

# *Thrust Bearings*

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## Thrust Bearings

From the three-digit "Series" number, it is known this is an inch size bearing. "50" is read as "5.0" and represents approximate or actual bore.

The series number (always three numerals) represents a specific size cage assembly.

50

TVB

190

**TVB** Thrust Ball Bearings  
**TVL** Angular Contact Thrust Ball Bearings  
**DTV** Angular Contact Thrust Ball Bearings –  
upper and lower complement of balls  
**TP** Thrust Cylindrical Roller Bearings  
**TPS** Thrust Cylindrical Roller Bearings –  
Two bottom washers  
**TTHD** Thrust Tapered Roller Bearings



## INTRODUCTION

Four basic designs of thrust rolling bearings are available from Torrington: ball, spherical roller, cylindrical roller and tapered roller. Dimensional data for all styles are presented in order by bore size.

Engineering data such as tolerances, shaft and housing fits, and life and load rating calculations are found in the Engineering section of this catalog.

## Bearing Types

### THRUST BALL BEARINGS

Torrington thrust ball bearings provide optimum performance in high speed installations, particularly where loads are generally lighter.

Two basic types of thrust ball bearings are available from Torrington, axial (TVB), and angular contact (TVL). Torrington also offers a DTVL type, with both an upper and lower complement of angular contact balls and three race elements.

Torrington standard tolerances for thrust ball bearings (both types) are equivalent to ABEC-1 where applicable, but higher precision tolerances are available. Consult a Torrington sales engineer about such installations.

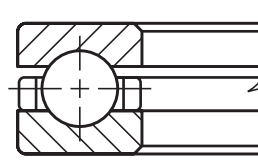
#### TVB

Torrington TVB thrust bearings are separable, and consist of two hardened and ground steel washers. The precision ground and lapped balls run in a grooved raceway, separated by a bronze cage. Other materials may be specified for the cage, depending on the application.

TVB ball thrust bearings provide axial rigidity, but are not recommended if radial loading is expected.

TVB bearings are exceptionally easy to mount, with the rotating washer usually shaft mounted. The stationary washer should be housed with an outside diameter clearance that allows the bearing to assume a normal operating position.

Most TVB bearings made by Torrington include washers of the same bore and outside diameter. Housings should therefore be designed to clear the O.D. of rotating washers, with shafts stepped to clear the bore of stationary washers.



TVB

#### TVL

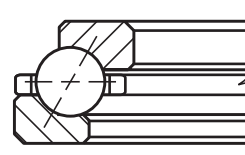
Torrington TVL angular-contact thrust ball bearings provide exceptionally low friction, cool running and quiet operation when operated at high speeds. They are also less sensitive to misalignment.

While TVL bearings have been designed exclusively for thrust loads, the angular contact design will accommodate some radial loading. Consult a Torrington sales engineer for assistance in determining the limits of such loading for specific applications.

The hardened and ground steel races of TVL bearings enclose a complement of precision ground and lapped steel balls, separated by a bronze cage (other material may be specified as required).

Although TVL is not strictly an annular ball bearing, the larger ring is identified as the outer ring; the smaller as the inner. The inner ring is usually the rotating element and is shaft mounted. The outer ring, normally stationary, should be mounted with an outside diameter clearance that allows the bearing to assume a normal operating position. If combined loads are expected, the outer ring must be radially located in the housing.

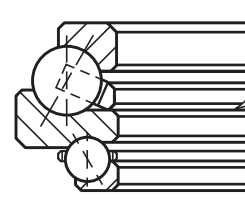
TVL bearings should always be operated under thrust loading, as will happen in the usual applications for thrust ball bearings (oil field rotary tables or machine tool indexing tables). If a constant thrust load is not normally present, it should be imposed by springs or other devices.



TVL

#### DTVL

The DTVL has an upper and lower complement of angular contact balls and three race elements. This series is capable of carrying thrust in one direction comparable to the TVL series and lighter thrust in the opposite direction.



DTVL

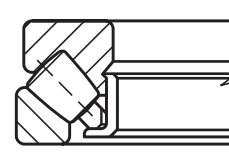
### THRUST SPHERICAL ROLLER BEARINGS

#### TSR

The Torrington self-aligning thrust spherical roller bearing is a combination radial and thrust bearing, designed to operate even if shaft and housing are, or become, misaligned under load. This type of heavy-duty bearing is the favored choice when conditions include heavy loads, plus difficulties in establishing or maintaining housing alignment, or when shaft deflection can be expected.

Shaft deflections and housing distortions caused by shock or heavy loads (which lead to misalignment) are compensated for by the internal self-alignment of the bearing elements during operation. Corner loading of rollers, a condition that limits service life on other types of bearings, cannot develop in spherical roller thrust bearings.

Torrington spherical roller thrust bearings achieve high thrust capacity and allow axial misalignment between the inner ring and the outer ring of up to  $\pm 2.5^\circ$ . Spherically contoured rollers, arranged in a steep angular position, not only accept high axial loads, but moderate radial loads as well. Torrington "E" styles (EM - machined bronze cage, EJ - stamped steel cage) have increased capacity. Should extreme conditions of loading and/or speed under misalignment be anticipated, Torrington engineers should be consulted before ordering.



TSR



## THRUST SPHERICAL ROLLER BEARINGS *(continued)*

The inherent compensation for misalignment provided by the spherical roller bearing offers the designer the opportunity to use weldments for housing frames instead of complex castings, eliminating high-cost machining operations. Even when castings may be preferred, bore alignment is less critical if spherical roller bearings are specified.

## THRUST CYLINDRICAL ROLLER BEARINGS

Torrington thrust cylindrical roller bearings have been designed to operate under heavy loads at moderate speeds. Standard versions of these bearings can be operated at peripheral speeds (bearing O.D.) of up to 3000 feet per minute. Special Torrington design features are available for both the bearing and mounting which will permit even higher rotational speeds for this type of bearing. Two types of cylindrical roller thrust bearings, TP and TPS, are available from Torrington.

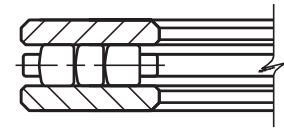
### TP

Torrington TP thrust bearings have two flat hardened and ground steel washers with a cage retainer holding one or more Controlled-Contour rollers in each pocket. If specifications call for two or more rollers per pocket, they are manufactured to different lengths. The longer rollers are placed in alternate positions in adjacent pockets. The overlapping roller paths prevent "grooving" of the washers and prolong bearing life. Because of the simplicity of their design, standard TP thrust bearings are among the most economical to buy and install. Minor radial displacement of the races does not affect the operation of the TP bearing, resulting in manufacturing economies and simplified installation.

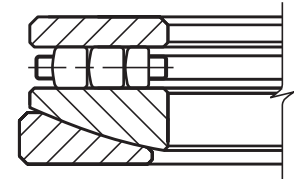
Shaft and housing seats must be square to the axis of rotation to prevent initial misalignment problems.

### TPS

The Torrington TPS bearing is similar to the TP style, except that the bottom washer assembly is comprised of two washers, with the contacting faces spherically ground. The TPS bearing is thus self-adjusting to initial misalignment. It is not, however, recommended for installations where alignment may be continuously changing (dynamic misalignment).



TP



TPS

## THRUST TAPERED ROLLER BEARINGS

Torrington true rolling thrust tapered roller bearings include rollers which have conical sections. These bearings have been engineered so that the rollers and raceways form a cone whose vertex is on the center line of the bearing. This bearing geometry assures a true rolling motion. In addition, the large end of each tapered roller is spherically ground so that its curvature matches the concave face of the washer rib. Pressure between the rib and roller, under load, guides the rollers accurately. Torrington manufactures three types of thrust tapered roller bearings: standard (TTHD), V-Flat (TTVF) and self-aligning V-Flat (TTVS).

### TTHD

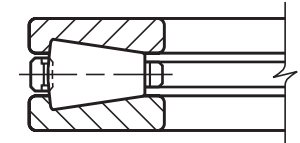
The standard TTHD bearing has an identical pair of hardened and ground steel washers, with tapered raceways. Since both washers have the same bore and O.D., housings should be designed to clear the O.D. of rotating washers and shafts stepped to clear the bore of stationary washers. The Controlled-Contour tapered rollers are equally spaced by a cage.

TTHD bearings are well suited for applications where extremely high thrust loads and heavy shock may be encountered, such as in crane hooks. For very low speed applications with unusually high loading, Torrington TTHD bearings can be supplied with a full complement of rollers. These bearings are identified in the tables by the suffix 278 following the bearing number. Applications for full-complement bearings should be reviewed with a Torrington sales engineer to assure selection of the proper bearing.

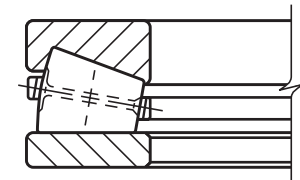
### TTVF, TTVS

V-Flat Tapered Roller bearings (TTVF and TTVS) combine the outstanding features of thrust tapered and cylindrical roller bearings to offer the highest possible capacity of any thrust bearing of its size. In the V-Flat design, one washer is flat, while the second has a tapered raceway matching the rollers. The design was originally developed for screwdown applications in metal rolling mills where thrust loads exceeding one million pounds are common.

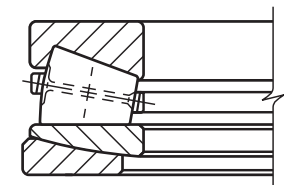
Torrington V-Flat bearings have exceptional dynamic capacity within a given envelope and provide superior static capacity. They have been highly successful in heavily loaded extruders, in cone crushers and other applications where a wide range of operating conditions are found. Most sizes of V-Flat bearings utilize cages with hardened pins through the center of the rollers. This allows closer spacing of the rollers to maximize capacity. Smaller sizes have cast bronze cages, carefully machined to permit full flow of lubricant. Self-aligning V-Flat bearings (TTVS) employs the same basic roller and raceway design, except the lower washer is in two pieces, with the contacting faces spherically ground to permit self-alignment under conditions of initial misalignment. TTVS bearings should not be used, however, if dynamic misalignment (changing under load) is expected.



