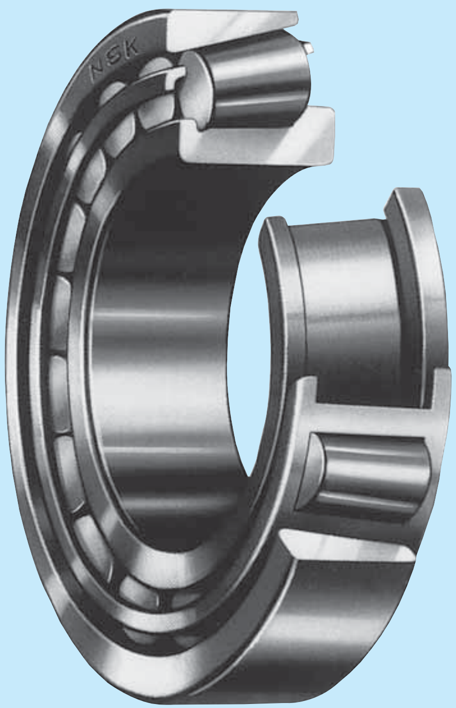
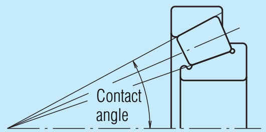


TAPERED ROLLER BEARINGS

The index for inch design tapered roller bearings is in an appendix (Page C52～C61).

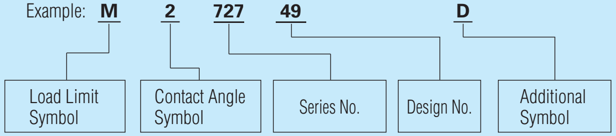


Design, Types, and Features

Tapered roller bearings are designed so the apices of the cones formed by the raceways of the cone and cup and the conical rollers all coincide at one point on the axis of the bearing. When a radial load is imposed, an axial force component occurs; therefore, it is necessary to use two bearings in opposition or some other multiple arrangement.

Among the metric design tapered roller bearings with high load capacity (HR series), some bearings have the basic number suffixed by J to conform to the specifications of ISO for the cup back face raceway diameter, cup width, and contact angle. Therefore, the cone assembly and cup of bearings with the same basic number suffixed by J are internationally interchangeable.

For the cone assemblies and cups of inch design tapered roller bearings, except four-row bearings, the bearing numbers are approximately formulated as follws:

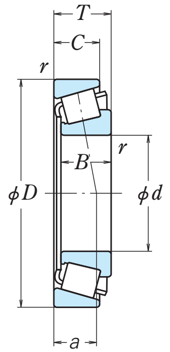


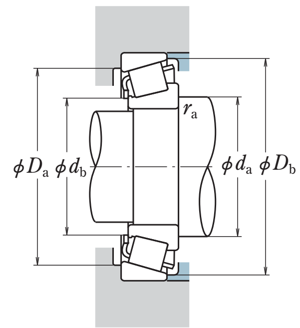
For tapered roller bearings, besides single-row bearings, there are also various combinations of bearings as listed in Table 1.

The cages of tapered roller bearings are either pressed steel or pin type.

Regarding four-row tapered roller bearings for roll necks, refer to page B344.

Bore Diameter 140 – 190 mm





Dynamic Equivalent Load

$P = XF_r + YF_a$

$F_a/F_r \leqq e$		$F_a/F_r > e$	
X	Y	X	Y
1	0	0.4	Y_1

Static Equivalent Load

$P_0 = 0.5F_r + Y_0F_a$

When $F_r > 0.5F_r + Y_0F_a$, use $P_0 = F_r$

The values of e, Y_1, and Y_0 are given in the table below.

