

9. THRUST CYLINDRICAL ROLLER BEARINGS

INTRODUCTION C 314

BEARING TABLES

THRUST CYLINDRICAL ROLLER BEARINGS

Bore Diameter 35mm – 320mm C 316



THRUST CYLINDRICAL ROLLER BEARINGS**DESIGN, TYPES, AND FEATURES****THRUST CYLINDRICAL ROLLER BEARINGS**

These are thrust bearings containing cylindrical rollers. They can sustain only axial loads but are suitable for heavy loads and feature high axial rigidity.

Machined brass cages are used with this bearing type.

TOLERANCES AND RUNNING ACCURACY**THRUST CYLINDRICAL ROLLER BEARINGS**

..... According to Table 7.6 (Pages A140 to A142)

RECOMMENDED FITS

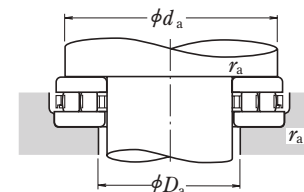
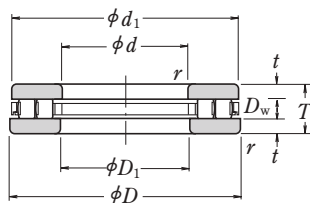
THRUST CYLINDRICAL ROLLER BEARINGS..... Table 8.4 (Pages A164)
Table 8.6 (Pages A165)

MINIMUM AXIAL LOAD

Be sure to apply some axial load to thrust bearings to prevent slippage between the rolling elements and raceways. For more details, please contact NSK.

THRUST CYLINDRICAL ROLLER BEARINGS

Bore Diameter 35 – 130 mm

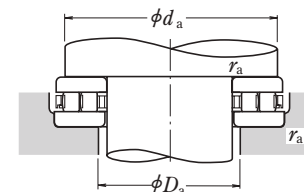
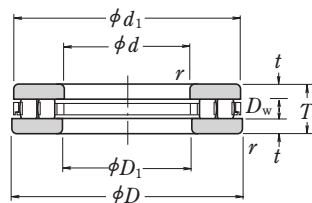


Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)		Bearing Designation	Dimensions (mm)				Abutment and Fillet Dimensions (mm)			Mass (kg) approx.
<i>d</i>	<i>D</i>	<i>T</i>	<i>r</i> _{min.}	<i>C</i> _a	<i>C</i> _{0a}	Grease	Oil		<i>d</i> ₁	<i>D</i> ₁	<i>D</i> _w	<i>t</i>	<i>d</i> _a _{min.}	<i>D</i> _a _{max.}	<i>r</i> _a _{max.}	
35	80	32	1.1	95 500	247 000	1 000	3 000	35 TMP 14	80	37	12	10	71	46	1	0.97
40	78	22	1	63 000	194 000	1 200	3 600	40 TMP 93	78	42	8	7	71	48	1	0.525
45	65	14	0.6	33 000	100 000	1 700	5 000	45 TMP 11	65	47	6	4	60	49	0.6	0.144
	85	24	1	71 000	233 000	1 100	3 400	45 TMP 93	85	47	8	8	78	53	1	0.665
50	110	27	1.1	139 000	470 000	900	2 800	50 TMP 74	109	52	11	8	100	61	1	1.52
	95	27	1.1	113 000	350 000	1 000	3 000	50 TMP 93	93	52	11	8	89	57	1	0.94
55	105	30	1.1	134 000	450 000	900	2 600	55 TMP 93	105	55.2	11	9.5	98	63	1	1.28
	60	95	26	1	99 000	325 000	1 000	3 000	60 TMP 12	95	62	10	8	88	67	1
110		30	1.1	139 000	480 000	850	2 600	60 TMP 93	110	62	11	9.5	103	68	1	1.36
65	100	27	1	110 000	325 000	950	2 800	65 TMP 12	100	67	12.5	7.25	93	71	1	0.805
	115	30	1.1	145 000	515 000	850	2 600	65 TMP 93	115	65.2	11	9.5	108	73	1	1.44
70	150	36	2	259 000	935 000	670	2 000	70 TMP 74	149	72	15	10.5	137	84	2	3.8
	125	34	1.1	191 000	635 000	750	2 200	70 TMP 93	125	72	14	10	117	78	1	1.95
75	100	19	1	63 500	221 000	1 100	3 400	75 TMP 11	100	77	8	5.5	96	79	1	0.41
	135	36	1.5	209 000	735 000	710	2 200	75 TMP 93	135	77	14	11	125	84	1.5	2.42
80	115	28	1	120 000	420 000	900	2 600	80 TMP 12	115	82	11	8.5	109	86	1	1.02
	140	36	1.5	208 000	740 000	710	2 000	80 TMP 93	138	82	14	11	130	91	1.5	2.54
85	110	19	1	75 000	298 000	1 100	3 200	85 TMP 11	110	87	7.5	5.75	105	89	1	0.46
	125	31	1	151 000	485 000	800	2 400	85 TMP 12	125	88	14	8.5	118	92	1	1.36
	150	39	1.5	257 000	995 000	630	1 900	85 TMP 93	148	87	14	12.5	140	95	1.5	3.2
90	120	22	1	96 000	370 000	950	3 000	90 TMP 11	119	91.5	9	6.5	114	95	1	0.725
	155	39	1.5	250 000	885 000	630	1 900	90 TMP 93	155	90.2	16	11.5	144	101	1.5	3.3
100	170	42	1.5	292 000	1 110 000	560	1 700	100 TMP 93	170	103	16	13	159	110	1.5	4.25
	110	160	38	1.1	228 000	855 000	630	1 900	110 TMP 12	160	113	15	11.5	150	119	1
190		48	2	390 000	1 490 000	500	1 500	110 TMP 93	190	113	19	14.5	179	120	2	6.15
120	170	39	1.1	233 000	895 000	600	1 800	120 TMP 12	170	123	15	12	160	129	1	2.93
	210	54	2.1	505 000	1 930 000	450	1 400	120 TMP 93	210	123	22	16	199	129	2	8.55
130	190	45	1.5	300 000	1 090 000	530	1 600	130 TMP 12	187	133	19	13	177	142	1.5	4.5
	225	58	2.1	585 000	2 370 000	430	1 300	130 TMP 93	225	133	22	18	214	140	2	10.4
	270	85	4	895 000	3 300 000	320	950	130 TMP 94	270	133	32	26.5	254	150	3	26.2

