SMC sintered metal elements are suitable for a wide range of industrial applications.

- **High mechanical strength and withstand pressure**
- **Anti-corrosion**
- **Suitable for high-accuracy filtration**
- **Suitable for machining, crimping, brazing, welding, and simultaneous sintering**
- **Washing allows repeated use**

Specifications

Item	Bronze	Stainless steel
Material	CAC403 equivalent	SUS316L equivalent
Sintering density (g/cm³)	5.0 to 6.5	4.2 to 5.2
Void ratio (%)	25 to 43	36 to 48
Operating temperature range (°C)	–160 to 200	–250 to 550
Thermal expansion coefficient (/°C)	1.8×10^{-5}	1.6×10^{-5}
Tensile strength (MPa)	9.8 to 83.4	
Nominal filtration accuracy (μm)	(1), 2, 5, 10, 20	
Abbreviated/Nominal (μm)	40, 70, 100, 120	
Typical configurations	Disc, square sheet, cylinder, cylinder with bottom, cone with flange, element with fitting, etc.	

Note 1) Sintering density, void ratio, and tensile strength differ according to nominal filtration accuracy.
Note 2) Thermal expansion coefficient applies to stainless steel or bronze material, not to sintered metal elements.
Note 3) Nominal filtration accuracy of 1 μm is an optional value.

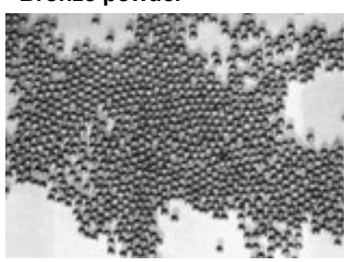
Raw material categories and nominal filtration accuracy (μm)

Sieve (mesh)	20	24	32	42	60	80	120	200	250
Opening (μm)	850	710	500	355	250	180	125	75	63
Nominal filtration accuracy (μm)	120	100	70	40	20	10	5	2	

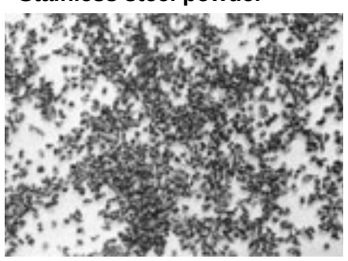
Note 1) Sieve (mesh) and opening values apply to metal mesh separating raw material, not to elements.
Note 2) Nominal filtration accuracy: Refers to value used to categorize raw material, not to filtration rating.
(Refer to the page 854 for "11 Nominal filtration accuracy".)

Raw Material Powder and Sintered Metal Element

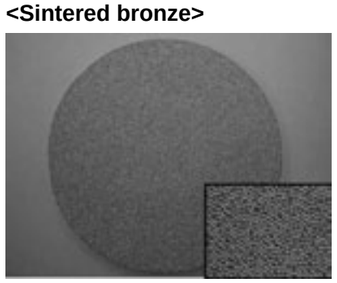
<Bronze powder>



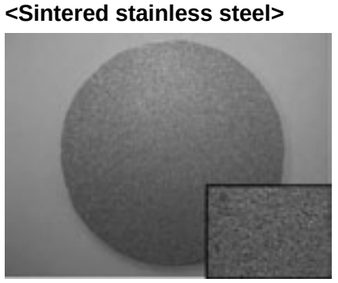
<Stainless steel powder>



<Sintered bronze>



<Sintered stainless steel>



Applications

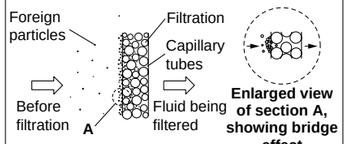
A sintered metal element consists of countless interconnected capillary tubes, making it suitable for a wide range of uses. For detailed information on purpose-specific applications, please contact SMC.

1. Filtration

Sintered metal elements are widely used for removing foreign particles from many different kinds of flow media.

Major application fields: General gases, water, various kinds of oils

Normally, filtration makes use of the so-called bridge effect where foreign particles are blocked because they form a bridge-like accumulation.
The size and distribution of particles to be filtered can be controlled through parameters such as the diameter of the capillary tubes. Particles may be blocked completely or selectively.



2. High-viscosity filtration

This is used to remove foreign matter or gel from raw materials for fibers or films.

3. Sound absorption

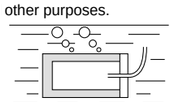
The porous quality of sintered metal elements allows them to absorb sound energy, providing a muffling or silencing effect.

4. Gas removal

Sintered metal elements are used for degassing purposes in forming and molding processes.

