,000   | 10,000   | 8,0      | 1,650 | <b>20,063</b> |
| HSK-A 63  | 25,000   | 45,000   | 65,000   | 110,000  | 56,000   | 10,000   | 10,0     | 2,340 | <b>25,063</b> |
| HSK-A 63  | 32,000   | 56,000   | 72,000   | 110,000  | 60,000   | 10,000   | 10,0     | 2,540 | <b>32,063</b> |
| HSK-A 100 | 6,000    | 15,000   | 25,000   | 90,000   | 36,000   | 10,000   | 3,0      | 2,600 | <b>6,100</b>  |
| HSK-A 100 | 8,000    | 20,000   | 28,000   | 90,000   | 36,000   | 10,000   | 4,0      | 2,600 | <b>8,100</b>  |
| HSK-A 100 | 10,000   | 25,000   | 35,000   | 90,000   | 40,000   | 10,000   | 5,0      | 2,600 | <b>10,100</b> |
| HSK-A 100 | 12,000   | 30,000   | 42,000   | 100,000  | 45,000   | 10,000   | 6,0      | 2,800 | <b>12,100</b> |
| HSK-A 100 | 14,000   | 32,000   | 44,000   | 100,000  | 45,000   | 10,000   | 6,0      | 2,850 | <b>14,100</b> |
| HSK-A 100 | 16,000   | 36,000   | 48,000   | 100,000  | 48,000   | 10,000   | 6,0      | 2,970 | <b>16,100</b> |
| HSK-A 100 | 18,000   | 38,000   | 50,000   | 100,000  | 48,000   | 10,000   | 6,0      | 3,100 | <b>18,100</b> |
| HSK-A 100 | 20,000   | 40,000   | 52,000   | 110,000  | 50,000   | 10,000   | 8,0      | 3,230 | <b>20,100</b> |
| HSK-A 100 | 25,000   | 45,000   | 65,000   | 120,000  | 56,000   | 10,000   | 10,0     | 4,060 | <b>25,100</b> |
| HSK-A 100 | 32,000   | 56,000   | 72,000   | 120,000  | 60,000   | 10,000   | 10,0     | 4,400 | <b>32,100</b> |

## Attacchi utensili

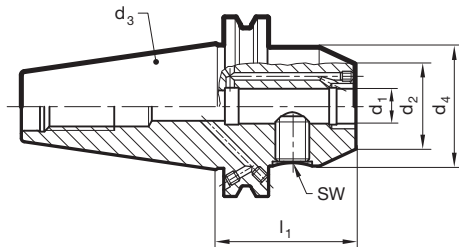
### Attacchi cilindrici Weldon SK



Catalogo n° 78317



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- SK a DIN ISO 7388-1 Forma AD/AF
- fori per Forma B chiusi, se forniti con perni filettati
- con canali refrigeranti nel foro di serraggio per raffreddamento periferico, migliorando così la lubrificazione
- da supporto d1 = 25 con due viti di serraggio
- condotti del liquido di raffreddamento: d1 = 6-14 mm con due condotti di raffreddamento, d1 = 16 - 32 mm con quattro condotti di raffreddamento
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio
- ordinare separatamente i perni



| d3    | Forma | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>± mm | SW<br>mm | kg    | Codice        |
|-------|-------|----------|----------|----------|------------|----------|-------|---------------|
| SK 40 | AD/AF | 6,000    | 15,000   | 25,000   | 50,000     | 3,0      | 0,900 | <b>6,040</b>  |
| SK 40 | AD/AF | 8,000    | 20,000   | 28,000   | 50,000     | 4,0      | 0,900 | <b>8,040</b>  |
| SK 40 | AD/AF | 10,000   | 25,000   | 35,000   | 50,000     | 5,0      | 1,000 | <b>10,040</b> |
| SK 40 | AD/AF | 12,000   | 30,000   | 42,000   | 50,000     | 6,0      | 1,200 | <b>12,040</b> |
| SK 40 | AD/AF | 14,000   | 32,000   | 44,000   | 50,000     | 6,0      | 1,200 | <b>14,040</b> |
| SK 40 | AD/AF | 16,000   | 36,000   | 48,000   | 63,000     | 6,0      | 1,200 | <b>16,040</b> |
| SK 40 | AD/AF | 18,000   | 38,000   | 50,000   | 63,000     | 6,0      | 1,400 | <b>18,040</b> |
| SK 40 | AD/AF | 20,000   | 40,000   | 52,000   | 63,000     | 8,0      | 1,500 | <b>20,040</b> |
| SK 40 | AD/AF | 25,000   | 45,000   | 65,000   | 100,000    | 10,0     | 2,300 | <b>25,040</b> |
| SK 40 | AD/AF | 32,000   | 56,000   | 72,000   | 100,000    | 10,0     | 2,500 | <b>32,040</b> |
| SK 50 | AD/AF | 6,000    | 15,000   | 25,000   | 63,000     | 3,0      | 2,700 | <b>6,050</b>  |
| SK 50 | AD/AF | 8,000    | 20,000   | 28,000   | 63,000     | 4,0      | 2,700 | <b>8,050</b>  |
| SK 50 | AD/AF | 10,000   | 25,000   | 35,000   | 63,000     | 5,0      | 2,900 | <b>10,050</b> |
| SK 50 | AD/AF | 12,000   | 30,000   | 42,000   | 63,000     | 6,0      | 3,000 | <b>12,050</b> |
| SK 50 | AD/AF | 14,000   | 32,000   | 44,000   | 63,000     | 6,0      | 3,000 | <b>14,050</b> |
| SK 50 | AD/AF | 16,000   | 36,000   | 48,000   | 63,000     | 6,0      | 3,000 | <b>16,050</b> |
| SK 50 | AD/AF | 18,000   | 38,000   | 50,000   | 63,000     | 6,0      | 3,000 | <b>18,050</b> |
| SK 50 | AD/AF | 20,000   | 40,000   | 52,000   | 63,000     | 8,0      | 3,100 | <b>20,050</b> |
| SK 50 | AD/AF | 25,000   | 45,000   | 65,000   | 80,000     | 10,0     | 3,700 | <b>25,050</b> |
| SK 50 | AD/AF | 32,000   | 56,000   | 72,000   | 100,000    | 10,0     | 4,500 | <b>32,050</b> |

## Attacchi utensili

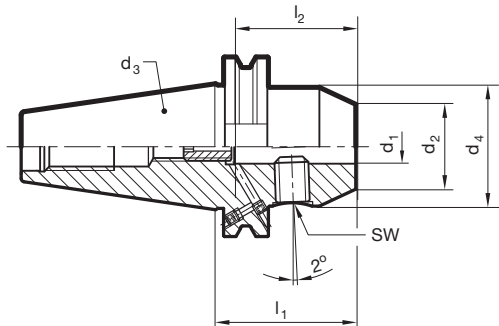
### Attacchi per codolo cilindrico Whistle Notch SK



Catalogo n° 78322



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“
- SK a DIN ISO 7388-1 Forma AD/AF
- da supporto d1 = 25 con due viti di serraggio
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente i perni



| d3    | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>± mm | SW<br>mm | kg    | Codice        |
|-------|----------|----------|----------|----------|------------|----------|-------|---------------|
| SK 40 | 6,000    | 15,000   | 25,000   | 50,000   | 36,000     | 3,0      | 0,900 | <b>6,040</b>  |
| SK 40 | 8,000    | 20,000   | 28,000   | 50,000   | 36,000     | 4,0      | 0,900 | <b>8,040</b>  |
| SK 40 | 10,000   | 25,000   | 35,000   | 50,000   | 40,000     | 5,0      | 1,000 | <b>10,040</b> |
| SK 40 | 12,000   | 30,000   | 42,000   | 50,000   | 45,000     | 6,0      | 1,200 | <b>12,040</b> |
| SK 40 | 14,000   | 32,000   | 44,000   | 50,000   | 45,000     | 6,0      | 1,200 | <b>14,040</b> |
| SK 40 | 16,000   | 36,000   | 48,000   | 63,000   | 48,000     | 6,0      | 1,200 | <b>16,040</b> |
| SK 40 | 18,000   | 38,000   | 50,000   | 63,000   | 48,000     | 6,0      | 1,400 | <b>18,040</b> |
| SK 40 | 20,000   | 40,000   | 52,000   | 63,000   | 50,000     | 8,0      | 1,500 | <b>20,040</b> |
| SK 40 | 25,000   | 45,000   | 65,000   | 100,000  | 56,000     | 10,0     | 2,300 | <b>25,040</b> |
| SK 40 | 32,000   | 56,000   | 72,000   | 100,000  | 60,000     | 10,0     | 2,500 | <b>32,040</b> |
| SK 50 | 6,000    | 15,000   | 25,000   | 63,000   | 36,000     | 3,0      | 2,700 | <b>6,050</b>  |
| SK 50 | 8,000    | 20,000   | 28,000   | 63,000   | 36,000     | 4,0      | 2,700 | <b>8,050</b>  |
| SK 50 | 10,000   | 25,000   | 35,000   | 63,000   | 40,000     | 5,0      | 2,900 | <b>10,050</b> |
| SK 50 | 12,000   | 30,000   | 42,000   | 63,000   | 45,000     | 6,0      | 3,000 | <b>12,050</b> |
| SK 50 | 14,000   | 32,000   | 44,000   | 63,000   | 45,000     | 6,0      | 3,000 | <b>14,050</b> |
| SK 50 | 16,000   | 36,000   | 48,000   | 63,000   | 48,000     | 6,0      | 3,000 | <b>16,050</b> |
| SK 50 | 18,000   | 38,000   | 50,000   | 63,000   | 48,000     | 6,0      | 3,000 | <b>18,050</b> |
| SK 50 | 20,000   | 40,000   | 52,000   | 63,000   | 50,000     | 8,0      | 3,100 | <b>20,050</b> |
| SK 50 | 25,000   | 45,000   | 65,000   | 80,000   | 56,000     | 10,0     | 3,700 | <b>25,050</b> |
| SK 50 | 32,000   | 56,000   | 72,000   | 100,000  | 60,000     | 10,0     | 4,500 | <b>32,050</b> |

## Attacchi utensili

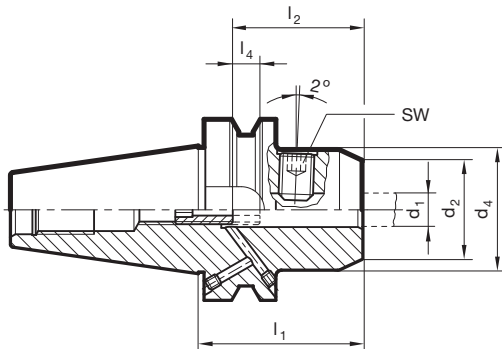
### Attacchi per codolo cilindrico WhistleNotch MAS/BT



Catalogo n° 78233



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- MAS/BT a DIN ISO 7388-2 Forma JD/JF
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“
- da supporto d1 = 25 con due viti di serraggio
- alimentazione di refrigerante Forma JD/JF (\* BT50 forma JD senza alimentazione di refrigerante attraverso il collarino)
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente i perni



| d3    | Forma | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | SW<br>mm | kg    | Codice        |
|-------|-------|----------|----------|----------|----------|----------|----------|----------|-------|---------------|
| BT 40 | JD/JF | 6,000    | 15,000   | 25,000   | 50,000   | 36,000   | 10,000   | 3,0      | 5,882 | <b>6,040</b>  |
| BT 40 | JD/JF | 8,000    | 20,000   | 28,000   | 50,000   | 36,000   | 10,000   | 4,0      | 5,890 | <b>8,040</b>  |
| BT 40 | JD/JF | 10,000   | 25,000   | 35,000   | 63,000   | 40,000   | 10,000   | 5,0      | 6,024 | <b>10,040</b> |
| BT 40 | JD/JF | 12,000   | 30,000   | 42,000   | 63,000   | 45,000   | 10,000   | 6,0      | 6,160 | <b>12,040</b> |
| BT 40 | JD/JF | 14,000   | 32,000   | 44,000   | 63,000   | 45,000   | 10,000   | 6,0      | 6,175 | <b>14,040</b> |
| BT 40 | JD/JF | 16,000   | 36,000   | 48,000   | 116,400  | 48,000   | 10,000   | 6,0      | 6,050 | <b>16,040</b> |
| BT 40 | JD/JF | 18,000   | 38,000   | 50,000   | 63,000   | 48,000   | 10,000   | 6,0      | 6,280 | <b>18,040</b> |
| BT 40 | JD/JF | 20,000   | 40,000   | 52,000   | 63,000   | 50,000   | 10,000   | 8,0      | 6,110 | <b>20,040</b> |
| BT 40 | JD/JF | 25,000   | 45,000   | 63,000   | 90,000   | 56,000   | 10,000   | 10,0     | 6,750 | <b>25,040</b> |
| BT 40 | JD/JF | 32,000   | 56,000   | 72,000   | 100,000  | 60,000   | 10,000   | 10,0     | 7,180 | <b>32,040</b> |
| BT 50 | JD    | 6,000    | 15,000   | 25,000   | 62,600   | 36,000   | 10,000   | 3,0      | 8,090 | <b>6,050</b>  |
| BT 50 | JD    | 8,000    | 20,000   | 28,000   | 62,600   | 36,000   | 10,000   | 4,0      | 8,430 | <b>8,050</b>  |
| BT 50 | JD    | 10,000   | 25,000   | 35,000   | 62,600   | 40,000   | 10,000   | 5,0      | 8,490 | <b>10,050</b> |
| BT 50 | JD    | 12,000   | 30,000   | 42,000   | 80,000   | 45,000   | 10,000   | 6,0      | 8,600 | <b>12,050</b> |
| BT 50 | JD    | 14,000   | 32,000   | 44,000   | 80,000   | 45,000   | 10,000   | 6,0      | 8,370 | <b>14,050</b> |
| BT 50 | JD    | 16,000   | 36,000   | 48,000   | 80,000   | 48,000   | 10,000   | 6,0      | 8,370 | <b>16,050</b> |
| BT 50 | JD    | 18,000   | 38,000   | 50,000   | 80,000   | 48,000   | 10,000   | 6,0      | 8,430 | <b>18,050</b> |
| BT 50 | JD    | 20,000   | 40,000   | 52,000   | 80,000   | 50,000   | 10,000   | 8,0      | 8,685 | <b>20,050</b> |
| BT 50 | JD    | 25,000   | 45,000   | 65,000   | 100,000  | 56,000   | 10,000   | 10,0     | 9,240 | <b>25,050</b> |
| BT 50 | JD    | 32,000   | 56,000   | 72,000   | 105,000  | 60,000   | 10,000   | 10,0     | 9,480 | <b>32,050</b> |

## Attacchi utensili

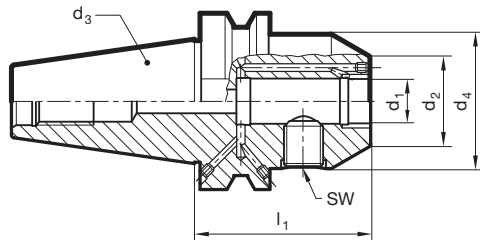
### Attacchi cilindrici Weldon MAS/BT



Catalogo n° 78234



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- da supporto d1 = 25 con due viti di serraggio
- con canali refrigeranti per il raffreddamento periferico, migliorando così la lubrificazione
- alimentazione di refrigerante Forma JD/JF
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio
- ordinare separatamente i perni



| d3    | Forma | d1<br>mm | d2<br>mm | d4<br>mm | l1<br>± mm | SW<br>mm | kg    | Codice        |
|-------|-------|----------|----------|----------|------------|----------|-------|---------------|
| BT 40 | JD/JF | 6,000    | 15,000   | 25,000   | 50,000     | 3,0      | 5,810 | <b>6,040</b>  |
| BT 40 | JD/JF | 8,000    | 20,000   | 28,000   | 50,000     | 4,0      | 5,800 | <b>8,040</b>  |
| BT 40 | JD/JF | 10,000   | 25,000   | 35,000   | 63,000     | 5,0      | 6,050 | <b>10,040</b> |
| BT 40 | JD/JF | 12,000   | 30,000   | 42,000   | 63,000     | 6,0      | 6,000 | <b>12,040</b> |
| BT 40 | JD/JF | 14,000   | 32,000   | 44,000   | 63,000     | 6,0      | 5,930 | <b>14,040</b> |
| BT 40 | JD/JF | 16,000   | 36,000   | 48,000   | 63,000     | 6,0      | 5,980 | <b>16,040</b> |
| BT 40 | JD/JF | 18,000   | 38,000   | 50,000   | 63,000     | 6,0      | 6,170 | <b>18,040</b> |
| BT 40 | JD/JF | 20,000   | 40,000   | 52,000   | 63,000     | 8,0      | 6,150 | <b>20,040</b> |
| BT 40 | JD/JF | 25,000   | 45,000   | 63,000   | 90,000     | 10,0     | 6,700 | <b>25,040</b> |
| BT 40 | JD/JF | 32,000   | 56,000   | 72,000   | 100,000    | 10,0     | 7,170 | <b>32,040</b> |

## Attacchi utensili

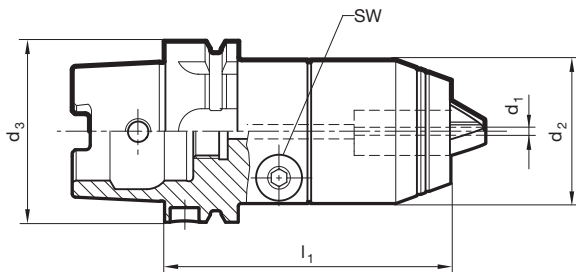
### Mandrini portapunte CN HSK-A con raffreddamento interno



Catalogo n° 78346



- per il serraggio di tutti i codoli cilindrici
- HSK-A a ISO 12164-1 / DIN 69893-1
- gamma di serraggio  $\varnothing$  continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente l'unità di adduzione refrigerante



| d3        | d1     | d2<br>mm | l1<br>mm | SW<br>mm | kg    | Codice        |
|-----------|--------|----------|----------|----------|-------|---------------|
| HSK-A 63  | 1,0-16 | 50,000   | 98,000   | 4,0      | 1,900 | <b>16,063</b> |
| HSK-A 100 | 1,0-16 | 50,000   | 104,000  | 4,0      | 3,300 | <b>16,100</b> |

## Attacchi utensili

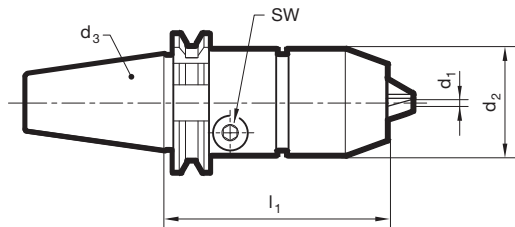
### Mandrini portapunte CN ISO DIN 96871 raffreddamento interno



Catalogo n° 78242



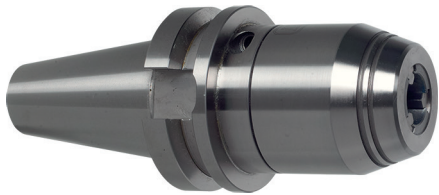
- per il serraggio di tutti i codoli cilindrici
- SK a DIN ISO 7388-1 Forma AD
- gamma di serraggio  $\varnothing$  continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente i perni



| d3    | d1     | d2<br>mm | l1<br>mm | SW<br>mm | kg    | Codice        |
|-------|--------|----------|----------|----------|-------|---------------|
| SK 40 | 1,0-16 | 50,000   | 80,000   | 4,0      | 1,557 | <b>16,040</b> |
| SK 50 | 1,0-16 | 50,000   | 80,000   | 4,0      | 3,500 | <b>16,050</b> |

## Attacchi utensili

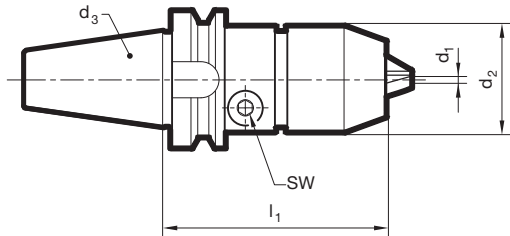
### Mandrini portapunte CN MAS/BT con raffreddamento interno



Catalogo n° 78240



- per il serraggio di tutti i codoli cilindrici
- MAS/BT a DIN ISO 7388-2 Forma JD
- gamma di serraggio  $\varnothing$  continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente i perni



| d3    | d1     | d2<br>mm | l1<br>mm | SW<br>mm | kg    | Codice        |
|-------|--------|----------|----------|----------|-------|---------------|
| BT 40 | 1,0-16 | 50,000   | 88,000   | 4,0      | 1,500 | <b>16,040</b> |
| BT 50 | 1,0-16 | 50,000   | 99,000   | 4,0      | 3,500 | <b>16,050</b> |



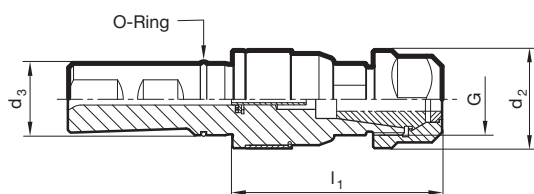
## Mandrini per maschiatura sincrona

### Mandrini di maschiatura sincrona cil. con raffr. interno



Catalogo n° 78326

- compensazione degli errori di sincronizzazione
- la minima lunghezza di compensazione in spinta e trazione bilancia le piccole differenze tra mandrini synchro e maschi e aumenta la qualità della filettatura e la vita utensile
- la vite di regolazione consente 2-3 mm di regolazione
- adatto per refrigerazione interna
- pressione refrigerante max. 50 bar
- Dotazione:
- compreso manicotto IC/ER chiuso a tenuta stagna
- compresa chiave di regolazione per viti di regolazione
- viti di regolazione „plan“ catalogo-Nr. 78364, pinza a filettare catalogo-Nr. 78308, mole catalogo-Nr. 78335 e chiavi di serraggio da ordinare separatamente



| d3<br>mm | Grandezza nom. | d2<br>mm | G        | l1<br>mm | ± mm  | Momento torc.<br>Nm | kg    | Codice        |
|----------|----------------|----------|----------|----------|-------|---------------------|-------|---------------|
| 25,000   | ER20           | 34,000   | M25 X1,5 | 73,000   | 0,150 | 40                  | 0,591 | <b>20,025</b> |
| 25,000   | ER32           | 50,000   | M40 X1,5 | 87,500   | 0,150 | 170                 | 1,300 | <b>32,025</b> |

## Mandrini per maschiatura sincrona

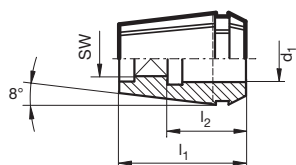
### Pinza di serraggio



Catalogo n° 78308



- per il serraggio di utensili a filettare con codolo quadro in mandrini Synchro o pinze



| Grandezza nom. | d1<br>mm | SW<br>mm | l1<br>mm | l2<br>mm | Codice        |
|----------------|----------|----------|----------|----------|---------------|
| ER20           | 4,000    | 3,2      | 31,500   | 18,000   | <b>4,020</b>  |
| ER20           | 4,500    | 3,4      | 31,500   | 18,000   | <b>4,520</b>  |
| ER20           | 5,500    | 4,3      | 31,500   | 18,000   | <b>5,520</b>  |
| ER20           | 6,000    | 4,9      | 31,500   | 18,000   | <b>6,020</b>  |
| ER20           | 7,000    | 5,5      | 31,500   | 18,000   | <b>7,020</b>  |
| ER20           | 8,000    | 6,2      | 31,500   | 22,000   | <b>8,020</b>  |
| ER20           | 9,000    | 7,0      | 31,500   | 22,000   | <b>9,020</b>  |
| ER20           | 10,000   | 8,0      | 31,500   | 25,000   | <b>10,020</b> |
| ER20           | 11,000   | 9,0      | 31,500   | 25,000   | <b>11,020</b> |
| ER32           | 4,000    | 3,2      | 40,000   | 18,000   | <b>4,032</b>  |
| ER32           | 4,500    | 3,4      | 40,000   | 18,000   | <b>4,532</b>  |
| ER32           | 5,500    | 4,3      | 40,000   | 18,000   | <b>5,532</b>  |
| ER32           | 6,000    | 4,9      | 40,000   | 18,000   | <b>6,032</b>  |
| ER32           | 7,000    | 5,5      | 40,000   | 18,000   | <b>7,032</b>  |
| ER32           | 8,000    | 6,2      | 40,000   | 22,000   | <b>8,032</b>  |
| ER32           | 9,000    | 7,0      | 40,000   | 22,000   | <b>9,032</b>  |
| ER32           | 10,000   | 8,0      | 40,000   | 25,000   | <b>10,032</b> |
| ER32           | 11,000   | 9,0      | 40,000   | 25,000   | <b>11,032</b> |
| ER32           | 12,000   | 9,0      | 40,000   | 25,000   | <b>12,032</b> |
| ER32           | 14,000   | 11,0     | 40,000   | 25,000   | <b>14,032</b> |
| ER32           | 16,000   | 12,0     | 40,000   | 25,000   | <b>16,032</b> |
| ER32           | 18,000   | 14,5     | 40,000   | 25,000   | <b>18,032</b> |
| ER32           | 20,000   | 16,0     | 40,000   | 28,000   | <b>20,032</b> |

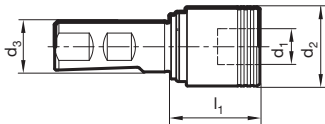
## Mandrini per maschiatura sincrona

### Mandrini di masch. cambio rapido no refrig. interno



- i mandrini a cambio rapido di filettatura sono equipaggiati con bussole a compensazione assiale, guidate su sfere, che pareggiano la differenza tra avanzamento del mandrino e passo del filetto

Catalogo n° 78340



| Grandezza nom. | d1<br>mm | d2<br>mm | d3<br>mm | l1<br>mm | ± mm   | kg    | Codice        |
|----------------|----------|----------|----------|----------|--------|-------|---------------|
| M3-M12         | 19,000   | 36,000   | 25,000   | 39,000   | 7,500  | 0,431 | <b>19,025</b> |
| M8-M20         | 31,000   | 53,000   | 25,000   | 63,000   | 10,000 | 0,900 | <b>31,025</b> |

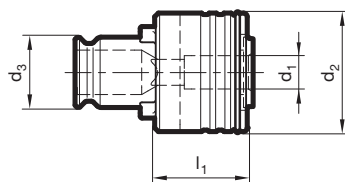
## Mandrini per maschiatura sincrona

### Attacchi intercambiabili per mandrini



Catalogo n° 78206

- con giunto di sicurezza
- adatto per utensili a filettare in HSS
- per utensili a filettare in MD è necessaria una scanalatura sul codolo per garantire un arresto aggiuntivo dell'utensile
- adatto per refrigerazione interna
- pressione refrigerante max. 50 bar



| Grandezza nom. | d1<br>mm | SW<br>mm | d3<br>mm | d2<br>mm | l1<br>mm | Codice |
|----------------|----------|----------|----------|----------|----------|--------|
| M3-M12         | 2,200    |          | 19,000   | 32,000   | 25,000   | 19,022 |
| M3-M12         | 2,500    | 2,1      | 19,000   | 32,000   | 25,000   | 19,025 |
| M3-M12         | 2,800    | 2,1      | 19,000   | 32,000   | 25,000   | 19,028 |
| M3-M12         | 3,500    | 2,7      | 19,000   | 32,000   | 25,000   | 19,035 |
| M3-M12         | 4,000    | 3,0      | 19,000   | 32,000   | 25,000   | 19,040 |
| M3-M12         | 4,500    | 3,4      | 19,000   | 32,000   | 25,000   | 19,045 |
| M3-M12         | 5,500    | 4,5      | 19,000   | 32,000   | 25,000   | 19,055 |
| M3-M12         | 6,000    | 4,9      | 19,000   | 32,000   | 25,000   | 19,060 |
| M3-M12         | 7,000    | 5,5      | 19,000   | 32,000   | 25,000   | 19,070 |
| M3-M12         | 8,000    | 6,2      | 19,000   | 32,000   | 25,000   | 19,080 |
| M3-M12         | 9,000    | 7,0      | 19,000   | 32,000   | 25,000   | 19,090 |
| M3-M12         | 10,000   | 8,0      | 19,000   | 32,000   | 25,000   | 19,100 |
| M8-M20         | 6,000    | 4,9      | 31,000   | 50,000   | 34,000   | 31,060 |
| M8-M20         | 7,000    | 5,5      | 31,000   | 50,000   | 34,000   | 31,070 |
| M8-M20         | 8,000    | 6,2      | 31,000   | 50,000   | 34,000   | 31,080 |
| M8-M20         | 9,000    | 7,0      | 31,000   | 50,000   | 34,000   | 31,090 |
| M8-M20         | 10,000   | 8,0      | 31,000   | 50,000   | 34,000   | 31,100 |
| M8-M20         | 11,000   | 9,0      | 31,000   | 50,000   | 34,000   | 31,110 |
| M8-M20         | 12,000   | 9,0      | 31,000   | 50,000   | 34,000   | 31,120 |
| M8-M20         | 14,000   | 11,0     | 31,000   | 50,000   | 34,000   | 31,140 |
| M8-M20         | 16,000   | 12,0     | 31,000   | 50,000   | 34,000   | 31,160 |

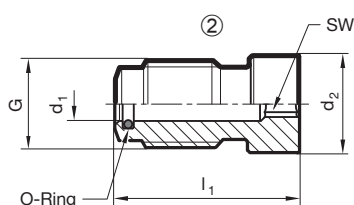
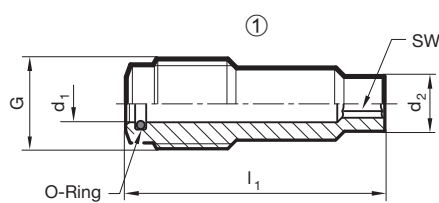
## Mandrini per maschiatura sincrona

### Viti di regolazione „plan“ per masch. sincro con raffr. interno



Catalogo n° 78364

- per mandrini Synchro con codolo cilindrico catalogo-Nr. 78326
- per refrigerazione interna convenzionale
- con arresto piatto per normali estremità del codolo
- posizionare la vite di regolazione sul codolo del maschio
- la vite di regolazione della lunghezza consente 3 mm di registrazione
- Dotazione:
- con anelli a tenuta stagna sicura



| Grandezza nom. | □<br>mm | G     | d1<br>mm | d2<br>mm | l1<br>mm | SW<br>mm | Tipo | Codice        |
|----------------|---------|-------|----------|----------|----------|----------|------|---------------|
| ER20           | 4,900   | M 8X1 | 3,600    | 4,800    | 26,000   | 2,5      | 1    | <b>6,020</b>  |
| ER20           | 5,500   | M 8X1 | 3,600    | 5,400    | 25,800   | 2,5      | 1    | <b>7,020</b>  |
| ER20           | 6,200   | M 8X1 | 3,600    | 6,100    | 20,900   | 2,5      | 1    | <b>8,020</b>  |
| ER20           | 7,000   | M 8X1 | 3,600    | 6,900    | 20,250   | 2,5      | 1    | <b>9,020</b>  |
| ER20           | 8,000   | M 8X1 | 3,600    | 7,800    | 15,800   | 2,5      | 2    | <b>10,020</b> |
| ER20           | 9,000   | M 8X1 | 3,600    | 8,800    | 14,800   | 2,5      | 2    | <b>11,020</b> |
| ER32           | 4,900   | M10X1 | 4,100    | 4,800    | 34,000   | 3,0      | 1    | <b>6,032</b>  |
| ER32           | 5,500   | M10X1 | 4,100    | 5,400    | 33,800   | 3,0      | 1    | <b>7,032</b>  |
| ER32           | 6,200   | M10X1 | 4,100    | 6,100    | 28,800   | 3,0      | 1    | <b>8,032</b>  |
| ER32           | 7,000   | M10X1 | 4,100    | 6,900    | 28,250   | 3,0      | 1    | <b>9,032</b>  |
| ER32           | 8,000   | M10X1 | 4,100    | 7,800    | 23,800   | 3,0      | 1    | <b>10,032</b> |
| ER32           | 9,000   | M10X1 | 4,100    | 8,800    | 22,900   | 3,0      | 1    | <b>11,032</b> |
| ER32           | 11,000  | M10X1 | 4,100    | 10,800   | 20,650   | 3,0      | 2    | <b>14,032</b> |
| ER32           | 12,000  | M10X1 | 4,100    | 11,800   | 19,650   | 3,0      | 2    | <b>16,032</b> |
| ER32           | 14,500  | M10X1 | 4,100    | 14,300   | 18,000   | 3,0      | 2    | <b>18,032</b> |

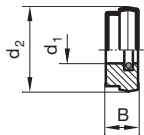
## Mandrini per maschiatura sincrona

### Dischi di tenuta



- Il campo di applicazione del disco di tenuta catalogo.Nr. 78335 va da un Ø nominale d1 fino alla misura successiva minore, cioè per un Ø di 6,3 mm (grandezza nominale ER20) deve essere ordinato un disco di tenuta mit d1 = 6,5 mm (codice 06,520).