Remark For cylindrical roller thrust bearings not listed above, please contact NSK.

THRUST CYLINDRICAL ROLLER BEARINGS

Bore Diameter 140 – 320 mm



<i>d</i>	Boundary Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (min ⁻¹)		Bearing Designation	Dimensions (mm)				Abutment and Fillet Dimensions (mm)			Mass (kg) approx.
	<i>D</i>	<i>T</i>	<i>r</i> _{min.}	<i>C</i> _a	<i>C</i> _{0a}	Grease	Oil		<i>d</i> ₁	<i>D</i> ₁	<i>D</i> _w	<i>t</i>	<i>d</i> _a min.	<i>D</i> _a max.	<i>r</i> _a max.	
140	200	46	2	285 000	1 120 000	500	1 500	140 TMP 12	197	143	17	14.5	188	153	2	4.85
	240	60	2.1	610 000	2 360 000	400	1 200	140 TMP 93	240	143	25	17.5	226	154	2	12.2
	280	85	4	990 000	3 800 000	300	900	140 TMP 94	280	143	32	26.5	262	158	3	27.5
150	215	50	2	375 000	1 500 000	480	1 400	150 TMP 12	215	153	19	15.5	202	163	2	6.15
	250	60	2.1	635 000	2 510 000	400	1 200	150 TMP 93	250	153	25	17.5	236	165	2	12.8
160	200	31	1	173 000	815 000	630	1 900	160 TMP 11	200	162	11	10	191	168	1	2.21
	270	67	3	745 000	3 150 000	360	1 100	160 TMP 93	265	164	25	21	255	173	2.5	16.9
170	240	55	1.5	485 000	1 960 000	430	1 300	170 TMP 12	237	173	22	16.5	227	182	1.5	8.2
	280	67	3	800 000	3 500 000	340	1 000	170 TMP 93	280	173	25	21	265	183	2.5	17.7
180	300	73	3	1 000 000	4 000 000	320	950	180 TMP 93	300	185	32	20.5	284	194	2.5	22.5
	360	109	5	1 640 000	6 200 000	240	710	180 TMP 94	354	189	45	32	335	205	4	58.2
190	270	62	3	705 000	2 630 000	360	1 100	190 TMP 12	266	195	30	16	255	200	2.5	11.8
	320	78	4	1 080 000	4 500 000	300	900	190 TMP 93	320	195	32	23	303	205	3	27.6
200	250	37	1.1	365 000	1 690 000	500	1 500	200 TMP 11	247	203	17	10	242	207	1	4.1
	340	85	4	1 180 000	5 150 000	280	800	200 TMP 93	340	205	32	26.5	322	218	3	34.5
220	270	37	1.1	385 000	1 860 000	480	1 500	220 TMP 11	267	223	17	10	262	227	1	4.5
	300	63	2	770 000	3 100 000	340	1 000	220 TMP 12	297	224	30	16.5	287	232	2	13.5
240	300	45	1.5	435 000	2 160 000	400	1 200	240 TMP 11	297	243	18	13.5	288	251	1.5	7.2
	340	78	2.1	965 000	4 100 000	280	850	240 TMP 12	335	244	32	23	322	258	2	23.3
260	320	45	1.5	460 000	2 350 000	400	1 200	260 TMP 11	317	263	18	13.5	308	272	1.5	7.75
	360	79	2.1	995 000	4 350 000	280	850	260 TMP 12	355	264	32	23.5	342	276	2	25.2
280	350	53	1.5	545 000	2 800 000	340	1 000	280 TMP 11	347	283	20	16.5	335	294	1.5	11.6
	380	80	2.1	1 050 000	4 750 000	260	800	280 TMP 12	375	284	32	24	362	296	2	27.2
300	380	62	2	795 000	4 000 000	300	900	300 TMP 11	376	304	25	18.5	365	315	2	16.7
	420	95	3	1 390 000	6 250 000	220	670	300 TMP 12	415	304	38	28.5	398	322	2.5	42
320	400	63	2	820 000	4 250 000	300	900	320 TMP 11	396	324	25	19	385	335	2	18
	440	95	3	1 420 000	6 550 000	220	670	320 TMP 12	435	325	38	28.5	418	340	2.5	44.5

Remark For cylindrical roller thrust bearings not listed above, please contact NSK.