TTHD



TTVF

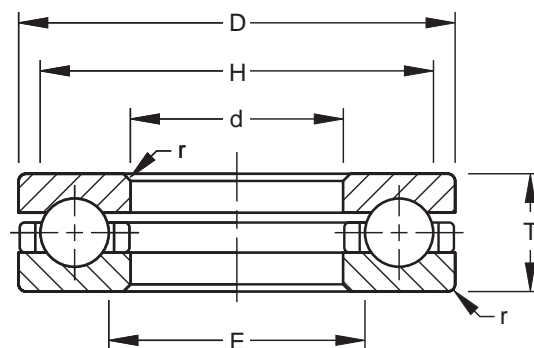


TTVS



# Thrust Ball Bearings Type TVB

Type TVB thrust ball bearings are designed for optimum performance in high speed installations. They provide axial rigidity, but are not recommended if radial loading is expected. Type TVB is exceptionally easy to mount, with the rotating washer usually shaft-mounted.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Fillet Radius <sup>(1)</sup> r (max.)	Wt.	Load Rating	
				Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs. kg	lbs. N	lbs. N
50TVB190	5.0000 127.000	7.2500 184.150	1.6250 41.275	6.72 170.7	5.53 140.5	0.09 2.4	7.2 3.4	131000 583000	38000 169000
52TVB253	5.2500 133.350	8.0000 203.200	2.0000 50.800	7.31 185.7	5.94 150.8	0.09 2.4	12.2 5.5	170000 756000	50200 223000
55TVB245	5.5000 139.700	8.2500 209.550	1.8750 47.625	7.56 192.1	6.19 157.2	0.09 2.4	11.3 5.1	173000 770000	52000 231000
57TVB248	5.7500 146.050	8.5000 215.900	1.8750 47.625	7.81 198.4	6.44 163.5	0.09 2.4	11.7 5.3	182000 810000	53800 239000
60TVB252	6.0000 152.400	8.7500 222.250	1.8750 47.625	8.06 204.8	6.69 169.9	0.09 2.4	12.4 5.6	187000 832000	53500 238000
62TVB291	6.2500 158.750	9.0000 228.600	1.8750 47.625	8.47 215.1	6.78 172.2	0.09 2.4	12.8 5.8	195000 867000	55100 245000
65TVB293	6.5000 165.100	9.5000 241.300	2.2500 57.150	8.84 224.6	7.16 181.8	0.12 3.2	17.0 7.7	238000 1060000	71300 317000
67TVB296	6.7500 171.450	9.7500 247.650	2.2500 57.150	9.03 229.4	7.47 189.7	0.12 3.2	17.5 7.9	251000 1110000	73800 328000
70TVB298	7.0000 177.800	10.0000 254.000	2.2500 57.150	9.28 235.7	7.72 196.1	0.12 3.2	18.1 8.2	263000 1170000	76300 339000
75TVB343	7.5000 190.500	10.5000 266.700	2.2500 57.150	9.84 250	8.16 207.2	0.12 3.2	20.0 9.1	255000 1140000	72300 321000
75TVB344	7.5000 190.500	10.8750 276.225	2.7500 69.850	10.19 258.8	8.19 208	0.12 3.2	27.9 12.7	313000 1390000	91400 407000
80TVB346	8.0000 203.200	11.0000 279.400	2.2500 57.150	10.34 262.7	8.66 219.9	0.12 3.2	19.3 8.8	309000 1370000	88900 395000

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.



# Thrust Ball Bearings Type TVB

## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Fillet Radius <sup>(1)</sup> r (max.)	Wt.	Load Rating	
				Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs. kg	lbs. N	lbs. N
80TVB347	8.0000 203.200	11.6250 295.275	3.0000 76.200	10.75 273.1	8.75 222.2	0.25 6.4	34.5 15.6	382000 1700000	113000 504000
85TVB391	8.5000 215.900	11.5000 292.100	2.2500 57.150	10.84 275.4	9.16 232.6	0.12 3.2	22.2 10.1	289000 1280000	78400 349000
90TVB393	9.0000 228.600	12.0000 304.800	2.2500 57.150	11.34 288.1	9.66 245.3	0.12 3.2	21.3 9.7	365000 1620000	99400 442000
95TVB431	9.5000 241.300	12.5000 317.500	2.2500 57.150	11.84 300.8	10.16 258	0.12 3.2	24.4 11.1	311000 1380000	82400 366000
100TVB433	10.0000 254.000	13.5000 342.900	2.2500 57.150	12.78 324.6	10.72 272.3	0.25 6.4	29.5 13.4	351000 1560000	96800 431000
105TVB471	10.5000 266.700	14.0000 355.600	2.2500 57.150	13.28 337.3	11.22 285	0.25 6.4	30.7 13.9	407000 1810000	107000 476000
110TVB472	11.0000 279.400	14.5000 368.300	2.2500 57.150	13.78 350	11.72 297.7	0.25 6.4	31.9 14.5	421000 1870000	109000 486000
120TVB511	12.0000 304.800	15.5000 393.700	2.2500 57.150	14.78 375.4	12.72 323.1	0.25 6.4	34.5 15.6	450000 2000000	114000 507000
130TVB551	13.0000 330.200	16.5000 419.100	2.5000 63.500	15.78 400.8	13.72 348.5	0.25 6.4	39.6 18	555000 2470000	141000 627000
140TVB581	14.0000 355.600	17.5000 444.500	2.5000 63.500	16.78 426.2	14.72 373.9	0.25 6.4	42.3 19.2	590000 2620000	146000 649000
150TVB610	15.0000 381.000	19.0000 482.600	2.5000 63.500	18.12 460.4	15.89 403.6	0.25 6.4	54.7 24.8	590000 2620000	146000 649000
160TVB640	16.0000 406.400	20.0000 508.000	2.5000 63.500	19.00 482.6	17.00 431.8	0.25 6.4	57.9 26.3	624000 2780000	152000 677000

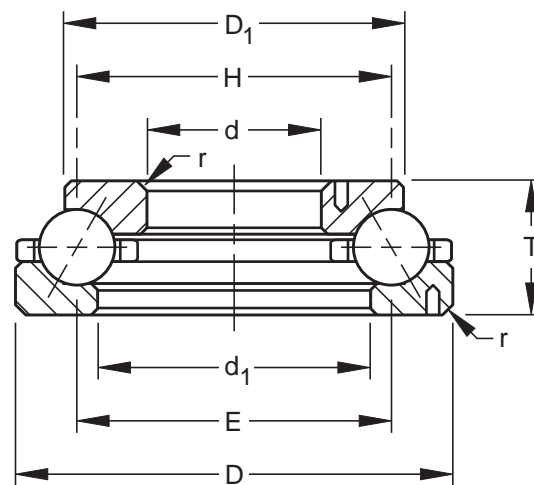
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.



# Angular Contact Thrust Ball Bearings Type TVL

Type TVL angular contact thrust ball bearings provide exceptionally low friction, cool running and quiet operation when run at high speeds.

Although designed exclusively for thrust loads, Type TVL will accommodate some radial loading.



## DIMENSIONS – LOAD RATINGS<sup>(2)</sup>

Bearing Number	Bore d	O.D. D	Height T	Washers		Shoulder Diam.		Dowel Pin (one per Washer)			Fillet <sup>(1)</sup> Radius r (max.)	Weight	Load Rating	
				Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H (min.)	Housing E (max.)	Pin Diameter	Hole Location from Centerline				Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
									Small Bore Washer	Large Bore Washer				
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
90TVL710	9.0000 228.600	11.6250 295.275	1.5000 38.100	10.938 277.81	9.688 246.06	10.31 261.9	10.31 261.9	— —	— —	— —	0.12 3.2	13.6 6.2	143000 636000	36900 164000
120TVL700	12.0000 304.800	16.0000 406.400	2.2500 57.150	14.500 368.30	13.500 342.90	14.00 355.6	14.00 355.6	0.375 9.52	6.50 165.1	7.50 190.5	0.12 3.2	40.8 18.5	359000 1600000	96400 429000
150TVL701	15.0000 381.000	20.5000 520.700	3.3120 84.125	19.000 482.60	16.500 419.10	17.75 450.8	17.75 450.8	0.500 12.70	8.12 206.4	9.62 244.5	0.19 4.8	110.7 50.2	606000 2700000	162000 721000
170TVL500	17.0000 431.800	25.0000 635.000	3.5000 88.900	22.250 565.15	19.250 488.95	21.00 533.4	21.00 533.4	0.500 12.70	9.25 235	11.75 298.4	0.31 7.9	197.5 89.6	986000 4390000	254000 1130000
180TVL605	18.0000 457.200	24.6250 625.475	3.6250 92.075	21.625 549.28	20.000 508	21.31 541.3	21.31 541.3	0.625 15.88	9.75 247.6	11.25 285.8	0.12 3.2	172.9 78.4	1076000 4790000	288000 1280000
195TVL470	19.5000 495.300	23.0000 584.200	2.2500 57.150	22.500 571.50	20.000 508	21.25 539.8	21.25 539.8	0.375 9.52	10.19 258.8	11.06 281	0.12 3.2	62.7 28.4	585000 2600000	134000 596000
200TVL850	20.0000 508.000	27.7500 704.850	4.6250 117.475	24.750 628.68	22.250 565.15	23.88 606.4	23.88 606.4	0.625 15.88	10.88 276.2	13.00 330.2	0.25 6.4	280.7 127.3	1160000 5160000	303000 1350000
201TVL615	20.1250 511.175	24.7500 628.650	2.6250 66.675	23.250 590.55	21.625 549.28	22.44 569.9	22.44 569.9	0.500 12.70	10.56 268.3	11.81 300	0.12 3.2	92.3 41.9	746000 3320000	177000 787000
202TVL620	20.5000 514.350	27.7500 704.850	4.5000 114.300	24.500 622.30	22.500 571.50	24.00 609.6	24.00 609.6	0.812 20.64	11.00 279.4	12.88 327	0.25 6.4	269.7 122.3	1330000 5910000	351000 1560000
227TVL302	22.7500 577.850	30.5000 774.700	4.6250 117.475	27.750 704.85	24.500 622.30	26.62 676.3	26.62 676.3	0.812 20.64	12.25 311.2	14.38 365.1	0.25 6.4	330.2 149.8	1490000 6620000	379000 1690000
233TVL303	23.3750 593.725	31.1250 790.575	4.6250 117.475	28.375 720.72	25.625 650.88	27.25 692.2	27.25 692.2	0.875 22.22	12.62 320.7	14.56 369.9	0.25 6.4	332.2 150.7	1540000 6850000	388000 1730000
238TVL304	23.8750 606.425	33.3750 847.725	5.2500 133.350	29.125 739.78	27.125 688.98	28.62 727.1	28.62 727.1	0.875 22.22	12.88 327	15.62 396.9	0.25 6.4	468.7 212.6	1910000 8510000	494000 2200000
245TVL716	24.5000 622.300	30.2500 768.350	3.2500 82.550	28.875 733.42	26.790 680.47	27.38 695.3	27.38 695.3	0.500 12.70	12.75 323.8	14.62 371.5	0.12 3.2	168.0 76.2	861000 3830000	194000 863000
245TVL612	24.5000 622.300	32.7500 831.850	4.6250 117.475	29.250 742.95	26.750 679.45	28.62 727.1	28.62 727.1	0.625 15.88	13.00 330.2	15.62 396.9	0.25 6.4	362.7 164.5	1590000 7070000	397000 1770000

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

<sup>(2)</sup> See Engineering section page E59 for application of Equivalent Thrust Load Factors: X = 0.76, Y = 1.00,  $\frac{T}{R}$  (min) = 1.56.  $\left[ \frac{T}{R} \text{ is Thrust Load} + \text{Radial Load} \right]$



# Angular Contact Thrust Ball Bearings Type TVL

(continued)