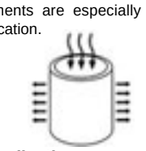
5. Foaming

Sintered metal elements positioned in various kinds of fluids are used to introduce gases, for stirring and other purposes.



6. Flow control

Because a sintered metal element consists of countless interconnected capillary tubes, it can be used to control the flow of fluids. Cylindrical bronze elements are especially suited for this type of application.



7. Other applications

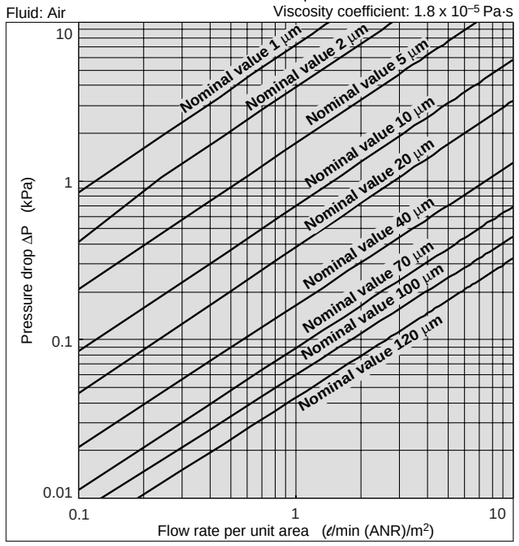
Various other applications make use of the fluid-passing functionality of sintered metal elements.

Flow Rate Characteristics

Bronze (BC)

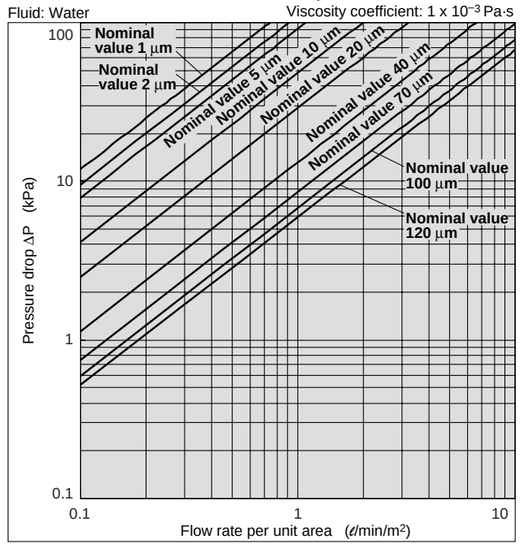
Element thickness: 3 mm
Temperature: 20°C
Viscosity coefficient: 1.8×10^{-5} Pa·s

Fluid: Air



Element thickness: 3 mm
Temperature: 20°C
Viscosity coefficient: 1×10^{-3} Pa·s

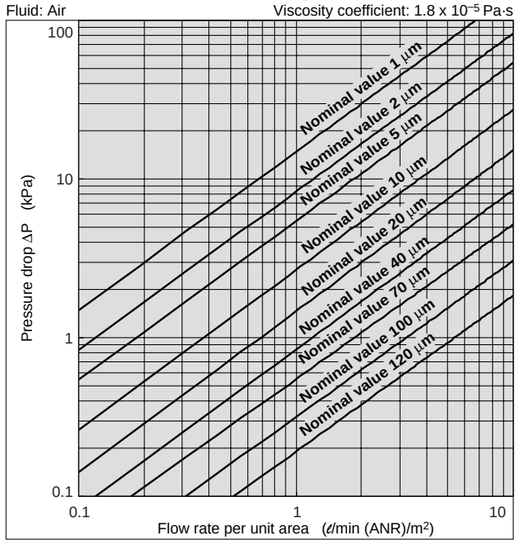
Fluid: Water



Stainless steel (SUS)

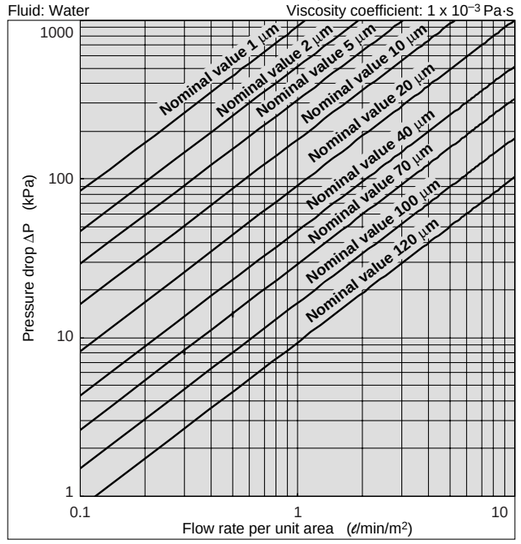
Element thickness: 2.3 mm
Temperature: 20°C
Viscosity coefficient: 1.8×10^{-5} Pa·s

Fluid: Air



Element thickness: 2.3 mm
Temperature: 20°C
Viscosity coefficient: 1×10^{-3} Pa·s

Fluid: Water



Note) Flow rate characteristics for stainless steel elements ESP-ESW (diameter 120 mm or less, no ESD seams) are different.