10. THRUST TAPERED ROLLER BEARINGS

INTRODUCTION C 322

BEARING TABLES

THRUST TAPERED ROLLER BEARINGS

Bore Diameter 101.600mm – 600mm C 324



DESIGN, TYPES, AND FEATURES

THRUST TAPERED ROLLER BEARINGS

These thrust bearings containing tapered rollers come in two types. TT bearings, which have a rib on the housing washer, can accurately guide the shaft in the radial direction, while TTF bearings, which have no rib on the housing washer, can tolerate some eccentricity during operation.



Fig. 1 TT and TTF Base Structure

TOLERANCES AND RUNNING ACCURACY

THRUST TAPERED ROLLER BEARINGS Table 7.7 (Page A144)

RECOMMENDED FITS

THRUST TAPERED ROLLER BEARINGS Table 8.4 (Page A164)
 Table 8.6 (Page A165)

For Inch Series tapered roller thrust bearings, please contact NSK.

MINIMUM AXIAL LOAD

Be sure to apply some axial load to thrust bearings to prevent slippage between the rolling elements and raceways. For more details, please contact NSK.

USAGE EXAMPLE

A typical structure of a heavy-duty Extruder is shown in Figure 2.

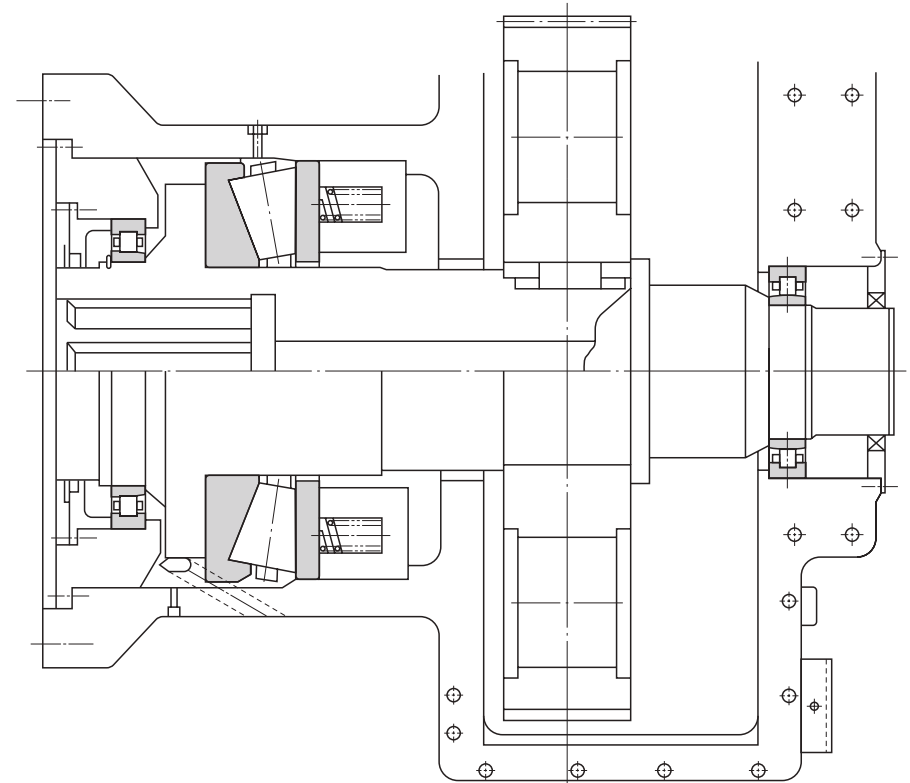
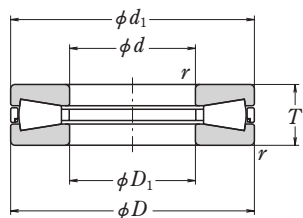


Fig. 2 Thrust Tapered Roller Bearings in a Heavy-Duty Extruder

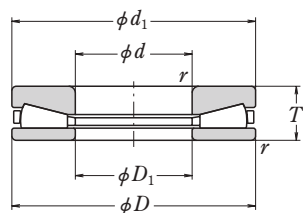
THRUST TAPERED ROLLER BEARINGS

TT, TTF Types

Bore Diameter 101.600 – 168.275 mm



TT



TTF

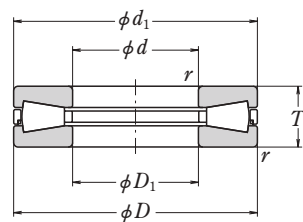
d	Boundary Dimensions (mm/inch)			Basic Load Ratings (kN)		Bearing Designation	Dimensions (mm)		Corner Radius of Shaft or Housing r _a max.	Mass (kg) approx.
	D	T	r min.	C _a	C _{0a}		D ₁	d ₁		
101.600 4.000	215.900 8.5000	46.038 1.8125	3.3	710	2 900	*101TT2151	103.200	214.300	3.3	8.9
111.760 4.400	223.520 8.8000	55.880 2.2000	3.3	790	2 920	*111TT2251	113.300	221.900	3.3	11.2
114.300 4.500	250.825 9.8750	53.975 2.1250	4.0	970	4 100	*114TT2551	114.500	250.825	4.0	14.4
127.000 5.000	266.700 10.5000	58.738 2.3125	4.8	1 040	4 350	*127TT2551	128.600	265.100	4.8	17.3
	266.700 10.5000	58.738 2.3125	4.8	1 030	4 500	*127TTF2651	128.600	265.100	4.8	17.3
128.575 5.0620	265.100 10.4370	63.500 2.5000	6.4	1 040	4 350	*128TT2651	128.900	265.100	6.4	18.2
130	250	70	2.1	1 100	4 100	130TTF2501	130.3	250	2	17
135	245	65	2.1	855	3 100	135TT2401	135.3	245	2	14.5
150	300	90	5	1 470	6 300	150TTF3001	152	306	4	34.2
152.400 6.000	317.500 12.5000	69.850 2.7500	6.4	1 470	6 300	*152TTF3151	152.700	315.900	6.4	28.9
	317.500 12.5000	69.850 2.7500	6.4	1 550	6 700	*152TT3152	152.400	317.500	6.4	28.9
165.100 6.500	311.150 12.2500	88.900 3.5000	6.4	1 560	5 250	*165TT3151	165.400	311.150	6.4	33
168.275 6.6250	304.800 12.0000	69.850 2.7500	6.4	1 230	5 000	*168TTF3051	169.000	302.500	6.4	24.1