## DIMENSIONS – LOAD RATINGS<sup>(2)</sup>

Bearing Number	Bore d	O.D. D	Height T	Washers		Shoulder Diam.		Dowel Pin (one per Washer)			Fillet <sup>(1)</sup> Radius r	Weight	Load Rating	
				Small Diameter O.D D <sub>1</sub>	Large Bore I.D d <sub>1</sub>	Shaft H (min.)	Housing E (max.)	Pin Diameter	Hole Location from Centerline				Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
									Small Bore Washer	Large Bore Washer				
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N	
252TVL505	25.2500 641.350	31.2500 793.750	3.5000 88.900	29.375 746.12	27.875 708.02	28.25 717.6	28.25 717.6	0.500 12.70	13.50 342.9	14.81 376.2	0.25 6.4	197.0 89.3	1220000 5430000	293000 1300000
260TVL635	26.0000 660.400	35.2500 895.350	5.2500 133.350	31.125 790.58	28.625 727.08	30.62 777.9	30.62 777.9	0.812 20.64	14.00 355.6	16.62 422.3	0.25 6.4	500.4 226.9	2140000 9520000	533000 2370000
302TVL510	30.2500 768.350	36.2500 920.750	3.5000 88.900	34.375 873.12	32.875 835.02	33.25 844.6	33.25 844.6	0.500 12.70	16.06 408	17.31 439.7	0.25 6.4	231.9 105.2	1430000 6360000	325000 1450000
302TVL624	30.2500 768.350	39.6250 1006.475	5.5000 139.700	35.500 901.7	33.000 838.2	34.94 887.4	34.94 887.4	0.875 22.22	16.12 409.6	18.75 476.2	0.25 6.4	597.8 271.1	2370000 10600000	570000 2540000
303TVL706	30.3750 771.525	35.3750 898.525	2.5000 63.500	33.875 860.42	31.875 809.62	32.88 835	32.88 835	0.500 12.70	15.88 403.2	17.00 431.8	0.25 6.4	128.0 58	877000 3900000	175000 7788000
309TVL707	30.9375 785.812	37.5000 952.500	3.7500 95.250	34.750 882.65	33.750 857.25	34.25 870	34.25 870	0.625 15.88	16.38 415.9	17.88 454	0.25 6.4	260.0 117.9	952000 4230000	248000 1100000
310TVL625	31.0000 787.400	40.3750 1025.525	5.5000 139.700	36.125 917.58	35.188 893.76	35.69 906.5	35.69 906.5	0.875 22.22	16.62 422.3	19.12 485.8	0.25 6.4	581.0 263.5	2450000 10900000	582000 2590000
317TVL307	31.7500 806.450	40.3750 1025.525	5.0000 127.000	36.750 933.45	34.375 873.12	36.00 914.4	36.00 914.4	0.875 22.22	16.81 427	18.75 476.2	0.25 6.4	530.6 240.6	2450000 10900000	582000 2590000
402TVL717	40.2500 1022.350	46.5000 1181.100	3.5000 88.900	44.625 1133.48	42.125 1069.98	43.38 1101.7	43.38 1101.7	0.750 19.05	20.88 530.2	22.50 571.5	0.25 6.4	326.0 147.8	1840000 8180000	384000 1710000
410TVL718	41.0000 1041.400	49.6250 1260.475	5.0000 127.000	46.812 1189.04	43.812 1112.84	45.31 1150.9	45.31 1150.9	0.750 19.05	21.44 544.5	23.88 606.4	0.25 6.4	681.0 308.8	3140000 14000000	687000 3060000
420TVL721	42.0000 1066.800	50.6250 1285.875	5.0000 127.000	47.812 1214.44	44.812 1138.24	46.31 1176.3	46.31 1176.3	0.875 22.22	22.06 560.4	24.25 616	0.25 6.4	695.0 315.2	3140000 14000000	687000 3060000
530TVL719	53.0000 1346.200	59.7500 1517.650	4.1250 104.775	57.375 1457.32	55.375 1406.52	56.38 1431.9	56.38 1431.9	0.875 22.22	27.38 695.3	28.88 733.4	0.25 6.4	507.0 229.99	2040000 9080000	412000 1830000
540TVL720	54.0000 1371.600	63.7500 1619.250	5.5000 139.700	60.375 1533.52	57.375 1457.32	58.88 1495.4	58.88 1495.4	0.875 22.22	28.12 714.4	30.75 781	0.25 6.4	1059.0 480.3	4060000 18000000	815000 3630000

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

<sup>(2)</sup> See Engineering section page E59 for application of Equivalent Thrust Load Factors: X = 0.76, Y = 1.00,  $\frac{T}{R}$  (min) = 1.56.  $\left[ \frac{T}{R} \text{ is Thrust Load} + \text{Radial Load} \right]$



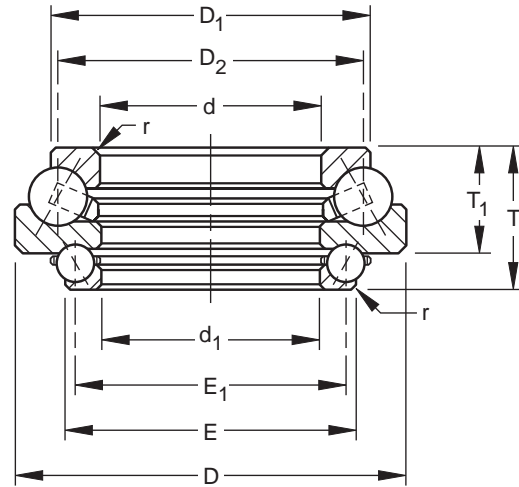


# Angular Contact Thrust Ball Bearings Type DTVL

Type DTVL angular contact thrust ball bearings are capable of carrying thrust in one direction, plus a lighter thrust in the opposite direction.

They are designed with an upper and lower complement of angular contact balls and three race elements.

Check for availability.



## DIMENSIONS – LOAD RATINGS<sup>(2)</sup>

Bearing Number	Bore		O.D. D		Upper Race		Lower Race		T <sub>1</sub>	Fillet <sup>(1)</sup> Radius r (max.)	Weight	Load Rating		
	Upper d	Lower d <sub>1</sub>			O.D. D <sub>1</sub>	Shoulder D <sub>2</sub>	O.D. E	Shoulder E <sub>1</sub>				Upper		Lower
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm				Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>	Static Load Rating C <sub>0a</sub>
200DTVL722	20.0000	20.0000	29.2500	6.7500	26.750	24.250	23.125	22.00	5.000	0.25	391.0	1200000	351000	519000
	508.000	508.000	742.95	171.45	679.45	616	587.38	558.8	127.000	6.4	177.3	5340000	1560000	2310000
202DTVL723	20.2500	20.1250	27.7500	6.2500	24.500	24.000	23.250	22.44	4.50	0.25	294.0	1220000	332000	844000
	514.350	511.175	704.85	158.75	622.30	609.60	590.55	569.9	114.3	6.4	133.3	5430000	1480000	3750000
235DTVL724	23.5000	23.2500	33.0000	7.2500	30.500	28.000	26.625	25.50	5.50	0.25	543.0	1700000	443000	822000
	596.900	590.550	838.2	184.15	774.70	711.20	676.28	647.7	139.7	6.4	246.2	7560000	1970000	3660000
245DTVL725	24.5000	24.3750	32.1250	6.2500	28.750	28.250	27.500	26.68	4.50	0.25	347.0	1440000	369000	995000
	622.300	619.125	815.975	158.75	730.25	717.60	698.50	677.9	114.3	6.4	157.4	6410000	1640000	4430000
266DTVL726	26.6250	26.5000	36.0000	7.6250	34.500	31.000	31.00	29.25	5.625	0.25	654.0	1910000	558000	1420000
	676.275	673.100	914.4	193.675	876.30	787.40	787.4	743	142.88	6.4	296.6	8510000	2480000	6320000
305DTVL727	30.5000	30.2500	38.2500	6.2500	34.875	34.380	33.38	32.56	4.50	0.25	429.0	1750000	423000	1210000
	774.700	768.350	971.55	158.75	885.82	873.10	847.72	827.1	114.3	6.4	194.6	7780000	1880000	5390000
312DTVL728	31.2500	31.0000	39.6250	7.8750	39.375	35.250	35.50	34.00	5.50	0.25	717.0	2300000	557000	1620000
	793.750	787.400	1006.475	200.025	1000.12	895.40	901.7	863.6	139.7	6.4	325.2	10200000	2480000	7200000
405DTVL729	40.5000	40.3750	48.5000	6.2500	45.000	44.500	43.50	42.69	4.50	0.25	561.0	2280000	504000	1470000
	1028.700	1025.525	1231.9	158.75	1143	1130.30	1104.9	1084.3	114.3	6.4	254.4	10200000	2240000	6540000
412DTVL730	41.2500	41.0000	49.6250	7.8750	49.375	45.250	45.50	44.00	5.50	0.25	920.0	2760000	625000	1850000
	1047.750	1041.400	1260.475	200.025	1254.12	1149.40	1155.7	1117.6	139.7	6.4	417.2	12300000	2780000	8230000
541DTVL731	54.1250	54.0000	62.8750	9.7500	60.500	58.310	58.625	57.00	6.625	0.25	1443.0	3980000	804000	2500000
	1374.775	1371.600	1597.025	247.65	1536.70	1481.10	1489.08	1447.8	168.28	6.4	654.4	17700000	3580000	11100000

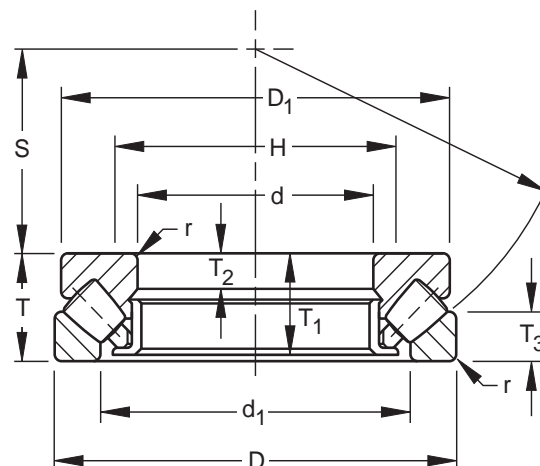
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

<sup>(2)</sup> See Engineering section page E59 for application of Equivalent Thrust Load Factors:  $X = 0.76$ ,  $Y = 1.00$ ,  $\frac{I}{R} (\min) = 1.56$ .  $\left[ \frac{I}{R} \text{ is Thrust Load} \div \text{Radial Load} \right]$