Catalogo n° 78335



| Grandezza nom. | d1<br>mm | d2<br>mm | l1<br>mm | Codice |
|----------------|----------|----------|----------|--------|
| ER 16          | 3,000    | 13,000   | 4,000    | 3,016  |
| ER 16          | 3,500    | 13,000   | 4,000    | 3,516  |
| ER 16          | 4,000    | 13,000   | 4,000    | 4,016  |
| ER 16          | 4,500    | 13,000   | 4,000    | 4,516  |
| ER 16          | 5,000    | 13,000   | 4,000    | 5,016  |
| ER 16          | 5,500    | 13,000   | 4,000    | 5,516  |
| ER 16          | 6,000    | 13,000   | 4,000    | 6,016  |
| ER 16          | 6,500    | 13,000   | 4,000    | 6,516  |
| ER 16          | 7,000    | 13,000   | 4,000    | 7,016  |
| ER 16          | 7,500    | 13,000   | 4,000    | 7,516  |
| ER 16          | 8,000    | 13,000   | 4,000    | 8,016  |
| ER 16          | 8,500    | 13,000   | 4,000    | 8,516  |
| ER 16          | 9,000    | 13,000   | 4,000    | 9,016  |
| ER 16          | 9,500    | 13,000   | 4,000    | 9,516  |
| ER 16          | 10,000   | 13,000   | 4,000    | 10,016 |
| ER 20          | 3,000    | 16,000   | 4,000    | 3,020  |
| ER 20          | 3,500    | 16,000   | 4,000    | 3,520  |
| ER 20          | 4,000    | 16,000   | 4,000    | 4,020  |
| ER 20          | 4,500    | 16,000   | 4,000    | 4,520  |
| ER 20          | 5,000    | 16,000   | 4,000    | 5,020  |
| ER 20          | 5,500    | 16,000   | 4,000    | 5,520  |
| ER 20          | 6,000    | 16,000   | 4,000    | 6,020  |
| ER 20          | 6,500    | 16,000   | 4,000    | 6,520  |
| ER 20          | 7,000    | 16,000   | 4,000    | 7,020  |
| ER 20          | 7,500    | 16,000   | 4,000    | 7,520  |
| ER 20          | 8,000    | 16,000   | 4,000    | 8,020  |
| ER 20          | 8,500    | 16,000   | 4,000    | 8,520  |
| ER 20          | 9,000    | 16,000   | 4,000    | 9,020  |
| ER 20          | 9,500    | 16,000   | 4,000    | 9,520  |
| ER 20          | 10,000   | 16,000   | 4,000    | 10,020 |
| ER 20          | 10,500   | 16,000   | 4,000    | 10,520 |
| ER 20          | 11,000   | 16,000   | 4,000    | 11,020 |
| ER 20          | 11,500   | 16,000   | 4,000    | 11,520 |
| ER 20          | 12,000   | 16,000   | 4,000    | 12,020 |
| ER 20          | 12,500   | 16,000   | 4,000    | 12,520 |
| ER 20          | 13,000   | 16,000   | 4,000    | 13,020 |
| ER 25          | 3,000    | 21,000   | 4,000    | 3,025  |
| ER 25          | 3,500    | 21,000   | 4,000    | 3,525  |
| ER 25          | 4,000    | 21,000   | 4,000    | 4,025  |
| ER 25          | 4,500    | 21,000   | 4,000    | 4,525  |
| ER 25          | 5,000    | 21,000   | 4,000    | 5,025  |
| ER 25          | 5,500    | 21,000   | 4,000    | 5,525  |

| Grandezza nom. | d1<br>mm | d2<br>mm | l1<br>mm | Codice |
|----------------|----------|----------|----------|--------|
| ER 25          | 6,000    | 21,000   | 4,000    | 6,025  |
| ER 25          | 6,500    | 21,000   | 4,000    | 6,525  |
| ER 25          | 7,000    | 21,000   | 4,000    | 7,025  |
| ER 25          | 7,500    | 21,000   | 4,000    | 7,525  |
| ER 25          | 8,000    | 21,000   | 4,000    | 8,025  |
| ER 25          | 8,500    | 21,000   | 4,000    | 8,525  |
| ER 25          | 9,000    | 21,000   | 4,000    | 9,025  |
| ER 25          | 9,500    | 21,000   | 4,000    | 9,525  |
| ER 25          | 10,000   | 21,000   | 4,000    | 10,025 |
| ER 25          | 10,500   | 21,000   | 4,000    | 10,525 |
| ER 25          | 11,000   | 21,000   | 4,000    | 11,025 |
| ER 25          | 11,500   | 21,000   | 4,000    | 11,525 |
| ER 25          | 12,000   | 21,000   | 4,000    | 12,025 |
| ER 25          | 12,500   | 21,000   | 4,000    | 12,525 |
| ER 25          | 13,000   | 21,000   | 4,000    | 13,025 |
| ER 25          | 13,500   | 21,000   | 4,000    | 13,525 |
| ER 25          | 14,000   | 21,000   | 4,000    | 14,025 |
| ER 25          | 14,500   | 21,000   | 4,000    | 14,525 |
| ER 25          | 15,000   | 21,000   | 4,000    | 15,025 |
| ER 25          | 15,500   | 21,000   | 4,000    | 15,525 |
| ER 25          | 16,000   | 21,000   | 4,000    | 16,025 |
| ER 32          | 3,000    | 27,000   | 4,000    | 3,032  |
| ER 32          | 3,500    | 27,000   | 4,000    | 3,532  |
| ER 32          | 4,000    | 27,000   | 4,000    | 4,032  |
| ER 32          | 4,500    | 27,000   | 4,000    | 4,532  |
| ER 32          | 5,000    | 27,000   | 4,000    | 5,032  |
| ER 32          | 5,500    | 27,000   | 4,000    | 5,532  |
| ER 32          | 6,000    | 27,000   | 4,000    | 6,032  |
| ER 32          | 6,500    | 27,000   | 4,000    | 6,532  |
| ER 32          | 7,000    | 27,000   | 4,000    | 7,032  |
| ER 32          | 7,500    | 27,000   | 4,000    | 7,532  |
| ER 32          | 8,000    | 27,000   | 4,000    | 8,032  |
| ER 32          | 8,500    | 27,000   | 4,000    | 8,532  |
| ER 32          | 9,000    | 27,000   | 4,000    | 9,032  |
| ER 32          | 9,500    | 27,000   | 4,000    | 9,532  |
| ER 32          | 10,000   | 27,000   | 4,000    | 10,032 |
| ER 32          | 10,500   | 27,000   | 4,000    | 10,532 |
| ER 32          | 11,000   | 27,000   | 4,000    | 11,032 |
| ER 32          | 11,500   | 27,000   | 4,000    | 11,532 |
| ER 32          | 12,000   | 27,000   | 4,000    | 12,032 |
| ER 32          | 12,500   | 27,000   | 4,000    | 12,532 |
| ER 32          | 13,000   | 27,000   | 4,000    | 13,032 |
| ER 32          | 13,500   | 27,000   | 4,000    | 13,532 |
| ER 32          | 14,000   | 27,000   | 4,000    | 14,032 |
| ER 32          | 14,500   | 27,000   | 4,000    | 14,532 |
| ER 32          | 15,000   | 27,000   | 4,000    | 15,032 |
| ER 32          | 15,500   | 27,000   | 4,000    | 15,532 |
| ER 32          | 16,000   | 27,000   | 4,000    | 16,032 |
| ER 32          | 16,500   | 27,000   | 4,000    | 16,532 |
| ER 32          | 17,000   | 27,000   | 4,000    | 17,032 |
| ER 32          | 17,500   | 27,000   | 4,000    | 17,532 |
| ER 32          | 18,000   | 27,000   | 4,000    | 18,032 |
| ER 32          | 18,500   | 27,000   | 4,000    | 18,532 |
| ER 32          | 19,000   | 27,000   | 4,000    | 19,032 |
| ER 32          | 19,500   | 27,000   | 4,000    | 19,532 |
| ER 32          | 20,000   | 27,000   | 4,000    | 20,032 |
| ER 40          | 3,500    | 33,500   | 4,000    | 3,540  |
| ER 40          | 4,000    | 33,500   | 4,000    | 4,040  |
| ER 40          | 4,500    | 33,500   | 4,000    | 4,540  |
| ER 40          | 5,000    | 33,500   | 4,000    | 5,040  |
| ER 40          | 5,500    | 33,500   | 4,000    | 5,540  |
| ER 40          | 6,000    | 33,500   | 4,000    | 6,040  |
| ER 40          | 6,500    | 33,500   | 4,000    | 6,540  |
| ER 40          | 7,000    | 33,500   | 4,000    | 7,040  |
| ER 40          | 7,500    | 33,500   | 4,000    | 7,540  |
| ER 40          | 8,000    | 33,500   | 4,000    | 8,040  |
| ER 40          | 8,500    | 33,500   | 4,000    | 8,540  |
| ER 40          | 9,000    | 33,500   | 4,000    | 9,040  |
| ER 40          | 9,500    | 33,500   | 4,000    | 9,540  |
| ER 40          | 10,000   | 33,500   | 4,000    | 10,040 |
| ER 40          | 10,500   | 33,500   | 4,000    | 10,540 |
| ER 40          | 11,000   | 33,500   | 4,000    | 11,040 |

| Grandezza nom. | d1<br>mm | d2<br>mm | l1<br>mm | Codice |
|----------------|----------|----------|----------|--------|
| ER 40          | 11,500   | 33,500   | 4,000    | 11,540 |
| ER 40          | 12,000   | 33,500   | 4,000    | 12,040 |
| ER 40          | 12,500   | 33,500   | 4,000    | 12,540 |
| ER 40          | 13,000   | 33,500   | 4,000    | 13,040 |
| ER 40          | 13,500   | 33,500   | 4,000    | 13,540 |
| ER 40          | 14,000   | 33,500   | 4,000    | 14,040 |
| ER 40          | 14,500   | 33,500   | 4,000    | 14,540 |
| ER 40          | 15,000   | 33,500   | 4,000    | 15,040 |
| ER 40          | 15,500   | 33,500   | 4,000    | 15,540 |
| ER 40          | 16,000   | 33,500   | 4,000    | 16,040 |
| ER 40          | 16,500   | 33,500   | 4,000    | 16,540 |
| ER 40          | 17,000   | 33,500   | 4,000    | 17,040 |
| ER 40          | 17,500   | 33,500   | 4,000    | 17,540 |
| ER 40          | 18,000   | 33,500   | 4,000    | 18,040 |
| ER 40          | 18,500   | 33,500   | 4,000    | 18,540 |
| ER 40          | 19,000   | 33,500   | 4,000    | 19,040 |
| ER 40          | 19,500   | 33,500   | 4,000    | 19,540 |
| ER 40          | 20,000   | 33,500   | 4,000    | 20,040 |
| ER 40          | 20,500   | 33,500   | 4,000    | 20,540 |
| ER 40          | 21,000   | 33,500   | 4,000    | 21,040 |
| ER 40          | 21,500   | 33,500   | 4,000    | 21,540 |
| ER 40          | 22,000   | 33,500   | 4,000    | 22,040 |
| ER 40          | 22,500   | 33,500   | 4,000    | 22,540 |
| ER 40          | 23,000   | 33,500   | 4,000    | 23,040 |
| ER 40          | 23,500   | 33,500   | 4,000    | 23,540 |
| ER 40          | 24,000   | 33,500   | 4,000    | 24,040 |
| ER 40          | 24,500   | 33,500   | 4,000    | 24,540 |
| ER 40          | 25,000   | 33,500   | 4,000    | 25,040 |
| ER 40          | 25,500   | 33,500   | 4,000    | 25,540 |
| ER 40          | 26,000   | 33,500   | 4,000    | 26,040 |

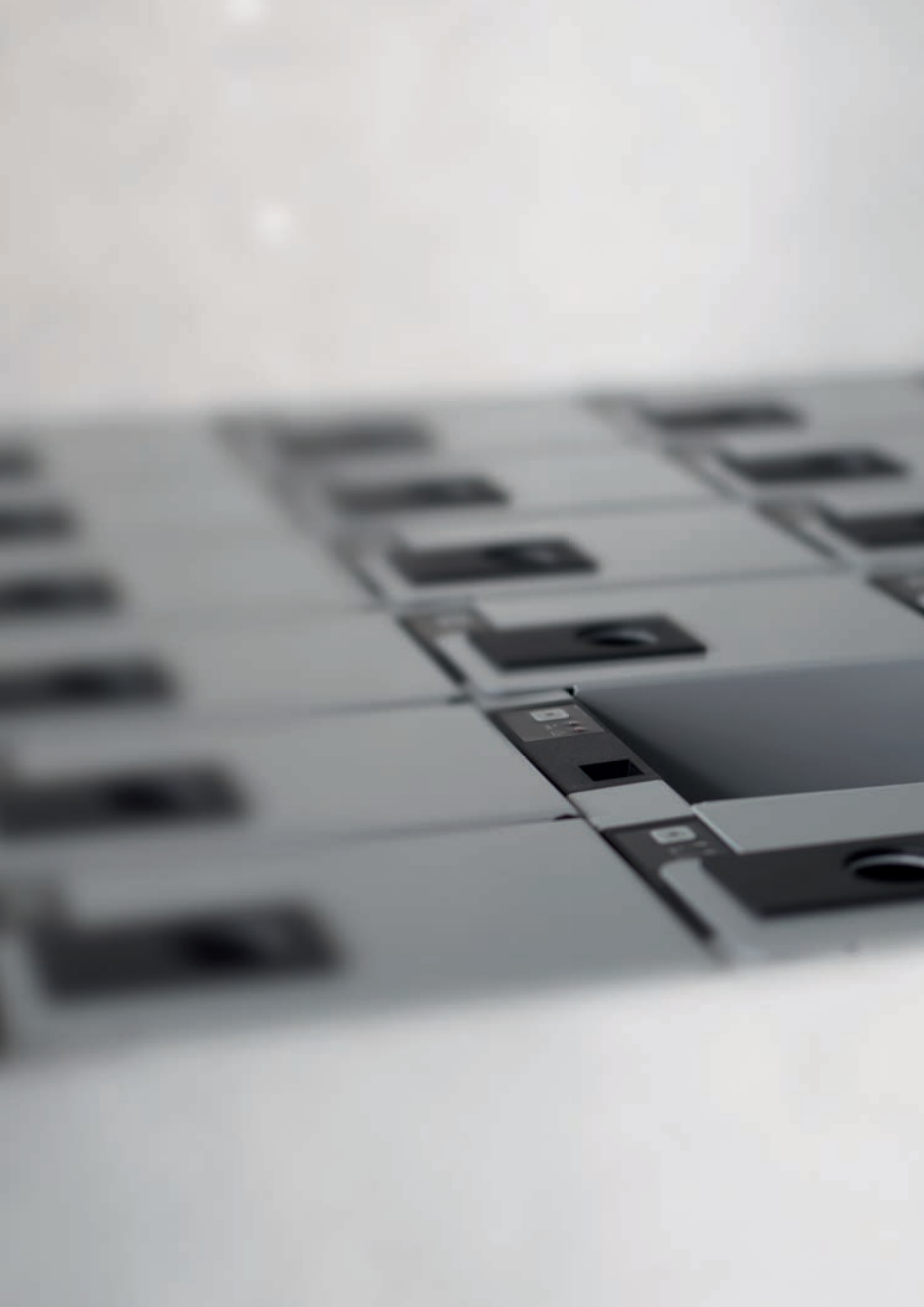


# **STOCK** UTENSILI SPECIALI

Soluzioni speciali per richieste individuali



Moduli di richiesta a pagina 816.





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# DISTRIBUTORE AUTOMATICO



# TSC mini



Il TSC mini è un sistema controllato elettronicamente a moduli estendibili con tutte le funzionalità del software TSC.

I cassetti elettronicamente bloccabili permettono il prelievo degli utensili in modo controllato. L' altezza degli scomparti e dei cassetti possono essere adattati alle esigenze del cliente.

Sistema per Portautensili



Scomparti elettronici

Scomparti per Inserti



Scomparti Regolabili

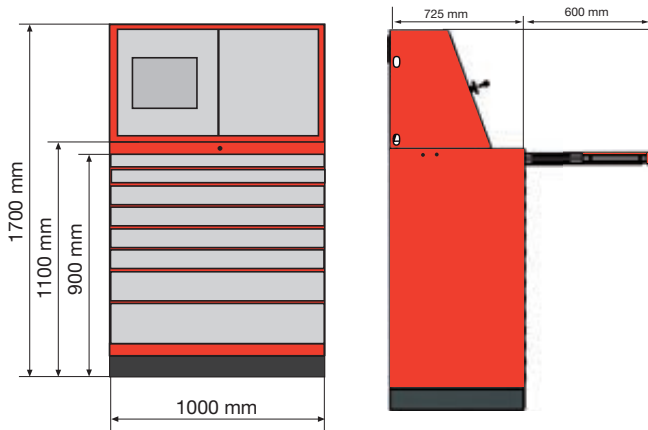


Scomparti Semplici

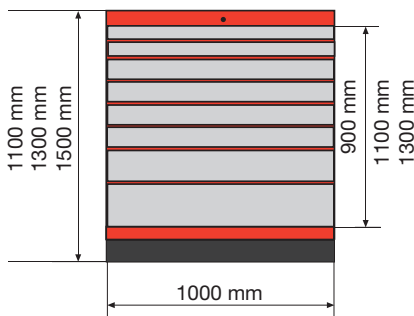


# TSC mini - Opzioni e Dimensioni

## Unità Base



- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Divisori per ogni tipologia di cassetto
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



## Unità Aggiuntiva

- Sistema di distribuzione utensili elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Divisori per ogni tipologia di cassetto
- Disponibile in tre differenti altezze: 1100 mm / 1300 mm / 1500 mm

### • Cassetti Standard

Dimensioni interne: 600 x 900 mm

Altezze: 75 mm / 100 mm / 125 mm / 150 mm  
200 mm / 250 mm / 300 mm / 400 mm

#### Tipologie Cassetti Disponibili

- Tappetino Anti-Scivolo
- Scomparti Regolabili
- Scomparti per Inserti
- Scomparti Semplici
- Sistema per Portautensili

### • Cassetti con Spirali

Altezza cassetto: 150 mm

Numero massimo di spirali: 10

Il cassetto di ritiro presenta 3 scomparti con serratura manuale

Altezza Cassetto : 150 mm

### • Cassetti con scomparti elettronicamente bloccati

Altezze disponibili: 75 / 100 / 150 / 200 / 250 mm

| Scomparti per Cassetto | Dim. Int. Scomparto Largh. x Profon. | Disposizione Scomparti Largh. x Profon. |
|------------------------|--------------------------------------|---|
| 4                      | 440 mm x 259 mm                      | 2 x 2                                   |
| 8                      | 440 mm x 125 mm                      | 2 x 4                                   |
| 12                     | 440 mm x 75 mm                       | 2 x 6                                   |
| 12                     | 225 mm x 200 mm                      | 3 x 4                                   |
| 16                     | 220 mm x 125 mm                      | 4 x 4                                   |
| 18                     | 146 mm x 175 mm                      | 6 x 3                                   |
| 20                     | 220 mm x 95 mm                       | 4 x 5                                   |
| 24                     | 146 mm x 125 mm                      | 6 x 4                                   |
| 24                     | 220 mm x 75 mm                       | 4 x 6                                   |
| 32                     | 109 mm x 125 mm                      | 8 x 4                                   |
| 36                     | 146 mm x 75 mm                       | 6 x 6                                   |
| 40                     | 109 mm x 95 mm                       | 8 x 5                                   |
| 48                     | 109 mm x 75 mm                       | 8 x 6                                   |

# TSC midi

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Il TSC midi fornisce il pieno controllo del prelievo degli utensili in quanto i cassetti si aprono solo in base alla quantità del prodotto selezionato in precedenza. Associando ai prelievi un centro di costo si ottiene la massima trasparenza.

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## Tipologia di Cassetti

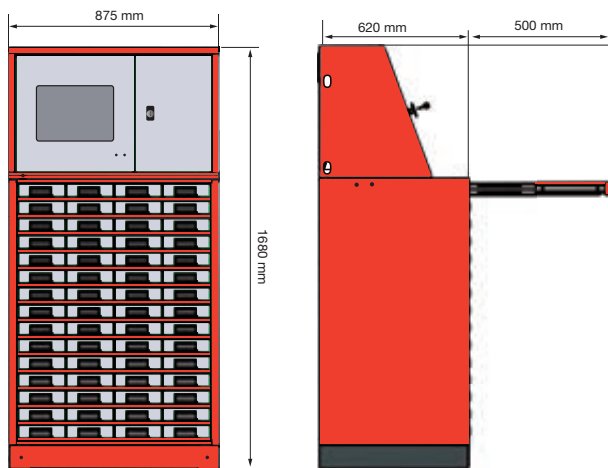
La configurazione dei cassetti è variabile e quindi può essere adattata alle esigenze del cliente.

Altezze Effettive Possibili: 42 / 60 / 113 / 186 / 258 mm

Altezze Effettive Possibili: 50 mm / 8 Schubladen cassetti per livello  
110 mm / 5 Schubladen cassetti per livello  
150 mm / 4 Schubladen cassetti per livello  
215 mm / 3 Schubladen cassetti per livello  
350 mm / 2 Schubladen cassetti per livello

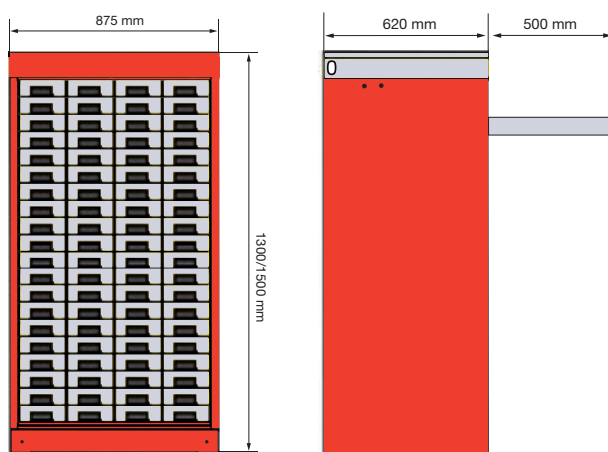
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# TSC midi - Opzioni e dimensioni



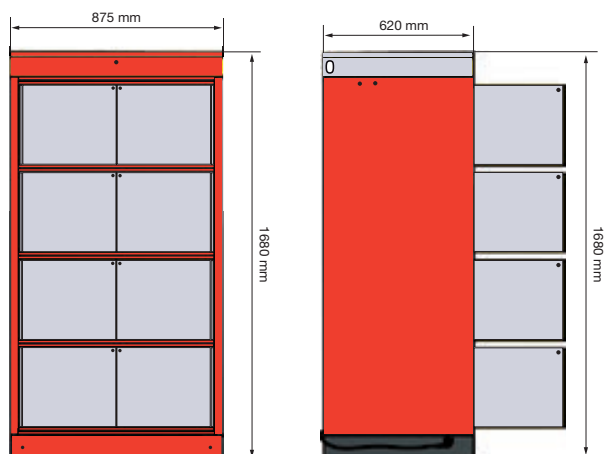
## Unità Base

- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



## Unità Aggiuntiva con cassetti

- due differenti configurazioni (1300 mm / 1500 mm)
- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente con estrazione elettronicamente limitata (portata max. 20 Kg per cassetto)
- Altezza e larghezza cassetti standard



## Unità Aggiuntiva con cassetti elettronicamente bloccati

- 8 o 16 scomparti elettronicamente bloccati
- 8 Scomparti      360 x 340 x 590 mm (BxHxT)
- 16 Scomparti     360 x 150 x 590 mm (BxHxT)

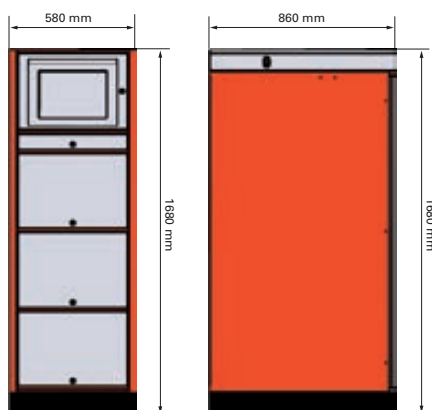
# TSC maxi

Il TSC maxi è la soluzione perfetta per immagazzinare grosse quantità di utensili in uno spazio ridotto. Nel sistema a spirale del TSC maxi, gli utensili sono immagazzinati in modo da occupare il minor spazio possibile, mantenendo però l'assoluta sicurezza. Durante il prelievo gli utensili vengono rilasciati attraverso un sistema di sollevamento.



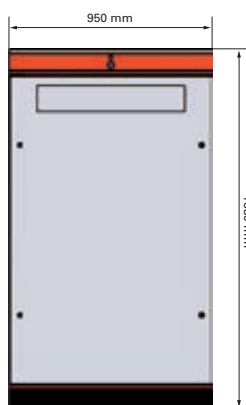


# TSC maxi - Opzioni e dimensioni



## Unità di Controllo

- 3 Cassetti manuali
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



## Unità di Erogazione/ Stoccaggio

- Principio di prelievo: FIFO
- Portata per ogni livello di spirale: 90 Kg
- Cassetto di ritiro situato nella parte alta dell' unità
- Sistema di sollevamento adattato per la distribuzione di utensili

- **Livelli di Spirale**

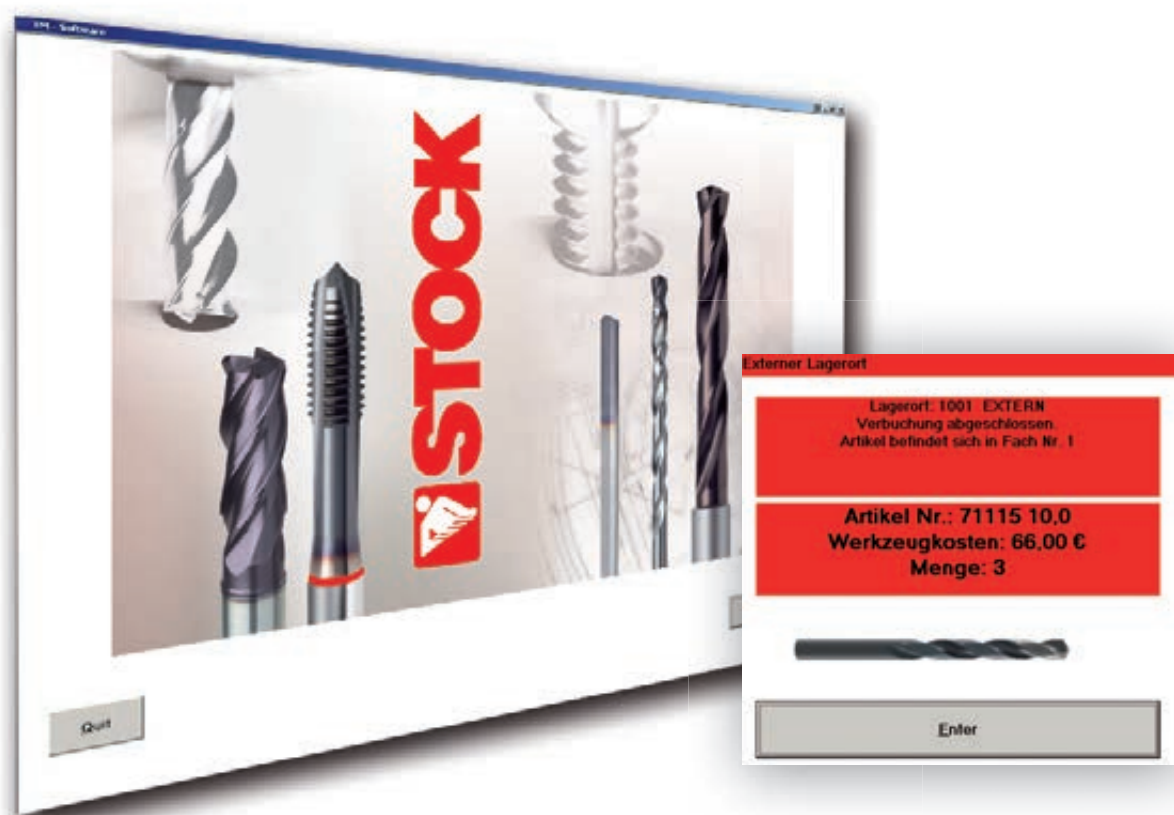
6 / 7 / 8 fino a 10 spirali per livello

- **Partizioni a Spirale**

9 / 13 / 15 / 21 / 24 / 31 ubicazioni

Materiale di separazione, per una gestione ottimale dei prodotti, su richiesta.