Note * Bearings marked with * are Inch Series bearings.

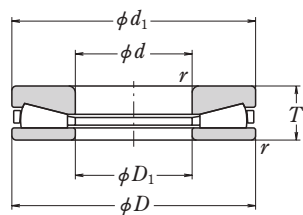
THRUST TAPERED ROLLER BEARINGS

TT, TTF Types

Bore Diameter 170 – 241.300 mm



TT



TTF

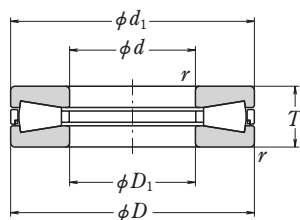
<i>d</i>	Boundary Dimensions (mm/inch)			Basic Load Ratings (kN)		Bearing Designation	Dimensions (mm)		Corner Radius of Shaft or Housing <i>r</i> _a max.	Mass (kg) approx.
	<i>D</i>	<i>T</i>	<i>r</i> min.	<i>C</i> _a	<i>C</i> _{0a}		<i>D</i> ₁	<i>d</i> ₁		
170	320	100	5	1 650	5 550	170TT3201	170.5	320	4	39.3
174.625 6.8750	358.775 14.1250	82.550 3.2500	6.4	1 740	7 400	*174TT3551	174.625	358.775	6.4	43.3
	358.775 14.1250	82.550 3.2500	6.4	1 740	7 400	*174TTF3551	174.625	358.775	6.4	43.3
177.800 7.0000	368.300 14.5000	82.550 3.2500	8.0	1 900	8 250	*177TT3651	180.400	365.800	8.0	45.9
203.200 8.0000	419.100 16.5000	92.075 3.6250	9.7	2 530	11 300	*203TT4151	205.600	416.700	9.7	66.1
	419.100 16.5000	92.075 3.6250	9.7	2 530	11 300	*203TTF4153A	203.200	419.100	9.7	66.1
	419.100 16.5000	120.650 4.7500	9.7	2 530	11 300	*203TT4152	205.600	416.700	9.7	86.6
	419.100 16.5000	120.650 4.7500	9.7	2 530	11 300	*203TTF4152	205.600	416.700	9.7	86.6
206.375 8.1250	419.100 16.5000	120.370 4.7390	C10	2 590	11 700	*206TT4151	206.375	419.100	6	85.5
228.600 9.0000	482.600 19.0000	104.775 4.1250	11.2	3 350	16 400	*228TT4851	228.900	482.600	11.2	101
	482.600 19.0000	104.775 4.1250	11.2	3 350	16 400	*228TTF4851	230.600	480.600	11.2	101
234.950 9.2500	546.100 21.5000	127.000 5.0000	15.9	4 600	21 400	*234TT5451	237.000	544.000	15.9	165
241	404	110	4	2 200	8 650	241TTF4002	241	404	3	61.8
241.300 9.5000	496.888 19.5625	129.000 5.0787	C8	3 450	16 700	*241TT4952	241.300	496.888	5	130

Note * Bearings marked with * are Inch Series bearings.