<Simplified formula for calculating pressure drop>

The state equation of an ideal gas (PV/T = constant) and the pressure drop are proportional to element thickness and viscosity. Based on this, the pressure drop under conditions that are different from those used in the flow rate characteristics chart can be calculated roughly for reference, using the following simplified procedure.

(1) Pressure drop ΔP kPa when flow medium is air, temperature T_1°C, pressurization P_1 kPa:

$$\Delta P = \frac{101.3 \times \Delta P_0 \times (273 + T_1)}{293 \times (P_1 + 101.3)}$$

ΔP_0: Pressure drop kPa obtained from flow rate characteristics chart

(2) Element thickness dependent pressure drop ΔP kPa when flow medium is air and water, element thickness t1 mm, and element thickness in flow rate characteristics chart differs:

$$\Delta P = \Delta P_0 \times \frac{t_1}{t_{0\ (2.3 \text{ or } 3)}}$$

ΔP_0: Pressure drop kPa obtained from flow rate characteristics chart or from (1)
t_0: Element thickness in flow rate characteristics chart (BC element = 3 mm/ SUS element = 2.3 mm)

(3) Pressure drop ΔP kPa when viscosity η_1 of flow medium differs from that of air or water:

$$\Delta P = \Delta P_0 \times \frac{\eta_1}{\eta_0}$$

ΔP_0: Pressure drop kPa obtained from flow rate characteristics chart
η_1: Viscosity of flow medium Pa·s
η_0: Viscosity of flow rate characteristics chart (air = 1.8×10^{-5} Pa·s, water = 1×10^{-3} Pa·s)

Standard Configurations and Dimensions (Unit: mm)

Stainless steel (SUS)

5. Element with Fitting (Standard product)

ESKA model number

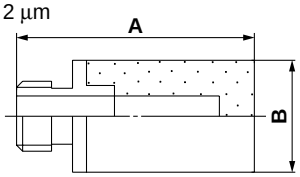
Connection thread	Model number	Dimensions A	B	C	Configuration
M3	ESKA-Z2701-□	9	6	N/A ∗1	①
	ESKA-Z2711-□	9.7	8	14	②
M5	ESKA-Z2702-□	17	8	N/A ∗1	①
	ESKA-Z2712-□	9.7	8	14	②
R1/8	ESKA-Z2801-□	38	13	N/A ∗2	③
	ESKA-Z2811-□	13.5	8	14	②
R1/4	ESKA-Z2802-□	52	17	17	③
	ESKA-Z2812-□	19	19	21	②
R3/8	ESKA-Z2803-□	53	17	17	③
	ESKA-Z2813-□	20	19	21	②
R1/2	ESKA-Z2804-□	58	17	22	③
	ESKA-Z2814-□	19.3	19	21	②

Model number suffix □ (nominal filtration accuracy) definition

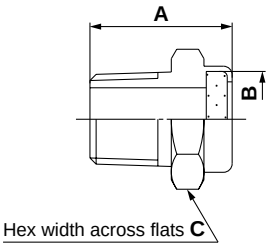
symbol	Nominal filtration accuracy
002	2 μm
005	5 μm
010	10 μm
020	20 μm
040	40 μm
070	70 μm
100	100 μm
120	120 μm

Example: Nominal filtration accuracy 2 μm
ESKA-Z2701-002

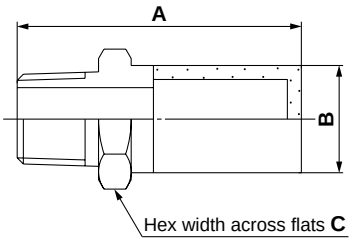
∗ Minimum order quantity is 10 pieces.



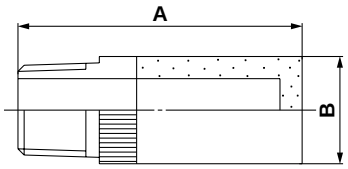
① **Simultaneous sintering (∗1)**



② **Crimping**



③ **Welding**



(∗2)