# Thrust Spherical Roller Bearings Type TSR

Type TSR thrust spherical roller bearing design achieves a high thrust capacity with low friction and continuous roller alignment. Spherically contoured rollers, arranged in steep angular position, not only accommodate high thrust loads but support moderate radial loads as well. The low friction of this bearing results from a combination of bearing geometry and manufacturing technology.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Inner Ring			Outer Ring Height T <sub>3</sub>	S	Fillet Radius r (max.)	Wt.	Load Rating		Approx. Limiting Speed (for Oil Bath Only)	k <sup>(2)</sup>
				d <sub>1</sub> Shaft (min.)	H Housing (max.)	O.D. D <sub>1</sub>	Assembly Height T <sub>1</sub>	Pilot Height T <sub>2</sub>					Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>		
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N	rpm	
29422	4.3307 110	9.0551 230	2.8740 73	6.378 162	6.496 165	8.661 220	2.717 69	1.024 26	1.378 35	2.717 69	0.10 2.5	33.4 15.2	260000 1150000	176000 800000	1500	30
29424	4.7244 120	9.8425 250	3.0709 78	6.850 174	7.087 180	9.291 236	2.913 74	1.142 29	1.476 37	2.933 74	0.12 3.0	40.7 18.5	256000 1180000	216000 965000	1350	40
29326	5.1181 130	8.8583 225	2.2835 58	6.744 171	6.963 177	8.465 215	2.165 55	0.748 19	1.130 29	2.972 75	0.08 2.0	21.6 9.8	197000 880000	132000 600000	1700	22
29426	5.1181 130	10.6299 270	3.3464 85	7.375 187	7.677 195	10.039 255	3.189 81	1.220 31	1.669 42	3.189 81	0.12 3.0	52.6 23.9	388000 1730000	253000 1120000	1250	60
29330	5.9055 150	9.8425 250	2.3622 60	7.638 194	7.677 195	9.449 240	2.244 57	0.787 20	1.142 29	3.425 87	0.08 2.0	27.5 12.5	255000 1140000	150000 670000	1550	30
29430	5.9055 150	11.8110 300	3.5433 90	8.405 213	8.661 220	11.220 285	3.386 86	1.260 32	1.732 44	3.622 92	0.12 3.0	64.5 29.3	440000 1930000	275000 1220000	1100	80
29334	6.6929 170	11.0236 280	2.6378 67	8.504 216	8.661 220	10.630 270	2.520 64	0.906 23	1.280 32	3.780 96	0.10 2.5	36.3 16.5	340000 1500000	196000 880000	1350	50
29434	6.6929 170	13.3858 340	4.0551 103	9.567 243	9.646 245	12.756 324	3.898 99	1.457 37	1.968 50	4.094 104	0.16 4.0	93.5 42.4	600000 2650000	365000 1630000	950	140
29338EJ	7.4803 190	12.5984 320	3.0709 78	9.685 246	9.843 250	12.126 308	2.913 74	1.063 27	1.496 38	4.331 110	0.12 3.0	56.5 25.6	549000 2442000	333000 1481000	1150	80
29438EJ	7.4803 190	14.9606 380	4.5276 115	10.669 271	10.827 275	14.173 360	4.370 111	1.614 41	2.185 55	4.606 117	0.16 4.0	133.0 60.3	937000 4168000	558000 2482000	850	210
29340	7.8740 200	13.3858 340	3.3465 85	10.3937 264	10.4331 265	12.7953 325	3.4252 81	1.1417 29	1.5748 40	4.4882 114	.12 3.0	63 29	485000 2157000	278000 1236000	950	100
29440	7.8740 200	15.7480 400	4.8031 122	11.254 286	11.417 290	14.961 380	4.606 117	1.693 43	2.323 59	4.803 122	0.16 4.0	154.0 69.8	815000 3625000	480000 2135000	800	260
29344	8.6614 220	14.1732 360	3.3464 85	11.024 280	11.220 285	13.583 345	3.189 81	1.142 29	1.614 41	4.921 125	0.12 3.0	74.8 33.9	550000 2500000	300000 1340000	1000	120
29444	8.6614 220	16.5354 420	4.8031 122	12.106 307	12.205 310	15.748 400	4.606 117	1.693 43	2.323 59	5.236 133	0.20 5.1	163.0 73.9	865000 3800000	500000 2200000	750	300
29348	9.4488 240	14.9606 380	3.3464 85	11.811 300	11.811 300	14.370 365	3.189 81	1.142 29	1.614 41	5.315 135	0.12 3.0	92.4 41.9	600000 2650000	315000 1400000	950	140
29448EM	9.4488 240	17.3228 440	4.8031 122	12.4016 315	12.6772 322	15.1575 385	3.4252 87	1.8110 46	2.4016 61	5.5906 142	24 6.1	171 78	1098000 4884000	615000 2736000	750	350
29352	10.2362 260	16.5354 420	3.7402 95	12.953 329	12.992 330	15.945 405	3.583 91	1.260 32	1.791 45	5.827 148	0.16 4.0	113.0 51.2	750000 3350000	400000 1800000	850	230

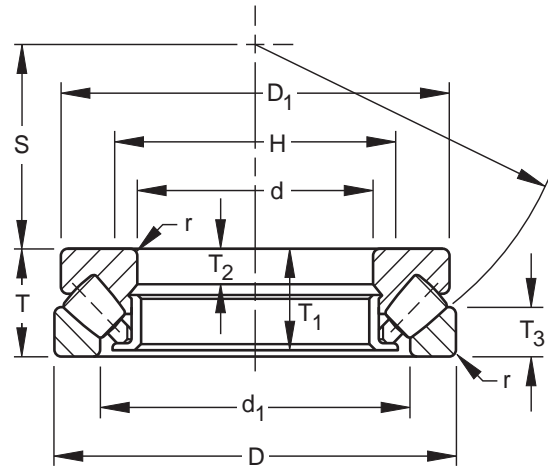
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

<sup>(2)</sup> Centrifugal force constant. See Engineering section page E59 for calculations using this factor.

*Continued on the next page.*



# Thrust Spherical Roller Bearings Type TSR (continued)



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Inner Ring			Outer Ring Height T <sub>3</sub>	S	Fillet Radius r (max.)	Wt.	Load Rating		Approx. Limiting Speed (for Oil Bath Only)	k <sup>(2)</sup>
				d <sub>1</sub> Shaft (min.)	H Housing (max.)	O.D. D <sub>1</sub>	Assembly Height T <sub>1</sub>	Pilot Height T <sub>2</sub>					Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>		
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg.	lbs N	lbs N	rpm	
29452	10.2362 260	18.8976 480	5.1968 132	14.055 357	14.173 360	18.110 460	5.000 127	1.890 48	2.520 64	6.063 154	0.20 5.1	227.0 103	1120000 4900000	620000 1800000	650	500
29360	11.8110 300	18.8976 480	4.2913 109	14.921 379	14.961 380	18.110 460	4.134 105	1.457 37	1.988 50	6.614 168	0.16 4.0	169.0 76.6	930000 4150000	490000 2160000	700	350
29460	11.8110 300	21.2598 540	5.7086 145	15.827 402	16.142 410	20.276 515	5.512 140	2.047 52	2.776 70	6.890 175	0.20 5.1	301.0 136	1430000 6400000	765000 3450000	550	780
29364	12.5984 320	19.6850 500	4.2913 109	15.709 399	15.748 400	18.976 482	4.134 105	1.457 37	2.087 53	7.087 180	0.16 4.0	176.0 79.8	980000 4300000	500000 2240000	650	380
29468	13.3858 340	24.4094 620	6.6929 170	18.189 462	18.307 465	23.228 590	6.457 164	2.402 61	3.248 82	7.913 201	0.24 6.1	486.0 220	1900000 8500000	1020000 4500000	450	1350
29372	14.1732 360	22.0472 560	4.8031 122	17.638 448	17.717 450	21.260 540	4.606 117	1.614 41	2.343 59	7.953 202	0.16 4.0	249.0 113	1250000 5600000	620000 2800000	550	640
29476	14.9606 380	26.3780 670	6.8898 175	19.842 504	20.079 510	25.197 640	6.614 168	2.480 63	3.331 85	8.740 220	0.24 6.1	575.0 261	2040000 9000000	1060000 4750000	410	1700
29576	14.9606 380	32.2835 820	10.4330 265	22.441 570	22.756 578	30.709 780	10.078 226	3.927 100	5.062 128	9.488 241	0.36 9.1	1816.0 824	3900000 17300000	2120000 9500000	280	5550
29380	15.7480 400	24.4094 620	5.1968 132	19.449 494	19.685 500	23.465 596	5.000 127	1.732 44	2.520 64	8.858 225	0.20 5.1	363.0 165	1600000 7100000	780000 3450000	500	970
29284EM	16.5354 420	22.8346 580	3.7402 95	18.8583 479	19.6850 500	21.339 542	2.7559 70	1.6142 41	1.9685 50	8.9764 228	.20 5.1	154.0 70	1198000 5329000	590000 2624000	630	300
29388	17.3228 440	26.7717 680	5.7089 145	21.5748 548	22.1654 563	25.866 657	5.5118 140	1.9291 49	2.7165 69	9.6850 246	.20 5.1	397.0 180	1706000 7588000	820000 3647000	480	1400
29488	17.3228 440	30.7087 780	8.1102 206	23.150 588	23.425 595	29.331 745	7.835 199	2.913 74	3.917 99	10.118 257	0.28 7.1	906.0 411	2900000 13200000	1500000 6700000	320	3400
29392	18.1102 460	27.9528 710	5.9055 150	22.293 566	22.638 575	26.969 685	5.669 144	2.008 51	2.857 72	10.118 257	0.20 5.1	486.0 220	2100000 9300000	1000000 4400000	400	1700
29496EM	18.8976 480	33.4646 850	8.8189 224	24.6457 626	25.9055 658	30.315 770	6.2598 159	3.6614 93	4.3307 110	10.9843 279	.38 9.7	1212.0 550	5049000 22458000	2550000 11342000	290	4700
294/500	19.6850 500	34.2520 870	8.8189 224	26.024 661	26.378 670	32.677 830	8.504 216	3.189 81	4.213 107	11.417 290	0.28 7.1	1235.0 560	3600000 16000000	1800000 8000000	270	4800
293/530	20.8661 530	31.4961 800	6.2992 160	25.512 648	25.591 650	30.394 772	6.063 154	2.126 54	2.992 76	11.614 295	0.24 6.1	634.0 288	2450000 11000000	1140000 5100000	350	2500
293/600	23.6220 600	35.4331 900	7.0866 180	28.6220 727	28.7402 730	34.173 868	6.8110 173	2.4016 61	3.4252 87	13.1102 333	.20 5.1	1400.0 635	3770000 16770000	1713000 7619000	320	4200
294/630	24.8031 630	42.9134 1090	11.0236 280	32.707 831	33.465 850	41.102 1044	10.669 271	3.976 101	5.236 133	14.393 365	0.36 9.1	2580.0 1170	5200000 23000000	2550000 11400000	250	12200

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

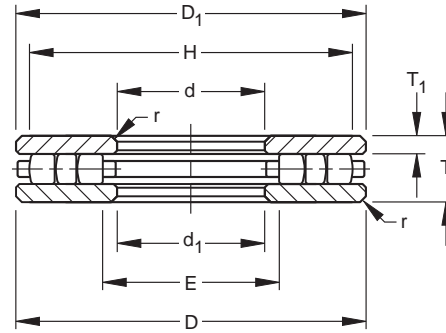
<sup>(2)</sup> Centrifugal force constant. See Engineering section page E59 for calculations using this factor.



# Thrust Cylindrical Roller Bearings Type TP

The design simplicity of the standard Type TP thrust cylindrical roller bearing makes it among the most economical to buy and install.