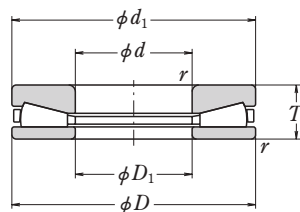
THRUST TAPERED ROLLER BEARINGS

TT, TTF Types

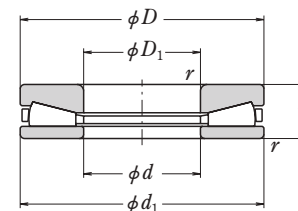
Bore Diameter 254.000 – 600 mm



TT



TTF



TTF-1

d	Boundary Dimensions (mm/inch)			Basic Load Ratings (kN)		Bearing Designation	Dimensions (mm)		Corner Radius of Shaft or Housing r _a max.	Mass (kg) approx.
	D	T	r min.	C _a	C _{0a}		D ₁	d ₁		
254.000 10.0000	539.750 21.2500	117.475 4.6250	11.2	3 950	18 600	*254TTF5351	254.000	539.750	11.2	142
260	360	75	2.1	1 110	4 650	260TTF3601	260.3	360	2	24.8
273.050 10.7500	552.450 21.7500	133.350 5.2500	C8	4 400	20 700	*273TT5551	273.050	552.450	5	164
279.400 11.0000	603.250 23.7500	136.525 5.3750	11.2	5 400	25 200	*279TT6051	279.700	603.250	11.2	208
330	440	85	3	1 300	6 300	330TTF4401	331	440	2.5	38.5
340	460	96	3	1 690	7 750	340TTF4603	340	460	2.5	49.2
350	460	85	2	1 370	6 600	350TTF4602A⁽¹⁾	351	450	2	40.4
360	470	85	4	1 440	6 950	360TTF4701	360.4	470	3	41.4
	600	120	4	3 700	20 100	360TTF6201	366	620	3	148
380	550	110	4	2 760	12 100	380TTF5501	381	550	3	92.9
406.400 16.0000	711.200 28.0000	146.050 5.7500	9.7	5 900	28 600	*406TT7151	406.800	711.200	9.7	266
	838.200 33.0000	177.800 7.0000	12.7	8 950	46 500	*406TT8351	406.800	837.800	12.7	510
431.800 17.0000	863.600 34.0000	228.600 9.0000	10.4	15 100	69 500	*431TTF8651	435.000	862.000	10.4	683
440	600	105	4	2 720	13 900	440TTF6001	440	600	3	93.3
450	570	100	3	2 170	10 500	450TTF5701	455	569	2.5	65.4
460	580	90	3	1 890	9 550	460TTF5801	465	579	2.5	60
500	630	82	3	2 020	11 600	500TTF6301	505	628	2.5	64.3
508	730.25	120.65	6	4 900	26 100	508TT7301	509	730.25	5	177
508.000 20.0000	990.600 39.0000	196.850 7.7500	12.7	12 000	65 000	*508TT9951	508.000	990.600	12.7	760
558	780	120	9.5	4 800	25 500	558TT7801	558	780	8	190
558.800 22.0000	1 066.800 42.0000	285.750 11.2500	10.4	21 100	94 500	*558TTF1051	561.980	1 065.219	10.4	1 260
560	670	85	3	1 950	10 700	560TTF6701	565	668	2.5	61.4
600	710	86	3	1 900	10 700	600TTF7101	604	710	2.5	66.2

Note * Bearings marked with * are Inch Series bearings.

⁽¹⁾ For this bearing, dimensional designations are defined by Figure TTF-1.

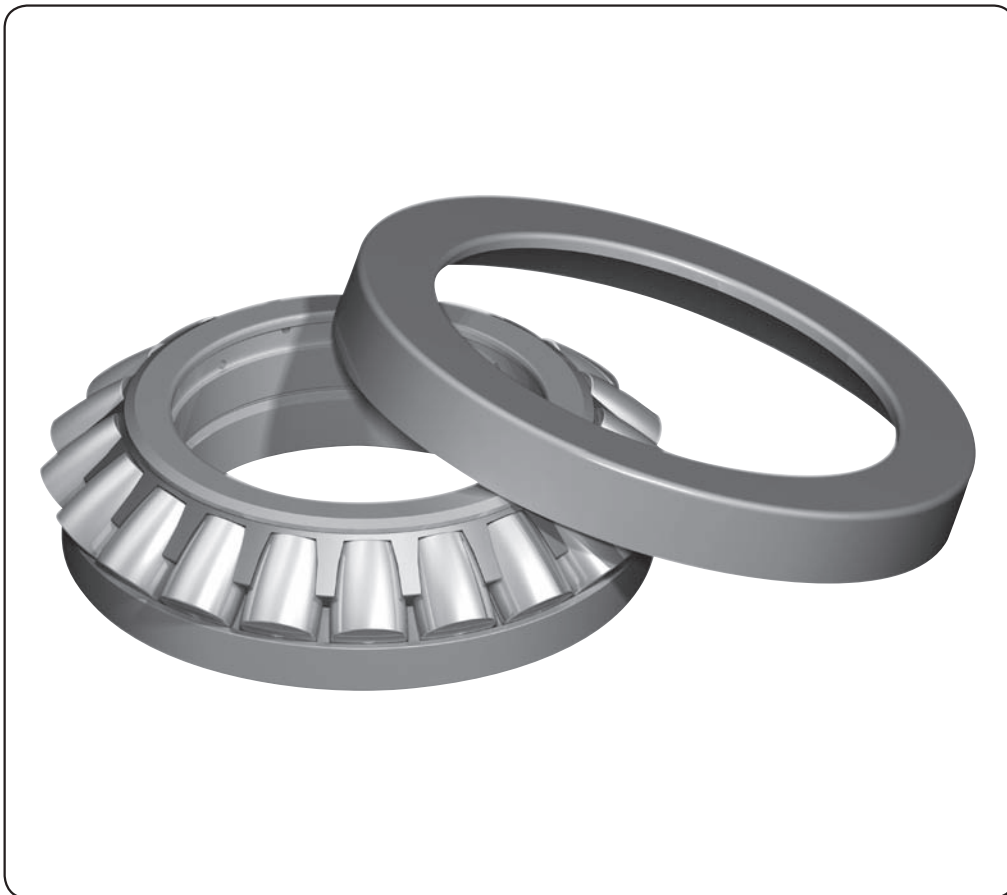
11. THRUST SPHERICAL ROLLER BEARINGS

INTRODUCTION C 332

BEARING TABLES

THRUST SPHERICAL ROLLER BEARINGS

Bore Diameter 60mm – 500mm C 334



DESIGN, TYPES, AND FEATURES

THRUST SPHERICAL ROLLER BEARINGS

These thrust bearings containing convex rollers have self-aligning capabilities and are free of any influence from mounting error or shaft deflection. E-type bearings (suffixed with E in the bearing tables) with pressed cages are available for high load applications.