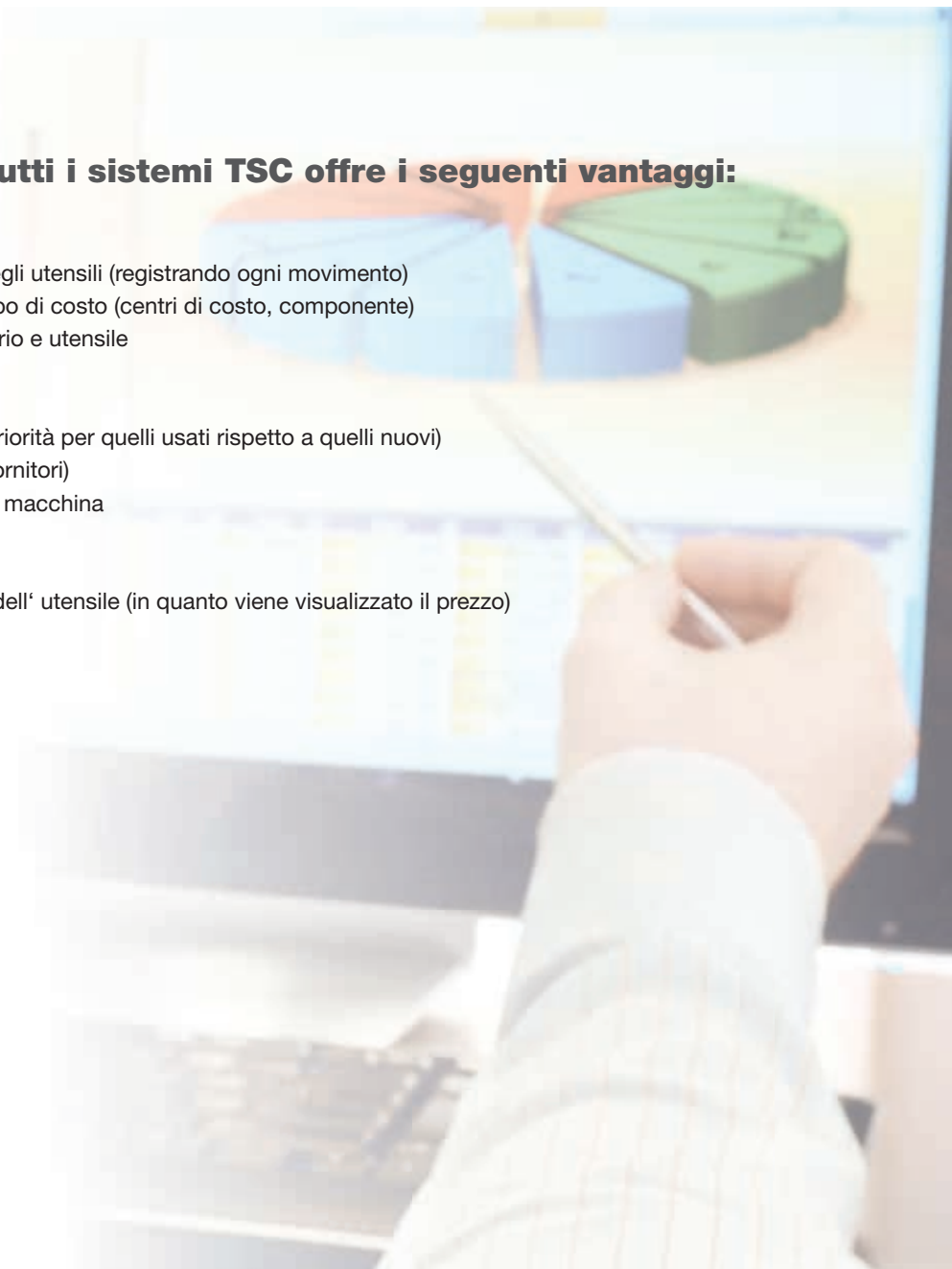
# TSC Software



Il software può essere collegato con tutti i sistemi gestionali ERP. Inoltre, c'è la possibilità di controllare e gestire il sistema tramite una terza parte come un paternoster o magazzini verticali. E' possibile anche integrare il software con una struttura già esistente, anche dopo una prima installazione.

## Il Software standard per tutti i sistemi TSC offre i seguenti vantaggi:

- Semplice e intuitivo
- Monitoraggio continuo del consumo degli utensili (registrando ogni movimento)
- Attribuzione dei costi utensile per gruppo di costo (centri di costo, componente)
- Analisi ABC, centri di costo/costo unitario e utensile
- Interfaccia con sistemi gestionali ERP
- Connessione via internet con i fornitori
- Gestione degli utensili ri-lavorati (con priorità per quelli usati rispetto a quelli nuovi)
- Sistema aperto (possono esistere più fornitori)
- Gestione degli utensili non ubicati nella macchina
- Gestione della riaffilatura
- Calibrazione
- Consapevolezza dell' utente sul costo dell' utensile (in quanto viene visualizzato il prezzo)



**9 S 20**

**1010**

**ISO**

**1.7149**

**1 ½**

**HSCO  
HSS-E**

**bright**

**TiN**

K20-K40

+34

H11

CO content  
[M-%]

pitch  
P

X 53  
CrMnNiN  
21 9

BT (min)

SCR 415 (H)

<700°

$9,3 \cdot 10^{-6}$

N7



## TABELLE

## Materiali taglienti

# I più importanti gruppi di metallo duro

| Tipo    | Contenuto di Co [M-%] | Grandezza grana WC [µm] | Durezza [HV] | Classificazione ISO [ISO 513]            | Caratteristiche   |
|---------|-----------------------|-------------------------|--------------|--|---|
| DK460UF | 10                    | 0,5                     | 1620         | K20-K40 ricoperto: P, M20-M40, H, S, N25 | Tipo per impiego molto vasto, che, prevalentemente ricoperto, si impiega per lavorare acciai, leghe tenere di Al, ghise, ma anche superleghe come inconel 718. Questo tipo rappresenta la colonna vertebrale della nostra produzione.                                       |
| DK500UF | 12                    | 0,5                     | 1680         | K25 ricoperto: P, M, H, S, N25           | Questo tipo è stato sviluppato specificatamente per la lavorazione di materiali temprati. Si distingue, rispetto al Dk 460 UF, per durezza superiore e grosse tolleranze di deformazione. Per l'elevato contenuto di Co si consiglia assolutamente di impiegarlo ricoperto. |
| DK255F  | 8                     | 0,7                     | 1720         | K20 ricoperto: P, M, H, S, N20           | Questo tipo è consigliato per lavorare materiali temprati, tipi di ghise molto dure e leghe dure di Al-Si. E' possibile la lavorazione a secco. E' preferibile impiegarlo ricoperto.  |
| DK120   | 6                     | 1,3                     | 1620         | K15 ricoperto: N15                       | Questo tipo è adatto specialmente per l'impiego con ricopertura diamantata.   |
| DK120UF | 7                     | 0,5                     | 1850         | K05                                      | Tipo a grana ultra fine con massima resistenza all'usura, adatto per macchine assolutamente stabili, preferito per alesatori.   |
| K55SF   | 9                     | 0,2 -0,5                | 1920         | K10-K30                                  | Per l'impiego con materiali molto resistenti all'usura, acciai inossidabili, materiali compositi, come kevlar o fibre di vetro rinforzate, lavorazione ad alta velocità e lavorazione a secco.  |
| DK400N  | 10                    | 0,7                     | 1580         | K35M ricoperto: P, M, S, N35M            | Tipo molto plastico per la lavorazione di metalli resistenti alle alte temperature.   |

## Acciai super rapidi

Produciamo utensili HSS solo con materiali taglienti di alto valore.

Con la scelta mirata degli elementi di lega, i nostri utensili acquistano le proprietà ottimali per i singoli lavori.

Wolframio: aumenta la rinvenibilità e la resistenza all'usura.

Molibdeno: migliora la plasticità. Vanadio: aumenta la resistenza all'usura per utensili di finitura.

Cobalto: consente superiori temperature nella tempera ed aumenta quindi la resistenza al calore.

| Designazione      | Designazione acciaio             | Nr. materiali (chiave x acciai) | Campo di impiego, proprietà   | Acciai esteri corrispondenti |                            |            |               |                |       |
|-------------------|----------------------------------|---------------------------------|---|------------------------------|----------------------------|------------|---------------|----------------|-------|
|                   |                                  |                                 |   | USA                          | Francia                    | Italia     | Gran Bretagna | China          | Japan |
| <b>HSS</b>        | HS 6-5-2 (DMo5)                  | 1.3343                          | Materiale tagliente standard per impiego universale   | M 2                          | Z 90 WDCV 06-05-04-02      | HS 6-5-2   | BM 2          | W6Mo5 Cr4V2    | SKH51 |
| <b>HSCO HSS-E</b> | HS 6-5-2-5 (EMo5Co5)             | 1.3243                          | Alta resistenza al calore, adatti soprattutto per sgrossare o con refrigerazione insufficiente            | M 35                         | Z 90 WDKCV 06-05-05-04-02  | HS 6-5-2-5 | BM 35         | W6Mo5 Cr4V2Co5 | SKH55 |
| <b>HSS-E</b>      | HS 6-5-3 (EMo5V3)                | 1.3344                          | Alta stabilità degli spigoli taglienti, importante in alesatura   | M 3                          | Z 120 WDCV 06-05-04-03     | HS 6-5-3   | -             | W6Mo5 Cr4V3    | SKH52 |
| <b>M42 HSS-E</b>  | HS 2-9-1-8                       | 1.3247                          | Elevata resistenza al calore e durezza, adatti per lavorare in materiali di difficile truciolabilità      | M 42                         | Z 110 DKCWV 09-08-04-02-01 | HS 2-9-1-8 | BM 42         | W2Mo9Cr4 VCo8  | SKH59 |
| <b>HSS-E-PM</b>   | 10-2-5-8 PM52<br>HS 6-5-3-8 PM30 | 1.3253<br>1.3294                | Alta durezza, resistenza al calore e stabilità degli spigoli taglienti, struttura molto spessa e costante | -                            | -                          | -          | -             | -              | -     |

## Finitura superficiale, rivestimento

### Indice base stesso codolo

#### lucido

Utensili di acciaio super rapido o in metallo duro offrono anche senza trattamenti superficiali e rivestimenti già in generale buone prestazioni. In ogni caso gli utensili lucidi del programma standard offrono la possibilità di un rivestimento economico a scelta del cliente tra tutti i rivestimenti.

#### vaporizzati-nitruati

##### nitruati sulle fasi

Valori consigliati per la lavorazione di materiali come ghisa grigia e alluminio con alto contenuto di silicio materie plastiche acciai con alti contenuti di perlite. I nitruati seguono diversi orientamenti di impiego.

#### Superfici trattamento di raffinazione

Per casi specifici si consiglia una finitura superficiale che elevi la resistenza alla fessurazione e la scorrevolezza e che diminuisca gli attriti. Qui rivestimenti duri perdono ogni significato di finitura superficiale, mentre rivestimenti teneri forniscono risultati molto migliori.

#### trattati a vapore

Utensili trattati al vapore o saldati come per la lavorazione di acciai a basso contenuto di carbonio possono essere esentati da rivestimenti. Questi sono in ogni caso esclusivamente impiegati per la lavorazione di materiali ferrosi.

### I rivestimenti

|                             | AlTiN  | AlTiN + AlTiN nano   | TiSiN  | TiCN                        | DLC                            | Diamant                                   |
|-----------------------------|--|--|--|-----------------------------|--------------------------------|---|
|                             |  |  |  |                             |                                |   |
| colore                      | violetto   | grigiovioletto   | ramato   | grigiovioletto              | nero                           | antracite                                 |
| durezza                     | 3200 HV  | 3400 HV  | 4000 HV  | 3000 HV                     | > 6000 HV                      | > 8000 HV                                 |
| coefficiente di attrito     | 0,55   | 0,6  | 0,5  | 0,4                         | < 0,1                          | < 0,1                                     |
| max. temperatura di impiego | < 800°   | < 900°   | < 800°   | < 400°                      | < 700°                         | < 700°                                    |
| descrizione breve           | durezza rivestimento per applicazioni abrasive HPC e MMS | durezza rivestimento per truciolatura difficile HPC come anche MMS | rivestimento molto duro e resistente alle fessurazioni | rivestimento durezza tenace | rivestimento estremamente duro | rivestimento diamantato estremamente duro |

|                             | TiAlN/ TiAlN nano  | AlCrN  | TiN                             | TiAlSiN  | AlTiZrN  | CrN                                    |
|-----------------------------|--|--|---------------------------------|--|--|--|
|                             |  |  |                                 |  |  |  |
| colore                      | violetto   | grigio-blu   | orogiallo                       | rossobronzo  | oro pallido                                      | grigio metallizzato                    |
| durezza                     | 3300 - HV  | 3200 HV  | 2300 - HV                       | 5500 - HV  | 3400 HV  | 3500 HV                                |
| coefficiente di attrito     | 0,6  | 0,35   | 0,5                             | 0,55   | 0,5  | 0,6                                    |
| max. temperatura di impiego | < 800°   | < 1100°  | < 600°                          | < 800°   | < 800°   | < 1000°                                |
| descrizione breve           | rivestimento multistrato anti fessurazione anche per lavorazioni con lubrificazione minimale | rivestimento resistente alle fessurazioni alle ossidazioni e al calore | rivestimento standard economico | rivestimento multistrato duro e resistente al calore | rivestimento duro e resistente alle fessurazioni | rivestimento duro resistente al calore |

## Informazioni basilari della filettatura

### Imbocco, scelta ed impiego

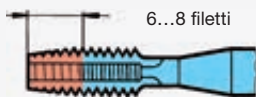
Nel filettare internamente, l'intero lavoro di truciolatura grava sui denti dell'imbocco. Di conseguenza la scelta della forma di imbocco più adatta deve essere molto accurata, poichè da essa dipende non solo la durata del maschio, ma anche la qualità della filettatura.

La forma e la lunghezza dell'imbocco dipendono principalmente dal tipo di preforo, se passante o cieco. Il foro passante non richiede ulteriori definizioni. Al contrario con il termine foro cieco sono indicate tutte le forature nelle quali lo scarico del truciolo è in direzione contraria a quella dell'avanzamento ed esso deve quindi essere tagliato nel ritorno del maschio. Fori ciechi possono anche essere forature passanti.

Anche la lunghezza dell'imbocco deve essere ben ponderata. Per evitare sovraccarichi, blocchi e filettature troppo grosse, non si deve tenere troppo basso il numero dei denti del filetto. D'altra parte un imbocco troppo lungo aumenta il momento di torsione e quindi fa insorgere pericolo di rottura. L'imbocco corretto forma B permette che lo scarico del truciolo avvenga nella direzione dell'avanzamento.

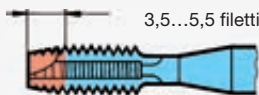
#### Forme di imbocco a DIN 2197

##### Forma A



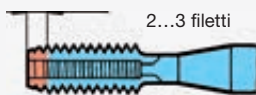
lunga, 6 - 8 filetti  
per fori passanti corti

##### Forma B



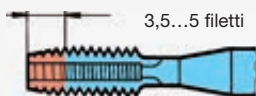
media, 3,5 - 5,5 filetti,  
con imbocco corretto,  
per tutti i fori passanti e  
grosse profondità di filettatura in materiali  
a truciolo medio e lungo

##### Forma C



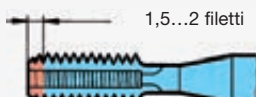
corta, 2 - 3 filetti  
per fori ciechi ed  
in generale per alu,  
ghisa grigia ed ottone

##### Forma D



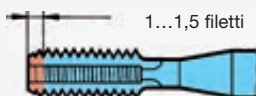
media, 3,5 - 5 filetti  
per fori passanti corti

##### Forma E



molto corta, 1,5-2 filetti,  
per fori ciechi con sbocco  
del filetto molto corto.

##### Forma F



molto corta, 1,5-2 filetti,  
per fori ciechi con sbocco  
del filetto molto corto.  
Da evitare se possibile.

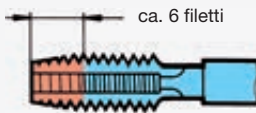


## Informazioni basilari della filettatura

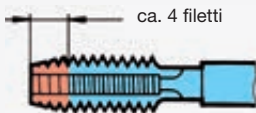
# Imbocco, scelta ed impiego

### Lunghezza di imbocco per serie di maschi, 3 pezzi

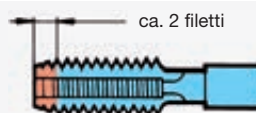
**Forma A**  
per sbozzatore



**Forma D**  
per intermedio

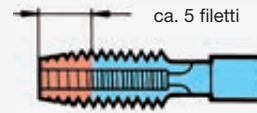


**Forma C**  
per finitore

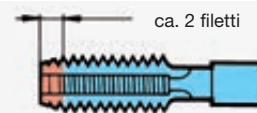


### Lunghezza di imbocco per serie di maschi, 2 pezzi

**Forma D**  
per sbozzatore



**Forma C**  
per finitore



### Consigli per l'impiego

Mentre il tipo di preforo determina in primo luogo l'imbocco, il resto della geometria del maschio, come forma, numero e direzione dei taglienti, angolo di taglio, ecc., dipendono anche dal materiale da lavorare e dal tipo di lavoro. Perciò i maschi per filettatura metrica ISO od in generale per lavorazione di acciaio hanno, di norma, 3 taglienti fino a M 16, per misure superiori, 4 o più taglienti.

Maschi con taglienti elicoidali sinistri come pure maschi con imbocco corretto spingono i trucioli nella direzione di taglio e di avanzamento e sono quindi molto indicati per la lavorazione di fori passanti. Anche taglienti dritti ed imbocco lungo (forma D) danno in questo caso buoni risultati.

Per fori ciechi consigliamo maschi con taglienti elicoidali destri o dritti con imbocco corto. Gli utensili con taglienti

destri portano i trucioli verso la parte posteriore in direzione del gambo. L'imbocco è concepito in modo tale che, nell'uscire, il truciolo non incollì, bensì sia facilmente asportato.

Per la lavorazione di alluminio, ghisa grigia ed ottone, sono necessari maschi speciali, generalmente con imbocco corto, sia che si tratti di fori passanti che di fori ciechi. Un imbocco lungo in questi materiali allargherebbe solo il preforo sul diametro nominale di filettatura invece di eseguire il filetto.

Maschi a taglienti dritti senza imbocco corretto sono utensili non specifici con lo svantaggio di non dare risultati ottimali nei singoli materiali. Vale la pena di fare lo sforzo di scegliere l'utensile più adatto per i vari tipi di lavorazione.



**foro passante**



maschi a taglienti dritti con imbocco corretto



maschi con taglienti elicoidali sinistri



maschi a taglienti dritti con imbocco lungo



**foro cieco**



maschi con taglienti elicoidali destri



maschi a taglienti dritti con imbocco corto

# Diametri dei fori di filettatura p. la maschiatura

| Filettatura metrica ISO DIN 13 |         |                            |                         |         | Filettatura metrica ISO, passo fine DIN 13 |           |                            |                        |         | Filettatura UNC ASME B1.1 |           |                            |                        |         |             |                     |                            |                        |         |
|--------------------------------|---------|----------------------------|-------------------------|---------|--|-----------|----------------------------|------------------------|---------|---------------------------|-----------|----------------------------|------------------------|---------|-------------|---------------------|----------------------------|------------------------|---------|
| Ø nom.                         | passo P | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 6H* |         | Ø nom.                                     | x passo P | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 6H |         | Ø nom.                    | x passo P | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 6H |         | Ø nom.      | filetti per pollici | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 2B |         |
|                                | mm      | mm                         | min. mm                 | max. mm |  | mm        | mm                         | min. mm                | max. mm |                           | mm        | mm                         | min. mm                | max. mm |             |                     | mm                         | min. mm                | max. mm |
| M 1                            | 0,25    | <b>0,75</b>                | 0,729                   | 0,785   | M 2,5 x 0,35                               |           | <b>2,15</b>                | 2,121                  | 2,221   | M 22 x 1,50               |           | <b>20,50</b>               | 20,376                 | 20,676  | Nr. 1 - 64  |                     | <b>1,55</b>                | 1,425                  | 1,580   |
| M 1,1                          | 0,25    | <b>0,85</b>                | 0,829                   | 0,885   | M 3,0 x 0,35                               |           | <b>2,65</b>                | 2,621                  | 2,721   | M 22 x 2,00               |           | <b>20,00</b>               | 19,835                 | 20,210  | Nr. 2 - 56  |                     | <b>1,85</b>                | 1,694                  | 1,872   |
| M 1,2                          | 0,25    | <b>0,95</b>                | 0,929                   | 0,985   | M 3,5 x 0,35                               |           | <b>3,15</b>                | 3,121                  | 3,221   | M 24 x 1,00               |           | <b>23,00</b>               | 22,917                 | 23,153  | Nr. 3 - 48  |                     | <b>2,10</b>                | 1,941                  | 2,146   |
| M 1,4                          | 0,30    | <b>1,10</b>                | 1,075                   | 1,142   | M 4,0 x 0,50                               |           | <b>3,50</b>                | 3,459                  | 3,599   | M 24 x 1,50               |           | <b>22,50</b>               | 22,376                 | 22,676  | Nr. 4 - 40  |                     | <b>2,35</b>                | 2,157                  | 2,385   |
| M 1,6                          | 0,35    | <b>1,25</b>                | 1,221                   | 1,321   | M 4,5 x 0,50                               |           | <b>4,00</b>                | 3,959                  | 4,099   | M 24 x 2,00               |           | <b>22,00</b>               | 21,835                 | 22,210  | Nr. 5 - 40  |                     | <b>2,65</b>                | 2,487                  | 2,698   |
| M 1,8                          | 0,35    | <b>1,45</b>                | 1,421                   | 1,521   | M 5,0 x 0,50                               |           | <b>4,50</b>                | 4,459                  | 4,599   | M 25 x 1,00               |           | <b>24,00</b>               | 23,917                 | 24,153  | Nr. 6 - 32  |                     | <b>2,85</b>                | 2,642                  | 2,896   |
| M 2                            | 0,40    | <b>1,60</b>                | 1,567                   | 1,679   | M 5,5 x 0,50                               |           | <b>5,00</b>                | 4,959                  | 5,099   | M 25 x 1,50               |           | <b>23,50</b>               | 23,376                 | 23,676  | Nr. 8 - 32  |                     | <b>3,50</b>                | 3,302                  | 3,531   |
| M 2,2                          | 0,45    | <b>1,75</b>                | 1,713                   | 1,838   | M 6,0 x 0,75                               |           | <b>5,20</b>                | 5,188                  | 5,378   | M 25 x 2,00               |           | <b>23,00</b>               | 22,835                 | 23,210  | Nr. 10 - 24 |                     | <b>3,90</b>                | 3,683                  | 3,937   |
| M 2,5                          | 0,45    | <b>2,05</b>                | 2,013                   | 2,138   | M 7,0 x 0,75                               |           | <b>6,20</b>                | 6,188                  | 6,378   | M 27 x 1,00               |           | <b>26,00</b>               | 25,917                 | 26,153  | Nr. 12 - 24 |                     | <b>4,50</b>                | 4,343                  | 4,597   |
| M 3                            | 0,50    | <b>2,50</b>                | 2,459                   | 2,599   | M 8,0 x 0,50                               |           | <b>7,50</b>                | 7,459                  | 7,599   | M 27 x 1,50               |           | <b>25,50</b>               | 25,376                 | 25,676  | 1/4 - 20    |                     | <b>5,10</b>                | 4,978                  | 5,258   |
| M 3,5                          | 0,60    | <b>2,90</b>                | 2,850                   | 3,010   | M 8,0 x 0,75                               |           | <b>7,20</b>                | 7,188                  | 7,378   | M 27 x 2,00               |           | <b>25,00</b>               | 24,835                 | 25,210  | 5/16 - 18   |                     | <b>6,60</b>                | 6,401                  | 6,731   |
| M 4                            | 0,70    | <b>3,30</b>                | 3,242                   | 3,422   | M 8,0 x 1,00                               |           | <b>7,00</b>                | 6,917                  | 7,153   | M 28 x 1,00               |           | <b>27,00</b>               | 26,917                 | 27,153  | 3/8 - 16    |                     | <b>8,00</b>                | 7,798                  | 8,153   |
| M 4,5                          | 0,75    | <b>3,70</b>                | 3,688                   | 3,878   | M 9,0 x 0,75                               |           | <b>8,20</b>                | 8,188                  | 8,378   | M 28 x 1,50               |           | <b>26,50</b>               | 26,376                 | 26,676  | 7/16 - 14   |                     | <b>9,40</b>                | 9,144                  | 9,550   |
| M 5                            | 0,80    | <b>4,20</b>                | 4,134                   | 4,334   | M 9,0 x 1,00                               |           | <b>8,00</b>                | 7,917                  | 8,153   | M 28 x 2,00               |           | <b>26,00</b>               | 25,835                 | 26,210  | 1/2 - 13    |                     | <b>10,80</b>               | 10,592                 | 11,024  |
| M 6                            | 1,00    | <b>5,00</b>                | 4,917                   | 5,153   | M 10 x 0,75                                |           | <b>9,20</b>                | 9,188                  | 9,378   | M 30 x 1,00               |           | <b>29,00</b>               | 28,917                 | 29,153  | 9/16 - 12   |                     | <b>12,20</b>               | 11,989                 | 12,446  |
| M 7                            | 1,00    | <b>6,00</b>                | 5,917                   | 6,153   | M 10 x 1,00                                |           | <b>9,00</b>                | 8,917                  | 9,153   | M 30 x 1,50               |           | <b>28,50</b>               | 28,376                 | 28,676  | 5/8 - 11    |                     | <b>13,50</b>               | 13,386                 | 13,868  |
| M 8                            | 1,25    | <b>6,80</b>                | 6,647                   | 6,912   | M 10 x 1,25                                |           | <b>8,80</b>                | 8,647                  | 8,912   | M 30 x 2,00               |           | <b>28,00</b>               | 27,835                 | 28,210  | 3/4 - 10    |                     | <b>16,50</b>               | 16,307                 | 16,840  |
| M 9                            | 1,25    | <b>7,80</b>                | 7,647                   | 7,912   | M 11 x 0,75                                |           | <b>10,20</b>               | 10,188                 | 10,378  | M 30 x 3,00               |           | <b>27,00</b>               | 26,752                 | 27,252  | 7/8 - 9     |                     | <b>19,50</b>               | 19,177                 | 19,761  |
| M 10                           | 1,50    | <b>8,50</b>                | 8,376                   | 8,676   | M 11 x 1,00                                |           | <b>10,00</b>               | 9,917                  | 10,153  | M 32 x 1,50               |           | <b>30,50</b>               | 30,376                 | 30,676  | 1 - 8       |                     | <b>22,25</b>               | 21,971                 | 22,606  |
| M 11                           | 1,50    | <b>9,50</b>                | 9,376                   | 9,676   | M 12 x 1,00                                |           | <b>11,00</b>               | 10,917                 | 11,153  | M 32 x 2,00               |           | <b>30,00</b>               | 29,835                 | 30,210  | 1 1/8 - 7   |                     | <b>25,00</b>               | 24,638                 | 25,349  |
| M 12                           | 1,75    | <b>10,20</b>               | 10,106                  | 10,441  | M 12 x 1,25                                |           | <b>10,80</b>               | 10,647                 | 10,912  | M 33 x 1,50               |           | <b>31,50</b>               | 31,376                 | 31,676  | 1 1/4 - 7   |                     | <b>28,00</b>               | 27,813                 | 28,524  |
| M 14                           | 2,00    | <b>12,00</b>               | 11,835                  | 12,210  | M 12 x 1,50                                |           | <b>10,50</b>               | 10,376                 | 10,676  | M 33 x 2,00               |           | <b>31,00</b>               | 30,835                 | 31,210  | 1 3/8 - 6   |                     | <b>30,75</b>               | 30,353                 | 31,115  |
| M 16                           | 2,00    | <b>14,00</b>               | 13,835                  | 14,210  | M 14 x 1,00                                |           | <b>13,00</b>               | 12,917                 | 13,153  | M 33 x 3,00               |           | <b>30,00</b>               | 29,752                 | 30,252  | 1 1/2 - 6   |                     | <b>34,00</b>               | 33,528                 | 34,290  |
| M 18                           | 2,50    | <b>15,50</b>               | 15,294                  | 15,744  | M 14 x 1,25                                |           | <b>12,80</b>               | 12,647                 | 12,912  | M 35 x 1,50               |           | <b>33,50</b>               | 33,376                 | 33,676  | 1 3/4 - 5   |                     | <b>39,50</b>               | 38,938                 | 39,802  |
| M 20                           | 2,50    | <b>17,50</b>               | 17,294                  | 17,744  | M 14 x 1,50                                |           | <b>12,50</b>               | 12,376                 | 12,676  | M 36 x 1,50               |           | <b>34,50</b>               | 34,376                 | 34,676  | 2 - 4,5     |                     | <b>45,00</b>               | 44,679                 | 45,593  |
| M 22                           | 2,50    | <b>19,50</b>               | 19,294                  | 19,744  | M 15 x 1,00                                |           | <b>14,00</b>               | 13,917                 | 14,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 24                           | 3,00    | <b>21,00</b>               | 20,752                  | 21,252  | M 15 x 1,50                                |           | <b>13,50</b>               | 13,376                 | 13,676  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 27                           | 3,00    | <b>24,00</b>               | 23,752                  | 24,252  | M 16 x 1,00                                |           | <b>15,00</b>               | 14,917                 | 15,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 30                           | 3,50    | <b>26,50</b>               | 26,211                  | 26,771  | M 16 x 1,25                                |           | <b>14,80</b>               | 14,647                 | 14,912  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 33                           | 3,50    | <b>29,50</b>               | 29,211                  | 29,771  | M 16 x 1,50                                |           | <b>14,50</b>               | 14,376                 | 14,676  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 36                           | 4,00    | <b>32,00</b>               | 31,670                  | 32,270  | M 17 x 1,00                                |           | <b>16,00</b>               | 15,917                 | 16,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 39                           | 4,00    | <b>35,00</b>               | 34,670                  | 35,270  | M 17 x 1,50                                |           | <b>15,50</b>               | 15,376                 | 15,676  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 42                           | 4,50    | <b>37,50</b>               | 37,129                  | 37,799  | M 18 x 1,00                                |           | <b>17,00</b>               | 16,917                 | 17,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 45                           | 4,50    | <b>40,50</b>               | 40,129                  | 40,799  | M 18 x 1,50                                |           | <b>16,50</b>               | 16,376                 | 16,676  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 48                           | 5,00    | <b>43,00</b>               | 42,587                  | 43,297  | M 20 x 1,00                                |           | <b>19,00</b>               | 18,917                 | 19,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 52                           | 5,00    | <b>47,00</b>               | 46,587                  | 47,297  | M 20 x 1,50                                |           | <b>18,50</b>               | 18,376                 | 18,676  |                           |           |                            |                        |         |             |                     |                            |                        |         |
| M 56                           | 5,50    | <b>50,50</b>               | 50,046                  | 50,796  | M 20 x 2,00                                |           | <b>18,00</b>               | 17,835                 | 18,210  |                           |           |                            |                        |         |             |                     |                            |                        |         |
|                                |         |                            |                         |         | M 22 x 1,00                                |           | <b>21,00</b>               | 20,917                 | 21,153  |                           |           |                            |                        |         |             |                     |                            |                        |         |