Minor radial displacement of the races does not affect its operation, resulting in manufacturing economies and simplified installation.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Washers			Shoulder Diameter		Fillet <sup>(1)</sup> Radius r (max.)	Wt.	Load Rating	
				Thickness T <sub>1</sub>	Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
20TP103	2.0000 50.800	6.0000 152.400	1.3750 34.925	0.375 9.52	5.938 150.81	2.062 52.39	5.56 141.3	2.44 61.9	0.06 1.6	8.1 3.7	183000 814000	74500 331000
20TP104	2.0000 50.800	7.0000 177.800	1.3750 34.925	0.375 9.52	6.938 176.21	2.062 52.39	6.44 163.5	2.56 65.1	0.06 1.6	11.3 5.1	227000 1010000	89500 398000
30TP106	3.0000 76.200	6.0000 152.400	1.3750 34.925	0.375 9.52	5.938 150.81	3.062 77.79	5.62 142.9	3.38 85.7	0.06 1.6	7.0 3.2	168000 747000	76500 340000
30TP107	3.0000 76.200	7.0000 177.800	1.3750 34.925	0.375 9.52	6.938 176.21	3.062 77.79	6.56 166.7	3.44 87.3	0.06 1.6	10.2 4.6	234000 1040000	93200 414000
30TP108	3.0000 76.200	8.0000 203.200	1.3750 34.925	0.375 9.52	7.938 201.61	3.062 77.79	7.44 188.9	3.56 90.5	0.06 1.6	13.9 6.3	311000 1380000	117000 520000
30TP109	3.0000 76.200	9.0000 228.600	1.3750 34.925	0.375 9.52	8.938 227.01	3.062 77.79	8.38 212.7	3.62 92.1	0.06 1.6	18.1 8.2	405000 1800000	143000 636000
35TP113	3.5000 88.900	5.2188 132.558	1.0000 25.400	0.281 7.14	5.156 130.97	3.562 90.49	4.88 123.8	3.84 97.6	0.06 1.6	3.0 1.4	85600 381000	40400 180000
40TP114	4.0000 101.600	7.0000 177.800	1.7500 44.450	0.500 12.7	6.938 176.21	4.062 103.19	6.62 168.3	4.38 111.1	0.06 1.6	11.0 5	231000 1030000	113000 503000
40TP115	4.0000 101.600	8.0000 203.200	1.7500 44.450	0.500 12.7	7.938 201.61	4.062 103.19	7.50 190.5	4.50 114.3	0.06 1.6	15.6 7.1	308000 1370000	132000 589000
40TP116	4.0000 101.600	9.0000 228.600	1.7500 44.450	0.500 12.7	8.938 227.01	4.062 103.19	8.44 214.3	4.56 115.9	0.06 1.6	21.0 9.5	397000 1770000	152000 676000
40TP117	4.0000 101.600	10.0000 254	1.7500 44.450	0.500 12.7	9.938 252.41	4.062 103.19	9.38 238.1	4.62 117.5	0.06 1.6	25.6 11.6	498000 2220000	202000 896000
50TP119	5.0000 127	8.0000 203.200	1.7500 44.450	0.500 12.7	7.938 201.61	5.062 128.59	7.50 190.5	5.50 139.7	0.06 1.6	13.1 5.9	288000 1280000	133000 593000
50TP120	5.0000 127	9.0000 228.600	1.7500 44.450	0.500 12.7	8.938 227.01	5.062 128.59	8.50 215.9	5.50 139.7	0.06 1.6	18.4 8.3	385000 1710000	161000 716000
50TP121	5.0000 127	10.0000 254	2.0000 50.800	0.562 14.29	9.938 252.41	5.062 128.59	9.44 239.7	5.56 141.3	0.12 3.2	27.4 12.4	491000 2180000	189000 841000
50TP122	5.0000 127	11.0000 279.400	2.0000 50.800	0.562 14.29	10.938 277.81	5.062 128.59	10.31 261.9	5.69 144.5	0.12 3.2	34.8 15.8	620000 2760000	224000 996000
50TP123	5.0000 127	12.0000 304.800	2.0000 50.800	0.562 14.29	11.938 303.21	5.062 128.59	11.38 288.9	5.75 146	0.12 3.2	42.8 19.4	789000 3290000	262000 1170000
60TP124	6.0000 152.400	9.0000 228.600	2.0000 50.800	0.562 14.29	8.938 227.01	6.062 153.99	8.56 217.5	6.44 163.5	0.12 3.2	16.8 7.6	317000 1410000	135000 600000
60TP125	6.0000 152.400	10.0000 254	2.0000 50.800	0.562 14.29	9.938 252.41	6.062 153.99	9.50 241.3	6.50 165.1	0.12 3.2	23.7 10.7	449000 2000000	190000 845000
60TP126	6.0000 152.400	11.0000 279.400	2.0000 50.800	0.562 14.29	10.938 277.81	6.062 153.99	10.44 265.1	6.56 166.7	0.12 3.2	31.4 14.2	608000 2700000	226000 1000000
60TP127	6.0000 152.400	12.0000 304.800	2.0000 50.800	0.562 14.29	11.938 303.31	6.062 153.99	11.31 287.3	6.69 169.9	0.12 3.2	39.4 17.7	725000 3220000	250000 1110000
70TP129	7.0000 177.800	10.0000 254	2.0000 50.800	0.562 14.29	9.906 251.62	7.094 180.18	9.56 242.9	7.44 188.9	0.12 3.2	20.2 9.2	365000 1620000	149000 663000
70TP130	7.0000 177.800	11.0000 279.400	2.0000 50.800	0.562 14.29	10.906 277.02	7.094 180.18	10.50 266.7	7.50 190.5	0.12 3.2	28.3 12.8	540000 2400000	209000 930000
70TP131	7.0000 177.800	12.0000 304.800	2.0000 50.800	0.562 14.29	11.906 302.42	7.094 180.18	11.38 288.9	7.62 193.7	0.12 3.2	37.0 16.8	695000 3090000	242000 1080000
70TP132	7.0000 177.800	14.0000 355.600	3.0000 76.200	0.812 20.64	13.906 353.22	7.094 180.18	13.19 335	7.81 198.4	0.25 6.4	80.1 36.3	1010000 4490000	394000 1750000

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

Continued on the next page.



# Type TP Bearings (continued)

## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Washers			Shoulder Diameter		Fillet <sup>(1)</sup> Radius r (max.)	Wt.	Load Rating	
				Thickness T <sub>1</sub>	Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
80TP134	8.0000 203.2	12.0000 304.8	3.0000 76.2	0.812 20.64	11.906 302.42	8.094 205.58	11.50 292.1	8.50 215.9	0.25 6.4	45.1 20.5	599000 2660000	258000 1150000
80TP135	8.0000 203.2	14.0000 355.6	3.0000 76.2	0.812 20.64	13.906 353.22	8.094 205.58	13.25 336.6	8.75 222.2	0.25 6.4	72.8 33	950000 4230000	389000 1730000
80TP136	8.0000 203.2	16.0000 406.4	3.0000 76.2	0.812 20.64	15.906 404.02	8.094 205.58	15.06 382.6	8.94 227.0	0.25 6.4	98.1 44.5	1290000 5740000	520000 2310000
90TP139	9.0000 228.6	14.0000 355.6	3.0000 76.2	0.812 20.64	13.906 353.22	9.094 230.98	13.38 339.7	9.62 244.5	0.25 6.4	64.5 29.3	879000 3910000	328000 1460000
90TP140	9.0000 228.6	16.0000 406.4	3.0000 76.2	0.812 20.64	15.906 404.02	9.094 230.98	15.19 385.8	9.81 249.2	0.25 6.4	96.2 43.6	1250000 5560000	482000 2140000
100TP143	10.0000 254	16.0000 406.4	3.0000 76.2	0.812 20.64	15.906 404.02	10.094 256.38	15.25 387.4	10.75 273.0	0.25 6.4	86.6 39.5	1160000 5160000	394000 1750000
100TP144	10.0000 254	18.0000 457.2	3.7500 95.25	1.031 26.19	17.906 454.82	10.094 256.38	17.12 435.0	10.88 276.2	0.25 6.4	151.8 68.8	1620000 7210000	604000 2690000
100TP145	10.0000 254	20.0000 508	3.7500 95.25	1.031 26.19	19.906 505.62	10.094 256.38	18.94 481.0	11.06 281.0	0.25 6.4	202.2 91.7	2150000 9560000	825000 3670000
120TP151	12.0000 304.8	18.0000 457.2	3.7500 95.25	1.031 26.19	17.906 454.82	12.094 307.18	17.25 438.2	12.75 323.8	0.25 6.4	125.1 56.7	1420000 6340000	518000 2300000
120TP152	12.0000 304.8	20.0000 508	4.5000 114.3	1.250 31.75	19.906 505.62	12.094 307.18	19.06 484.2	12.94 328.6	0.25 6.4	230.5 104.5	1780000 7900000	743000 3300000
120TP153	12.0000 304.8	24.0000 609.6	4.5000 114.3	1.250 31.75	23.906 607.22	12.094 307.18	23.00 584.2	13.00 330.2	0.25 6.4	371.5 168.5	2900000 12900000	1050000 4680000
140TP158	14.0000 355.6	20.0000 508	3.7500 95.25	1.031 26.19	19.875 504.82	14.125 358.78	19.25 489.0	14.75 374.6	0.25 6.4	138.1 62.6	1620000 7200000	588000 2610000
140TP159	14.0000 355.6	22.0000 558.8	3.7500 95.25	1.031 26.19	21.875 555.62	14.125 358.78	21.06 535.0	14.94 379.4	0.25 6.4	197.5 89.6	2250000 10000000	802000 3750000
140TP160	14.0000 355.6	24.0000 609.6	3.7500 95.25	1.031 26.19	23.875 606.4	14.125 358.78	22.88 581.0	15.12 384.2	0.25 6.4	276.2 125.3	2840000 12600000	908000 4040000
160TP164	16.0000 406.4	22.0000 558.8	4.5000 114.3	1.250 31.75	21.875 555.6	16.125 409.6	21.25 539.8	16.75 425.4	0.25 6.4	189.4 85.9	1770000 7860000	695000 3090000
160TP165	16.0000 406.4	24.0000 609.6	4.5000 114.3	1.250 31.75	23.875 606.4	16.125 409.6	23.06 585.8	16.94 430.2	0.25 6.4	267.7 121.4	2510000 11200000	937000 4170000
160TP166	16.0000 406.4	26.0000 660.4	4.5000 114.3	1.250 31.75	25.875 657.2	16.125 409.6	24.94 633.4	17.06 433.4	0.25 6.4	372.1 168.8	3090000 13800000	1060000 4710000
180TP168	18.0000 457.2	26.0000 660.4	5.0000 127	1.375 34.92	25.875 657.2	18.125 460.4	25.00 635	19.00 482.6	0.25 6.4	328.1 148.8	2650000 11800000	919000 4090000
180TP169	18.0000 457.2	28.0000 711.2	5.0000 127	1.375 34.92	27.875 708.0	18.125 460.4	26.94 684.2	19.06 484.2	0.25 6.4	430.7 195.3	3480000 15500000	1230000 5480000
180TP170	18.0000 457.2	30.0000 762	5.5000 139.7	1.500 38.10	29.875 758.8	18.125 460.4	28.94 735.0	19.06 484.2	0.25 6.4	618.9 280.7	4430000 19700000	1540000 6840000
200TP171	20.0000 508	28.0000 711.2	5.5000 139.7	1.500 38.10	27.875 708.0	20.125 511.2	27.00 685.8	21.00 533.4	0.25 6.4	392.5 178	2940000 13100000	1060000 4710000
200TP172	20.0000 508	30.0000 762	5.5000 139.7	1.500 38.10	29.875 758.8	20.125 511.2	29.00 736.6	21.00 533.4	0.25 6.4	512.0 232.2	3930000 17500000	1430000 6370000
200TP173	20.0000 508	32.0000 812.8	6.0000 152.4	1.656 42.07	31.875 809.6	20.125 511.2	31.00 787.4	21.00 533.4	0.25 6.4	698.9 317	5050000 22400000	1700000 7610000
220TP174	22.0000 558.8	30.0000 762	5.5000 139.7	1.500 38.10	29.875 758.8	22.125 562	29.00 736.6	23.00 584.2	0.25 6.4	425.0 192.7	3200000 14200000	1140000 5070000
220TP175	22.0000 558.8	32.0000 812.8	5.5000 139.7	1.500 38.10	31.875 809.6	22.125 562.0	30.81 782.6	23.19 589.0	0.25 6.4	552.6 250.6	4270000 19000000	1480000 6570000
220TP176	22.0000 558.8	34.0000 863.6	6.0000 152.4	1.656 42.07	33.875 860.4	22.125 562.0	33.00 838.2	23.00 584.2	0.25 6.4	751.6 340.9	5500000 24500000	1840000 8200000
240TP177	24.0000 609.6	32.0000 812.8	5.5000 139.7	1.500 38.10	31.875 809.6	24.125 612.8	31.12 790.6	24.88 631.8	0.38 9.5	455.4 206.5	3600000 16000000	1270000 5650000
240TP178	24.0000 609.6	34.0000 863.6	5.5000 139.7	1.500 38.10	33.875 860.4	24.125 612.8	33.00 838.2	25.00 635.0	0.38 9.5	593.2 269	4610000 20500000	1550000 6880000
240TP179	24.0000 609.6	36.0000 914.4	6.0000 152.4	1.656 42.07	35.875 911.2	24.125 612.8	35.00 889.0	25.00 635.0	0.38 9.5	804.2 364.7	5670000 25200000	1900000 8450000

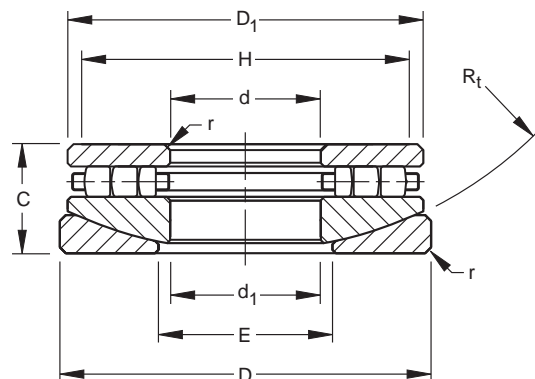
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.