Machined-brass cages are recommended for horizontal shafts or high-speed applications; please contact NSK for details.

Since there are several places where lubrication is difficult, such as the area between the roller heads and inner ring rib, the sliding surfaces between cage and guide sleeve, etc., oil lubrication should be used, even at low speeds.

Machined-brass cages are used in standard bearings of this type.

TOLERANCES AND RUNNING ACCURACY

THRUST SPHERICAL ROLLER BEARINGSTable 7.8 (Pages A145)

RECOMMENDED FITS

THRUST SPHERICAL ROLLER BEARINGSTable 8.4 (Pages A164)
 Table 8.6 (Pages A165)

DIMENSIONS RELATED TO MOUNTING

Dimensions related to mounting of thrust spherical roller bearings are listed in the bearing tables.

If the bearing load is heavy, design the shaft shoulder with ample strength to provide sufficient support for the shaft washer.

PERMISSIBLE MISALIGNMENT

The permissible misalignment of thrust spherical roller bearings varies depending on size, but it is approximately 0.018 to 0.036 radian (1° to 2°) with average loads.

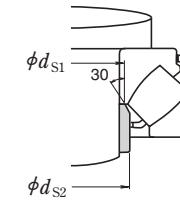
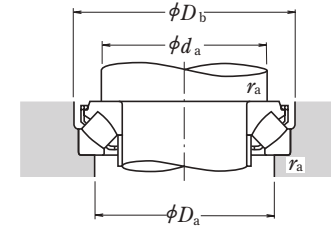
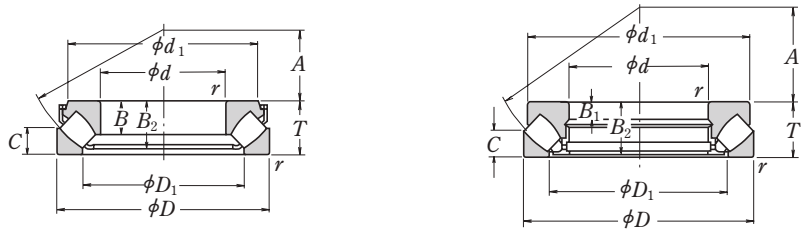
MINIMUM AXIAL LOAD

Be sure to apply some axial load to thrust bearings to prevent slippage between the rolling elements and raceways. For more details, please refer to Page A198.



THRUST SPHERICAL ROLLER BEARINGS

Bore Diameter 60 – 200 mm



Dynamic Equivalent Load

$$P = 1.2F_r + F_a$$

Static Equivalent Load

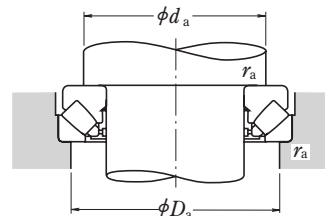
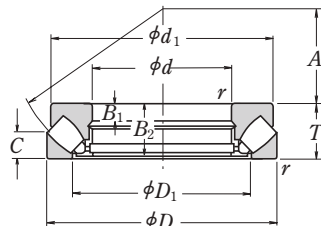
$$P_0 = 2.8F_r + F_a$$

However, $F_r/F_a \leq 0.55$ must be satisfied.