\* M 1,1 fino a M 1,4 nom.-Ø madrevite 5H

| Filettatura MJ DIN ISO 5855 |           |                            |                         |         | Filettatura UNC ISO 3161 |                     |                            |                        |         | Filettatura UNF ISO 3161 |                     |                            |                        |         |
|-----------------------------|-----------|----------------------------|-------------------------|---------|--------------------------|---------------------|----------------------------|------------------------|---------|--------------------------|---------------------|----------------------------|------------------------|---------|
| Ø nom.                      | x passo P | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 5H* |         | Ø nom.                   | filetti per pollici | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 3B |         | Ø nom.                   | filetti per pollici | Ø preforo (foro) Ø DIN 336 | Ø preforo madrevite 3B |         |
|                             | mm        | mm                         | min. mm                 | max. mm |                          |                     | mm                         | min. mm                | max. mm |                          |                     | mm                         | min. mm                | max. mm |
| MJ 3                        | x 0,50    | <b>2,60</b>                | 2,513                   | 2,653   | Nr. 6 - 32               |                     | <b>2,85</b>                | 2,733                  | 2,939   | Nr. 6 - 40               |                     | <b>3,00</b>                | 2,888                  | 3,053   |
| MJ 4                        | x 0,70    | <b>3,40</b>                | 3,318                   | 3,498   | Nr. 8 - 32               |                     | <b>3,55</b>                | 3,393                  | 3,599   | Nr. 8 - 36               |                     | <b>3,60</b>                | 3,480                  | 3,663   |
| MJ 5                        | x 0,80    | <b>4,30</b>                | 4,221                   | 4,421   | Nr. 10 - 24              |                     | <b>4,00</b>                | 3,795                  | 4,064   | Nr. 10 - 32              |                     | <b>4,20</b>                | 4,054                  | 4,255   |
| MJ 6                        | x 0,50    | <b>5,55</b>                | 5,513                   | 5,625   | Nr. 12 - 24              |                     | <b>4,60</b>                | 4,455                  | 4,704   | Nr. 12 - 28              |                     | <b>4,75</b>                | 4,602                  | 4,816   |
| MJ 6                        | x 0,75    | <b>5,35</b>                | 5,269                   | 5,419   | 1/4 - 20                 |                     | <b>5,30</b>                | 5,113                  | 5,387   | 1/4 - 28                 |                     | <b>5,60</b>                | 5,466                  | 5,662   |
| MJ 6                        | x 1,00    | <b>5,10</b>                | 5,026                   | 5,216   | 5/16 - 18                |                     | <b>6,75</b>                | 6,563                  | 6,833   | 5/16 - 24                |                     | <b>7,00</b>                | 6,906                  | 7,109   |
| MJ 8                        | x 0,50    | <b>7,55</b>                | 7,513                   | 7,625   | 3/8 - 16                 |                     | <b>8,20</b>                | 7,978                  | 8,255   | 3/8 - 24                 |                     | <b>8,60</b>                | 8,494                  | 8,679   |
| MJ 8                        | x 0,75    | <b>7,35</b>                | 7,269                   | 7,419   | 7/16 - 14                |                     | <b>9,60</b>                | 9,346                  | 9,639   | 7/16 - 20                |                     | <b>10,00</b>               | 9,876                  | 10,084  |
| MJ 8                        | x 1,00    | <b>7,10</b>                | 7,026                   | 7,216   | 1/2 - 13                 |                     | <b>11,00</b>               | 10,798                 | 11,095  | 1/2 - 20                 |                     | <b>11,60</b>               | 11,463                 | 11,661  |
| MJ 8                        | x 1,25    | <b>6,90</b>                | 6,782                   | 6,994   | 9/16 - 12                |                     | <b>12,40</b>               | 12,228                 | 12,482  | 9/16 - 18                |                     | <b>13,00</b>               | 12,913                 | 13,122  |
| MJ 10                       | x 1,00    | <b>9,10</b>                | 9,026                   | 9,216   | 5/8 - 11                 |                     | <b>13,80</b>               | 13,627                 | 13,904  | 5/8 - 18                 |                     | <b>14,60</b>               | 14,501                 | 14,702  |
| MJ 10                       | x 1,25    | <b>8,90</b>                | 8,782                   | 8,994   |                          |                     |                            |                        |         |                          |                     |                            |                        |         |
| MJ 10                       | x 1,50    | <b>8,60</b>                | 8,539                   | 8,775   |                          |                     |                            |                        |         |                          |                     |                            |                        |         |
| MJ 12                       | x 1,75    | <b>10,40</b>               | 10,295                  | 10,560  |                          |                     |                            |                        |         |                          |                     |                            |                        |         |
| MJ 16                       | x 2,00    | <b>14,20</b>               | 14,051                  | 14,351  |                          |                     |                            |                        |         |                          |                     |                            |                        |         |

\* MJ3 x 0,50 fino a MJ 5 x 0,80 nom.-Ø madrevite 6H

# Diametri dei fori di filettatura p. la maschiatura

| Filettatura UNF ASME B1.1 |                     |                               |  |        | Filettatura BSW-(Whitworth) BS84 |                     |                               |                                     |        | Filettatura (Whitworth-) (a DIN-ISO 228-1) |                     |                               |                                     |        | Filettatura PG a DIN 40430 |                     |                               |                                     |        |
|---------------------------|---------------------|-------------------------------|--|--------|----------------------------------|---------------------|-------------------------------|-------------------------------------|--------|--|---------------------|-------------------------------|-------------------------------------|--------|----------------------------|---------------------|-------------------------------|-------------------------------------|--------|
| Ø nom.                    | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite 2B min. mm max. mm |        | Ø nom.                           | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        | Ø nom.                                     | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        | Ø nom.                     | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        |
| Nr. 1 - 72                |                     | <b>1,55</b>                   | 1,473                                  | 1,610  | W 1/16                           | 60                  | <b>1,20</b>                   | 1,045                               | 1,230  | G 1/16                                     | 28                  | <b>6,80</b>                   | 6,561                               | 6,843  | Pg 7                       | 20                  | <b>11,40</b>                  | 11,280                              | 11,430 |
| Nr. 2 - 64                |                     | <b>1,85</b>                   | 1,755                                  | 1,910  | W 3/32                           | 48                  | <b>1,80</b>                   | 1,704                               | 1,912  | G 1/8                                      | 28                  | <b>8,80</b>                   | 8,566                               | 8,848  | Pg 9                       | 18                  | <b>14,00</b>                  | 13,860                              | 14,010 |
| Nr. 3 - 56                |                     | <b>2,15</b>                   | 2,024                                  | 2,197  | W 1/8                            | 40                  | <b>2,50</b>                   | 2,362                               | 2,591  | G 1/4                                      | 19                  | <b>11,80</b>                  | 11,445                              | 11,890 | Pg 11                      | 18                  | <b>17,30</b>                  | 17,260                              | 17,410 |
| Nr. 4 - 48                |                     | <b>2,40</b>                   | 2,271                                  | 2,459  | W 5/32                           | 32                  | <b>3,20</b>                   | 2,952                               | 3,214  | G 3/8                                      | 19                  | <b>15,25</b>                  | 14,950                              | 15,395 | Pg 13,5                    | 18                  | <b>19,00</b>                  | 19,060                              | 19,210 |
| Nr. 5 - 44                |                     | <b>2,70</b>                   | 2,550                                  | 2,741  | W 3/16                           | 24                  | <b>3,60</b>                   | 3,407                               | 3,745  | G 1/2                                      | 14                  | <b>19,00</b>                  | 18,631                              | 19,172 | Pg 16                      | 18                  | <b>21,30</b>                  | 21,160                              | 21,310 |
| Nr. 6 - 40                |                     | <b>2,95</b>                   | 2,819                                  | 3,023  | W 7/32                           | 24                  | <b>4,50</b>                   | 4,201                               | 4,539  | G 5/8                                      | 14                  | <b>21,00</b>                  | 20,587                              | 21,128 | Pg 21                      | 16                  | <b>26,90</b>                  | 26,780                              | 27,030 |
| Nr. 8 - 36                |                     | <b>3,50</b>                   | 3,404                                  | 3,607  | W 1/4                            | 20                  | <b>5,10</b>                   | 4,724                               | 5,156  | G 3/4                                      | 14                  | <b>24,50</b>                  | 24,117                              | 24,658 | Pg 29                      | 16                  | <b>35,50</b>                  | 35,480                              | 35,730 |
| Nr. 10 - 32               |                     | <b>4,10</b>                   | 3,962                                  | 4,166  | W 5/16                           | 18                  | <b>6,50</b>                   | 6,130                               | 6,590  | G 7/8                                      | 14                  | <b>28,25</b>                  | 27,877                              | 28,418 | Pg 36                      | 16                  | <b>45,50</b>                  | 45,480                              | 45,730 |
| Nr. 12 - 28               |                     | <b>4,60</b>                   | 4,496                                  | 4,724  | W 3/8                            | 16                  | <b>7,90</b>                   | 7,492                               | 7,987  | G 1  | 11                  | <b>30,75</b>                  | 30,291                              | 30,931 | Pg 42                      | 16                  | <b>52,50</b>                  | 52,480                              | 52,730 |
| 1/4 - 28                  |                     | <b>5,50</b>                   | 5,359                                  | 5,588  | W 7/16                           | 14                  | <b>9,20</b>                   | 8,789                               | 9,330  | G 1 1/8                                    | 11                  | <b>35,50</b>                  | 34,939                              | 35,579 | Pg 48                      | 16                  | <b>57,80</b>                  | 57,780                              | 58,030 |
| 5/16 - 24                 |                     | <b>6,90</b>                   | 6,782                                  | 7,036  | W 1/2                            | 12                  | <b>10,50</b>                  | 9,989                               | 10,591 | G 1 1/4                                    | 11                  | <b>39,50</b>                  | 38,952                              | 39,592 |                            |                     |                               |                                     |        |
| 3/8 - 24                  |                     | <b>8,50</b>                   | 8,382                                  | 8,636  | W 9/16                           | 12                  | <b>12,00</b>                  | 11,577                              | 12,179 | G 1 1/2                                    | 11                  | <b>45,25</b>                  | 44,845                              | 45,485 |                            |                     |                               |                                     |        |
| 7/16 - 20                 |                     | <b>9,90</b>                   | 9,728                                  | 10,033 | W 5/8                            | 11                  | <b>13,50</b>                  | 12,918                              | 13,558 | G 1 3/4                                    | 11                  | <b>51,00</b>                  | 50,788                              | 51,428 |                            |                     |                               |                                     |        |
| 1/2 - 20                  |                     | <b>11,50</b>                  | 11,328                                 | 11,608 | W 3/4                            | 10                  | <b>16,25</b>                  | 15,797                              | 16,483 | G 2  | 11                  | <b>57,00</b>                  | 56,656                              | 57,296 |                            |                     |                               |                                     |        |
| 9/16 - 18                 |                     | <b>12,90</b>                  | 12,751                                 | 13,081 | W 7/8                            | 9                   | <b>19,25</b>                  | 18,611                              | 19,353 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 5/8 - 18                  |                     | <b>14,50</b>                  | 14,351                                 | 14,681 | W 1                              | 8                   | <b>22,00</b>                  | 21,334                              | 22,147 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 3/4 - 16                  |                     | <b>17,50</b>                  | 17,323                                 | 17,678 | W 1 1/8                          | 7                   | <b>24,50</b>                  | 23,928                              | 24,832 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 7/8 - 14                  |                     | <b>20,40</b>                  | 20,269                                 | 20,650 | W 1 1/4                          | 7                   | <b>27,75</b>                  | 27,103                              | 28,007 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 1 - 12                    |                     | <b>23,25</b>                  | 23,114                                 | 23,571 | W 1 3/8                          | 6                   | <b>30,50</b>                  | 29,504                              | 30,528 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 1 1/8 - 12                |                     | <b>26,50</b>                  | 26,289                                 | 26,746 | W 1 1/2                          | 6                   | <b>33,50</b>                  | 32,679                              | 33,703 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 1 1/4 - 12                |                     | <b>29,50</b>                  | 29,464                                 | 29,921 | W 1 5/8                          | 5                   | <b>35,50</b>                  | 34,769                              | 35,963 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 1 3/8 - 12                |                     | <b>32,75</b>                  | 32,639                                 | 33,096 | W 1 3/4                          | 5                   | <b>39,00</b>                  | 37,944                              | 39,138 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |
| 1 1/2 - 12                |                     | <b>36,00</b>                  | 35,814                                 | 36,271 | W 2                              | 4,5                 | <b>44,50</b>                  | 43,571                              | 44,877 |  |                     |                               |                                     |        |                            |                     |                               |                                     |        |

| Filettatura NPT ANSI B 2.1<br>filettatura conica americana, conicità 1:16 |  |            |  |        |                     |                                      |                                     |                   |                        |
|---|--|------------|--|--------|---------------------|--------------------------------------|-------------------------------------|-------------------|------------------------|
| versione A<br>(da evitare se possibile)                                   |  | versione B |  | Ø nom. | filetti per pollici | Ø preforo cilind. (A) d <sub>1</sub> | Ø preforo conico (B) D <sub>1</sub> | prof. t. p. ET mm | prof. fil. BT (min) mm |
|   |  |            |  | 1/16   | - 27                | <b>6,15</b>                          | 6,39                                | 9,29              | 10,7                   |
|   |  |            |  | 1/8    | - 27                | <b>8,40</b>                          | 8,74                                | 9,32              | 10,8                   |
|   |  |            |  | 1/4    | - 18                | <b>11,10</b>                         | <b>11,36</b>                        | 13,52             | 15,6                   |
|   |  |            |  | 3/8    | - 18                | <b>14,30</b>                         | <b>14,80</b>                        | 13,83             | 16,0                   |
|   |  |            |  | 1/2    | - 14                | <b>17,90</b>                         | <b>18,32</b>                        | 18,07             | 20,8                   |
|   |  |            |  | 3/4    | - 14                | <b>23,30</b>                         | <b>23,67</b>                        | 18,55             | 21,3                   |
|   |  |            |  | 1      | - 11,5              | <b>29,00</b>                         | <b>29,69</b>                        | 22,29             | 25,6                   |
|   |  |            |  | 1 1/4  | - 11,5              | <b>37,70</b>                         | <b>38,45</b>                        | 22,80             | 26,1                   |
|   |  |            |  | 1 1/2  | - 11,5              | <b>43,70</b>                         | <b>44,52</b>                        | 22,80             | 26,1                   |
|   |  |            |  | 2      | - 11,5              | <b>55,60</b>                         | <b>56,56</b>                        | 23,20             | 26,5                   |
|   |  |            |  | 2 1/2  | - 8                 | <b>66,30</b>                         | <b>67,62</b>                        | 31,75             | 36,3                   |
|   |  |            |  | 3      | - 8                 | <b>82,30</b>                         | <b>83,52</b>                        | 33,74             | 38,5                   |

| Filett. EG metr./metr. passo fine (EG M 14 x 1,25) per impiego di helicoil DIN 8140 |              |                               |                                     |        |
|---|--------------|-------------------------------|-------------------------------------|--------|
| Ø nom.  | x passo P mm | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        |
| EG M 4  | 0,70         | <b>4,20</b>                   | 4,152                               | 4,292  |
| EG M 5  | 0,80         | <b>5,25</b>                   | 5,174                               | 5,334  |
| EG M 6  | 1,00         | <b>6,30</b>                   | 6,217                               | 6,407  |
| EG M 8  | 1,25         | <b>8,40</b>                   | 8,271                               | 8,483  |
| EG M10  | 1,50         | <b>10,50</b>                  | 10,324                              | 10,560 |
| EG M12  | 1,75         | <b>12,50</b>                  | 12,379                              | 12,644 |
| EG M14 x 1,25   | <b>14,40</b> | 14,271                        | 14,483                              |        |
| EG M16  | 2,00         | <b>16,50</b>                  | 16,433                              | 16,733 |

| Filettatura EG UNC (UNC-STI) per impiego di helicoil ASME B18.29.1 |                     |                               |                                     |        |
|--|---------------------|-------------------------------|-------------------------------------|--------|
| Ø nom.   | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        |
| EG Nr. 6   | - 32                | <b>3,80</b>                   | 3,678                               | 3,879  |
| EG Nr. 8   | - 32                | <b>4,40</b>                   | 4,338                               | 4,524  |
| EG Nr. 10  | - 24                | <b>5,20</b>                   | 5,055                               | 5,283  |
| EG Nr. 12  | - 24                | <b>5,80</b>                   | 5,715                               | 5,944  |
| EG 1/4   | - 20                | <b>6,70</b>                   | 6,624                               | 6,868  |
| EG 5/16  | - 18                | <b>8,40</b>                   | 8,242                               | 8,489  |
| EG 3/8   | - 16                | <b>10,00</b>                  | 9,868                               | 10,127 |
| EG 7/16  | - 14                | <b>11,60</b>                  | 11,506                              | 11,783 |
| EG 1/2   | - 13                | <b>13,30</b>                  | 13,122                              | 13,393 |
| EG 9/16  | - 12                | <b>14,90</b>                  | 14,747                              | 15,032 |
| EG 5/8   | - 11                | <b>16,50</b>                  | 16,375                              | 16,673 |

| Filettatura EG UNF (UNF-STI) per impiego di helicoil ASME B18.29.1 |                     |                               |                                     |        |
|--|---------------------|-------------------------------|-------------------------------------|--------|
| Ø nom.   | filetti per pollici | Ø preforo (foro) Ø DIN 336 mm | Ø preforo madrevite min. mm max. mm |        |
| EG Nr. 6   | - 40                | <b>3,70</b>                   | 3,644                               | 3,818  |
| EG Nr. 8   | - 36                | <b>4,40</b>                   | 4,321                               | 4,498  |
| EG Nr. 10  | - 32                | <b>5,10</b>                   | 4,999                               | 5,184  |
| EG Nr. 12  | - 28                | <b>5,70</b>                   | 5,682                               | 5,809  |
| EG 1/4   | - 28                | <b>6,60</b>                   | 6,546                               | 6,721  |
| EG 5/16  | - 24                | <b>8,25</b>                   | 8,166                               | 8,352  |
| EG 3/8   | - 24                | <b>9,80</b>                   | 9,754                               | 9,931  |
| EG 7/16  | - 20                | <b>11,50</b>                  | 11,389                              | 11,585 |
| EG 1/2   | - 20                | <b>13,10</b>                  | 12,974                              | 13,172 |
| EG 9/16  | - 18                | <b>14,70</b>                  | 14,592                              | 14,798 |
| EG 5/8   | - 18                | <b>16,25</b>                  | 16,180                              | 16,386 |

## Diametri dei fori consigl. p. maschiatura a rullare

| Filettatura metrica ISO<br>DIN 13 |       |              |         |                            |         |        |
|-----------------------------------|-------|--------------|---------|----------------------------|---------|--------|
| Ø nom.                            | passo | Ø foro       |         | Ø preforo<br>madrevite 7H* |         |        |
|                                   |       | min. mm      | max. mm | min. mm                    | max. mm |        |
| mm                                | mm    | mm           | mm      | mm                         | mm      |        |
| M 1                               | 0,25  | <b>0,75</b>  | 0,729   | 0,785                      |         |        |
| M 1,1                             | 0,25  | <b>0,85</b>  | 0,829   | 0,885                      |         |        |
| M 1,2                             | 0,25  | <b>0,95</b>  | 0,929   | 0,985                      |         |        |
| M 1,4                             | 0,30  | <b>1,10</b>  | 1,075   | 1,142                      |         |        |
| M 1,6                             | 0,35  | <b>1,25</b>  | 1,221   | 1,321                      |         |        |
| M 1,8                             | 0,35  | <b>1,45</b>  | 1,421   | 1,521                      |         |        |
| M 2                               | 0,40  | <b>1,85</b>  | 1,84    | 1,88                       | 1,567   | 1,679  |
| M 2,2                             | 0,45  | <b>2,00</b>  | 2,01    | 2,05                       | 1,713   | 1,838  |
| M 2,5                             | 0,45  | <b>2,30</b>  | 2,28    | 2,32                       | 2,013   | 2,138  |
| M 3                               | 0,50  | <b>2,80</b>  | 2,78    | 2,85                       | 2,459   | 2,639  |
| M 3,5                             | 0,60  | <b>3,25</b>  | 3,23    | 3,30                       | 2,850   | 3,050  |
| M 4                               | 0,70  | <b>3,70</b>  | 3,68    | 3,76                       | 3,242   | 3,466  |
| M 4,5                             | 0,75  | <b>4,20</b>  |         |                            |         |        |
| M 5                               | 0,80  | <b>4,65</b>  | 4,62    | 4,71                       | 4,134   | 4,384  |
| M 6                               | 1,00  | <b>5,55</b>  | 5,52    | 5,62                       | 4,917   | 5,217  |
| M 7                               | 1,00  | <b>6,55</b>  | 6,52    | 6,62                       | 5,917   | 6,217  |
| M 8                               | 1,25  | <b>7,40</b>  | 7,36    | 7,47                       | 6,647   | 6,982  |
| M 9                               | 1,25  | <b>8,40</b>  | 8,36    | 8,47                       | 7,647   | 7,982  |
| M 10                              | 1,50  | <b>9,30</b>  | 9,26    | 9,38                       | 8,376   | 8,751  |
| M 11                              | 1,50  | <b>10,30</b> | 10,26   | 10,38                      | 9,376   | 9,751  |
| M 12                              | 1,75  | <b>11,20</b> | 11,15   | 11,29                      | 10,106  | 10,531 |
| M 14                              | 2,00  | <b>13,10</b> | 13,05   | 13,20                      | 11,835  | 12,310 |
| M 16                              | 2,00  | <b>15,10</b> | 15,05   | 15,20                      | 13,835  | 14,310 |
| M 18                              | 2,50  | <b>16,90</b> | 16,83   | 17,02                      | 15,294  | 15,854 |
| M 20                              | 2,50  | <b>18,90</b> | 18,83   | 19,02                      | 17,294  | 17,854 |
| M 22                              | 2,50  | <b>20,90</b> | 20,83   | 21,02                      | 19,294  | 19,854 |
| M 24                              | 3,00  | <b>22,70</b> | 22,62   | 22,80                      | 20,752  | 21,382 |
| M 27                              | 3,00  | <b>25,70</b> | 25,62   | 25,80                      | 23,752  | 24,382 |
| M 30                              | 3,50  | <b>28,50</b> | 28,40   | 28,60                      | 26,211  | 26,921 |
| M 33                              | 3,50  | <b>31,50</b> | 31,40   | 31,60                      | 29,211  | 29,921 |
| M 36                              | 4,00  | <b>34,30</b> | 34,17   | 34,40                      | 31,670  | 32,420 |
| M 39                              | 4,00  | <b>37,30</b> | 37,17   | 37,40                      | 34,670  | 35,420 |
| M 42                              | 4,50  | <b>40,10</b> | 39,95   | 40,20                      | 37,129  | 37,979 |

\* M 2 fino a M 2,5 Ø preforo madrevite 6H

| Filettatura metrica ISO, passo fine<br>DIN 13 |              |         |         |                            |         |                   |              |         |         |                            |        |
|---|--------------|---------|---------|----------------------------|---------|-------------------|--------------|---------|---------|----------------------------|--------|
| Ø x passo<br>nom.                             | Ø foro       | Ø foro  |         | Ø preforo<br>madrevite 7H* |         | Ø x passo<br>nom. | Ø foro       | Ø foro  |         | Ø preforo<br>madrevite 7H* |        |
|   |              | min. mm | max. mm | min. mm                    | max. mm |                   |              | min. mm | max. mm |                            |        |
| mm  | mm           | mm      | mm      | mm                         | mm      | mm                | mm           | mm      | mm      | mm                         |        |
| M 2,5 x 0,35                                  | <b>2,35</b>  | 2,35    | 2,38    | 2,121                      | 2,221   | M 20 x 1,50       | <b>19,30</b> | 19,26   | 19,38   | 18,376                     | 19,751 |
| M 3 x 0,35                                    | <b>2,85</b>  | 2,85    | 2,88    | 2,621                      | 2,721   | M 24 x 1,00       | <b>23,55</b> | 23,52   | 23,62   | 22,917                     | 23,217 |
| M 4 x 0,35                                    | <b>3,85</b>  | 3,85    | 3,88    | 3,621                      | 3,721   | M 24 x 1,50       | <b>23,30</b> | 23,26   | 23,38   | 22,376                     | 22,751 |
| M 4 x 0,50                                    | <b>3,80</b>  | 3,78    | 3,83    | 3,459                      | 3,639   | M 24 x 2,00       | <b>23,10</b> | 23,05   | 23,20   | 21,835                     | 22,310 |
| M 5 x 0,50                                    | <b>4,80</b>  | 4,78    | 4,83    | 4,459                      | 4,639   | M 27 x 1,50       | <b>26,30</b> | 26,26   | 26,38   | 25,376                     | 25,751 |
| M 5,5 x 0,50                                  | <b>5,30</b>  | 5,28    | 5,33    | 4,959                      | 5,139   | M 30 x 1,50       | <b>29,30</b> | 29,26   | 29,38   | 28,376                     | 28,751 |
| M 6 x 0,75                                    | <b>5,65</b>  | 5,62    | 5,70    | 5,188                      | 5,424   | M 33 x 1,50       | <b>32,30</b> | 32,26   | 32,38   | 31,376                     | 31,751 |
| M 7 x 0,75                                    | <b>6,65</b>  | 6,62    | 6,70    | 6,188                      | 6,424   | M 36 x 1,50       | <b>35,30</b> | 35,26   | 35,38   | 34,376                     | 34,751 |
| M 8 x 0,75                                    | <b>7,65</b>  | 7,62    | 7,70    | 7,188                      | 7,424   | M 39 x 1,50       | <b>38,30</b> | 38,26   | 38,38   | 37,376                     | 37,751 |
| M 8 x 1,00                                    | <b>7,55</b>  | 7,52    | 7,62    | 6,917                      | 7,217   | M 42 x 1,50       | <b>41,30</b> | 41,26   | 41,38   | 42,376                     | 42,751 |
| M 9 x 0,75                                    | <b>8,65</b>  | 8,62    | 8,70    | 8,188                      | 8,424   |                   |              |         |         |                            |        |
| M 9 x 1,00                                    | <b>8,55</b>  | 8,52    | 8,62    | 7,917                      | 8,217   |                   |              |         |         |                            |        |
| M 10 x 0,75                                   | <b>9,65</b>  | 9,62    | 9,70    | 9,188                      | 9,424   |                   |              |         |         |                            |        |
| M 10 x 1,00                                   | <b>9,55</b>  | 9,52    | 9,62    | 8,917                      | 9,217   |                   |              |         |         |                            |        |
| M 10 x 1,25                                   | <b>9,40</b>  | 9,36    | 9,47    | 8,647                      | 8,982   |                   |              |         |         |                            |        |
| M 11 x 0,75                                   | <b>10,65</b> | 10,62   | 10,70   | 10,188                     | 10,424  |                   |              |         |         |                            |        |
| M 11 x 1,00                                   | <b>10,55</b> | 10,52   | 10,62   | 9,917                      | 10,217  |                   |              |         |         |                            |        |
| M 12 x 1,00                                   | <b>11,55</b> | 11,52   | 11,62   | 10,917                     | 11,217  |                   |              |         |         |                            |        |
| M 12 x 1,25                                   | <b>11,40</b> | 11,36   | 11,47   | 10,647                     | 10,982  |                   |              |         |         |                            |        |
| M 12 x 1,50                                   | <b>11,30</b> | 11,26   | 11,38   | 10,376                     | 10,751  |                   |              |         |         |                            |        |
| M 14 x 1,00                                   | <b>13,55</b> | 13,52   | 13,62   | 12,917                     | 13,217  |                   |              |         |         |                            |        |
| M 14 x 1,25                                   | <b>13,40</b> | 13,36   | 13,47   | 12,647                     | 12,982  |                   |              |         |         |                            |        |
| M 14 x 1,50                                   | <b>13,30</b> | 13,26   | 13,38   | 12,376                     | 12,751  |                   |              |         |         |                            |        |
| M 15 x 1,00                                   | <b>14,55</b> | 14,52   | 14,62   | 13,917                     | 14,217  |                   |              |         |         |                            |        |
| M 15 x 1,50                                   | <b>14,30</b> | 14,26   | 14,38   | 13,376                     | 13,751  |                   |              |         |         |                            |        |
| M 16 x 1,00                                   | <b>15,55</b> | 15,52   | 15,62   | 14,917                     | 15,217  |                   |              |         |         |                            |        |
| M 16 x 1,50                                   | <b>15,30</b> | 15,26   | 15,38   | 14,376                     | 14,751  |                   |              |         |         |                            |        |
| M 17 x 1,00                                   | <b>16,55</b> | 16,52   | 16,62   | 15,917                     | 16,217  |                   |              |         |         |                            |        |
| M 17 x 1,50                                   | <b>16,30</b> | 16,26   | 16,38   | 15,376                     | 15,751  |                   |              |         |         |                            |        |
| M 18 x 1,00                                   | <b>17,55</b> | 17,52   | 17,62   | 16,917                     | 17,217  |                   |              |         |         |                            |        |
| M 18 x 1,50                                   | <b>17,30</b> | 17,26   | 17,38   | 16,376                     | 16,751  |                   |              |         |         |                            |        |
| M 18 x 2,00                                   | <b>17,10</b> | 17,05   | 17,20   | 15,835                     | 16,310  |                   |              |         |         |                            |        |
| M 20 x 1,00                                   | <b>19,55</b> | 19,52   | 19,62   | 18,917                     | 19,217  |                   |              |         |         |                            |        |

\* M 2,5 x 0,35 fino a M 4 x 0,35 Ø preforo madrevite 6H

### Tolleranza dei diametri di fori di filettatura nei maschi a rullare (a DIN 13, parte 50)

Per ragioni di resistenza, non è necessario mantenere la tolleranza 6H per i fori di filettatura; la tolleranza 7H è sufficiente a garantire che non sia superato il rivestimento del diametro medio di 0,32 x P tra madrevite e bullone. Inoltre, la filettatura a rullare, per la corsa della fase non interrotta e la deformazione a freddo, conferisce di regola una resistenza superiore a quella della filettatura normale.