# Thrust Cylindrical Roller Bearings Type TPS

The Type TPS thrust cylindrical roller bearing is similar to the type TP except one washer is spherically ground to seat against an aligning washer, thus making it adaptable to initial misalignment.

It is not recommended for operating conditions where alignment is constantly changing.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height C	Aligning Washer radius R <sub>t</sub>	Washers		Shoulder Diameter		Fillet <sup>(1)</sup> Radius r (max.)	Wt.	Load Rating	
					Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
20TPS103	2.0000 50.800	6.3120 160.325	1.8125 46.038	7.500 190.50	5.938 150.81	2.062 52.39	5.56 141.3	3.38 85.7	0.06 1.6	11.4 5.2	183000 814000	74500 331000
20TPS104	2.0000 50.800	7.3120 185.725	1.8125 46.038	9.500 241.30	6.938 176.21	2.062 52.39	6.44 163.5	4.25 108.0	0.06 1.6	15.7 7.12	227000 1010000	89500 398000
30TPS106	3.0000 76.200	6.3120 160.325	1.8125 46.038	6.000 152.40	5.938 150.81	3.062 77.79	5.62 142.9	4.00 101.6	0.06 1.6	9.9 4.5	168000 747000	76500 340000
30TPS107	3.0000 76.200	7.3120 185.725	1.8125 46.038	9.500 241.30	6.938 176.21	3.062 77.79	6.56 166.7	4.38 111.1	0.06 1.6	14.2 6.4	234000 1040000	93200 414000
30TPS108	3.0000 76.200	8.3120 211.125	1.8125 46.038	12.000 304.80	7.938 201.61	3.062 77.79	7.44 188.9	5.25 133.4	0.06 1.6	19.2 8.7	311000 1380000	117000 520000
35TPS113	3.5000 88.900	5.4688 138.908	1.3125 33.338	5.000 127.00	5.156 130.97	3.594 91.28	4.88 123.8	4.06 103.2	0.06 1.6	4.1 1.9	85600 381000	40400 180000
40TPS114	4.0000 101.600	7.3750 187.327	2.3125 58.738	6.375 161.93	6.938 176.21	4.094 103.98	6.62 168.3	5.00 127	0.06 1.6	15.4 7.0	231000 1030000	113000 503000
40TPS115	4.0000 101.600	8.3750 212.725	2.3125 58.738	8.500 215.90	7.938 201.61	4.094 103.98	7.50 190.5	5.25 133.4	0.06 1.6	22.1 10.0	308000 1370000	132000 589000
40TPS116	4.0000 101.600	9.3750 238.125	2.3125 58.738	10.000 254.00	8.938 227.01	4.094 103.98	8.44 214.3	5.88 149.2	0.06 1.6	29.5 13.4	397000 1770000	152000 676000
40TPS117	4.0000 101.600	10.5000 266.7	2.3125 58.738	14.000 355.60	9.938 252.41	4.094 103.98	9.38 238.1	6.50 165.1	0.06 1.6	37.7 17.1	498000 2220000	202000 896000
50TPS119	5.0000 127	8.5000 215.9	2.3125 58.738	7.375 187.33	7.938 201.61	5.125 130.18	7.50 190.5	6.00 152.4	0.06 1.6	18.5 8.4	288000 1280000	133000 592000
50TPS120	5.0000 127	9.5000 241.3	2.3125 58.738	10.500 266.70	8.938 227.01	5.125 130.18	8.50 215.9	6.12 155.6	0.06 1.6	26.1 11.8	385000 1710000	161000 716000
50TPS121	5.0000 127	10.5000 266.7	2.6250 66.675	12.750 323.85	9.938 252.41	5.125 130.18	9.44 239.7	6.25 158.8	0.12 3.2	38.7 17.6	491000 2180000	189000 841000
50TPS122	5.0000 127	11.5000 292.1	2.6250 66.675	16.000 406.40	10.938 277.81	5.125 130.18	10.31 261.9	7.00 177.8	0.12 3.2	48.8 22.1	620000 2760000	224000 996000
50TPS123	5.0000 127.000	12.5000 317.5	2.6250 66.675	19.750 501.65	11.938 303.21	5.125 130.18	11.38 288.9	7.25 184.1	0.12 3.2	60.0 27.2	739000 3290000	262000 1170000
60TPS124	6.0000 152.400	9.5000 241.3	2.6250 66.675	6.750 171.45	8.938 227.01	6.125 155.58	8.56 217.5	7.25 184.1	0.12 3.2	23.8 10.8	317000 1410000	135000 600000
60TPS125	6.0000 152.400	10.5000 266.7	2.6250 66.675	9.500 241.30	9.938 252.46	6.125 155.58	9.50 241.3	7.38 187.3	0.12 3.2	33.5 15.2	449000 2000000	190000 845000
60TPS126	6.0000 152.400	11.5000 292.1	2.6250 66.675	13.500 342.90	10.938 277.81	6.125 155.58	10.44 265.1	7.38 187.3	0.12 3.2	44.3 20.1	607000 2700000	225000 1000000
60TPS127	6.0000 152.400	12.5000 317.5	2.6250 66.675	17.000 431.80	11.938 303.21	6.125 155.58	11.31 287.3	7.50 190.5	0.12 3.2	55.6 25.2	725000 3220000	250000 1110000
70TPS129	7.0000 177.800	10.5000 266.7	2.6250 66.675	8.125 206.38	9.906 251.62	7.125 180.8	9.56 242.9	8.12 206.4	0.12 3.2	27.9 12.7	365000 1620000	149000 663000

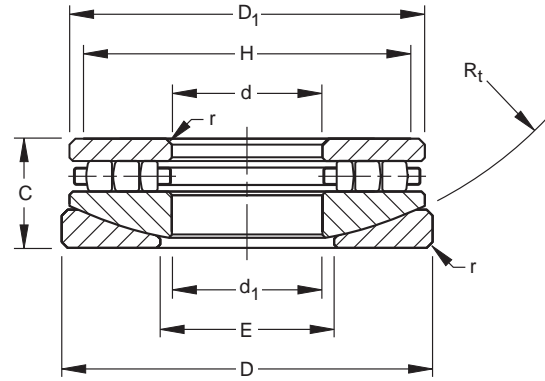
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

Continued on the next page.



# Thrust Cylindrical Roller Bearings Type TPS

(continued)



**DIMENSIONS – LOAD RATINGS**

Bearing Number	Bore d	O.D. D	Height C	Aligning Washer radius Rt	Washers		Shoulder Diameter		Fillet Radius r (max.)	Wt.	Load Rating	
					Small Diameter O.D. D1	Large Bore I.D. d1	Shaft H (min.)	Housing E (max.)			Static Load Rating Coa	Dynamic Load Rating Ct
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
70TPS130	7.0000 177.800	11.5000 292.100	2.6250 66.675	11.500 292.10	10.906 277.02	7.125 180.98	10.50 266.7	8.25 209.6	0.12 3.2	39.1 17.7	540000 2400000	209000 930000
70TPS131	7.0000 177.800	12.5000 317.500	2.6250 66.675	15.375 390.53	11.906 302.42	7.125 180.98	11.38 288.9	8.25 209.6	0.12 3.2	51.3 23.3	695000 3090000	242000 1080000
70TPS132	7.0000 177.800	14.7500 374.650	4.0000 101.600	15.375 390.53	13.906 353.22	7.125 180.98	13.19 335.0	9.00 228.6	0.25 6.4	115.9 52.6	1010000 4490000	394000 1750000
80TPS134	8.0000 203.200	12.7500 323.850	4.0000 101.600	8.500 215.90	11.906 302.42	8.188 207.96	11.50 292.1	9.38 238.1	0.25 6.4	65.8 29.8	599000 2660000	258000 1150000
80TPS135	8.0000 203.200	14.7500 374.650	4.0000 101.600	12.000 304.80	13.906 353.22	8.188 207.96	13.25 336.6	10.38 263.5	0.25 6.4	105.2 47.7	950000 4230000	389000 1730000
80TPS136	8.0000 203.200	16.8750 428.625	4.0000 101.600	19.500 495.30	15.906 404.02	8.250 209.55	15.06 382.6	10.50 266.7	0.25 6.4	150.4 68.2	1290000 5740000	520000 2310000
90TPS139	9.0000 228.600	14.7500 374.650	4.0000 101.600	12.000 304.80	13.906 353.22	9.250 234.95	13.38 339.7	10.38 263.5	0.25 6.4	93.1 42.2	879000 3910000	328000 1460000
90TPS140	9.0000 228.600	16.8750 428.625	4.0000 101.600	19.500 495.30	15.906 404.02	9.250 234.95	15.19 385.8	10.50 266.7	0.25 6.4	139.5 63.3	1250000 5560000	482000 2140000
100TPS143	10.0000 254.000	16.8750 428.625	4.0000 101.600	16.750 425.45	15.906 404.02	10.250 260.36	15.25 387.4	11.50 292.1	0.25 6.4	124.0 56.2	1160000 5160000	394000 1750000
100TPS144	10.0000 254.000	18.8750 479.425	5.0000 127.000	20.000 508.00	17.906 454.82	10.250 260.36	17.12 435.0	12.00 304.8	0.25 6.4	219.5 99.5	1620000 7210000	604000 2690000
100TPS145	10.0000 254.000	20.8750 530.225	5.0000 127.000	24.000 609.60	19.906 505.62	10.250 260.36	18.94 481.0	13.25 336.6	0.25 6.4	290.6 131.8	2150000 9560000	825000 3670000
120TPS151	12.0000 304.800	18.8750 479.425	5.0000 127.000	15.375 390.53	17.906 454.82	12.250 311.15	17.25 438.2	13.62 346.1	0.25 6.4	181.0 82.1	1420000 6340000	518000 2300000
120TPS152	12.0000 304.800	20.8750 530.225	6.0000 152.400	24.375 619.13	19.906 505.62	12.250 311.15	19.06 484.2	13.88 352.4	0.25 6.4	307.4 139.4	1780000 7900000	743000 3300000
120TPS153	12.0000 304.800	24.8750 631.825	6.0000 152.400	28.500 723.90	23.906 607.22	12.250 311.15	23.00 584.2	16.00 406.4	0.25 6.4	522.4 236.9	2900000 12900000	1050000 4680000
140TPS158	14.0000 355.600	20.8750 530.225	4.8750 123.825	19.500 495.30	19.875 504.82	14.250 361.95	19.25 489.0	15.50 393.7	0.25 6.4	196.6 89.2	1620000 7200000	588000 2610000
140TPS159	14.0000 355.600	22.8750 581.025	4.8750 123.825	28.500 723.90	21.875 555.62	14.250 361.95	21.06 535.0	15.50 393.7	0.25 6.4	275.6 125.0	2250000 10000000	802000 3570000
140TPS160	14.0000 355.600	24.8750 631.825	4.8750 123.825	36.125 917.58	23.875 606.62	14.250 361.95	22.88 581.0	16.38 415.9	0.25 6.4	376.9 170.9	2840000 12600000	908000 4040000
160TPS164	16.0000 406.400	22.8750 581.025	6.0000 152.400	17.500 444.50	21.875 555.62	16.250 412.75	21.25 539.8	17.50 444.5	0.25 6.4	273.2 123.9	1770000 7860000	695000 3090000
160TPS165	16.0000 406.400	25.0000 635.000	6.0000 152.400	23.500 596.90	23.875 606.62	16.250 412.75	23.06 585.8	18.00 457.2	0.25 6.4	384.6 174.4	2510000 11200000	937000 4170000
160TPS166	16.0000 406.400	27.0000 685.800	6.0000 152.400	29.625 752.48	25.875 657.22	16.250 412.75	24.94 633.4	18.50 469.9	0.25 6.4	506.7 229.8	3090000 13800000	1060000 4710000