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹) Oil	Bearing Designation	Dimensions (mm)						Spacer Sleeve Dimensions (mm)		Abutment and Fillet Dimensions (mm)				Mass (kg) approx.
d	D	T	r min.	C _a	C _{0a}			d ₁	D ₁	B, B ₁	B ₂	C	A	d _{s1} max.	d _{s2} max.	d _a ⁽¹⁾ min.	D _a max.	D _b min.	r _a max.	
60	130	42	1.5	330 000	885 000	2 600	29412 E	114.5	89	27	38	20	38	67	67	90	108	133	1.5	2.55
65	140	45	2	405 000	1 100 000	2 400	29413 E	121.5	93	29.5	40.5	22	42	72	72	100	115	143	2	3.2
70	150	48	2	450 000	1 240 000	2 400	29414 E	131.5	102	31	43	24	44	78	78	105	125	153	2	3.9
75	160	51	2	515 000	1 430 000	2 200	29415 E	138	107	33.5	46	25	47	83	83	115	132	163	2	4.65
80	170	54	2.1	575 000	1 600 000	2 000	29416 E	148	114.5	35	48.5	27	50	89	89	120	140	173	2	5.55
85	150	39	1.5	330 000	1 040 000	2 400	29317 E	134.5	112	24.5	35.5	19	50	91	91	115	135	153	1.5	2.7
	180	58	2.1	630 000	1 760 000	1 900	29417 E	156.5	124	37	51.5	28	54	95	95	130	150	183	2	6.55
90	155	39	1.5	350 000	1 080 000	2 200	29318 E	139.5	118	24.5	35	19	52	97	97	120	140	158	1.5	2.83
	190	60	2.1	695 000	1 950 000	1 800	29418 E	165.5	129.5	39	54.5	29	56	100	100	135	157	193	2	7.55
100	170	42	1.5	410 000	1 280 000	2 000	29320 E	152	128	26.2	38	20.8	58	107	107	130	150	173	1.5	3.6
	210	67	3	840 000	2 400 000	1 600	29420 E	185	144	43	59.5	33	62	111	111	150	175	214	2.5	10.3
110	190	48	2	530 000	1 710 000	1 800	29322 E	169.5	142.5	30.3	43.5	24	64	117	117	145	165	193	2	5.25
	230	73	3	1 010 000	2 930 000	1 500	29422 E	200	157	47	64.5	36	69	121	129	165	190	234	2.5	13.3
120	210	54	2.1	645 000	2 100 000	1 600	29324 E	187.5	156.5	34	48.5	27	70	130	130	160	180	214	2	7.3
	250	78	4	1 160 000	3 400 000	1 400	29424 E	215	171	50.5	69.5	38	74	132	142	180	205	254	3	16.6
130	225	58	2.1	740 000	2 450 000	1 500	29326 E	203.5	168.5	37	53.5	28	76	141	143	170	195	229	2	8.95
	270	85	4	1 330 000	3 900 000	1 200	29426 E	235	185	54	74.5	42	81	143	153	195	225	275	3	21.1
140	240	60	2.1	840 000	2 810 000	1 400	29328 E	216.5	179	38.5	54	30	82	148	154	185	205	244	2	10.4
	280	85	4	1 370 000	4 200 000	1 200	29428 E	244.5	195.5	54	74.5	42	86	153	162	205	235	285	3	22.2
150	250	60	2.1	870 000	2 900 000	1 400	29330 E	224	190	38	54.5	29	87	158	163	195	215	254	2	10.8
	300	90	4	1 580 000	4 900 000	1 100	29430 E	266	209	58	81	44	92	164	175	220	250	306	3	27.3
160	270	67	3	1 010 000	3 400 000	1 300	29332 E	243	203	42	60	33	92	169	176	210	235	275	2.5	14.3
	320	95	5	1 740 000	5 400 000	1 100	29432 E	278	224.5	60.5	84.5	46	99	175	189	230	265	326	4	32.1
170	280	67	3	1 050 000	3 500 000	1 200	29334 E	252	214.5	42.2	60.5	32	96	178	188	220	245	285	2.5	14.8
	340	103	5	1 680 000	5 800 000	1 000	29434	310	243	37	99	50	104	—	—	245	285	—	4	43.5
180	300	73	3	1 230 000	4 200 000	1 100	29336 E	270	227	46	65.5	36	103	189	195	235	260	306	2.5	19
	360	109	5	1 870 000	6 500 000	900	29436	330	255	39	105	52	110	—	—	260	300	—	4	52
190	320	78	4	1 370 000	4 700 000	1 100	29338 E	288.5	244	49	69	38	110	200	211	250	275	326	3	23
	380	115	5	2 100 000	7 450 000	850	29438	345	271	41	111	55	117	—	—	275	320	—	4	60
200	280	48	2	540 000	2 310 000	1 500	29240	266	236	15	46	24	108	—	—	235	255	—	2	8.55
	340	85	4	1 570 000	5 450 000	1 000	29340 E	306.5	257	53.5	75	41	116	211	224	265	295	346	3	28.5
	400	122	5	2 290 000	8 150 000	800	29440	365	280	43	117	59	122	—	—	290	335	—	4	69

Note ⁽¹⁾ For heavy load applications, ensure that the d_a value chosen is large enough to support the shaft washer rib.

Bore Diameter 220 – 420 mm



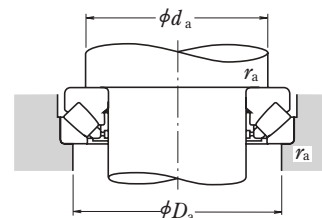
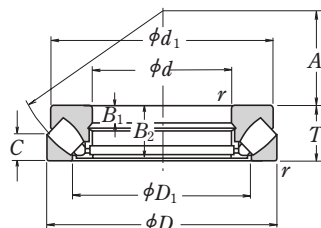
Dynamic Equivalent Load
 $P = 1.2F_r + F_a$
Static Equivalent Load
 $P_0 = 2.8F_r + F_a$
 However, $F_r/F_a \leq 0.55$ must be satisfied.