## Diametri dei fori consigl. p. maschiatura a rullare

| Filettatura UNC<br>ASME B1.1 |                           |            |            |                           |            |
|------------------------------|---------------------------|------------|------------|---------------------------|------------|
| Ø nom.                       | filetti<br>per<br>pollici | Ø foro     |            | Ø preforo<br>madrevite 2B |            |
|                              |                           | min.<br>mm | max.<br>mm | min.<br>mm                | max.<br>mm |
| Nr. 1 - 64                   | 1,68                      | 1,67       | 1,70       | 1,425                     | 1,580      |
| Nr. 2 - 56                   | 1,98                      | 1,97       | 2,01       | 1,694                     | 1,872      |
| Nr. 3 - 48                   | 2,28                      | 2,27       | 2,32       | 1,941                     | 2,146      |
| Nr. 4 - 40                   | 2,55                      | 2,54       | 2,59       | 2,157                     | 2,385      |
| Nr. 5 - 40                   | 2,90                      | 2,89       | 2,94       | 2,487                     | 2,698      |
| Nr. 6 - 32                   | 3,15                      | 3,14       | 3,19       | 2,642                     | 2,896      |
| Nr. 8 - 32                   | 3,80                      | 3,78       | 3,82       | 3,302                     | 3,531      |
| Nr. 10 - 24                  | 4,35                      | 4,33       | 4,39       | 3,683                     | 3,937      |
| Nr. 12 - 24                  | 5,00                      | 4,97       | 5,03       | 4,343                     | 4,597      |
| 1/4 - 20                     | 5,75                      | 5,72       | 5,80       | 4,978                     | 5,258      |
| 5/16 - 18                    | 7,30                      | 7,26       | 7,37       | 6,401                     | 6,731      |
| 3/8 - 16                     | 8,80                      | 8,77       | 8,88       | 7,798                     | 8,153      |
| 7/16 - 14                    | 10,30                     | 10,27      | 10,37      | 9,144                     | 9,550      |
| 1/2 - 13                     | 11,80                     | 11,77      | 11,88      | 10,592                    | 11,024     |
| 9/16 - 12                    | 13,30                     | 13,28      | 13,39      | 11,989                    | 12,446     |
| 5/8 - 11                     | 14,80                     | 14,78      | 14,90      | 13,386                    | 13,868     |
| 3/4 - 10                     | 17,90                     | 17,85      | 17,97      | 16,307                    | 16,840     |
| 7/8 - 9                      | 21,00                     | 20,95      | 21,10      | 19,177                    | 19,761     |
| 1 - 8                        | 24,00                     | 23,95      | 24,12      | 21,971                    | 22,606     |

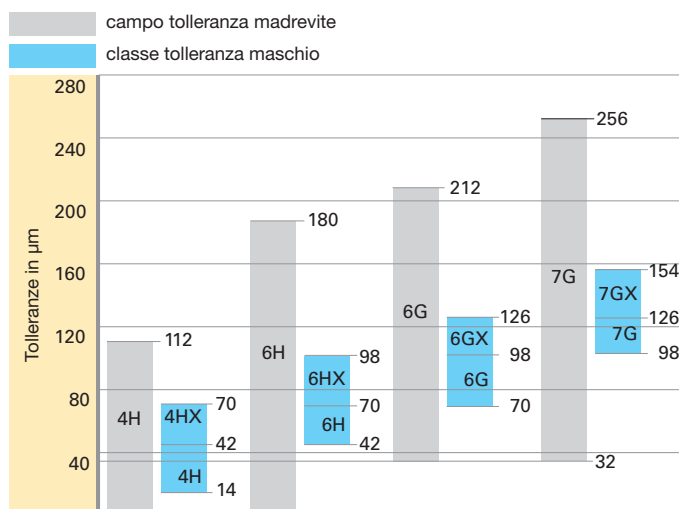
| Filettatura UNF<br>ASME B1.1 |                           |            |            |                           |            |
|------------------------------|---------------------------|------------|------------|---------------------------|------------|
| Ø nom.                       | filetti<br>per<br>pollici | Ø foro     |            | Ø preforo<br>madrevite 2B |            |
|                              |                           | min.<br>mm | max.<br>mm | min.<br>mm                | max.<br>mm |
| Nr. 1 - 72                   | 1,70                      | 1,69       | 1,72       | 1,473                     | 1,610      |
| Nr. 2 - 64                   | 2,00                      | 1,99       | 2,03       | 1,755                     | 1,910      |
| Nr. 3 - 56                   | 2,30                      | 2,29       | 2,34       | 2,024                     | 2,197      |
| Nr. 4 - 48                   | 2,60                      | 2,59       | 2,63       | 2,271                     | 2,459      |
| Nr. 5 - 44                   | 2,90                      | 2,89       | 2,93       | 2,550                     | 2,741      |
| Nr. 6 - 40                   | 3,20                      | 3,19       | 3,24       | 2,819                     | 3,023      |
| Nr. 8 - 36                   | 3,85                      | 3,83       | 3,88       | 3,404                     | 3,607      |
| Nr. 10 - 32                  | 4,45                      | 4,43       | 4,49       | 3,962                     | 4,166      |
| Nr. 12 - 28                  | 5,10                      | 5,07       | 5,13       | 4,496                     | 4,724      |
| 1/4 - 28                     | 5,95                      | 5,92       | 5,99       | 5,359                     | 5,588      |
| 5/16 - 24                    | 7,45                      | 7,42       | 7,50       | 6,782                     | 7,036      |
| 3/8 - 24                     | 9,05                      | 9,02       | 9,10       | 8,838                     | 9,106      |
| 7/16 - 20                    | 10,55                     | 10,48      | 10,58      | 9,728                     | 10,033     |
| 1/2 - 20                     | 12,10                     | 12,08      | 12,18      | 11,328                    | 11,608     |
| 9/16 - 18                    | 13,65                     | 13,61      | 13,72      | 12,751                    | 13,081     |
| 5/8 - 18                     | 15,25                     | 15,21      | 15,32      | 14,351                    | 14,681     |
| 3/4 - 16                     | 18,35                     | 18,30      | 18,41      | 17,323                    | 17,678     |
| 7/8 - 14                     | 21,40                     | 21,35      | 21,49      | 20,269                    | 20,650     |
| 1 - 12                       | 24,45                     | 24,40      | 24,54      | 23,114                    | 23,571     |

| Filettatura (Whitworth-)<br>DIN EN ISO 228-1 |                           |            |            |                        |            |
|--|---------------------------|------------|------------|------------------------|------------|
| Ø nom.                                       | filetti<br>per<br>pollici | Ø foro     |            | Ø preforo<br>madrevite |            |
|  |                           | min.<br>mm | max.<br>mm | min.<br>mm             | max.<br>mm |
| G 1/16 28                                    | 7,30                      | 7,28       | 7,35       | 6,561                  | 6,843      |
| G 1/8 28                                     | 9,30                      | 9,28       | 9,35       | 8,566                  | 8,848      |
| G 1/4 19                                     | 12,50                     | 12,48      | 12,55      | 11,445                 | 11,890     |
| G 3/8 19                                     | 16,00                     | 15,98      | 16,05      | 14,950                 | 15,395     |
| G 1/2 14                                     | 20,00                     | 19,98      | 20,12      | 18,631                 | 19,172     |
| G 5/8 14                                     | 22,00                     | 21,98      | 22,12      | 20,587                 | 21,128     |
| G 3/4 14                                     | 25,50                     | 25,48      | 25,62      | 24,117                 | 24,658     |
| G 7/8 14                                     | 29,25                     | 29,23      | 29,37      | 27,877                 | 28,418     |
| G 1 11                                       | 32,00                     | 31,98      | 32,15      | 30,291                 | 30,931     |
| G 1 1/4 11                                   | 40,75                     | 40,70      | 40,85      | 38,952                 | 39,592     |

## I campi di tolleranze/le classi di tolleranze

La qualità e la posizione determinano la tolleranza. Essa è designata usando le rispettive cifre e lettere. L'indicazione per la classe di tolleranza del maschio corrisponde a quella della madrevite per la quale il maschio è prevalentemente usato. Quindi essa non è identica in ciascun caso di impiego alla tolleranza della madrevite maschiata. Maschi con differenti tolleranze a DIN 802 parte 1 sono contraddistinti dall'aggiunta della lettera »X« (6 HX, 6 GX). Noi consigliamo di impiegare i maschi secondo la sottostante tabella:

### Ordinamento campo/classe di tolleranza



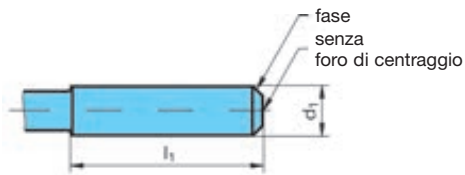
| DIN EN 22857                  |              | Tolleranza della madrevite da maschiare |    |    |    | DIN 802 parte 1 (ritirata) |
|-------------------------------|--------------|---|----|----|----|----------------------------|
| Classe di impiego del maschio | Indicazione* | Designazione                            |    |    |    | Tolleranza del maschio     |
| classe 1                      | ISO 1        | 4H                                      | 5H |    |    | 4H                         |
| classe 2                      | ISO 2        |   | 6H |    |    | 6H                         |
| classe 3                      | ISO 3        |   |    | 6G |    | 6G                         |
| -                             | -            |   |    |    | 7G | 7G                         |

\* Le tolleranze delle tre classi di impiego, in base alle indicazioni sotto-segnate, sono calcolate secondo un'unità di tolleranza t, il cui valore corrisponde alla tolleranza del diametro medio TD2 con classe di tolleranza 5 della madrevite (estrapolata fino al passo 0,2 mm):  
t = TD2 tolleranza 5 della madrevite

## Esecuzione dei codoli

# Codoli cilindrici per punte elicoidali e frese frontali in acciaio super rapido DIN 6535

### Forma HA, liscio

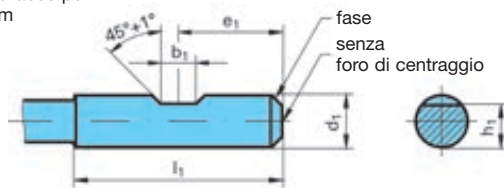


Misure in mm

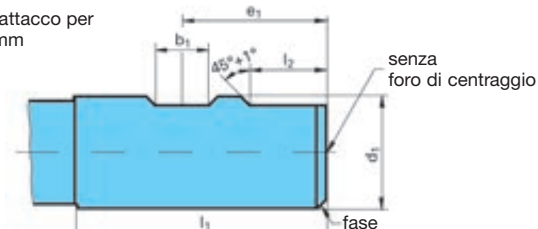
| d1 | l1      | d1 | l1      |
|----|---------|----|---------|
| h6 | +2<br>0 | h6 | +2<br>0 |
| 2  | 28      | 14 | 45      |
| 3  | 28      | 16 | 48      |
| 4  | 28      | 18 | 48      |
| 5  | 28      | 20 | 50      |
| 6  | 36      | 25 | 56      |
| 8  | 36      | 32 | 60      |
| 10 | 40      |    |         |
| 12 | 45      |    |         |

### Forma HB, con piano di attacco laterale

con un piano di attacco per  
d1 = 6 und 20 mm



con due piani di attacco per  
d1 = 25 und 32 mm



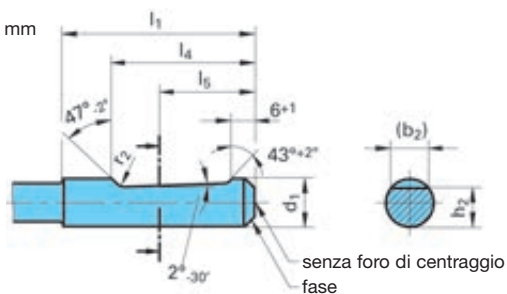
Misure in mm

| d1 | b1         | e1      | h1   | l1      | l2      |
|----|------------|---------|------|---------|---------|
| h6 | +0,05<br>0 | 0<br>-1 | h11  | +2<br>0 | +1<br>0 |
| 6  | 4,2        | 18      | 5,1  | 36      | -       |
| 8  | 5,5        | 18      | 6,9  | 36      | -       |
| 10 | 7          | 20      | 8,5  | 40      | -       |
| 12 | 8          | 22,5    | 10,4 | 45      | -       |
| 14 | 8          | 22,5    | 12,7 | 45      | -       |
| 16 | 10         | 24      | 14,2 | 48      | -       |
| 18 | 10         | 24      | 16,2 | 48      | -       |
| 20 | 11         | 25      | 18,2 | 50      | -       |
| 25 | 12         | 32      | 23   | 56      | 17      |
| 32 | 14         | 36      | 30   | 60      | 19      |

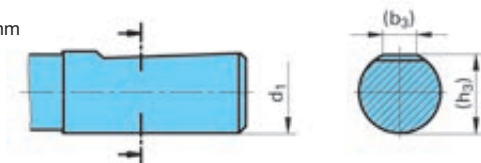
### Forma HE, con piano di attacco inclinato, senza fori di refrigerazione\*

\* Esecuzione: codoli cilindrici a DIN 6535 sono eseguiti senza o con fori di refrigerazione. L'impiego dell'esecuzione per differenti utensili come pure indicazioni dimensionali e designazione per la posizione dei fori di refrigerazione sono contenute nelle corrispondenti norme.

per d1 = da 6 a 20 mm



per d1 = 25 e 32 mm



Misure in mm

| d1 | (b2) | (b3) | h2   | (h3) | l1      | l4      | l5             | r2   |
|----|------|------|------|------|---------|---------|----------------|------|
| h6 | ≈    |      | h11  |      | +2<br>0 | 0<br>-1 | misura<br>nom. | min. |
| 6  | 4,3  | -    | 5,1  | -    | 36      | 25      | 18             | 1,2  |
| 8  | 5,5  | -    | 6,9  | -    | 36      | 25      | 18             | 1,2  |
| 10 | 7,1  | -    | 8,5  | -    | 40      | 28      | 20             | 1,2  |
| 12 | 8,2  | -    | 10,4 | -    | 45      | 33      | 22,5           | 1,2  |
| 14 | 8,1  | -    | 12,7 | -    | 45      | 33      | 22,5           | 1,2  |
| 16 | 10,1 | -    | 14,2 | -    | 48      | 36      | 24             | 1,6  |
| 18 | 10,8 | -    | 16,2 | -    | 48      | 36      | 24             | 1,6  |
| 20 | 11,4 | -    | 18,2 | -    | 50      | 38      | 25             | 1,6  |
| 25 | 13,6 | 9,3  | 23,0 | 24,1 | 56      | 44      | 32             | 1,6  |
| 32 | 15,5 | 9,9  | 30,0 | 31,2 | 60      | 48      | 35             | 1,6  |

## I raccordi HSK

# Tecnica e vantaggi

- **Elevata trasmissione del momento torcente e posizionamento radiale preciso**

Durante il serraggio del codolo cavo, per attrito, scaturiscono forze molto alte sull'intera superficie del codolo e sulle superfici piane (figura 1). Due chiavette, che si trovano al termine del codolo dell'attacco, afferrano l'utensile e provvedono ad un posizionamento radiale preciso e non modificabile.

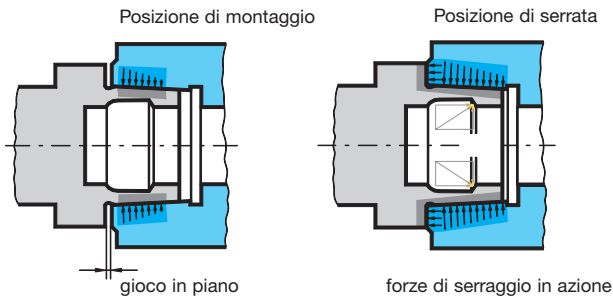
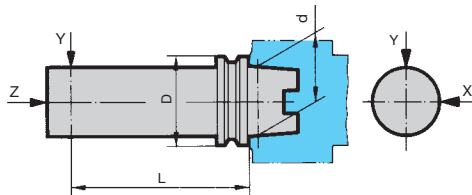


Figura 1  
Forze di precarico e frizione del codolo cavo nei raccordi automatico e manuale.

- **Elevata precisione di cambio e ripetibilità**

La presa a forma di anello delle morse di serraggio all'interno del codolo cavo dell'utensile garantisce il collegamento assolutamente privo di gioco tra codolo e mandrino od attacco (figure 1 e 2).



| HSK-Grand. D | d mm | L mm | X mm  | Y mm  | Z mm  |
|--------------|------|------|-------|-------|-------|
| 32           | 24   | 50   | 0,002 | 0,002 | 0,002 |
| 40           | 30   | 60   | 0,002 | 0,002 | 0,002 |
| 50           | 38   | 75   | 0,002 | 0,002 | 0,002 |
| 63           | 48   | 100  | 0,002 | 0,002 | 0,002 |
| 100          | 75   | 150  | 0,002 | 0,002 | 0,002 |

Figura 2  
Precisione ripetibilità radiale ed assiale dei raccordi automatico e manuale.

- **Idoneità all'alta velocità**

Ad un maggiore numero di giri, corrisponde una forza superiore di bloccaggio del meccanismo di serraggio tra codoli conici. L'iniziale precarico tra codolo cavo ed attacco del mandrino compensa l'espansione del mandrino, provocata dalla forza centrifuga, in modo che il gioco radiale sia completamente eliminato (figura 1). La superficie piana evita lo slittamento assiale.

- **Brevi tempi di cambio**

Razionale cambio utensili, dovuto alla ridotta lun-ghezza (ca. 1/3 del cono ISO convenzionale) ed al peso limitato (ca. 50% del cono ISO).

- **Costruzione del codolo semplice e conveniente**

Il corpo monolitico significa anche nessuna pezzo usurabile.

- **Insensibilità allo sporco**

Il piano a forma di anello non è interrotto, quindi si semplifica la pulizia del sistema. Con il cambio automatico dell'utensile è consigliabile la pulizia con aria durante il cambio.

- **Codifica ovvero identificazione**

Per permettere sistemi di identificazione convenzionali, è stato previsto, in prossimità del collarino, un foro con  $\varnothing 10$  mm e 4,5 mm di profondità per collocazione dei dati (code-chip).

- **Standardizzazione, normalizz. del raccordo autom.**

corrisponde a ISO 12164-1/DIN 69893

- **Alimentazione del refrigerante**

Gli utensili per cambio automatico HSK-A ed E sono predisposti per alimentazione centrale del refrigerante mediante tubo di adduzione od attraverso il collarino. Anche per utensili a cambio manuale con raccordo GM 300 l'alimentazione avviene centralmente. Gli elementi di serraggio sono a completa tenuta stagna, in tal modo l'interno del mandrino non può entrare in contatto con il refrigerante.

- **Montaggio unità di adduzione refrigerante**

Per tutti i moduli GM 300 A è necessaria l'unità di adduzione refrigerante Il montaggio dell'unità è a carico dell'utilizzatore.

## Attacchi utensili SK DIN 69871 e MAS/BT JIS B 6339-2

### Tecnica e vantaggi

Abbiamo sensibilmente ampliato il nostro programma nell'ambito degli attacchi utensili ISO e MAS-BT. Naturalmente anche questi attacchi sono della massima qualità. Vale a dire che produciamo attacchi ISO e MAS-BT in acciaio speciale legato da cementazione, con una resistenza nel nucleo di almeno 900 N/mm<sup>2</sup>, temprato con un procedimento a bassa deformazione a HRC 58 con una profondità di tempra da 0,8 fino a 1,0 mm. La superficie degli attacchi è protetta dalla corrosione e sabbiata per una lunga durata.

#### Qualità derivata da precisione

Il nostro impegno per la massima precisione si estende anche al campo degli attacchi utensili, perciò i mandrini ISO e MAS-BT sono rettificati: nel campo del cono ISO con Ra ≤ 0,2, dal lato attacco con Ra ≤ 0,4. la tolleranza del cono è superiore ad AT 3 con una sicurezza di misurazione di ≤ 1 μm. Troverete indicazione dettagliate delle tolleranze di forma e posizionamento sulle pagine del catalogo per i singoli attacchi utensili. Le tolleranze dei fori e dei perni di attacco sono max. 2/3 della tolleranza DIN.

#### Qualità equilibratura

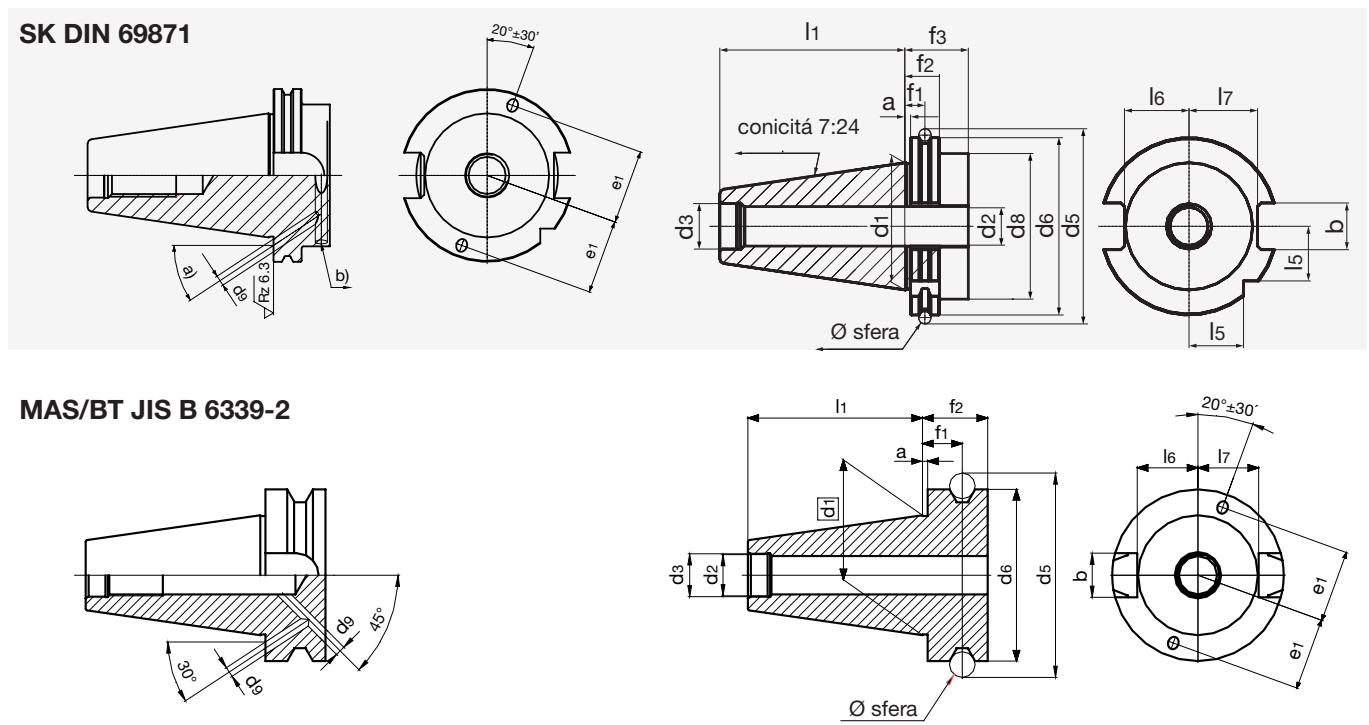
Generalmente attacchi utensili adatti per alti numeri di giri sono equilibrati. A questo scopo abbiamo determinato lo squilibrio ed inserito nei disegni superfici e fori di equilibratura. In tal modo lo squilibrio è ampiamente compensato e si può evitare un'equilibratura di fine almeno sino a ca. 8000 giri/min. Con superiori numeri di giri, gli attacchi preequilibrati devono essere equilibrati di fine a G 6,3 ovvero G 2,5.

#### Esecuzione AD/AF

Produciamo gli attacchi utensili ISO generalmente nell'esecuzione AD/AF; se è fornita l'esecuzione AD, i fori per refrigerante sul collare sono chiusi con viti.

#### Misure e tolleranze generali

Per i nostri attacchi utensili ISO e MAS-BT valgono le seguenti misure:



| Cono ISO | Ø sfera |    | b mm | d1 mm | d2 mm | d3 mm | d5 mm  | d6 mm  | d8 mm | d9 mm | e1 mm | f1 mm | f2 mm | f3 mm | l1 mm  | l5 mm | l6 mm | l7 mm |
|----------|---------|----|------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
|          | a mm    | mm |      |       |       |       |        |        |       |       |       |       |       |       |        |       |       |       |
| SK30     | 3,2     | 7  | 16,1 | 31,75 | M12   | 13    | 59,3   | 50,00  | 45    | 4     | 21    | 11,1  | 19,1  | 35    | 47,80  | 15,00 | 16,4  | 19,0  |
| SK40     | 3,2     | 7  | 16,1 | 44,45 | M16   | 17    | 72,3   | 63,55  | 50    | 4     | 27    | 11,1  | 19,1  | 35    | 68,40  | 18,5  | 22,8  | 25,0  |
| SK50     | 3,2     | 7  | 25,7 | 69,85 | M24   | 25    | 107,25 | 97,50  | 80    | 6     | 42    | 11,1  | 19,1  | 35    | 101,75 | 30,0  | 35,5  | 37,7  |
| BT30     | 2,0     | 8  | 16,1 | 31,75 | M12   | 12,5  | 56,03  | 46,00  | -     | -     | -     | 13,6  | 22,0  | -     | 48,40  | -     | 16,3  | 16,3  |
| BT40     | 2,0     | 10 | 16,1 | 44,45 | M16   | 17    | 75,56  | 63,00  | -     | 4     | 27    | 16,6  | 27,0  | -     | 65,4   | -     | 22,6  | 22,6  |
| BT50     | 3,0     | 15 | 25,7 | 69,85 | M24   | 25    | 118,89 | 100,00 | -     | 5,4   | 42    | 23,2  | 38,0  | -     | 101,8  | -     | 35,4  | 35,4  |



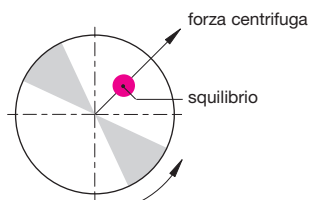
## Influsso dello squilibrio su mandrini, attacchi utensili ed utensili

### Lo squilibrio

Uno squilibrio causa nel mandrino in rotazione una forza centrifuga, che disturba la corsa tranquilla dell'utensile. Questo squilibrio influenza il processo produttivo e la durata dei cuscinetti del mandrino.

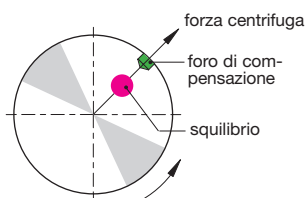
La forza centrifuga  $F$  cresce linearmente con lo squilibrio  $S$  ed al quadrato con il numero di giri secondo la formula qui sotto.

$$F = U \cdot \omega$$



### Equilibratura

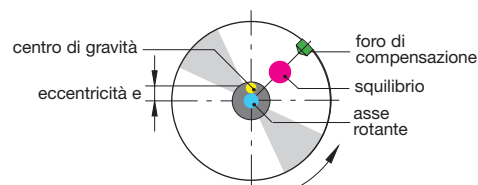
Per compensare forze centrifughe indesiderate, si deve ricostruire la distribuzione simmetrica della massa, allo scopo di eliminare qualsiasi forza centrifuga che influenzi i cuscinetti del mandrino. Negli attacchi utensili sono normalmente presenti fori o superfici di compensazione, tramite i quali si tende a portare la somma di tutte le forze centrifughe, che agiscono sull'asse, verso lo zero (v. DIN ISO 1940).



### Spostamento del centro di gravità

Lo squilibrio di un albero sposterà il suo centro di gravità dall'asse baricentrale con uno scostamento in direzione dello squilibrio. Questo scostamento è anche detto eccentricità residua „ $e$ “ oppure spostamento del centro di gravità. Maggiore è il peso della massa „ $m$ “, superiore può risultare lo squilibrio „ $S$ “ consentito.

$$e = \frac{U}{m}$$



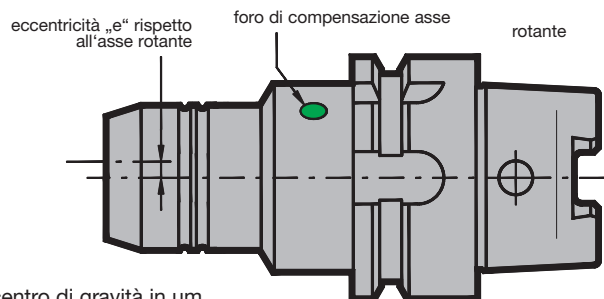
### Calcolo dello squilibrio

Lo squilibrio è una misura che indica di quanto la massa distribuita in modo asimmetrico si scosti radialmente dall'asse baricentrale.

Esso è indicato in gmm. La misura di scostamento „ $e$ “ determina di quanto il centro di gravità di un pezzo si discosta dall'asse rotante. Lo squilibrio si ottiene come segue:

$$U = m \cdot e$$

$U$  = squilibrio in gmm  
 $e$  = scostamento dal centro di gravità in  $\mu\text{m}$   
 $m$  = massa in kg



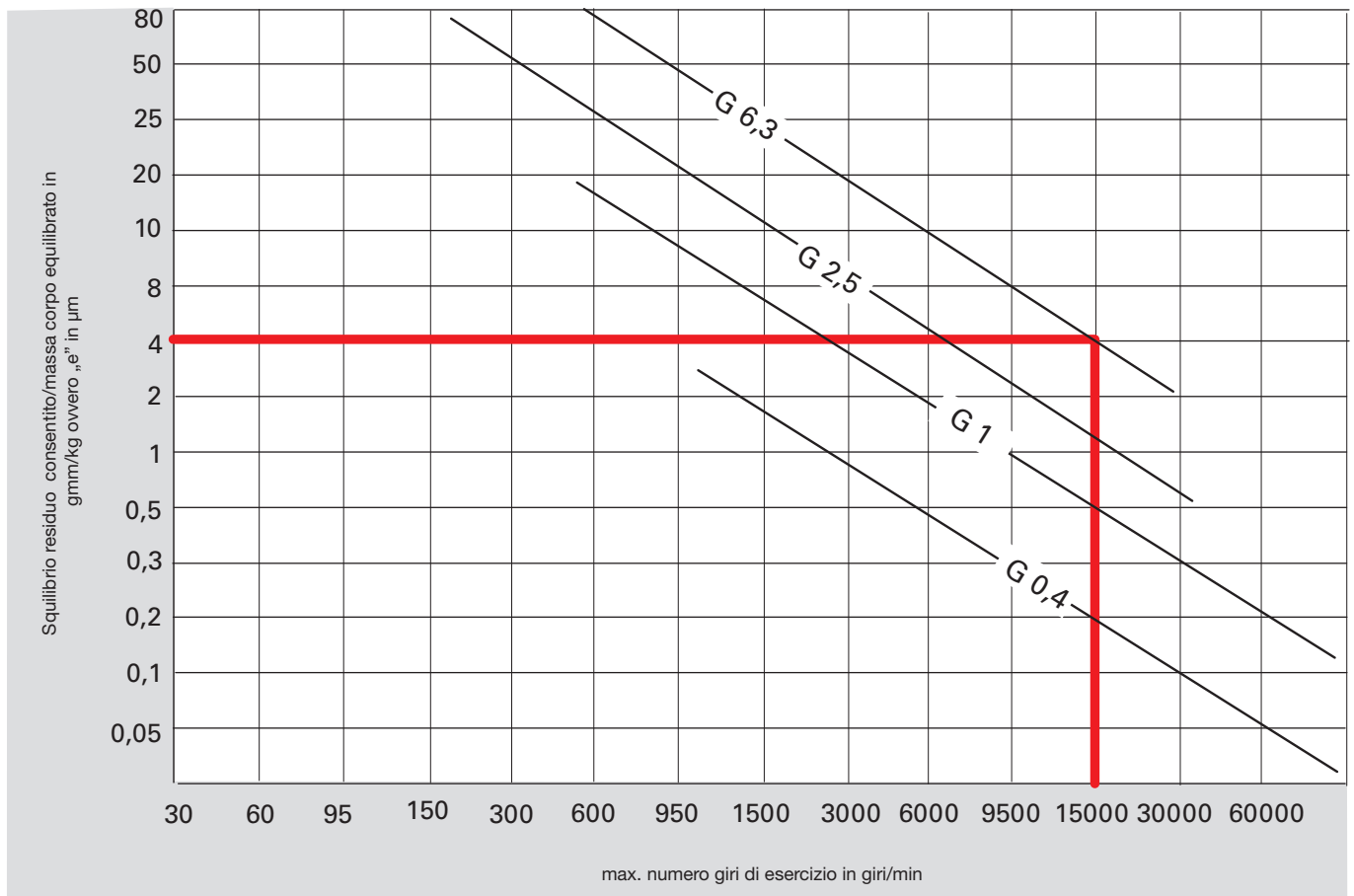
### Limiti dell'equilibratura

In base alla DIN ISO 1940 la qualità dell'equilibratura è indicata con G nonchè dalle unità gmm/kg ovvero  $\mu\text{m}$  e si basa sul numero di giri. Con un numero di giri di 15.000 giri/min ed un peso 1 kg., G6,3 corrisponde ad uno scostamento consentito dal centro tra asse rotante e centro di gravità del mandrino di 4  $\mu\text{m}$ .