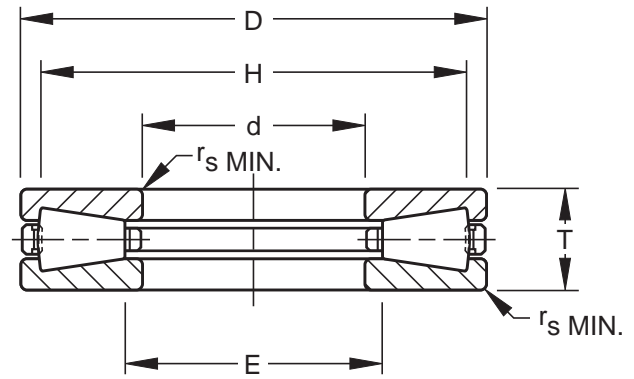
<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.



# Thrust Tapered Roller Bearings Type TTHD

Type TTHD thrust tapered roller bearings are well suited for applications, such as in crane hooks, where high thrust loads and heavy shock may be encountered.

Suffix 278 in the bearing number indicates a full complement of rollers without cage. These full complement bearings are used only in slow speed applications.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Fillet <sup>(1)</sup> Radius r <sub>s</sub> (min.)	Wt.	Load Rating	
				Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
30TTHD013	3.0000 76.2	6.3750 161.925	1.3125 33.338	5.88 149.2	3.44 87.3	0.12 3.2	7.9 3.6	179000 796000	106000 471000
30TTHD01300278	3.0000 76.2	6.3750 161.925	1.3125 33.338	5.88 149.2	3.44 87.3	0.12 3.2	7.7 3.5	281000 1250000	139000 618000
40TTHD015AA967	4.0000 101.6	8.5000 215.9	1.8125 46.038	7.78 197.6	4.50 114.3	0.12 3.2	19.8 9	398000 1770000	219000 974000
40TTHD015AA968	4.0000 101.6	8.5000 215.9	1.8125 46.038	7.78 197.6	4.50 114.3	0.12 3.2	19.0 8.6	515000 2290000	250000 1110000
45TTHD020	4.5000 114.3	9.8750 250.825	2.1250 53.975	9.16 232.6	5.12 130.2	0.16 4	31.9 14.5	516000 2300000	281000 1250000
50TTHD024	5.0000 127	9.8750 250.825	2.1875 55.562	9.06 230.2	5.75 146	0.19 4.8	31.0 14.1	447000 1990000	249000 1110000
50TTHD02400278	5.0000 127	9.8750 250.825	2.1875 55.562	9.06 230.2	5.75 146	0.19 4.8	29.2 13.2	614000 2730000	297000 1320000
50TTHD025	5.0000 127	10.5000 266.7	2.3125 58.738	9.75 247.6	5.62 142.9	0.19 4.8	38.5 17.5	588000 2620000	315000 1400000
50TTHD02500278	5.0000 127	10.5000 266.7	2.3125 58.738	9.75 247.6	5.62 142.9	0.19 4.8	36.5 16.6	770000 3420000	363000 1610000
60TTHD026	6.0000 152.4	12.5000 317.5	2.7500 69.85	11.56 293.7	6.69 169.9	0.25 6.4	65.2 29.6	821000 3650000	426000 1890000
60TTHD02600278	6.0000 152.4	12.5000 317.5	2.7500 69.85	11.56 293.7	6.69 169.9	0.25 6.4	61.3 27.8	1080000 4800000	491000 2180000
65TTHD029	6.5000 165.1	12.2500 311.15	3.5000 88.9	11.06 281	7.62 193.7	0.25 6.4	75.5 34.2	611000 2720000	370000 1650000
65TTHD02900278	6.5000 165.1	12.2500 311.15	3.5000 88.9	11.06 281	7.62 193.7	0.25 6.4	67.6 30.7	742000 3300000	403000 1790000
66TTHD030	6.6250 168.275	12.0000 304.8	2.7500 69.85	11.06 281	7.44 188.9	0.25 6.4	54.1 24.5	599000 2660000	335000 1490000
66TTHD03000278	6.6250 168.275	12.0000 304.8	2.7500 69.85	11.06 281	7.44 188.9	0.25 6.4	50.2 22.8	786000 3500000	386000 1720000
68TTHD031	6.8750 174.625	14.1250 358.775	3.2500 82.55	13.00 330.2	7.88 200	0.25 6.4	100.6 45.6	973000 4330000	517000 2300000

<sup>(1)</sup> The fillet radius for shaft or housing should be min 1/4" less than r.

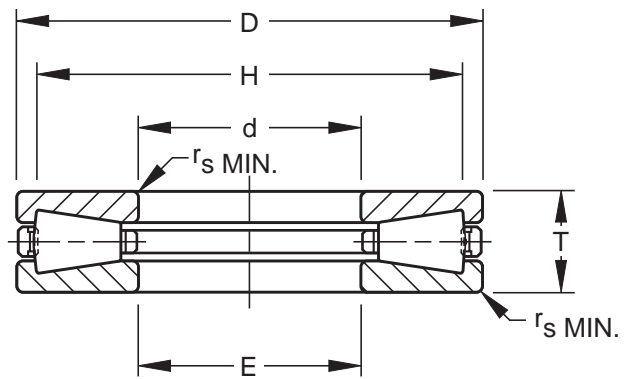
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# Thrust Tapered Roller Bearings Type TTHD

(continued)



## DIMENSIONS – LOAD RATINGS

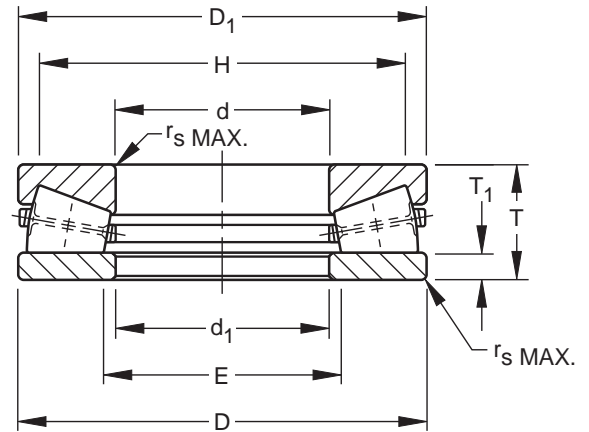
Bearing Number	Bore d	O.D. D	Height T	Shoulder Diameter		Fillet <sup>(1)</sup> Radius r <sub>s</sub> (min.)	Wt.	Load Rating	
				Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N
70TTHD032	7.0000 177.8	14.5000 368.3	3.2500 82.55	13.25 336.6	8.00 203.2	0.31 7.9	104.2 47.3	1040000 4640000	538000 2390000
70TTHD03200278	7.0000 177.8	14.5000 368.3	3.2500 82.55	13.25 336.6	8.00 203.2	0.31 7.9	96.4 43.7	1370000 6100000	620000 2760000
70TTHD033	7.0000 177.8	17.0000 431.8	4.0000 101.6	15.69 398.4	8.06 204.8	0.31 7.9	191.0 86.6	1800000 7980000	882000 3920000
80TTHD034	8.0000 203.2	16.5000 419.1	3.6250 92.075	15.12 384.2	8.88 225.4	0.38 9.5	150.4 68.2	1400000 6210000	705000 3140000
80TTHD03400278	8.0000 203.2	16.5000 419.1	3.6250 92.075	15.12 384.2	8.88 225.4	0.38 9.5	139.5 63.3	1830000 8150000	813000 3620000
81TTHD035	8.1250 206.375	16.5000 419.1	4.7500 120.65	14.81 376.2	9.19 233.4	0.38 9.5	198.0 89.8	1380000 6150000	770000 3420000
90TTHD039	9.0000 228.6	19.0000 482.6	4.1250 104.775	17.56 446.1	10.19 258.8	0.44 11.1	230.1 104.4	2060000 9160000	1010000 4510000
90TTHD03900278	9.0000 228.6	19.0000 482.6	4.1250 104.775	17.56 446.1	10.19 258.8	0.44 11.1	213.3 96.7	2540000 11300000	1120000 4960000
92TTHD039	9.2500 234.95	19.0000 482.6	4.1250 104.775	17.56 446.1	10.19 258.8	0.44 11.1	223.1 101.2	2060000 9160000	1010000 4510000
92TTHD043	9.2500 234.95	21.5000 546.1	5.0000 127	19.75 501.6	10.62 269.9	0.62 15.9	377.4 171.2	2740000 12200000	1370000 6100000
100TTHD045	10.0000 254	21.2500 539.75	4.6250 117.475	19.62 498.5	11.25 285.8	0.44 11.1	326.0 147.8	2700000 12000000	1280000 5680000
110TTHD047	11.0000 279.4	23.7500 603.25	5.3750 136.525	21.75 552.4	12.50 317.5	0.44 11.1	478.7 217.1	3190000 14200000	1600000 7120000
110TTHD04700278	11.0000 279.4	23.7500 603.25	5.3750 136.525	21.75 552.4	12.50 317.5	0.44 11.1	438.6 198.9	3990000 17700000	1770000 7860000
160TTHD064*	16.0000 406.4	28.0000 711.2	5.7500 146.05	26.00 660.4	17.69 449.3	0.38 9.5	608.8 276.1	3770000 16800000	1880000 8370000
160TTHD065*	16.0000 406.4	33.0000 838.2	7.0000 177.8	30.56 776.3	18.06 458.8	0.50 12.7	1168.8 530.1	6240000 27800000	3100000 13800000
160TTHD06500278*	16.0000 406.4	33.0000 838.2	7.0000 177.8	30.56 776.3	18.06 458.8	0.50 12.7	1068.7 484.7	7710000 34300000	3410000 15200000

<sup>(1)</sup> The fillet radius for shaft or housing should be a minimum of 1/64" less than r.



# Thrust Tapered Roller Bearings Type TTVF

Thrust V-Flat Tapered Roller bearings Type TTVF combine the outstanding features of thrust tapered and cylindrical roller bearings to offer the highest possible capacity of any thrust bearing of its size. In the V-Flat design, one washer is perfectly flat, while the second includes a tapered raceway matching the rollers. The design was originally developed for screwdown applications in metal rolling mills where thrust loads exceeding one million pounds are common.