Boundary Dimensions (mm)							Basic Load Ratings (kN)		{kgf}		Bearing Numbers	Abutment and Fillet Dimensions (mm)						Eff. Load Centers (mm)	Constant	Axial Load Factors		Mass (kg)
d	D	T	B	C	CONE r min.	CUP r min.	C_r	C_{0r}	C_r	C_{0r}		d_a	d_b	D_a	D_b	CONE r_a max.	CUP r_a max.	a	e	Y_1	Y_0	approx.
140	190	32	32	25	2	1.5	206	390	21 000	39 500	**HR32928J**	155	148	178	184	2	1.5	33.6	0.36	1.7	0.92	2.64
	210	45	45	34	2.5	2	325	555	33 000	57 000	**HR32028XJ**	161	148	193	205	2	2	46.6	0.46	1.3	0.72	5.32
	250	45.75	42	36	4	3	390	515	40 000	52 500	**HR30228J**	169	154	228	240	3	2.5	48.9	0.44	1.4	0.76	8.74
	250	71.75	68	58	4	3	610	915	62 000	93 500	**HR32228J**	171	152	224	242	3	2.5	60.5	0.44	1.4	0.76	14.3
	300	67.75	62	53	5	4	740	945	75 500	96 500	**HR30328J**	178	150	269	284	4	3	55.7	0.35	1.7	0.96	21.1
	300	107.75	102	85	5	4	985	1 440	101 000	147 000	**32328**	185	161	265	288	4	3	76.4	0.37	1.6	0.88	33.9
150	210	38	38	30	2.5	2	281	520	28 600	53 000	**HR32930J**	168	160	196	203	2	2	36.5	0.33	1.8	1.0	4.05
	225	48	48	36	3	2.5	375	650	38 000	66 500	**HR32030XJ**	173	159	206	219	2.5	2	49.8	0.46	1.3	0.72	6.6
	270	49	45	38	4	3	485	665	49 000	67 500	**HR30230J**	180	164	245	258	3	2.5	51.3	0.44	1.4	0.76	11.2
	270	77	73	60	4	3	705	1 080	71 500	110 000	**HR32230J**	183	166	241	259	3	2.5	64.7	0.44	1.4	0.76	17.8
	320	72	65	55	5	4	825	1 060	84 500	108 000	**HR30330J**	192	178	288	301	4	3	60.0	0.35	1.7	0.96	25
	320	114	108	90	5	4	1 120	1 700	114 000	174 000	**32330**	198	173	282	306	4	3	81.5	0.37	1.6	0.88	41.4
160	220	38	38	30	2.5	2	296	570	30 000	58 000	**HR32932J**	178	170	206	213	2	2	38.7	0.35	1.7	0.95	4.32
	240	51	51	38	3	2.5	425	750	43 500	76 500	**HR32032XJ**	184	169	221	234	2.5	2	53.0	0.46	1.3	0.72	7.93
	290	52	48	40	4	3	470	610	47 500	62 000	**30232**	195	178	266	279	3	2.5	55.0	0.43	1.4	0.77	13.1
	290	84	80	67	4	3	795	1 120	81 000	125 000	**HR32232J**	195	177	259	278	3	2.5	70.5	0.44	1.4	0.76	22.7
	340	75	68	58	5	4	915	1 180	93 000	120 000	HR30332J	203	182	307	323	4	3	62.9	0.35	1.7	0.96	29.2
	340	121	114	95	5	4	1 210	1 770	123 000	181 000	**32332**	210	183	301	327	4	3	87.1	0.37	1.6	0.88	48.3
170	230	38	38	30	2.5	2	294	560	30 000	57 000	**HR32934J**	187	179	215	223	2	2	41.7	0.38	1.6	0.86	4.44
	260	57	57	43	3	2.5	505	890	51 500	90 500	**HR32034XJ**	196	180	239	253	2.5	2	56.6	0.44	1.4	0.74	10.6
	310	57	52	43	5	4	525	690	53 500	70 500	**30234**	207	189	282	297	4	3	59.8	0.43	1.4	0.77	16.1
	310	91	86	71	5	4	930	1 450	94 500	148 000	**HR32234J**	209	185	276	300	4	3	76.4	0.44	1.4	0.76	28
	360	80	72	62	5	4	1 010	1 310	103 000	134 000	**HR30334J**	214	194	325	342	4	3	67.3	0.35	1.7	0.96	36.4
	360	127	120	100	5	4	1 370	2 050	140 000	209 000	**32334**	222	194	319	346	4	3	91.3	0.37	1.6	0.88	57
180	250	45	45	34	2.5	2	350	685	36 000	69 500	**HR32936J**	201	189	231	242	2	2	53.9	0.48	1.3	0.69	6.56
	280	64	64	48	3	2.5	640	1 130	65 000	115 000	**HR32036XJ**	208	192	257	272	2.5	2	60.4	0.42	1.4	0.78	14.3
	320	57	52	43	5	4	520	695	53 000	70 500	**30236**	215	199	291	306	4	3	62.1	0.44	1.4	0.74	16.6
	320	91	86	71	5	4	960	1 540	98 000	157 000	**HR32236J**	219	199	285	307	4	3	78.8	0.45	1.3	0.73	29.8
	380	83	75	64	5	4	935	1 230	95 500	126 000	**30336**	230	209	343	360	4	3	72.4	0.36	1.7	0.92	39.3
	380	134	126	106	5	4	1 520	2 290	155 000	234 000	**32336**	232	205	336	364	4	3	96.6	0.37	1.6	0.88	66.8
190	260	45	45	34	2.5	2	365	715	37 000	73 000	**HR32938J**	210	199	241	252	2	2	55.3	0.48	1.3	0.69	6.83
	290	64	64	48	3	2.5	650	1 170	66 000	119 000	**HR32038XJ**	219	202	267	283	2.5	2	63.3	0.44	1.4	0.75	14.9
	340	60	55	46	5	4	580	790	59 000	80 500	**30238**	230	212	311	326	4	3	62.7	0.40	1.5	0.82	20.1
	340	97	92	75	5	4	1 110	1 770	113 000	181 000	**HR32238J**	231	209	305	327	4	3	80.5	0.44	1.4	0.76	35.2
	400	86	78	65	6	5	1 010	1 340	103 000	136 000	**30338**	243	222	362	380	5	4	76.1	0.36	1.7	0.92	46
	400	140	132	109	6	5	1 660	2 580	169 000	263 000	**32338**	249	220	355	385	5	4	102.7	0.37	1.6	0.88	78.9