Raddoppiando il numero di giri a 30.000 giri/min sarebbe di 2  $\mu\text{m}$ . Se l'attacco utensile però pesa la metà, cioè 0,5 kg, allora la tolleranza di squilibrio consentita si dimezza. Scopo dell'equilibratura deve essere di trovare un compromesso tra fattibilità tecnica e logica economica. Dato che la precisione di cambio radiale di un attacco HSK nuovo può già essere di 2 - 3  $\mu\text{m}$  e per un attacco ISO di 5 - 10  $\mu\text{m}$ , significa disporre già di un limite di qualità di G2,5 ovvero G6,3 a 10.000 giri/min.

Il grafico nella pagina accanto mostra la qualità di equilibratura alla DIN ISO 1940-1, quindi gli squilibri residui consentiti, basati sulla massa del corpo equilibrato, per differenti qualità G di equilibratura, a seconda del massimo numero di giri utilizzato.

## Influsso dello squilibrio su mandrini, attacchi utensili ed utensili



Gli attacchi utensili Stock sono equilibrati a G2,5/25.000 giri/min o a G6,3/15.000 giri/min. A richiesta, specialmente su prescrizione dei produttori di macchine, possiamo equilibrare di fine, con protocollo di equilibratura, sino ad avere uno squilibrio residuo di 0,3  $\text{gmm}$ .

## Mandrini ed apparecchi di calettamento

### Tecnica e vantaggi

I mandrini di calettamento ottengono un'unione ottimale tra mandrino e codolo dell'utensile. Mentre alcuni fornitori utilizzano normale acciaio da cementazione, STOCK impiega uno speciale acciaio utensile orientato all'impiego. Il risultato è una maggiore dilatabilità ed una migliore tollerabilità al calore. Calettamento e dissaldamento si possono effettuare quante volte si voglia.

#### I Vantaggi:

- brevi tempi di calettamento
- massima forza di serraggio
- mandrini di calettamento per codoli dell'utensile con diam. da 3 a 32 mm
- lunga durata

Questi vantaggi sono evidenti soprattutto per: fresatura HSC, truciolatura di materiali temprati, sgrossatura, foratura, alesatura e tornitura interna, lavorazione di legno.

#### Principali proprietà:

- eccellente precisione di coassialità
- ottime forza di serraggio e rigidità
- superiore durata di impiego
- minimo squilibrio della simmetria di rotazione
- convenienza

#### Il principio di serraggio

Riscaldamento e raffreddamento sono i soli fattori determinanti nel serraggio dell'utensile nel mandrino di calettamento per ottenere una sicura tenuta. Il riscaldamento provoca la dilatazione del mandrino, che permette di serrare e disserrare un utensile. Il raffreddamento lo fa contrarre di nuovo, serrando l'utensile montato con la massima forza di bloccaggio. Poiché il riscaldamento rende il mandrino di calettamento molto caldo ed inoltre si serrano e disserrano utensili con spigoli acuminati, si devono assolutamente indossare guanti in kevlar, per proteggersi da scottature e tagli.

#### Prolunghe di calettamento: aumentano il rendimento

Le prolunghe di calettamento incrementano la capacità di rendimento di un utensile e ne riducono gli spigoli di disturbo. Come con il mandrino, l'utensile è serrato nella prolunga e quindi bloccato in modo ideale nel mandrino ad espansione idraulica. Naturalmente le prolunghe si possono montare anche nel mandrino di calettamento.

#### Il team perfetto: mandrini ed apparecchi di calettamento

Per il serraggio ed il disserraggio di utensili nei nostri mandrini di calettamento, offriamo differenti apparecchi per le specifiche esigenze della Vostra produzione.



## Montaggio dell'unità di adduzione refrigerante per nebulizzazione MMS

1. L'attacco HSK deve essere pulito e privo di trucioli e danni.
2. Ingrassare gli anello O prima del montaggio.
3. Inserire l'unità adduzione refrigerante (tubo di adduzione, dado di risvolto e 2 anelli O) completamente e centrarla nell' HSK, con l'aiuto della chiave a tubo.

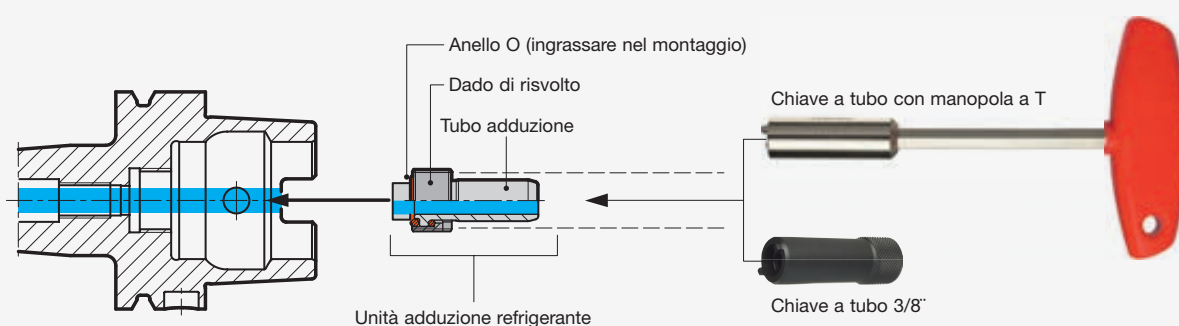
Nell'inserire l'unità di adduzione per nebulizzazione, prestare molta attenzione a che il tubicino di nebulizzazione sia inserito nella vite di regolazione centrato e senza danni (senza deviazioni).

4. Avvitare e stringere bene l'unità di adduzione refrigerante (per momento torcente, vedere tabella a destra).
5. Verificare la possibilità di mobilità radiale del tubo di adduzione.

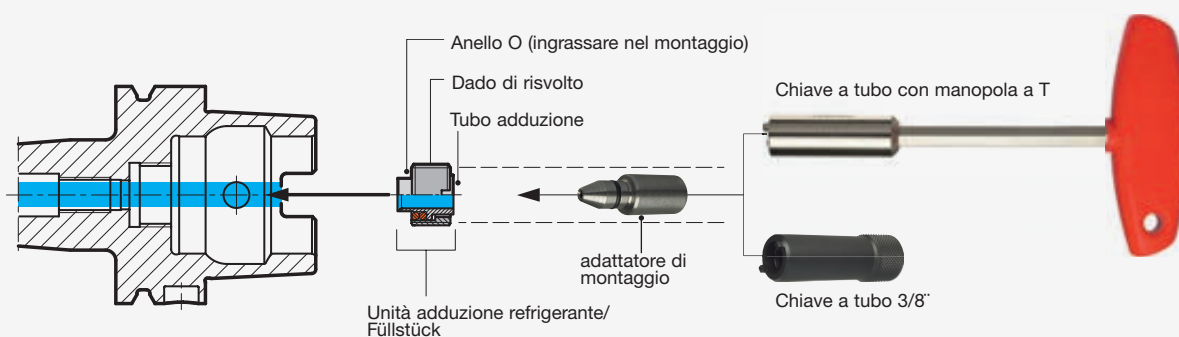
Momento torcente

| per HSK | MA Nm |
|---------|-------|
| 32      | 7     |
| 40      | 11    |
| 50      | 15    |
| 63      | 20    |
| 80      | 25    |
| 100     | 30    |

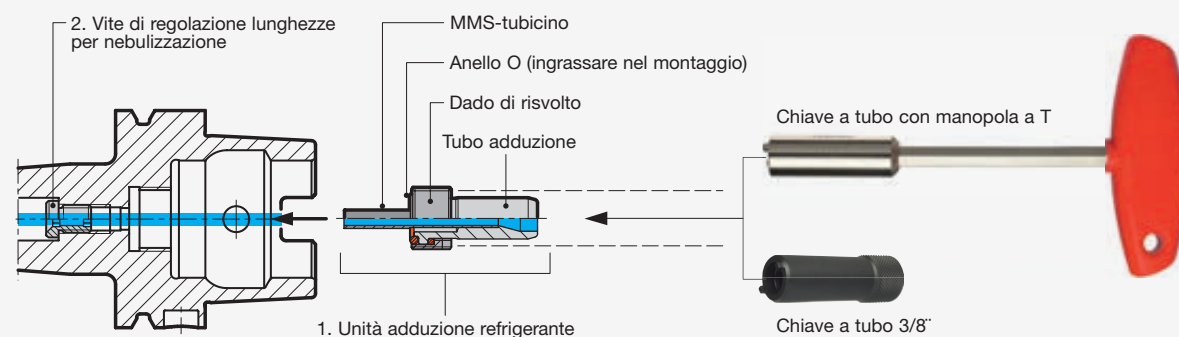
### Montaggio unità adduzione refrigerante per nebulizzazione MMS



### Montaggio unità adduzione refrigerante per nebulizzazione MMS monoblocco



### Montaggio unità adduzione refrigerante per nebulizzazione MMS



## Consigli per l'impiego di mandrini ad espansione idraulica

### Tecnica e vantaggi

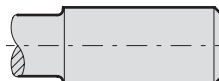
#### Serraggio di codolo utensili normalizzati a DIN 6535 in mandrini ad espansione idraulica

Codoli utensili per serraggio diretto  
Circolarità  $\leq 0,003$  mm

**forma HA**  $\varnothing 6 \dots 20$  mm



**forma HA**  $\varnothing 25 \dots 32$  mm

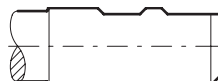


**forma HB**  $\varnothing 6 \dots 20$  mm



Codoli utensili per serraggio con bussola di riduzione  
Circolarità  $\leq 0,005$  mm

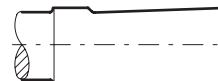
**forma HB**  $\varnothing 25 \dots 32$  mm



**forma HE**  $\varnothing 6 \dots 20$  mm



**forma HE**  $\varnothing 25 \dots 32$  mm



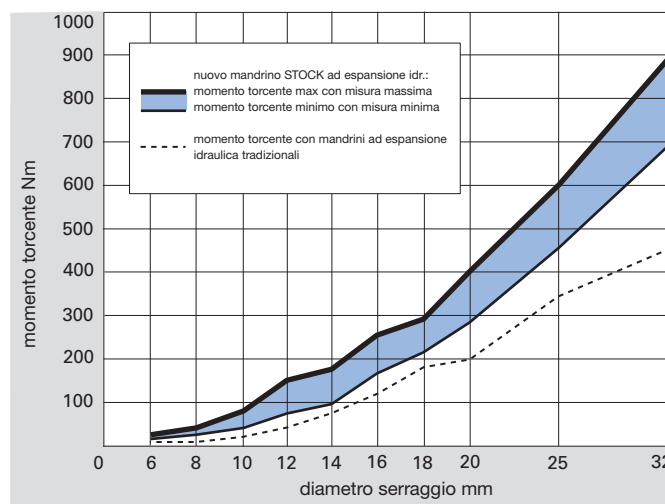
#### Consigli generali:

i nostri mandrini ad espansione idraulica non devono essere azionati con utensili comandati a motore (registratore di impulso o simili). La chiave esagonale non dovrebbe (sull'intera lunghezza) superare la misura della vite, in questo modo si evita ampiamente di trasferire un momento torcente eccessivo. Consigliamo l'impiego della chiave esagonale più comune, art. 4912. Non si dovrebbe superare una coppia di serraggio di 10 Nm.

Il mandrino ad espansione idraulica Stock con maggiore forza di serraggio è adatto per bloccare utensili a rotazione simmetrica o pezzi da lavorare. Con utensili con codolo, si possono serrare direttamente sia codoli cilindrici lisci fino al  $\varnothing 32$  mm che codoli a DIN 6535 forme HA e HB fino al  $\varnothing 20$  mm. Nell'uso non si devono superare i valori della tabella. La mancata osservanza della profondità minima di inserimento o l'impiego di codoli differenti da quelli citati porta a perdite di precisione e forza di serraggio!

Soprattutto con alti numeri di giri per „high speed cutting“ insorgono specifiche esigenze per gli attacchi utensili. In questo ambito il serraggio dell'utensile nel mandrino ad espansione assume una particolare importanza. Per questo motivo ha sviluppato un mandrino ad espansione, che serra con un superiore momento torcente in modo sicuro e forte, quindi assicura una tenuta particolarmente buona dell'utensile nell'attacco.

Il nuovo mandrino ad espansione si contraddistingue, oltre che per l'esatta concentricità (errore max 3  $\mu$ m), per il cambio utensile molto veloce e semplice, nonché per l'azione di smorzamento delle vibrazioni della camera di serraggio ad espansione, anche per effettuare lavori con massime esigenze. Ne risultano ottimali durate degli utensili e migliori finiture di superficie, nonché tenute di misura del pezzo lavorato.



Superiore:  
la forza di serraggio del nuovo mandrino ad espansione idraulica HSK-A STOCK rispetto ad un mandrino ad espansione tradizionale.

## Mandrini ad espansione idraulica

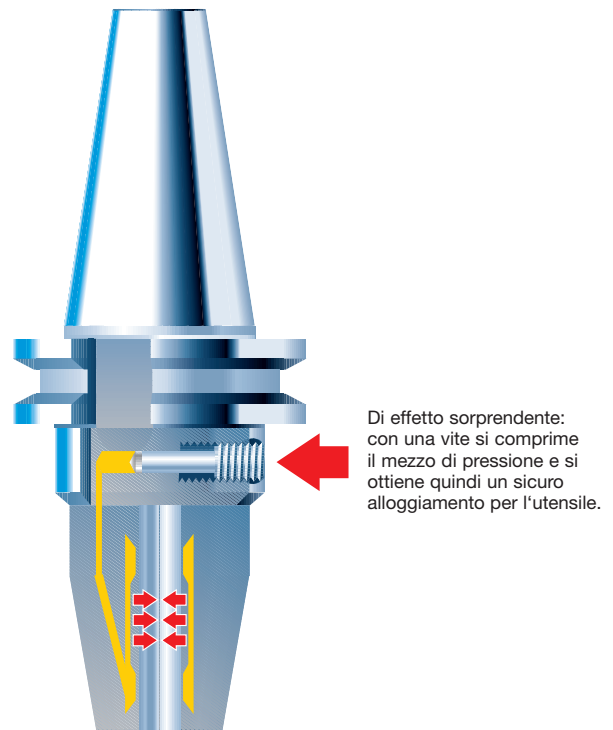
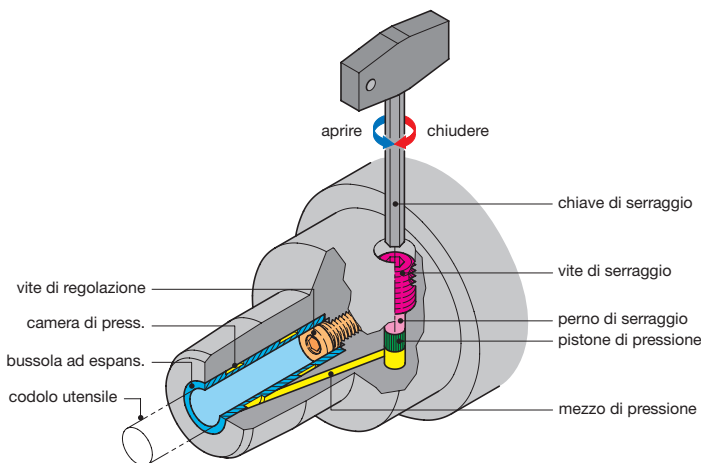
### Tecnica e vantaggi

Gli attacchi utensili devono adeguarsi alle particolari esigenze dei moderni procedimenti di truciolatura. Mandrini ad espansione idraulica offrono perciò la migliore tenuta, unita ad una esatta Circolarità. Inoltre consentono un facile e veloce cambio utensili, al quale contribuisce una speciale chiave di estrazione.

Ruotando la vite a pressione si forma nella camera una pressione sufficientemente alta, che porta alla deformazione elastica della bussola di espansione, tramite la quale l'utensile è serrato con forza, con l'esatta Circolarità. Ciò permette un alloggiamento sicuro e dinamicamente accoppiato. Se si utilizzano bussole di riduzione, che possono montare utensili con differenti diametri, si amplia la gamma di utensili impiegabili. Se però non la si usa, bisogna porre la massima attenzione sulla profondità di inserimento minima!

#### Vantaggi:

- serraggio utensili preciso con errore di coassialità massimo di 3 µm;
- trasmissione di alti momenti torcenti con sistema di bussola ad espansione ottimizzato (massimo serraggio);
- adatti all'alta velocità (nessuna forza centrifuga attraverso i segmenti di serraggio);
- precisa Circolarità, quindi eccellente finitura di superficie e tenuta di misura nel pezzo da lavorare;
- rapido cambio utensile tramite vite di serraggio facilmente azionabile;
- ottimale durata di impiego dell'utensile;
- effetto di smorzamento vibrazioni con cuscinetti idraulici.



| per Ø attacco in mm | max. no. giri in 1/min | momento torcente trasmissibile in Nm | minima prof. bloccaggio in mm | max. registrazione l <sub>3</sub> in mm | forza rad. F consentita su mandrino con 50 mm sporgenza in N | temper. esercizio in °C | max. pressione refrig. in bar |
|---------------------|------------------------|--------------------------------------|-------------------------------|---|--|-------------------------|-------------------------------|
| 6 h <sub>6</sub>    | 50 000                 | 16                                   | 27                            | 10                                      | 225  | 20 - 50                 | 80                            |
| 8 h <sub>6</sub>    | 50 000                 | 26                                   | 27                            | 10                                      | 370  | 20 - 50                 | 80                            |
| 10 h <sub>6</sub>   | 50 000                 | 50                                   | 31                            | 10                                      | 540  | 20 - 50                 | 80                            |
| 12 h <sub>6</sub>   | 50 000                 | 82                                   | 36                            | 10                                      | 650  | 20 - 50                 | 80                            |
| 14 h <sub>6</sub>   | 50 000                 | 125                                  | 36                            | 10                                      | 900  | 20 - 50                 | 80                            |
| 16 h <sub>6</sub>   | 50 000                 | 190                                  | 39                            | 10                                      | 1410   | 20 - 50                 | 80                            |
| 18 h <sub>6</sub>   | 50 000                 | 275                                  | 39                            | 10                                      | 1580   | 20 - 50                 | 80                            |
| 20 h <sub>6</sub>   | 50 000                 | 310                                  | 41                            | 10                                      | 1860   | 20 - 50                 | 80                            |
| 25 h <sub>6</sub>   | 25 000                 | 520                                  | 47                            | 10                                      | 4400   | 20 - 50                 | 80                            |
| 32 h <sub>6</sub>   | 25 000                 | 770                                  | 51                            | 10                                      | 6500   | 20 - 50                 | 80                            |

## Confronto internazionale dei materiali

| Germania    |              | Gran Bretagna |     | Giappone        | Stati Uniti    |
|-------------|--------------|---------------|-----|-----------------|----------------|
| No. di mat. | DIN          | BS            | EN  | JIS             | AISI/SAE/ASTM  |
| 1.0711      | 9 S 20       | 220 M 07      | -   | SUM 21          | 1212           |
| 1.0715      | 9 SMn 28     | 230 M 07      | -   | SUM 22          | 1213           |
| 1.0718      | 9 SMnPb 28   | -             | -   | SUM 22 L        | 12 L 13        |
| 1.0721      | 10 S 20      | 210 M 15      | -   | -               | 1108           |
| 1.0722      | 10 SPb 20    | -             | -   | -               | 11 L 08        |
| 1.0723      | 15 S 20      | 210 A 15      | -   | SUM 32          | -              |
| 1.0736      | 9 SMn 36     | 240 M 07      | 1B  | -               | 1215           |
| 1.0737      | 9 SMnPb 36   | -             | -   | -               | 12 L 14        |
| 1.0726      | 35 S 20      | 212 M 36      | 8M  | -               | 1140           |
| 1.0727      | 45 S 20      | 212 M 44      | -   | -               | 1146           |
| 1.0728      | 60 S 20      | -             | -   | -               | -              |
| 1.0037      | St 37-2      | -             | -   | STKM 12 C       | -              |
| 1.0044      | St 44-2      | 4360-43 B     | -   | SM 41 B         | A 570 Gr. 40   |
| 1.0116      | St 37-3      | 4360-40 C     | -   | -               | A 573 Gr. 58   |
| 1.0144      | St 44-3      | 4360-43 C     | -   | SM 41 C         | A 573 Gr. 70   |
| 1.0050      | St 50-2      | 4360-50 B     | -   | SS 50           | A 570 Gr. 50   |
| 1.0570      | St 52-3      | 4360-50 B     | -   | SM 50 YA        | -              |
| 1.0060      | St 60-2      | 4360-SSE; SS  | -   | SM 58           | -              |
| 1.5415      | 15 Mo 3      | 1501-240      | -   | -               | A 204 Gr. A    |
| 1.5423      | 16 Mo 5      | 1503-245-420  | -   | -               | 4520           |
| 1.5622      | 14 Ni 6      | -             | -   | -               | A 350-LF 5     |
| 1.5680      | 12 Ni 19     | -             | -   | -               | 2515           |
| 1.7335      | 13 CrMo 4 4  | 1501-620 Gr.  | -   | -               | A 182-F11; F12 |
| 1.7337      | 16 CrMo 4 4  | 1501-620 Gr.  | -   | -               | A 387 Gr. 12 C |
| 1.7380      | 10 CrMo 9 10 | 1501-622 Gr.  | -   | -               | A 182-F22      |
| 1.7709      | 21 CrMoV 5 7 | -             | -   | -               | -              |
| 1.7715      | 14 MoV 6 3   | 1503-660-440  | -   | -               | -              |
| 1.7735      | 14 CrMoV 6 9 | -             | -   | -               | -              |
| 1.0904      | 55 Si 7      | 250 A 53      | 45  | -               | 9255           |
| 1.0961      | 60 SiCr 7    | -             | -   | SUP 7           | 9262           |
| 1.1231      | CK 67        | 060 A 67      | -   | -               | 1070           |
| 1.1248      | CK 75        | 060 A 78      | -   | -               | 1078; 1080     |
| 1.1274      | CK 101       | 060 A 96      | -   | SUP 4           | 1095           |
| 1.7103      | 67 SiCr 5    | -             | -   | -               | -              |
| 1.7176      | 55 Cr 3      | 527 A 60      | 48  | SUP 9 (A)       | 5155           |
| 1.8159      | 50 CrV 4     | 735 A 50      | 47  | SUP 10          | 6150           |
| 1.0301      | C 10         | 045 M 10      | -   | S 10 C          | 1010           |
| 1.0401      | C 15         | 080 M 15      | -   | -               | 1015           |
| 1.1121      | CK 10        | 045 M 10      | -   | S 10 C; S 9 CK  | 1010           |
| 1.1141      | CK 15        | 080 M 15      | 32C | S 15 C; S 15 CK | 1015           |
| 1.7012      | 13 Cr 2      | -             | -   | -               | -              |
| 1.7015      | 15 Cr 3      | 523 M 15      | -   | SCR 415 (H)     | 5015           |
| 1.5732      | 14 NiCr 10   | -             | -   | SNC 415 (H)     | 3415           |
| 1.5752      | 14 NiCr 14   | 655 M 13      | 36A | SNC 815 (H)     | 3310; 9314     |
| 1.5860      | 14 NiCr 18   | -             | -   | -               | -              |
| 1.5919      | 15 CrNi 6    | S 107         | -   | -               | -              |
| 1.5920      | 18 NiCr 8    | -             | -   | -               | -              |
| 1.6523      | 21 NiCrMo 2  | 805 M 20      | 362 | SNCM 220 (H)    | 8620           |
| 1.6587      | 17 CrNiMo 6  | 820 A 16      | -   | -               | -              |
| 1.7131      | 16 MnCr 5    | 527 M 17      | -   | SCR 415         | 5115           |
| 1.7139      | 16 MnCrS 5   | -             | -   | -               | -              |
| 1.7147      | 20 MnCr 5    | -             | -   | SMnC 420 (H)    | 5120           |
| 1.7149      | 20 MnCrS 5   | -             | -   | -               | -              |
| 1.7262      | 15 CrMo 5    | -             | -   | SCM 415 (H)     | -              |
| 1.7264      | 20 CrMo 5    | -             | -   | SCM 421         | -              |
| 1.7271      | 23 CrMoB 3 3 | -             | -   | -               | -              |
| 1.7311      | 20 CrMo 2    | -             | -   | -               | -              |
| 1.7321      | 20 MoCr 4    | -             | -   | -               | -              |
| 1.7323      | 20 MoCrS 4   | -             | -   | -               | -              |
| 1.7325      | 25 MoCr 4    | -             | -   | -               | -              |
| 1.7326      | 25 MoCrS 4   | -             | -   | -               | -              |
| 1.8504      | 34 CrAl 6    | -             | -   | -               | -              |
| 1.8506      | 34 CrAlS 5   | -             | -   | -               | -              |
| 1.8507      | 34 CrAlMo 5  | 905 M 31      | -   | -               | A 355 Cl. D    |
| 1.0038      | RSt37-2      | 4360 40C      | 1A  | STKM 12A;C      | A570.36        |

## Confronto internazionale dei materiali

| No. di mat. | Germania      | Gran Bretagna |      | Giappone        | Stati Uniti   |
|-------------|---------------|---------------|------|-----------------|---------------|
|             | DIN           | BS            | EN   | JIS             | AISI/SAE/ASTM |
| 1.0402      | C22           | 050 A 20      | 2C   | -               | 1020          |
| 1.5026      | 55 Si 7       | 250 A 53      | -    | -               | 9255          |
| 1.8509      | 41 CrAlMo 7   | 905 M 39      | 41B  | SACM 645        | A 355 Cl. A   |
| 1.8515      | 31 CrMo 12    | 722 M 24      | -    | -               | -             |
| 1.8519      | 31 CrMoV 9    | -             | -    | -               | -             |
| 1.8521      | 15 CrMoV 5 9  | -             | -    | -               | -             |
| 1.8523      | 39 CrMoV 13 9 | 897 M 39      | 40C  | -               | -             |
| 1.8550      | 34 CrAlNi 7   | -             | -    | -               | -             |
| 1.0402      | C 22          | 050 A 20      | 2D   | -               | 1020          |
| 1.0406      | C 25          | 070 M 26      | -    | -               | 1025          |
| 1.0501      | C 35          | 060 A 35      | -    | -               | 1035          |
| 1.0503      | C 45          | 080 M 46      | -    | -               | 1045          |
| 1.0511      | C 40          | -             | -    | -               | 1040          |
| 1.0528      | C 30          | -             | -    | -               | -             |
| 1.1151      | Ck 22         | 050 A 20      | -    | S 20 C; S 20 CK | 1023          |
| 1.1158      | Ck 25         | 070 M 26      | -    | S 25 C          | 1025          |
| 1.1178      | Ck 30         | -             | -    | -               | -             |
| 1.1181      | Ck 35         | 080 M 36      | -    | S 35 C          | 1035          |
| 1.1186      | Ck 40         | 080 M 40      | -    | S 40 C          | 1040          |
| 1.1191      | Ck 45         | 080 M 46      | -    | S 45 C          | 1045          |
| 1.0535      | C 55          | 070 M 55      | -    | -               | 1055          |
| 1.0540      | C 50          | -             | -    | -               | -             |
| 1.0601      | C 60          | 080 A 62      | 43D  | -               | 1060          |
| 1.1203      | Ck 55         | 070 M 55      | -    | S 55 C          | 1055          |
| 1.1206      | Ck 50         | 080 M 50      | -    | -               | 1050          |
| 1.1221      | Ck 60         | 080 A 62      | 43D  | S 58 C          | 1060          |
| 1.1133      | 20 Mn 5       | 120 M 19      | -    | -               | 1022; 1518    |
| 1.3505      | 100 Cr 6      | 534 A 99      | 31   | SUJ 2           | 52100         |
| 1.5120      | 38 MnSi 4     | -             | -    | -               | -             |
| 1.5121      | 46 MnSi 4     | -             | -    | -               | -             |
| 1.5141      | 53 MnSi 4     | -             | -    | -               | -             |
| 1.5710      | 36 NiCr 6     | 640 A 35      | 111A | SNC 236         | 3135          |
| 1.6546      | 40 NiCrMo     | 311-Type7     | -    | SNM 240         | 8740          |
| 1.6565      | 40 NiCrMo     | 311-Type6     | -    | SNM 439         | 4340          |
| 1.7003      | 38 Cr 2       | -             | -    | -               | -             |
| 1.7006      | 46 Cr 2       | -             | -    | -               | 5045          |
| 1.7020      | 32 Cr 2       | -             | -    | -               | -             |
| 1.7030      | 28 Cr 4       | 530 A 30      | -    | -               | 5130          |
| 1.7033      | 34 Cr 4       | 530 A 32      | 18B  | SCr 430 (H)     | 5132          |
| 1.7218      | 25 CrMo 4     | 1717 CDS 110  | -    | SCM 420; SCM    | 4130          |
| 1.7220      | 34 CrMo 4     | 708 A 37      | 19B  | SCM 432; SCCrM  | 4135; 4137    |
| 1.7223      | 41 CrMo 4     | 708 M 40      | 19A  | SCM 440         | 4142; 4140    |
| 1.7225      | 42 CrMo 4     | 708 M 40      | 19A  | SCM 440         | 4142; 4140    |
| 1.7228      | 50 CrMo 4     | 708 A 47      | -    | SCM 445 (H)     | 4150          |
| 1.1157      | 40 Mn 4       | 150 M 36      | 15   | -               | 1039          |
| 1.1165      | 30 Mn 5       | 120 M 36      | -    | SMn 433 H; SCMn | 1330          |
| 1.1167      | 36 Mn 5       | 150 M 36      | -    | SMn 438 H; SCMn | 1335          |
| 1.1170      | 28 Mn 5       | 150 M 28      | 14A  | SCMn 1          | 1330          |
| 1.3561      | 44 Cr 2       | -             | -    | -               | -             |
| 1.3563      | 43 CrMo 4     | -             | -    | -               | -             |
| 1.3565      | 48 CrMo 4     | 817 M 40      | -    | SNC 836         | -             |
| 1.5120      | 38 MnSi 4     | -             | -    | -               | -             |
| 1.5121      | 46 MnSi 4     | -             | -    | -               | -             |
| 1.5122      | 37 MnSi 4     | -             | -    | -               | -             |
| 1.5131      | 50 MnSi4      | -             | -    | -               | -             |
| 1.5141      | 53 MnSi 4     | -             | -    | -               | -             |
| 1.5223      | 42 MnV 7      | -             | -    | -               | -             |
| 1.5710      | 36 NiCr 6     | 640 A 35      | 111A | SNC 236         | 3135          |
| 1.5736      | 36 NiCr 10    | -             | -    | SNC 631 (H)     | 3435          |
| 1.5755      | 31 NiCr 14    | 653 M 31      | -    | SNC 836         | -             |
| 1.6511      | 36 CrNiMo     | 816 M 40      | 110  | SNC 836         | 9840          |
| 1.6513      | 28 NiCrMo     | -             | -    | -               | -             |
| 1.7003      | 38 Cr 2       | -             | -    | -               | -             |
| 1.7006      | 46 Cr 2       | -             | -    | -               | 5045          |
| 1.7030      | 28 Cr 4       | 530 A 30      | -    | -               | 5130          |