## DIMENSIONS – LOAD RATINGS

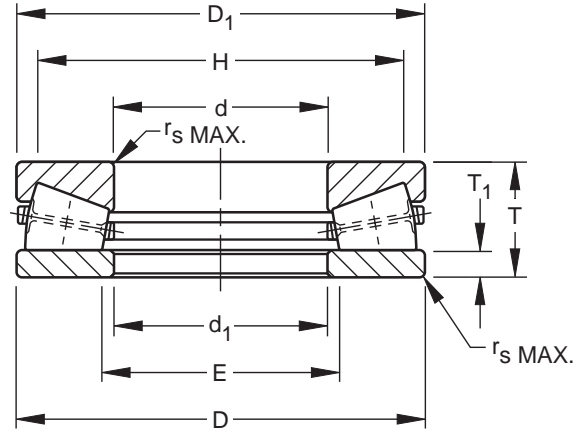
Bearing Number	Bore d	O.D. D	Height T	Washers			Shoulder Diameter		Fillet <sup>(1)</sup> Radius rs	Wt.	Load Rating		Approx. Limiting Speed (oil bath only)
				Thickness T <sub>1</sub>	Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H	Housing E			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>	
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N	rpm
F-3167-B	3.9990 101.575	8.4990 215.875	1.8125 46.038	0.375 9.53	8.470 215.14	4.039 102.59	7.62 193.7	4.25 108	0.10 2.5	20.5 9.3	353000 1570000	198000 880000	1350
W-3217-B	5.0000 127.000	10.5000 266.700	2.3125 58.738	0.500 12.70	10.470 265.94	5.020 127.51	9.38 238.1	5.88 149.2	0.14 3.6	41.0 18.6	578000 2570000	304000 1350000	1090
S-4055-C	5.9045 149.974	11.8000 299.720	3.5312 89.692	1.000 25.40	11.750 298.45	6.063 154	10.53 267.5	6.88 174.6	0.12 3	79.0 35.8	754000 3350000	416000 1850000	970
G-3304-B	6.6250 168.275	12.0000 304.800	2.7500 69.850	0.562 14.29	11.938 303.21	6.750 171.45	10.94 277.8	7.44 188.9	0.25 6.4	57.0 25.9	839000 3730000	429000 1910000	950
W-3218-B	7.0000 177.800	14.5000 368.300	3.2500 82.550	0.688 17.46	14.438 366.71	7.125 180.98	13.25 336.6	8.00 203.2	0.24 6.1	109.0 49.4	1410000 6270000	660000 2940000	790
F-3094-C	8.9990 228.575	16.9980 431.749	3.5000 88.900	0.625 15.88	16.968 430.99	9.125 231.78	15.62 396.9	10.12 257.2	0.20 5.1	158.0 71.7	1600000 7120000	769000 3420000	670
I-2077-C	9.9990 253.975	20.0000 508.000	3.7500 95.250	0.750 19.05	19.968 507.19	10.094 256.38	18.44 468.3	11.12 282.6	0.25 6.4	243.0 110.2	2260000 10000000	1020000 4530000	570
R-2927-C	10.0000 254.000	20.0000 508.000	4.2500 107.950	0.844 21.43	19.938 506.41	10.125 257.18	18.38 466.7	11.25 285.8	0.19 4.8	272.0 123.4	2720000 12100000	1250000 5550000	570
G-3224-C	10.1000 256.540	21.5000 546.100	6.5000 165.100	1.375 34.92	21.375 542.92	10.188 258.76	20.31 515.9	11.88 301.6	0.24 6.1	501.0 227.2	3350000 14900000	1780000 7900000	530
S-4077-C	10.2362 259.999	18.8956 479.948	5.2000 132.080	1.062 26.99	18.833 478.36	10.361 263.17	16.81 427	11.81 300	0.19 4.8	279.0 126.5	2020000 8980000	1060000 4720000	610
C-8091-C	11.0000 279.400	23.7500 603.250	5.3750 136.525	1.188 30.16	23.688 601.66	11.125 282.58	21.75 552.4	12.50 317.5	0.19 4.8	508.0 230.4	3980000 1770000	1770000 7890000	480

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.

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# Thrust Tapered Roller Bearings Type TTVF (continued)



## DIMENSIONS – LOAD RATINGS

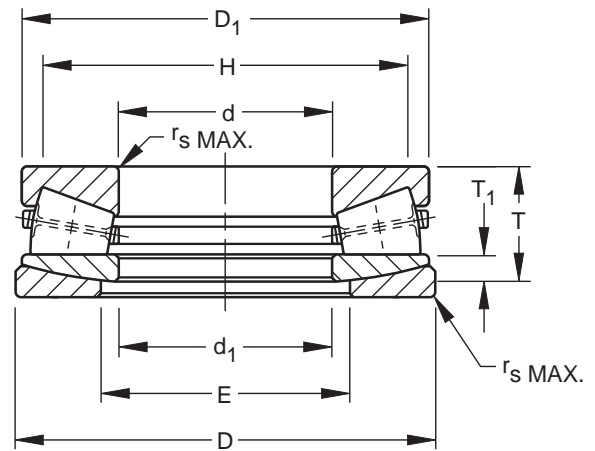
Bearing Number	Bore d	O.D. D	Height T	Washers			Shoulder Diameter		Fillet <sup>(1)</sup> Radius r <sub>s</sub> (max.)	Wt.  lbs kg	Load Rating		Approx. Limiting Speed (oil bath only)  rpm
				Thickness T <sub>1</sub>	Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H  (min.)	Housing E  (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>	
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N	rpm
G-3272-C	11.9990 304.775	24.0000 609.600	4.5000 114.300	1.125 28.58	23.890 606.81	12.094 307.18	22.25 565.2	13.50 342.9	0.25 6.4	421.0 190.9	3990000 17800000	1660000 7380000	480
E-1994-C	12.0000 304.800	26.5000 673.100	6.7500 171.450	1.469 37.31	26.438 671.51	12.125 307.98	23.94 608	13.88 352.4	0.30 7.6	767.0 347.8	5100000 22700000	2470000 11000000	430
F-3090-A	12.0000 304.800	29.0000 736.600	11.0000 279.400	1.750 44.45	28.938 735.01	12.125 307.98	24.19 614.4	15.19 385.8	0.36 9.1	1614.0 732	6300000 28000000	3850000 17100000	400
I-2060-C	14.5095 368.541	23.9825 609.156	4.7500 120.650	1.000 25.40	23.812 604.84	14.625 371.48	22.25 565.2	15.81 401.6	0.38 9.7	388.0 176	2640000 11800000	1310000 5840000	480
B-8350-C	16.0000 406.400	28.0000 711.200	6.5781 167.084	1.453 36.91	27.938 709.61	16.125 409.58	25.75 654	17.75 450.8	0.36 9.1	786.0 356.5	4480000 19900000	2310000 10300000	410
F-3163-C	16.0000 406.400	28.0470 712.394	5.7500 146.050	1.219 30.96	28.003 711.28	16.125 409.58	25.62 650.9	17.94 455.6	0.30 7.6	669.0 303.4	4350000 19300000	2070000 9190000	410
F-3131-G	17.0000 431.800	34.0000 863.600	9.0000 228.600	1.750 44.45	33.938 862.01	17.125 434.98	31.00 787.4	19.25 489	0.40 10.2	1708.0 774.6	8480000 37700000	4230000 18800000	340
A-6096-C	20.0000 508	39.0000 990.600	7.7500 196.850	2.656 67.47	39.000 990.60	20.062 508.58	36.50 927.1	22.19 563.6	0.50 12.7	1946.0 882.5	9320000 41500000	3760000 16700000	290
F-3093-A	22.0000 558.800	42.0000 1066.800	11.2500 285.750	2.250 57.15	41.938 1065.21	22.125 561.98	37.50 952.5	25.19 639.8	0.40 10.2	3090.0 1401.4	11100000 49400000	6300000 28000000	270
F-3172-C	28.0000 711.2	38.0000 965.200	5.0000 127	1.188 30.16	37.938 963.61	28.125 714.38	36.12 917.6	30.00 762	0.19 4.8	781.0 354.2	4400000 19600000	1950000 8670000	300
H-2054-G	28.0000 711.2	39.0000 990.600	7.5000 190.500	1.750 44.45	38.938 989.01	28.062 712.79	36.88 936.6	29.75 755.6	0.40 10.2	1262.0 572.3	6300000 28000000	3200000 14200000	290
D-2864-C	32.4970 825.424	46.0000 1168.400	5.0000 127	1.250 31.75	46.000 1168.40	32.500 825.50	44.50 1130.3	33.88 860.4	0.56 14.2	1212.0 549.7	9920000 44100000	3500000 15600000	250
F-3067-C	48.0314 1219.998	62.0027 1574.869	7.0000 177.800	1.750 44.45	62.008 1575	48.031 1219.99	59.00 1498.6	49.88 1266.8	0.25 6.4	2587.0 1173.2	11200000 49900000	4930000 21900000	180

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.



# Thrust Tapered Roller Bearings Type TTVS

V-Flat Tapered Roller bearings Type TTVS have the same basic roller and raceway design as the TTVF except that the lower washer is two pieces, to permit self-alignment under conditions of initial misalignment.



## DIMENSIONS – LOAD RATINGS

Bearing Number	Bore d	O.D. D	Height T	Washers			Shoulder Diameter		Fillet <sup>(1)</sup> Radius r <sub>s</sub> (max.)	Wt.	Load Rating		Approx. Limiting Speed (oil bath only)
				Thickness T <sub>1</sub>	Small Diameter O.D. D <sub>1</sub>	Large Bore I.D. d <sub>1</sub>	Shaft H (min.)	Housing E (max.)			Static Load Rating C <sub>0a</sub>	Dynamic Load Rating C <sub>t</sub>	
	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	lbs kg	lbs N	lbs N	rpm
B-7976-C	7.2500 184.15	16.0000 406.4	8.0000 203.2	2.625 66.68	15.938 404.81	7.375 187.32	13.62 346.1	9.00 228.6	0.24 6.1	347.0 157.4	1720000 7650000	1020000 4540000	720
B-8824-C	7.8730 199.374	15.7460 399.948	4.7969 121.841	1.433 36.4	15.625 396.88	8.000 203.2	14.12 358.8	9.47 240.5	0.16 4.1	190.0 86.2	1580000 7020000	807000 3590000	730
E-2004-C	9.0000 228.6	18.9980 482.549	6.2500 158.75	1.768 44.91	18.880 479.55	9.125 231.78	16.50 419.1	11.12 282.6	0.19 4.8	375.0 170.1	2440000 10900000	1320000 5870000	600
H-1685-C	9.5000 241.3	19.2480 488.899	6.0000 152.4	2.250 57.15	19.000 482.6	9.531 242.09	17.00 431.8	11.00 279.4	0.24 6.1	359.0 162.8	2240000 9940000	1120000 4980000	600
W-3120-C	9.9990 253.975	20.0000 508	8.5000 215.9	2.437 61.91	19.875 504.82	11.250 285.75	16.75 425.4	12.50 317.5	0.40 10.2	553.0 250.8	2200000 9770000	1350000 6020000	580
P-1739-C	12.0000 304.8	24.0000 609.6	8.5000 215.9	2.437 61.91	23.938 608.01	12.125 307.98	21.12 536.6	13.75 349.2	0.30 7.6	793.0 359.6	4010000 17800000	2260000 10000000	480
N-2827-G	14.0000 355.6	26.0000 660.4	10.0000 254	3.000 76.2	25.875 657.22	14.125 358.78	22.75 577.8	16.25 412.8	0.40 10.2	1065.0 483	4180000 18600000	2490000 11100000	440
B-8424-C	16.0000 406.4	34.2500 869.95	9.5000 241.3	3.250 82.55	34.938 887.41	17.250 438.15	31.62 803.3	18.25 463.6	0.65 16.5	1892.0 858	8770000 39000000	3980000 17700000	330

<sup>(1)</sup> Maximum shaft or housing fillet radius which bearing corners will clear.