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13 Spherical roller thrust bearings

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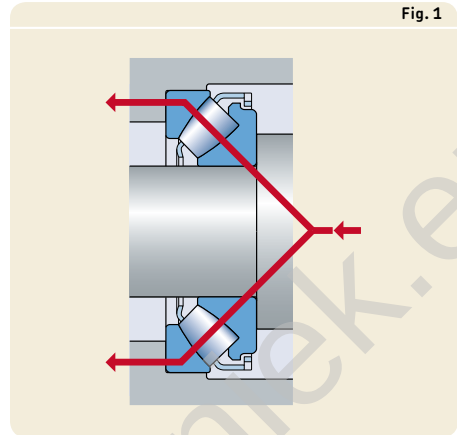
Product table

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Designs

SKF spherical roller thrust bearings have specially designed raceways and accommodate a large number of asymmetrical rollers. The rollers have an optimum conformity with the washer raceways to optimize load distribution along the roller length. Therefore, they can accommodate relatively high speeds, heavy axial loads in one direction and heavy radial loads. The load is transmitted between the raceways at an angle to the bearing axis (→ **fig. 1**). Spherical roller thrust bearings are self-aligning and can accommodate misalignment of the shaft relative to the housing, which can be caused, for example, by shaft deflection.



Basic design bearings

Depending on their series and size, SKF spherical roller thrust bearings are manufactured to two basic designs: bearings with no designation suffix and E design bearings.

Bearings with no designation suffix (e.g. 29272) are fitted with a machined prong-type brass cage as standard (→ **fig. 2**). The cage is guided by a sleeve held in the shaft washer bore. The shaft washer, cage and rollers form a non-separable unit.

Bearings with an E designation suffix have larger rollers and an optimized internal design for increased load carrying capacity. E design bearings up to size 68 are fitted with a stamped window-type steel cage (→ **fig. 3**), which forms a non-separable unit with the shaft washer and rollers.

E design bearings from size 72 and larger are fitted with a machined prong-type cage. This type of cage is guided by a sleeve held in the shaft washer bore. The shaft washer, cage and rollers form a non-separable unit.

More information

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Mounting instructions for individual bearings → skf.com/mount

Cages

Cages in SKF spherical roller thrust bearings are an integral part of the bearing internal design. All SKF spherical roller thrust bearings contain a strong metal cage. This enables them to tolerate high temperatures and all lubricants.

For additional information about the suitability of cages, refer to *Cages* (→ **page 37**) and *Cage materials* (→ **page 152**).

Performance classes

SKF Explorer bearings

In response to the ever-demanding performance requirements of modern machinery, SKF developed the SKF Explorer performance class of rolling bearings.

SKF Explorer spherical roller thrust bearings realized this substantial improvement in performance by optimizing the internal geometry and surface finish of all contact surfaces, combining the extremely clean and homogeneous steel with a unique heat treatment, improving the cage, roller profile and the geometry of the raceways.

These improvements provide the following benefits:

- higher dynamic load carrying capacity compared to conventional design bearings
- improved wear-resistance
- reduced noise and vibration levels
- less frictional heat
- significantly extended bearing service life

SKF Explorer bearings reduce environmental impact by enabling downsizing and reducing both lubricant and energy use. Just as importantly, SKF Explorer bearings can reduce the need for maintenance and contribute to increased productivity.

SKF Explorer bearings are shown with an asterisk in the product tables. The bearings retain the designation of earlier standard bearings. However, each bearing and its box are marked with the name "SKF EXPLORER".

Fig. 2

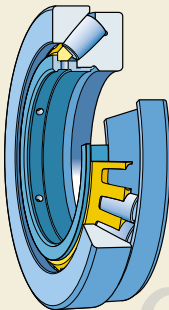
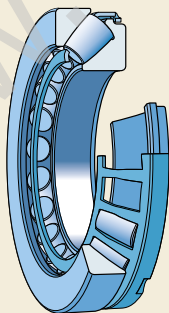


Fig. 3



Bearing data

Dimension standards	Boundary dimensions: ISO 104
Tolerances	Normal Total height H: • for basic design bearings tolerance at least 50% tighter than ISO standard • for SKF Explorer bearings tolerance 75% tighter than ISO standard
For additional information (→ page 132)	Values: ISO 199 (→ table 10, page 144)
Misalignment	The permissible misalignment is reduced as the load increases. Guideline values for misalignment and rotating shaft washer with respect to the housing washer: table 1. Whether these values can be fully exploited depends on the design of the bearing arrangement, the external sealing design, etc. When designing bearing arrangements with rotating housing washer in combination with misalignment or when the shaft wobbles in relation to the housing, contact the SKF application engineering service.
Friction, starting torque, power loss	Frictional moment, starting torque and power loss can be calculated as specified under <i>Friction</i> (→ page 97), or using the tools available online at skf.com/bearingcalculator. For temperature and/or cooling requirement calculations in large bearings ($d_m > 400 \text{ mm}$)¹⁾, vertical shaft arrangements and fully submerged conditions, contact the SKF application engineering service.
Defect frequencies	Defect frequencies can be calculated using the tools available online at skf.com/bearingcalculator .