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| No. di mat. | DIN          | BS            | EN   | JIS              | AISI/SAE/ASTM |
| 1.7033      | 34 Cr 4      | 530 A 32      | 18B  | SCr 430 (H)      | 5132          |
| 1.7034      | 37 Cr 4      | 530 A 36      | -    | SCr 435 (H)      | 5135          |
| 1.7035      | 41 Cr 4      | 530 M 40      | 18   | SCr 440 (H)      | 5140          |
| 1.7218      | 25 CrMo 4    | 1717 CDS 110  | -    | SCM 420; SCM 430 | 4130          |
| 1.7220      | 34 CrMo 4    | 708 A 37      | 19B  | SCM 432; SCCrM 3 | 4135; 4137    |
| 1.7223      | 41 CrMo 4    | 708 M 40      | 19A  | SCM 440          | 4142; 4140    |
| 1.7225      | 42 CrMo 4    | 708 M 40      | 19A  | SCM 440          | 4142; 4140    |
| 1.7228      | 50 CrMo 4    | 708 A 47      | -    | SCM 445 (H)      | 4150          |
| 1.7561      | 42 CrV 6     | -             | -    | -                | -             |
| 1.7735      | 14 CrMoV 6 9 | -             | -    | -                | -             |
| 1.8159      | 50 CrV 4     | 735 A 50      | 47   | SUP 10           | 6150          |
| 1.3563      | 43 CrMo 4    | -             | -    | -                | -             |
| 1.3565      | 48 CrMo 4    | 817 M 40      | -    | SNC 836          | -             |
| 1.5120      | 38 MnSi 4    | -             | -    | -                | -             |
| 1.5121      | 46 MnSi 4    | -             | -    | -                | -             |
| 1.5122      | 37 MnSi 4    | -             | -    | -                | -             |
| 1.5223      | 42 MnV 7     | -             | -    | -                | -             |
| 1.5710      | 36 NiCr 6    | 640 A 35      | 111A | SNC 236          | 3135          |
| 1.5736      | 36 NiCr 10   | -             | -    | SNC 631 (H)      | 3435          |
| 1.5864      | 35 NiCr 18   | -             | -    | -                | -             |
| 1.6511      | 36 CrNiMo 4  | 816 M 40      | 110  | SNC 836          | 9840          |
| 1.6580      | 30 CrNiMo 8  | 823 M 30      | -    | SNM 431          | -             |
| 1.6582      | 34 CrNiMo 6  | 817 M 40      | 24   | SNM 447          | 4340          |
| 1.7033      | 34 Cr 4      | 530 A 32      | 18B  | SCr 430 (H)      | 5132          |
| 1.7034      | 37 Cr 4      | 530 A 36      | -    | SCr 435 (H)      | 5135          |
| 1.7035      | 41 Cr 4      | 530 M 40      | 18   | -                | 5140          |
| 1.7045      | 42 Cr 4      | 530 A 40      | -    | 2245             | 5140          |
| 1.7218      | 25 CrMo 4    | 1717 CDS 110  | -    | 2225             | 4130          |
| 1.7220      | 34 CrMo 4    | 708 A 37      | 19B  | 2234             | 4135; 4137    |
| 1.7223      | 41 CrMo 4    | 708 M 40      | 19A  | 2244             | 4142; 4140    |
| 1.7225      | 42 CrMo 4    | 708 M 40      | 19A  | 2244             | 4142; 4140    |
| 1.7228      | 50 CrMo 4    | 708 A 47      | -    | -                | 4150          |
| 1.7361      | 32 CrMo 12   | 722 M 24      | 40B  | 2240             | -             |
| 1.7561      | 42 CrV 6     | -             | -    | -                | -             |
| 1.7707      | 30 CrMoV 9   | -             | -    | -                | -             |
| 1.7735      | 14 CrMoV 6 9 | -             | -    | -                | -             |
| 1.8159      | 50 CrV 4     | 735 A 50      | 47   | 2230             | 6150          |
| 1.8161      | 58 CrV 4     | -             | -    | -                | -             |
| 1.1520      | C 70 W1      | -             | -    | -                | -             |
| 1.1525      | C 80 W1      | -             | -    | -                | W 108         |
| 1.1545      | C 105 W1     | -             | -    | -                | W 110         |
| 1.1620      | C 70 W2      | -             | -    | -                | -             |
| 1.1625      | C 80 W2      | BW 1B         | -    | -                | W 1           |
| 1.1645      | C105 W2      | -             | -    | -                | -             |
| 1.1654      | C 110 W      | -             | -    | -                | -             |
| 1.1663      | C 125 W      | -             | -    | -                | W 112         |
| 1.1673      | C 135 W      | -             | -    | -                | -             |
| 1.1730      | C 45 W       | -             | -    | -                | -             |
| 1.1740      | C 60 W       | -             | -    | -                | -             |
| 1.1744      | C 67 W       | -             | -    | -                | -             |
| 1.1750      | C 75 W       | BW 1A         | -    | -                | W 1           |
| 1.1820      | C 55 W       | -             | -    | -                | -             |
| 1.1830      | C 85 W       | -             | -    | -                | -             |
| 1.2067      | 100 Cr 6     | BL 3          | -    | -                | L 3           |
| 1.2101      | 62 SiMnCr 4  | -             | -    | -                | -             |
| 1.2103      | 58 SiCr 8    | -             | -    | -                | -             |
| 1.2108      | 90 CrSi 5    | -             | -    | -                | -             |
| 1.2162      | 21 MnCr 5    | -             | -    | -                | -             |
| 1.2210      | 115 CRV 3    | -             | -    | -                | L 2           |
| 1.2330      | 35 CrMo 4    | 708 A 37      | -    | 2234             | 4135          |
| 1.2332      | 47 CrMo 4    | 709 M 40      | -    | 2244             | 4142          |
| 1.2419      | 105 WCr 6    | -             | -    | -                | -             |
| 1.2510      | 100 MnCrW 4  | BO 1          | -    | 2140             | O 1           |
| 1.2516      | 120 W 4      | BF 1          | -    | -                | -             |
| 1.2542      | 45 WCrV 7    | BS 1          | -    | 2710             | S 1           |

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| 1.2550      | 60 WCrV 7            | -             | -   | -                | -             |
| 1.2721      | 50 NiCr 13           | -             | -   | -                | -             |
| 1.2735      | 15 NiCr 14           | -             | -   | SNC 22           | -             |
| 1.2762      | 75 CrMoNiW 6 7       | -             | -   | -                | -             |
| 1.2826      | 60 MnSiCr 4          | -             | -   | -                | -             |
| 1.2833      | 100 V 1              | BW 2          | -   | SKS 43           | W 210         |
| 1.2842      | 90 MnCrV 8           | BO 2          | -   | -                | O 2           |
| 1.2080      | X 210 Cr 12          | BD 3          | -   | SKD 1            | D 3           |
| 1.2341      | X 6 CrMo 4           | -             | -   | -                | -             |
| 1.2363      | X 100 CrMoV 5 1      | BA 2          | -   | SKD 12           | A 2           |
| 1.2379      | X 155 CrVMo12 1      | BD 2          | -   | SKD 11           | D 2           |
| 1.2436      | X 210 CrW 12         | -             | -   | SKD 2            | -             |
| 1.2601      | X 165 CrMoV 12       | -             | -   | -                | -             |
| 1.2311      | 40 CrMnMo 7          | -             | -   | -                | -             |
| 1.2312      | 40 CrMnMoS 8 6       | -             | -   | -                | -             |
| 1.2711      | 54 NiCrMoV 6         | -             | -   | -                | -             |
| 1.2713      | 55 NiCrMoV 6         | -             | -   | SKT 4            | L 6           |
| 1.2738      | 40 CrMnNiMo 8        | -             | -   | -                | -             |
| 1.2744      | 57 NiCrMoV 77        | -             | -   | -                | -             |
| 1.2764      | X 19 NiCrMo 4        | -             | -   | -                | -             |
| 1.2767      | X 45 NiCrMo 4        | -             | -   | -                | -             |
| 1.2083      | X 42 Cr 13           | -             | -   | SUS 420 J 2      | -             |
| 1.2343      | X 38 CrMoV 5 1       | BH 11         | -   | SKD 6            | H 11          |
| 1.2344      | X 40 CrMoV 5 1       | BH 13         | -   | SKD 61           | H 13          |
| 1.2365      | X 32 CrMoV 3 3       | BH 10         | -   | SKD 7            | H 10          |
| 1.2567      | X 30 WCrV 5 3        | -             | -   | SKD 4            | -             |
| 1.2581      | X 30 WCrV 9 3        | BH 21         | -   | SKD 5            | H 21          |
| 1.2885      | X 32 CrMoV 3 3 3     | -             | -   | -                | -             |
| 1.2316      | X 36 CrMo 17         | -             | -   | -                | -             |
| 1.0420      | GS-38                | -             | -   | -                | -             |
| 1.1118      | GS-24 Mn 6           | -             | -   | -                | -             |
| 1.1120      | GS-20 Mn 5           | -             | -   | -                | -             |
| 1.5419      | GS-22 Mo 4           | -             | -   | -                | -             |
| 1.5633      | GS-24 Ni 8           | -             | -   | -                | -             |
| 1.5681      | GS-10 Ni 19          | -             | -   | -                | -             |
| 1.6309      | GS-20 Mn MoNi 5 5    | -             | -   | -                | -             |
| 1.6582      | GS-34 CrNiMo 6       | -             | 24  | -                | -             |
| 1.6748      | GS-40 NiCrMo 6 5 6   | -             | -   | -                | -             |
| 1.4311      | X 2 CrNi 18 10       | 304 S 62      | -   | SUS 304 LN       | 304 LN        |
| 1.4401      | X 5 CrNiMo 18 10     | 316 S 16      | 58J | SUS 316          | 316           |
| 1.4404      | X 2 CrNiMo 17 13 2   | 316 S 11      | -   | SUS 316 L        | 316 L         |
| 1.4406      | X 2 CrNiMoN 17 12 2  | 316 S 61      | 58C | SUS 316 LN       | 316 LN        |
| 1.4429      | X 2 CrNiMoN 17 13 3  | 316 S 62      | -   | SUS 316 LN       | 316 LN        |
| 1.4435      | X 2 CrNiMo 18 14 3   | 317 S 12      | -   | SCS 16; SUS 316  | 316 L         |
| 1.4436      | X 5 CrNiMo 17 13 3   | 316 S 16      | -   | SUS 316          | 316           |
| 1.4438      | X 2 CrNiMo 18 16 4   | 317 S 12      | -   | SUS 317 L        | 317 L         |
| 1.4460      | X 8 CrNiMo 27 5      | -             | -   | SUS 329 J 1      | 329           |
| 1.4462      | X 2 CrNiMoN 22 5     | -             | -   | -                | -             |
| 1.4541      | X 6 CrNiTi 18 10     | 321 S 12      | 58B | SUS 321          | 321           |
| 1.4542      | X 5 CrNiCuNb 17 14   | -             | -   | SCS 124; SUS 630 | 630           |
| 1.4546      | X 5 CrNiNb 18 10     | 347 S 18      | -   | -                | 348           |
| 1.4550      | X 6 CrNiNb 18 10     | 347 S 17      | 58F | SUS 347          | 347           |
| 1.4571      | X 6 CrNiMoTi 17 12 2 | 320 S 31      | 58J | -                | 316 Ti        |
| 1.4580      | X 6 CrNiMoNb 17 12 2 | 318 S 17      | -   | -                | 316 Cb        |
| 1.4301      | X 5 CrNi 18 9        | 304 S 15      | 58E | SUS 304          | 304; 304 H    |
| 1.4303      | X 5 CrNi 18 12       | 305 S 19      | -   | SUS 305          | 308; 305      |
| 1.4305      | X 10 CrNiS 18 9      | 303 S 21      | 58M | SUS 303          | 303           |
| 1.4306      | X 2 CrNi 19 11       | 304 S 12      | -   | SCS 19           | 304 L         |
| 1.4310      | X 12 CrNi 17 7       | 301 S 21      | -   | SUS 301          | 301           |
| 1.4350      | X 5 CrNi 18 9        | 304 S 31      | 58E | SUS 302          | 304           |
| 1.4573      | X 10 CrNiMoTi 18 12  | 320 S 33      | -   | -                | 316 Ti        |
| 1.4583      | X 10 CrNiMoNb 18 12  | -             | -   | -                | 318           |
| 1.4000      | X 6 Cr 13            | 403 S 17      | -   | SUS 403          | 403           |
| 1.4002      | X 6 CrAl 13          | 405 S 17      | -   | SUS 405          | 405           |
| 1.4016      | X 6 Cr 17            | 430 S 15      | 960 | SUS 430          | 430           |

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| No. di mat. | DIN                  | BS              | EN  | JIS          | AISI/SAE/ASTM   |
| 1.4113      | X 6 CrMo 17          | 434 S 17        | -   | SUS 434      | 434             |
| 1.4313      | X 5 CrNi 13 4        | 425 C 11        | -   | SCS 5        | CA 6-NM         |
| 1.4510      | X 6 CrTi 17          | -               | -   | SUS 430 LX   | XM 8; 430 Ti    |
| 1.4512      | X 5 CrTi 12          | 409 S 19        | -   | SUH 409      | 409             |
| 1.4005      | X 12 CrS 13          | 416 S 21        | -   | SUS 416      | 416             |
| 1.4006      | X 10 Cr 13           | 410 S 21        | 56A | SUS 410      | 410; CA-15      |
| 1.4021      | X 20 Cr 13           | 420 S 37        | -   | SUS 420 J 1  | 420             |
| 1.4028      | X 30 Cr 13           | 420 S 45        | -   | SUS 420 J 2  | -               |
| 1.4031      | X 38 Cr 13           | -               | -   | SUS 420 J 2  | -               |
| 1.4034      | X 46Cr 13            | 420 S 45        | 56D | SUS 420 J 2  | -               |
| 1.4057      | X 20 CrNi 17 2       | 431 S 29        | 57  | SUS 431      | 431             |
| 1.4104      | X 12 CrMoS 17        | -               | -   | SUS 430 F    | 430 F           |
| 1.4125      | X 105 CrMo 17        | -               | -   | SUS 440 C    | 440 C           |
| 1.4742      | X 10 CrAl 18         | 430 S 15        | 60  | SUS 430; SUH | 430             |
| 1.4747      | X 80 CrNiSi 20       | 443 S 65        | 59  | SUH 4        | HNV 6           |
| 1.4762      | X 10 CrAl 24         | -               | -   | -            | 446             |
| 1.4876      | X 10 NiCrAlTi 33     | NA 15 (H)       | -   | NCF 800      | B 163           |
| 0.6010      | GG-10                | -               | -   | FC 10        | A48-20 B        |
| 0.6015      | GG-15                | Grade 150       | -   | FC 15        | A48-25 B        |
| 0.6020      | GG-20                | Grade 220       | -   | FC 20        | A48-30 B        |
| 0.6025      | GG-25                | Grade 260       | -   | FC 25        | A48-40 B        |
| 0.6030      | GG-30                | Grade 300       | -   | FC 30        | A48-45 B        |
| 0.6035      | GG-35                | Grade 350       | -   | FC 35        | A48-50 B        |
| 0.6040      | GG-40                | Grade 400       | -   | -            | A48-60 B        |
| 0.6655      | GGL-NiCuCr 15 6      | L-NUC 15 6 2    | -   | -            | A-436 Type 1    |
| 0.7040      | GGG-40               | SNG 420/12      | -   | FCD 40       | 60-40-18        |
| 0.7050      | GGG-50               | SNG 500/7       | -   | FCD 50       | 65-45-12        |
| 0.7060      | GGG-60               | SNG 600/3       | -   | FCD 60       | 80-55-06        |
| 0.7070      | GGG-70               | SNG 700/2       | -   | FCD 70       | 100-70-03       |
| 0.7080      | GGG-80               | SNG 800/2       | -   | -            | 120-90-02       |
| 0.7660      | GGG-NiCr 20 2        | S-NiCr 20 2     | -   | -            | A 439 Type D-2  |
| 0.7661      | GGG-NiCr 20 3        | S-NiCr 20 3     | -   | -            | A 439 Type D-2B |
| 0.7670      | GGG-Ni 22            | S-Ni 22         | -   | -            | A 439 Type D-2C |
| 0.7673      | GGG-NiMn 23 4        | S-NiMn 23 4     | -   | -            | A 439 Type D-2M |
| 0.7676      | GGG-NiCr 30 3        | S-NiCr 30 3     | -   | -            | A 439 Type D-3  |
| 0.7677      | GGG-NiCr 30 1        | S-NiCr 30 1     | -   | -            | A 439 Type D-3A |
| 0.7680      | GGG-NiSiCr 30 5      | S-NiSiCr 30 5 5 | -   | -            | A 439 Type D-4  |
| 0.7683      | GGG-Ni 35            | S-Ni 35         | -   | -            | A 439 Type D-5  |
| 0.7685      | GGG-NiCr 35 3        | S-NiCr 35 3     | -   | -            | A 439 Type D-5B |
| 0.8135      | GTS-35               | B340/12         | -   | -            | 32510           |
| 0.8145      | GTS-45               | P440/7          | -   | -            | 40010           |
| 0.8155      | GTS-55               | P510/4          | -   | -            | 50005           |
| 0.8165      | GTS-65               | P570/3          | -   | -            | 70003           |
| 0.8170      | GTS-70               | P690/2          | -   | -            | 90001           |
| 0.8035      | GTW-35               | W340/3          | -   | -            | -               |
| 3.0225      | Al99.5               | 1B              | -   | A1x1         | -               |
| 3.0305      | Al99.9               | -               | -   | -            | -               |
| 3.0505      | AlMn0.5Mg0.5         | N31             | -   | -            | -               |
| 3.0515      | AlMn1                | N3              | -   | 144054       | -               |
| 3.0525      | AlMn1Mg0.5           | -               | -   | -            | -               |
| 3.3315      | AlMg1                | N41             | -   | A2x8         | -               |
| 3.3535      | AlMg3                | N5              | -   | -            | -               |
| 3.1325      | AlCuMg1              | H14             | -   | -            | -               |
| 3.1355      | AlCuMg2              | 2L97            | -   | A3x4         | -               |
| 3.2315      | AlMgSi1              | H30             | -   | -            | -               |
| 3.3206      | AlMgSi0.5            | H9              | -   | A2x5         | -               |
| 3.3211      | AlMg1SiCu            | -               | -   | -            | -               |
| 3.4345      | AlZnMgCu0.5          | L86             | -   | -            | 7050            |
| 3.4365      | AlZnMgCu1.5          | L87             | -   | -            | 7175            |
| -           | Al1Mg1SiCrTi         | -               | -   | -            | 6011            |
| -           | Al0.3Cu1Mg0.6SiCr    | -               | -   | -            | 6061            |
| -           | Al1Cu1.1Mg1.4Si0.8Mn | -               | -   | -            | 6066            |
| 3.2134      | G-AlSi5Cu1Mg         | -               | -   | -            | -               |
| 3.3241      | G-AlMg3Si            | -               | -   | -            | -               |
| 3.3292      | GD-AlMg9             | -               | -   | -            | -               |

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| No. di mat.    | DIN               | BS            | EN | JIS                | AISI/SAE/ASTM  |
| 3.3541         | GD-AlMg3          | -             | -  | -                  | -              |
| 3.2161         | G-AISI8Cu3        | -             | -  | -                  | -              |
| 3.2373         | G-AISI9Mg         | -             | -  | -                  | -              |
| 3.2381         | G-AISI10Mg        | LM9           | -  | -                  | -              |
| 3.2383         | G-AISI10Mg(Cu)    | LM 9          | -  | -                  | A 360.2        |
| 3.2581         | G-AISI12          | LM 6          | -  | -                  | A 413.2        |
| 2.2583         | G-AISI12(Cu)      | LM 20         | -  | -                  | A 413.1        |
| 2.0240         | CuZn15            | CZ 102        | -  | -                  | C23000         |
| 2.0265         | CuZn30            | CZ 106        | -  | -                  | C26000         |
| 2.0321         | CuZn37            | CZ 108        | -  | -                  | C27200         |
| 2.0335         | CuZn36            | -             | -  | -                  | -              |
| 2.0360         | CuZn40            | -             | -  | -                  | -              |
| 2.0401         | CuZn39Pb3         | -             | -  | -                  | -              |
| 2.1016         | CuSn4             | -             | -  | -                  | -              |
| 2.1030         | CuSn8             | -             | -  | -                  | -              |
| -              | -                 | -             | -  | -                  | -              |
| -              | -                 | -             | -  | -                  | -              |
| 2.0975         | G-CuAl10Ni        | -             | -  | -                  | -              |
| 2.1096.01      | G-CuSn5ZnPb       | -             | -  | -                  | -              |
| 2.1090.01      | G-CuSn7ZnPb       | -             | -  | -                  | -              |
| 2.1086.01      | G-CuSn10Zn        | -             | -  | -                  | -              |
| 2.4360         | NiCu30Fe          | NA 13         | -  | -                  | Monel 400      |
| 2.4375         | NiCu30Al          | NA 18         | -  | -                  | Monel K-500    |
| 2.4685         | G-NiMo28          | -             | -  | -                  | Hastelloy B    |
| 2.4610         | NiMo16Cr16Ti      | -             | -  | -                  | Hastelloy C-4  |
| 2.4810         | G-NiMo30          | -             | -  | -                  | Hastelloy C    |
| 2.4630, 2.4951 | NiCr20Ti          | HR 5          | -  | -                  | Nimonic 75     |
| 2.4631         | NiCr20TiAl        | HR 401; 601   | -  | NCF 80 A           | Nimonic 80 A   |
| 2.4632         | NiCr20Co18Ti      | -             | -  | -                  | Nimonic 90     |
| 2.4634         | NiCo20Cr15MoAlTi  | -             | -  | -                  | Nimonic 105    |
| 2.4662         | NiCr13Mo6Ti3      | -             | -  | -                  | Nimonic 901    |
| 2.4670         | -                 | -             | -  | -                  | Nimocast 713   |
| 2.4674         | -                 | -             | -  | -                  | Nimocast PK 24 |
| 2.6554         | -                 | -             | -  | -                  | Waspaloy       |
| Hardox 400     | -                 | -             | -  | -                  | Hardox 400     |
| Hardox 500     | -                 | -             | -  | -                  | Hardox 500     |
| 2.4856         | NiCr22Mo9Nb       | NA 21         | -  | -                  | Inconel 625    |
| 2.4668         | NiCr19FeNbMo      | -             | -  | -                  | Inconel 718    |
| 3.7024         | Ti99.5            | TA 6          | -  | -                  | -              |
| 3.7064         | Ti99.2            | TA 7          | -  | -                  | R50400         |
| Ti99.9         | Ti99.9            | TA 9          | -  | -                  | R50700         |
| 3.7112         | Ti5Al2.5Sn        | TA 14/17      | -  | -                  | R54520         |
| 3.7165         | TiAl6V4           | TA 28         | -  | -                  | R56400         |
| 1.4718         | X 45 CrSi 9 3     | 401 S 45      | 52 | SUH 1              | HNV 3          |
| 1.4828         | X 15 CrNiSi 20 12 | 309 S 24      | -  | SUH 309            | 309            |
| 1.4841         | X 15 CrNiSi 25 20 | -             | -  | SUH 310            | 314; 310       |
| 1.4845         | X 12 CrNi 25 21   | 310 S 24      | -  | SUH 310; SUS 310 S | 310 S          |
| 1.4864         | X 12 NiCrSi 36 16 | NA 17         | -  | SUH 330            | 330            |
| 1.4871         | X 53 CrMnNiN 21 9 | 349 S 54      | -  | SUH 35; SUH 36     | EV 8           |
| 1.4878         | X 12 CrNiTi 18 9  | 321 S 20      | -  | SUS 321            | 321            |

Basi di frese

## Comparazione durezza

| Rm (N/mm <sup>2</sup> ) | HRC | HB30 | HV10 |
|-------------------------|-----|------|------|
| 240                     |     | 71   | 75   |
| 255                     |     | 76   | 80   |
| 270                     |     | 81   | 85   |
| 285                     |     | 86   | 90   |
| 305                     |     | 90   | 95   |
| 320                     |     | 95   | 100  |
| 335                     |     | 100  | 105  |
| 350                     |     | 105  | 110  |
| 370                     |     | 109  | 115  |
| 385                     |     | 114  | 120  |
| 400                     |     | 119  | 125  |
| 415                     |     | 124  | 130  |
| 430                     |     | 128  | 135  |
| 450                     |     | 133  | 140  |
| 465                     |     | 138  | 145  |
| 480                     |     | 143  | 150  |
| 495                     |     | 147  | 155  |
| 510                     |     | 152  | 160  |
| 530                     |     | 157  | 165  |
| 545                     |     | 162  | 170  |
| 560                     |     | 166  | 175  |
| 575                     |     | 171  | 180  |
| 595                     |     | 176  | 185  |
| 610                     |     | 181  | 190  |
| 625                     |     | 185  | 195  |
| 640                     |     | 190  | 200  |
| 660                     |     | 195  | 205  |
| 675                     |     | 199  | 210  |
| 690                     |     | 204  | 215  |
| 705                     |     | 209  | 220  |
| 720                     |     | 214  | 225  |
| 740                     |     | 219  | 230  |
| 755                     |     | 223  | 235  |
| 770                     |     | 228  | 240  |
| 785                     |     | 233  | 245  |
| 800                     | 22  | 238  | 250  |
| 820                     | 23  | 242  | 255  |
| 835                     | 24  | 247  | 260  |
| 860                     | 25  | 255  | 268  |
| 870                     | 26  | 258  | 272  |
| 900                     | 27  | 266  | 280  |
| 920                     | 28  | 273  | 287  |
| 940                     | 29  | 278  | 293  |
| 970                     | 30  | 287  | 302  |
| 995                     | 31  | 295  | 310  |
| 1020                    | 32  | 301  | 317  |
| 1050                    | 33  | 311  | 327  |
| 1080                    | 34  | 319  | 336  |

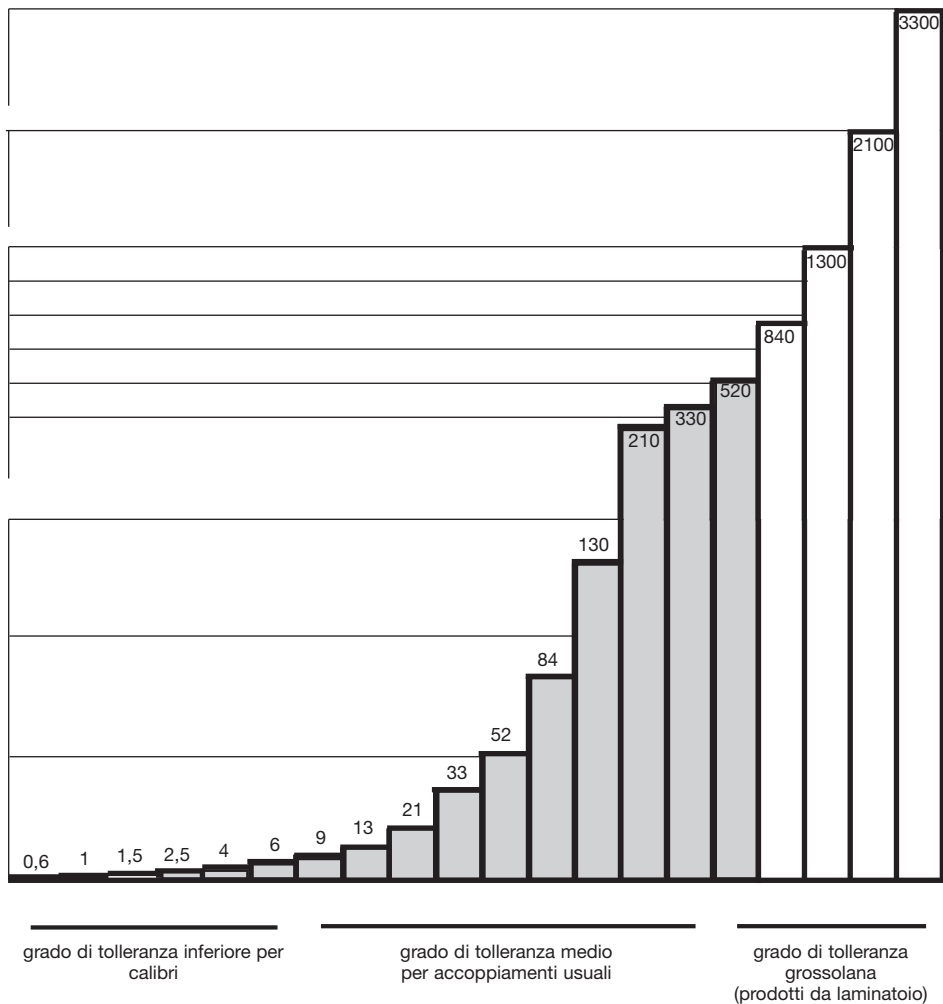
| Rm (N/mm <sup>2</sup> ) | HRC | HB30 | HV10 |
|-------------------------|-----|------|------|
| 1110                    | 35  | 328  | 345  |
| 1140                    | 36  | 337  | 355  |
| 1170                    | 37  | 346  | 364  |
| 1200                    | 38  | 354  | 373  |
| 1230                    | 39  | 363  | 382  |
| 1260                    | 40  | 372  | 392  |
| 1300                    | 41  | 383  | 403  |
| 1330                    | 42  | 393  | 413  |
| 1360                    | 43  | 402  | 423  |
| 1400                    | 44  | 413  | 434  |
| 1440                    | 45  | 424  | 446  |
| 1480                    | 46  | 435  | 458  |
| 1530                    | 47  | 449  | 473  |
| 1570                    | 48  | 460  | 484  |
| 1620                    | 49  | 472  | 497  |
| 1680                    | 50  | 488  | 514  |
| 1730                    | 51  | 501  | 527  |
| 1790                    | 52  | 517  | 544  |
| 1845                    | 53  | 532  | 560  |
| 1910                    | 54  | 549  | 578  |
| 1980                    | 55  | 567  | 596  |
| 2050                    | 56  | 584  | 615  |
| 2140                    | 57  | 607  | 639  |
| 2180                    | 58  | 622  | 655  |
|                         | 59  |      | 675  |
|                         | 60  |      | 698  |
|                         | 61  |      | 720  |
|                         | 62  |      | 745  |
|                         | 63  |      | 773  |
|                         | 64  |      | 800  |
|                         | 65  |      | 829  |
|                         | 66  |      | 864  |
|                         | 67  |      | 900  |
|                         | 68  |      | 940  |