Boundary Dimensions (mm)				Basic Load Ratings (N)		Limiting Speeds (min ⁻¹) Oil	Bearing Designation	Dimensions (mm)					Abutment and Fillet Dimensions (mm)			Mass (kg) approx.	
<i>d</i>	<i>D</i>	<i>T</i>	<i>r</i> _{min.}	<i>C_a</i>	<i>C_{0a}</i>			<i>d</i> ₁	<i>D</i> ₁	<i>B</i> ₁	<i>B</i> ₂	<i>C</i>	<i>A</i>	<i>d_a</i> ⁽¹⁾ min.	<i>D_a</i> max.		<i>r_a</i> max.
220	300	48	2	560 000	2 500 000	1 400	29244	285	254	15	46	24	117	260	275	2	9.2
	360	85	4	1 340 000	5 200 000	950	29344	335	280	29	81	41	125	285	315	3	33
	420	122	6	2 350 000	8 650 000	800	29444	385	308	43	117	58	132	310	355	5	74
240	340	60	2.1	800 000	3 450 000	1 200	29248	325	283	19	57	30	130	285	305	2	16.5
	380	85	4	1 360 000	5 400 000	950	29348	355	300	29	81	41	135	300	330	3	35.5
	440	122	6	2 420 000	9 100 000	750	29448	405	326	43	117	59	142	330	375	5	79
260	360	60	2.1	855 000	3 850 000	1 200	29252	345	302	19	57	30	139	305	325	2	18
	420	95	5	1 700 000	6 800 000	800	29352	390	329	32	91	45	148	330	365	4	48.5
	480	132	6	2 820 000	10 700 000	710	29452	445	357	48	127	64	154	360	405	5	105
280	380	60	2.1	885 000	4 100 000	1 100	29256	365	323	19	57	30	150	325	345	2	19
	440	95	5	1 830 000	7 650 000	800	29356	410	348	32	91	46	158	350	390	4	52.5
	520	145	6	3 400 000	13 100 000	630	29456	480	384	52	140	68	166	390	440	5	132
	520	145	6	3 950 000	14 900 000	630	29456 EM	480	380	52	140	70	166	410	445	5	134
300	420	73	3	1 160 000	5 150 000	950	29260	400	353	21	69	38	162	355	380	2.5	30
	480	109	5	2 190 000	9 100 000	710	29360	450	379	37	105	50	168	380	420	4	74
	540	145	6	3 500 000	13 700 000	630	29460	500	402	52	140	70	175	410	460	5	140
320	440	73	3	1 190 000	5 450 000	950	29264	420	372	21	69	38	172	375	400	2.5	32.5
	500	109	5	2 230 000	9 400 000	670	29364	470	399	37	105	53	180	400	440	4	77
	580	155	7.5	3 650 000	14 600 000	560	29464	555	436	55	149	75	191	435	495	6	175
340	460	73	3	1 230 000	5 750 000	900	29268	440	395	21	69	37	183	395	420	2.5	33.5
	540	122	5	2 640 000	11 200 000	630	29368	510	428	41	117	59	192	430	470	4	103
	620	170	7.5	4 400 000	17 400 000	530	29468	590	462	61	164	82	201	465	530	6	218
360	500	85	4	1 550 000	7 300 000	800	29272	480	423	25	81	44	194	420	455	3	51
	560	122	5	2 670 000	11 500 000	600	29372	525	448	41	117	59	202	450	495	4	107
	640	170	7.5	4 200 000	17 200 000	500	29472	610	480	61	164	82	210	485	550	6	228
	640	170	7.5	5 450 000	20 400 000	500	29472 EM	580	474	61	164	83	210	495	550	6	220
380	520	85	4	1 620 000	7 800 000	800	29276	496	441	27	81	42	202	440	475	3	52
	600	132	6	3 300 000	14 500 000	560	29376	568	477	44	127	63	216	480	525	5	140
	670	175	7.5	4 800 000	19 500 000	480	29476	640	504	63	168	85	230	510	575	6	254
400	540	85	4	1 640 000	8 000 000	750	29280	517	460	27	81	42	212	460	490	3	55
	620	132	6	3 250 000	14 500 000	530	29380	590	494	44	127	64	225	500	550	5	150
	710	185	7.5	5 400 000	22 100 000	450	29480	680	536	67	178	89	236	540	610	6	306
420	580	95	5	2 010 000	9 800 000	670	29284	553	489	30	91	46	225	490	525	4	72
	650	140	6	3 500 000	15 700 000	500	29384	620	520	48	135	68	235	525	575	5	170
	730	185	7.5	5 650 000	23 500 000	450	29484	700	556	67	178	89	244	560	630	6	323

Note (1) For heavy load applications, ensure that the *d_a* value chosen is large enough to support the shaft washer rib.

THRUST SPHERICAL ROLLER BEARINGS

Bore Diameter 440 – 500 mm



Dynamic Equivalent Load

$$P = 1.2F_r + F_a$$

Static Equivalent Load

$$P_0 = 2.8F_r + F_a$$

However, $F_r/F_a \leq 0.55$ must be satisfied.

d	Boundary Dimensions (mm)			Basic Load Ratings (N)		Limiting Speeds (min ⁻¹) Oil	Bearing Designation	Dimensions (mm)					Abutment and Fillet Dimensions (mm)			Mass (kg) approx.	
	D	T	r min.	C _a	C _{0a}			d ₁	D ₁	B ₁	B ₂	C	A	d _a ⁽¹⁾ min.	D _a max.		r _a max.
440	600	95	5	2 030 000	10 100 000	670	29288	575	508	30	91	49	235	510	545	4	77
	680	145	6	3 750 000	16 700 000	480	29388	645	548	49	140	70	245	550	600	5	190
	780	206	9.5	6 550 000	27 200 000	400	29488	745	588	74	199	100	260	595	670	8	407
	780	206	9.5	8 000 000	31 500 000	400	29488 EM	710	577	74	199	101	257	605	675	8	402
460	620	95	5	2 060 000	10 300 000	670	29292	592	530	30	91	46	245	530	570	4	80
	710	150	6	4 100 000	18 400 000	450	29392	666	567	51	144	72	257	575	630	5	210
	800	206	9.5	6 750 000	28 600 000	380	29492	765	608	74	199	100	272	615	690	8	420
480	650	103	5	2 370 000	12 100 000	600	29296	624	556	33	99	55	259	555	595	4	97
	730	150	6	4 150 000	19 000 000	450	29396	690	590	51	144	72	270	595	650	5	215
	850	224	9.5	7 200 000	31 000 000	360	29496	810	638	81	216	108	280	645	730	8	545
500	670	103	5	2 390 000	12 400 000	600	292/500	645	574	33	99	55	268	575	615	4	100
	750	150	6	4 350 000	20 400 000	450	293/500	715	611	51	144	74	280	615	670	5	220
	870	224	9.5	7 850 000	33 000 000	340	294/500	830	661	81	216	107	290	670	750	8	560

Note (1) For heavy load applications, ensure that the d_a value chosen is large enough to support the shaft washer rib.