## Tolleranze di costruzione

# Tolleranze base ISO p. misure di lunghezze 1 - 120 mm DIN ISO 286-1

| Misure nominali |     | IT in $\mu\text{m}$ |    |    |    |    |    |    |     |     |     |     |     |
|-----------------|-----|---------------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|                 |     | 3                   | 4  | 5  | 6  | 7  | 8  | 9  | 10  | 11  | 12  | 13  | 14  |
| da              | 1   |                     |    |    |    |    |    |    |     |     |     |     |     |
| fino a          | 3   | 2                   | 3  | 4  | 6  | 10 | 14 | 25 | 40  | 60  | 100 | 140 | 250 |
| oltre           | 3   | 2.5                 | 4  | 5  | 8  | 12 | 18 | 30 | 48  | 75  | 120 | 180 | 300 |
| fino a          | 6   |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 6   | 2.5                 | 4  | 6  | 9  | 15 | 22 | 36 | 58  | 90  | 150 | 220 | 360 |
| fino a          | 10  |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 10  | 3                   | 5  | 8  | 11 | 18 | 27 | 43 | 70  | 110 | 180 | 270 | 430 |
| fino a          | 18  |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 18  | 4                   | 6  | 9  | 13 | 21 | 33 | 52 | 84  | 130 | 210 | 330 | 520 |
| fino a          | 30  |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 30  | 4                   | 7  | 11 | 16 | 25 | 39 | 62 | 100 | 160 | 250 | 390 | 620 |
| fino a          | 50  |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 50  | 5                   | 8  | 13 | 19 | 30 | 46 | 74 | 120 | 190 | 300 | 460 | 740 |
| fino a          | 80  |                     |    |    |    |    |    |    |     |     |     |     |     |
| oltre           | 80  | 6                   | 10 | 15 | 22 | 35 | 54 | 87 | 140 | 220 | 350 | 540 | 870 |
| fino a          | 120 |                     |    |    |    |    |    |    |     |     |     |     |     |

### Esempio di tolleranza base ISO per misure nominali oltre 18 fino a 30 mm



## Gli accoppiamenti più utilizzati in $\mu\text{m}$

| Diametri nominali<br>in mm |        | A    |      | B    |      |      |      | C    |      |      |      |
|----------------------------|--------|------|------|------|------|------|------|------|------|------|------|
| oltre                      | fino a | 9    | 11   | 8    | 9    | 10   | 11   | 8    | 9    | 10   | 11   |
| 0                          | 3      | +295 | +330 | +154 | +165 | +180 | +200 | +74  | +85  | +100 | +120 |
|                            |        | +270 | +270 | +140 | +140 | +140 | +140 | +60  | +60  | +60  | +60  |
| 3                          | 6      | +300 | +345 | +158 | +170 | +188 | +215 | +88  | +100 | +118 | +145 |
|                            |        | +270 | +270 | +140 | +140 | +140 | +140 | +70  | +70  | +70  | +70  |
| 6                          | 10     | +316 | +370 | +172 | +186 | +208 | +240 | +102 | +116 | +138 | +170 |
|                            |        | +280 | +280 | +150 | +150 | +150 | +150 | +80  | +80  | +80  | +80  |
| 10                         | 18     | +333 | +400 | +177 | +193 | +220 | +260 | +122 | +138 | +165 | +205 |
|                            |        | +290 | +290 | +150 | +150 | +150 | +150 | +95  | +95  | +95  | +95  |
| 18                         | 30     | +352 | +430 | +193 | +212 | +244 | +290 | +143 | +162 | +194 | +240 |
|                            |        | +300 | +300 | +160 | +160 | +160 | +160 | +110 | +110 | +110 | +110 |
| 30                         | 40     | +372 | +470 | +209 | +232 | +270 | +330 | +159 | +182 | +220 | +280 |
|                            |        | +310 | +310 | +170 | +170 | +170 | +170 | +120 | +120 | +120 | +120 |
| 40                         | 50     | +382 | +480 | +219 | +242 | +280 | +340 | +169 | +192 | +230 | +290 |
|                            |        | +320 | +320 | +180 | +180 | +180 | +180 | +130 | +130 | +130 | +130 |
| 50                         | 65     | +414 | +530 | +236 | +264 | +310 | +380 | +186 | +214 | +260 | +330 |
|                            |        | +340 | +340 | +190 | +190 | +190 | +190 | +140 | +140 | +140 | +140 |
| 65                         | 80     | +434 | +550 | +246 | +274 | +320 | +390 | +196 | +224 | +270 | +340 |
|                            |        | +360 | +360 | +200 | +200 | +200 | +200 | +150 | +150 | +150 | +150 |
| 80                         | 100    | +467 | +600 | +274 | +307 | +360 | +440 | +224 | +257 | +310 | +390 |
|                            |        | +380 | +380 | +220 | +220 | +220 | +220 | +170 | +170 | +170 | +170 |
| 100                        | 120    | +497 | +630 | +294 | +327 | +380 | +460 | +234 | +267 | +320 | +400 |
|                            |        | +410 | +410 | +240 | +240 | +240 | +240 | +180 | +180 | +180 | +180 |

| Diametri nominali<br>in mm |        | D    |      |      |      |      | E    |      |      | F   |     |     |      |
|----------------------------|--------|------|------|------|------|------|------|------|------|-----|-----|-----|------|
| oltre                      | fino a | 8    | 9    | 10   | 11   | 12   | 7    | 8    | 9    | 6   | 7   | 8   | 9    |
| 0                          | 3      | +34  | +45  | +60  | +80  | +120 | +24  | +28  | +39  | +12 | 16  | +20 | +31  |
|                            |        | +20  | +20  | +20  | +20  | +20  | +14  | +14  | +14  | +6  | +6  | +6  | +6   |
| 3                          | 6      | +48  | +60  | +78  | +105 | +150 | +32  | +38  | +50  | +18 | +22 | +28 | +40  |
|                            |        | +30  | +30  | +30  | +30  | +30  | +20  | +20  | +20  | +10 | +10 | +10 | +10  |
| 6                          | 10     | +62  | +76  | +98  | +130 | +190 | +40  | +47  | +61  | +22 | +28 | +35 | +49  |
|                            |        | +40  | +40  | +40  | +40  | +40  | +25  | +25  | +25  | +13 | +13 | +13 | +13  |
| 10                         | 18     | +77  | +93  | +120 | +160 | +230 | +50  | +59  | +75  | +27 | +34 | +43 | +59  |
|                            |        | +50  | +50  | +50  | +50  | +50  | +32  | +32  | +32  | +16 | +16 | +16 | +16  |
| 18                         | 30     | +98  | +117 | +149 | +195 | +275 | +61  | +73  | +92  | +33 | +41 | +53 | +72  |
|                            |        | +65  | +65  | +65  | +65  | +65  | +40  | +40  | +40  | +20 | +20 | +20 | +20  |
| 30                         | 50     | +119 | +142 | +180 | +240 |      | +75  | +89  | +112 | +41 | +50 | +64 | +87  |
|                            |        | +80  | +80  | +80  | +80  |      | +50  | +50  | +50  | +25 | +25 | +25 | +25  |
| 50                         | 80     | +146 | +174 | +220 | +290 |      | +90  | +106 | +134 | +49 | +60 | +76 | +104 |
|                            |        | +100 | +100 | +100 | +100 |      | +60  | +60  | +60  | +30 | +30 | +30 | +30  |
| 80                         | 120    | +174 | +207 | +260 | +340 |      | +107 | +126 | +159 | +58 | +71 | +90 | +123 |
|                            |        | +120 | +120 | +120 | +120 |      | +72  | +72  | +72  | +36 | +36 | +36 | +36  |
| 120                        | 180    |      |      |      |      |      |      | +148 |      |     |     |     |      |
|                            |        |      |      |      |      |      |      | +85  |      |     |     |     |      |
| 180                        | 250    |      |      |      |      |      |      | +172 |      |     |     |     |      |
|                            |        |      |      |      |      |      |      | +100 |      |     |     |     |      |

## Gli accoppiamenti più utilizzati in $\mu\text{m}$

| Diametri nominali<br>in mm |        | G   |     | H   |     |     |      |      |      |      | J   |     |     |
|----------------------------|--------|-----|-----|-----|-----|-----|------|------|------|------|-----|-----|-----|
| oltre                      | fino a | 6   | 7   | 6   | 7   | 8   | 9    | 10   | 11   | 12   | 6   | 7   | 8   |
| 0                          | 3      | +8  | +12 | +6  | +10 | +14 | +25  | +40  | +60  | +100 | +2  | +4  | +6  |
|                            |        | +2  | +2  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -4  | -6  | -8  |
| 3                          | 6      | +12 | +16 | +8  | +12 | +18 | +30  | +48  | +75  | +120 | +5  | +6  | +10 |
|                            |        | +4  | +4  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -3  | -6  | -8  |
| 6                          | 10     | +14 | +20 | +9  | +15 | +22 | +36  | +58  | +90  | +150 | +5  | +8  | +12 |
|                            |        | +5  | +5  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -4  | -7  | -10 |
| 10                         | 18     | +17 | +24 | +11 | +18 | +27 | +43  | +70  | +110 | +180 | +6  | +10 | +15 |
|                            |        | +6  | +6  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -5  | -8  | -12 |
| 18                         | 30     | +20 | +28 | +13 | +21 | +33 | +52  | +84  | +130 | +210 | +8  | +12 | +20 |
|                            |        | +7  | +7  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -5  | -9  | -13 |
| 30                         | 50     | +25 | +34 | +16 | +25 | +39 | +62  | +100 | +160 | +250 | +10 | +14 | +24 |
|                            |        | +9  | +9  | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -6  | -11 | -15 |
| 50                         | 80     | +29 | +40 | +19 | +30 | +46 | +74  | +120 | +190 | +300 | +13 | +18 | +28 |
|                            |        | +10 | +10 | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -6  | -12 | -18 |
| 80                         | 120    | +34 | +47 | +22 | +35 | +54 | +87  | +140 | +220 | +350 | +16 | +22 | +34 |
|                            |        | +12 | +12 | 0   | 0   | 0   | 0    | 0    | 0    | 0    | -6  | -13 | -20 |
| 120                        | 180    |     | +54 | +25 | +40 | +63 | +100 | +160 | +250 |      | +18 | +26 | +41 |
|                            |        |     | +14 | 0   | 0   | 0   | 0    | 0    | 0    | 0    |     | -7  | -14 |
| 180                        | 250    |     | +61 | +29 | +46 | +72 | +115 | +185 | +290 |      | +22 | +30 | +47 |
|                            |        |     | +15 | 0   | 0   | 0   | 0    | 0    | 0    |      | -7  | -16 | -25 |

| Diametri nominali<br>in mm |        | JS   |       |       |       | K   |     |     | M   |      |     |
|----------------------------|--------|------|-------|-------|-------|-----|-----|-----|-----|------|-----|
| oltre                      | fino a | 6    | 7     | 8     | 9     | 6   | 7   | 8   | 6   | 7    | 8   |
| 0                          | 3      | +3   | +5    | +7    | +12,5 | 0   | 0   | 0   | -2  | -2   | -4  |
|                            |        | -3   | -5    | -7    | -12,5 | -6  | -10 | -14 | -8  | -12  | -18 |
| 3                          | 6      | +4   | +6    | +9    | +15   | +2  | +3  | +5  | -1  | 0    | +2  |
|                            |        | -4   | -6    | -9    | -15   | -6  | -9  | -13 | -9  | -12  | -16 |
| 6                          | 10     | +4,5 | +7,5  | +11   | +18   | +2  | +5  | +6  | -3  | 0    | +1  |
|                            |        | -4,5 | -7,5  | -11   | -18   | -7  | -10 | -16 | -12 | -215 | -21 |
| 10                         | 18     | +5,5 | +9    | +13,5 | +21,5 | +2  | +6  | +8  | -4  | 0    | +2  |
|                            |        | -5,5 | -9    | -13,5 | -21,5 | -9  | -12 | -19 | -15 | -18  | -25 |
| 18                         | 30     | +6,5 | +10,5 | +16,5 | +26   | +2  | +6  | +10 | -4  | 0    | +4  |
|                            |        | -6,5 | -10,5 | -16,5 | -26   | -11 | -15 | -23 | -17 | -21  | -29 |
| 30                         | 50     | +8   | +12,5 | +19,5 | +31   | +3  | +7  | +12 | -4  | 0    | +5  |
|                            |        | -8   | -12,5 | -19,5 | -31   | -13 | -18 | -27 | -20 | -25  | -34 |
| 50                         | 80     | +9,5 | +15   | +23   | +37   | +4  | +9  | +14 | -5  | 0    | +5  |
|                            |        | -9,5 | -15   | -23   | -37   | -15 | -21 | -32 | -24 | -30  | -41 |
| 80                         | 120    | +11  | +17,5 | +27   | +43,5 | +4  | +10 | +16 | -6  | 0    | +6  |
|                            |        | -11  | -17,5 | -27   | -43,5 | -18 | -25 | -38 | -28 | -35  | -48 |
| 120                        | 180    |      |       |       |       | +4  | +12 |     |     |      |     |
|                            |        |      |       |       |       | -21 | -28 |     |     |      |     |
| 180                        | 250    |      |       |       |       | +5  | +13 |     |     |      |     |
|                            |        |      |       |       |       | -24 | -33 |     |     |      |     |



## Gli accoppiamenti più utilizzati in $\mu\text{m}$

| Diametri nominali<br>in mm |        | N   |     |     |     |      |      | P   |     |      | R   |     |
|----------------------------|--------|-----|-----|-----|-----|------|------|-----|-----|------|-----|-----|
| oltre                      | fino a | 6   | 7   | 8   | 9   | 10   | 11   | 6   | 7   | 9    | 6   | 7   |
| 0                          | 3      | -4  | -4  | -4  | -4  | -4   | -4   | -6  | -6  | -6   | -10 | -10 |
|                            |        | -10 | -14 | -8  | -29 | -44  | -64  | -12 | -16 | -31  | -16 | -20 |
| 3                          | 6      | -5  | -4  | -2  | 0   | 0    | 0    | -9  | -8  | -12  | -12 | -11 |
|                            |        | -13 | -16 | -20 | -30 | -48  | -75  | -17 | -20 | -42  | -20 | -23 |
| 6                          | 10     | -7  | -4  | -3  | 0   | 0    | 0    | -12 | -9  | -15  | -16 | -13 |
|                            |        | -16 | -19 | -25 | -36 | -58  | -90  | -21 | -24 | -51  | -25 | -28 |
| 10                         | 18     | -9  | -5  | -3  | 0   | 0    | 0    | -15 | -11 | -18  | -20 | -16 |
|                            |        | -20 | -23 | -30 | -43 | -70  | -110 | -26 | -29 | -61  | -31 | -34 |
| 18                         | 30     | -11 | -7  | -3  | 0   | 0    | 0    | -18 | -14 | -22  | -24 | -20 |
|                            |        | -24 | -28 | -36 | -52 | -84  | -130 | -31 | -35 | -74  | -37 | -41 |
| 30                         | 50     | -12 | -8  | -3  | 0   | 0    | 0    | -21 | -17 | -26  | -29 | -25 |
|                            |        | -28 | -33 | -42 | -62 | -100 | -160 | -37 | -42 | -88  | -45 | -50 |
| 50                         | 65     | -14 | -9  | -4  | 0   | 0    | 0    | -26 | -21 | -32  | -35 | -30 |
|                            |        | -33 | -39 | -50 | -74 | -120 | -190 | -45 | -51 | -106 | -54 | -60 |
| 65                         | 80     | -14 | -9  | -4  | 0   | 0    | 0    | -26 | -21 | -32  | -37 | -32 |
|                            |        | -33 | -39 | -50 | -74 | -120 | -190 | -45 | -51 | -106 | -56 | -62 |
| 80                         | 100    | -16 | -10 | -4  | 0   | 0    | 0    | -30 | -24 | -37  | -44 | -38 |
|                            |        | -38 | -45 | -58 | -87 | -140 | -220 | -52 | -59 | -124 | -66 | -73 |
| 100                        | 120    | -16 | -10 | -4  | 0   | 0    | 0    | -30 | -24 |      | -47 | -41 |
|                            |        | -38 | -45 | -58 | -87 | -140 | -220 | -52 | -59 |      | -69 | -76 |

| Diametri nominali<br>in mm |        | S   |      | T    | U    |      |      | X    |      | Z    |      |
|----------------------------|--------|-----|------|------|------|------|------|------|------|------|------|
| oltre                      | fino a | 6   | 7    | 6    | 6    | 7    | 10   | 10   | 11   | 10   | 11   |
| 0                          | 3      | -14 | -14  | -18  | -18  | -18  | -18  | -20  | -20  | -26  | -26  |
|                            |        | -20 | -24  | -24  | -24  | -28  | -58  | -60  | -80  | -66  | -86  |
| 3                          | 6      | -16 | -15  | -20  | -20  | -19  | -23  | -28  | -28  | -35  | -35  |
|                            |        | -24 | -27  | -28  | -28  | -31  | -71  | -76  | -103 | -83  | -110 |
| 6                          | 10     | -20 | -17  | -25  | -25  | -22  | -28  | -34  | -34  | -42  | -42  |
|                            |        | -29 | -32  | -34  | -34  | -37  | -86  | -92  | -124 | -100 | -132 |
| 10                         | 14     | -25 | -21  | -30  | -30  | -26  | -33  | -40  | -40  | -50  | -50  |
|                            |        | -36 | -39  | -41  | -41  | -44  | -103 | -110 | -150 | -120 | -160 |
| 14                         | 18     | -25 | -21  | -30  | -30  | -26  | -33  | -45  | -45  | -60  | -60  |
|                            |        | -36 | -39  | -41  | -41  | -44  | -103 | -115 | -155 | -130 | -170 |
| 18                         | 24     | -31 | -27  | -37  | -37  | -33  | -41  | -54  | -54  | -73  | -73  |
|                            |        | -44 | -48  | -50  | -50  | -54  | -125 | -138 | -184 | -157 | -203 |
| 24                         | 30     | -31 | -27  | -37  | -44  | -40  | -48  | -64  | -64  | -88  | -88  |
|                            |        | -44 | -48  | -50  | -57  | -61  | -132 | -148 | -194 | -172 | -218 |
| 30                         | 40     | -38 | -34  | -43  | -55  | -51  | -60  | -80  | -80  | -112 | -112 |
|                            |        | -54 | -59  | -59  | -71  | -76  | -160 | -180 | -240 | -212 | -272 |
| 40                         | 50     | -38 | -34  | -49  | -65  | -61  | -70  | -97  | -97  | -136 | -136 |
|                            |        | -54 | -59  | -65  | -81  | -86  | -170 | -197 | -257 | -236 | -296 |
| 50                         | 65     | -47 | -42  | -60  | -81  | -76  | -87  | -122 | -122 | -172 | -172 |
|                            |        | -66 | -72  | -79  | -100 | -106 | -207 | -242 | -312 | -292 | -362 |
| 65                         | 80     | -53 | -48  | -69  | -96  | -91  | -102 | -146 | -146 | -210 | -210 |
|                            |        | -72 | -78  | -88  | -115 | -121 | -222 | -266 | -336 | -330 | -400 |
| 80                         | 100    | -64 | -58  | -84  | -117 | -111 | -124 | -178 | -178 | -258 | -258 |
|                            |        | -86 | -93  | -106 | -139 | -146 | -264 | -318 | -398 | -398 | -478 |
| 100                        | 120    | -72 | -66  | -97  | -137 | -131 | -144 | -210 | -210 | -310 | -310 |
|                            |        | -94 | -101 | -119 | -159 | -166 | -284 | -350 | -430 | -450 | -530 |



# FILETTARE

## Modulo soluzione speciali

Quantità \_\_\_\_\_

Nr. Fori \_\_\_\_\_

### Materiale

Materiale da lavorare \_\_\_\_\_

Caprico di rottura durezza \_\_\_\_\_ N/mm<sup>2</sup> HRC

### Pezzo da lavorare

Lunghezza Filetto \_\_\_\_\_ mm

Misura Filetto \_\_\_\_\_  
as. M18x0,5 ISO3/6H

**Utensile in**

Metallo duro  HSS-E-PM  HSS-E

**Refrigerazione**

Interna  Esterna

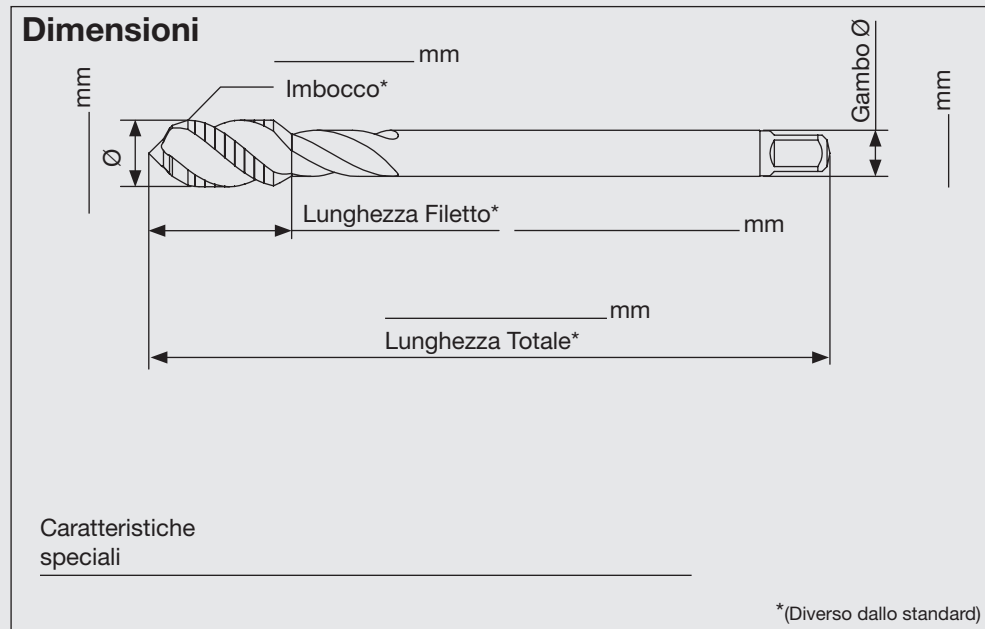
Simile allo standard codice

\_\_\_\_\_

**Gambo**

DIN 371 codolo rinforzato

DIN 374 / DIN 376



**Tipo di foro**

Foro passante

Foro Cielo

**Utensile**

a filettare

maschi a rullare

### Rivestimento

superficie lucida  vaporizzato  TiN  TiCN  TiAlN  AlCrN

### Contatto

Società: \_\_\_\_\_

Timbro società

Persona: \_\_\_\_\_

Telefono/Fax: \_\_\_\_\_

Data: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Firma: \_\_\_\_\_

# FRESE

## Modulo soluzione speciali

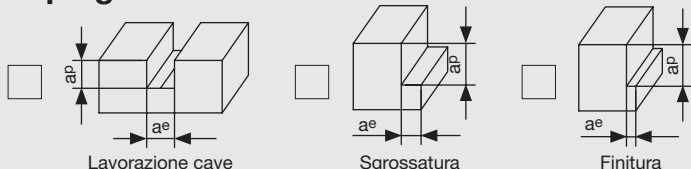
**Quantità**  5  10  >10 \_\_\_\_\_ Pezzi.

### Materiale

Materiale da lavorare \_\_\_\_\_

Caprico di rottura durezza \_\_\_\_\_ N/mm<sup>2</sup> HRC

### Impiego



Profondità di taglio ap: \_\_\_\_\_ mm

Laghezza di taglio ae: \_\_\_\_\_ mm

**Utensile in**

Metallo Duro  HSS-E-PM  HSCO  M 42

**Angolo Radiale**

X  R

Testa sferica  Smusso Esterno  Raggio Esterno

Simile allo standard codice

**Dimensioni**

Collo Ridotto  si  no

Caratteristiche speciali \_\_\_\_\_

\*(Diverso dallo standard)

**Gambo**

Form HA  plano  Form HB  Weldon

**Nr. dei Taglienti**

\_\_\_\_\_

**Taglio al centro**

**Rivestimento**

superficie lucida  TiN  TiAlN  AlTiN nano  TiAlSiN  \_\_\_\_\_ (altro)

**Forma del Profilo**

### Contatto

Società: \_\_\_\_\_

Timbro società

Persona: \_\_\_\_\_

Telefono/Fax: \_\_\_\_\_

Data: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Firma: \_\_\_\_\_

# ALESATORI

## Modulo soluzione speciali

### Quantità

\_\_\_\_\_ (quantità minima 5 pezzi)

Simile allo

standard codice \_\_\_\_\_

### Materiale

Materiale da lavorare \_\_\_\_\_

Capricio di

rottura durezza \_\_\_\_\_

N/mm<sup>2</sup>

HRC

### Pezzo da lavorare

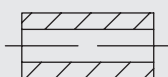
Profondità \_\_\_\_\_ mm

Diametro-Ø \_\_\_\_\_ mm

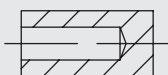
Tolleranza \_\_\_\_\_

#### Tipologia del Foro

Foro Passante




Foro Cieco



#### Refrigerazione

Esterna

Interna

Pressione della Refrigerazione \_\_\_\_\_

#### Utensile in

Metallo Duro

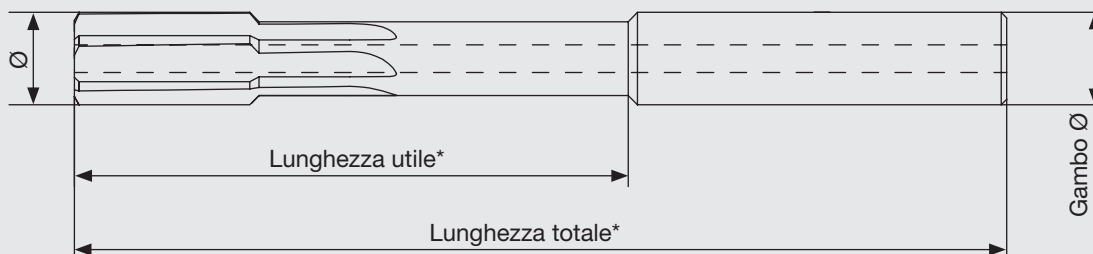
Cuspide in Metallo Duro

HSS-E

Cuspide in Cermet

Super R-HS

#### Dimensioni



#### Rivestimento

no

si

\_\_\_\_\_

Caratteristiche

speciali

\_\_\_\_\_

\*(Diverso dallo standard)

#### Contatto

Società: \_\_\_\_\_

Timbro società

Persona: \_\_\_\_\_

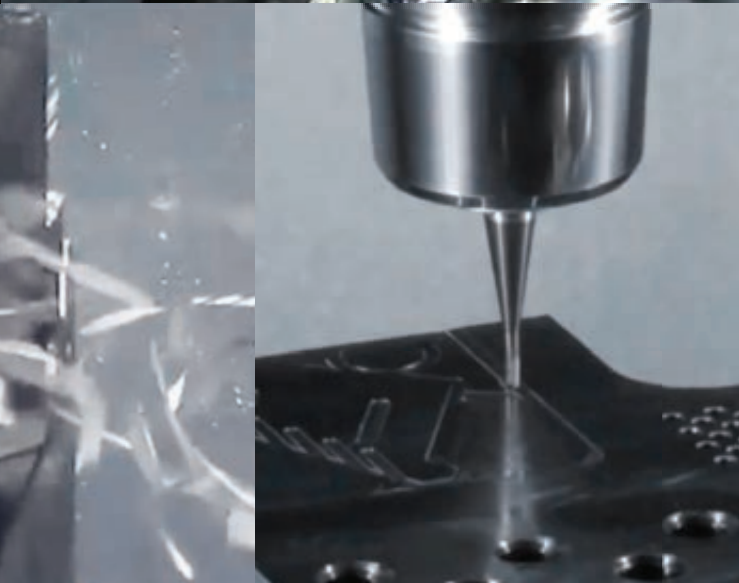
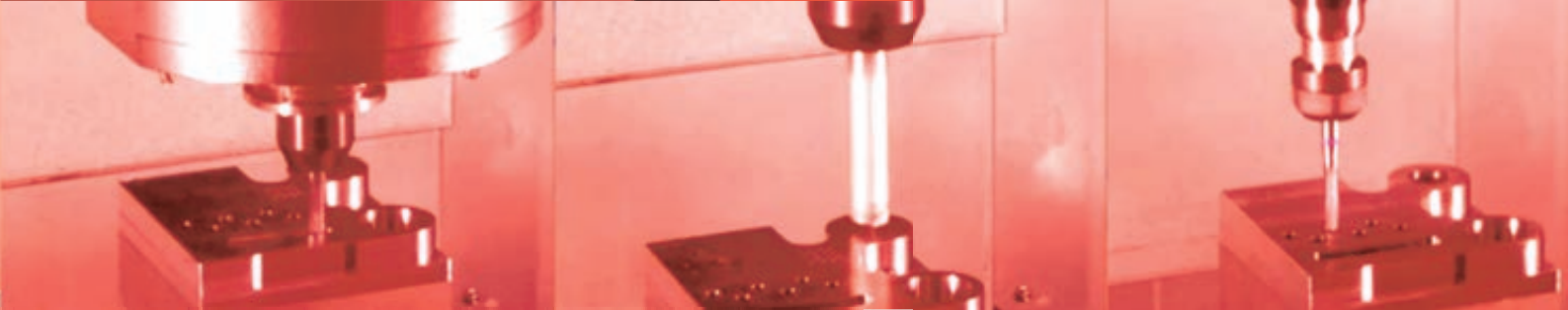
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Data: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Firma: \_\_\_\_\_





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