¹⁾ d_m = bearing mean diameter [mm]
 $= 0,5 (d + D)$

Table 1

Permissible angular misalignment for rotating shafts

Bearing series	Permissible misalignment when bearing load P_0 ¹⁾		
	$< 0,05 C_0$	$\geq 0,05 C_0$	$> 0,3 C_0$
—	°		
292 (E)	2	1,5	1
293 (E)	2,5	1,5	0,3
294 (E)	3	1,5	0,3

¹⁾ Refer to *Equivalent static bearing load* (→ page 1082)

Loads

Minimum load

$$F_{am} = C_r F_r + A \left(\frac{n}{1000} \right)^2 + F_{lub}$$

$$v n \geq 2000 \rightarrow F_{lub} = \frac{2 \times 10^{-9} f_0 (v n)^{2/3} [0,5 (d + D)]^3}{d}$$

$$v n < 2000 \rightarrow F_{lub} = \frac{3,2 \times 10^{-7} f_0 [0,5 (d + D)]^3}{d}$$

The weight of the components supported by the bearing, together with external forces, generally exceed the requisite minimum load. If this is not the case, the bearing must be subjected to an additional axial load.

However, the requisite minimum load can be neglected for bearings operating at relatively slow speeds, depending on the outside diameter (→ **diagram 1, page 1084**).

Example:

For additional information (→ **page 86**)

A 29444 E bearing is to operate at 90 r/min, from **diagram 1** with $D = 420$ mm the two lines converge below the blue line. Therefore, the minimum load requirement can be ignored.

Equivalent dynamic bearing load

$F_r \leq 0,55 F_a$ and:

- if run-out in the bearing arrangement does not affect the load distribution in the spherical roller thrust bearing
→ $P = 0,88 (F_a + X F_r)$
- if run-out in the bearing arrangement affects the load distribution in the spherical roller thrust bearing (e.g. the run-out of another bearing that induces radial forces)
→ $P = F_a + X F_r$

For additional information (→ **page 85**)

$F_r > 0,55 F_a \rightarrow$ Contact the SKF application engineering service.

Equivalent static bearing load

$F_r \leq 0,55 F_a \rightarrow P_0 = F_a + X_0 F_r$

$F_r > 0,55 F_a \rightarrow$ Contact the SKF application engineering service.

For additional information (→ **page 88**)

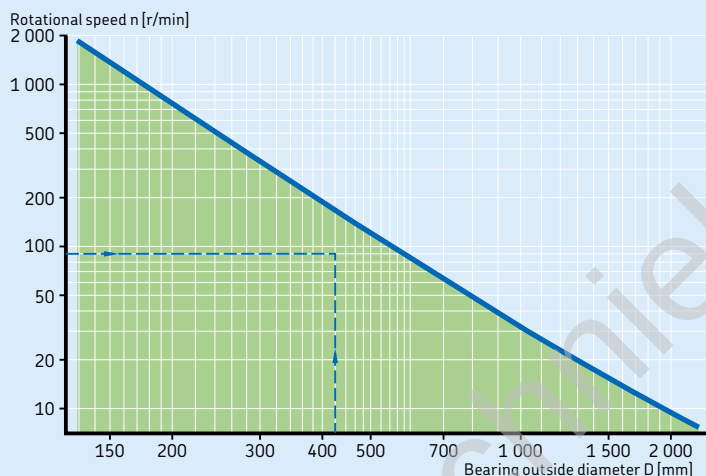
Symbols

A	= minimum load factor (→ product tables)
C_r	= load factor 1,8 for 292 series 2,0 for 293 series 2,2 for 294 series
D	= bearing outside diameter [mm]
d	= bearing bore diameter [mm]
f_0	= factor for lubrication method: for oil bath lubrication with a horizontal shaft and for grease lubrication: 3 for 292 series 3,5 for 293 series 4 for 294 series for oil bath lubrication with a vertical shaft and for oil jet lubrication: 6 for 292 series 7 for 293 series 8 for 294 series
F_{am}	= minimum axial load [kN]
F_{lub}	= axial load required to overcome lubricant drag [kN]
F_r	= radial load [kN]
n	= rotational speed [r/min]
P	= equivalent dynamic bearing load [kN]
P_0	= equivalent static bearing load [kN]
X	= calculation factor 1,1 for 292 series 1,2 for 293 series 1,3 for 294 series
X_0	= calculation factor 2,5 for 292 series 2,7 for 293 series 2,9 for 294 series
ν	= actual operating viscosity of the lubricant [mm ² /s]

13 Spherical roller thrust bearings

Diagram 1

Minimum load requirements for spherical roller thrust bearings



Temperature limits

The permissible operating temperature for spherical roller thrust bearings can be limited by:

- the dimensional stability of the bearing washers
- the lubricant

When temperatures outside the permissible range are expected, contact the SKF application engineering service.

Bearing washers

SKF spherical roller thrust bearings undergo a special heat treatment. The bearing washers are heat stabilized for use at temperatures up to 200 °C (390 °F) for at least 2 500 h, or for brief periods at even higher temperatures.

Lubricants

Temperature limits for SKF greases are provided under *Lubrication* (→ **page 239**). When using lubricants not supplied by SKF, the temperature limits should be evaluated according to the SKF traffic light concept (→ **page 244**).

Permissible speed

The permissible speed can be estimated using the speed ratings listed in the product tables and applying the information provided under *Speeds* (→ **page 117**).

Design of bearing arrangements

Abutment dimensions

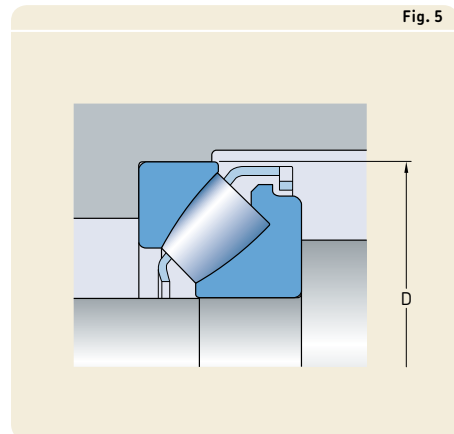
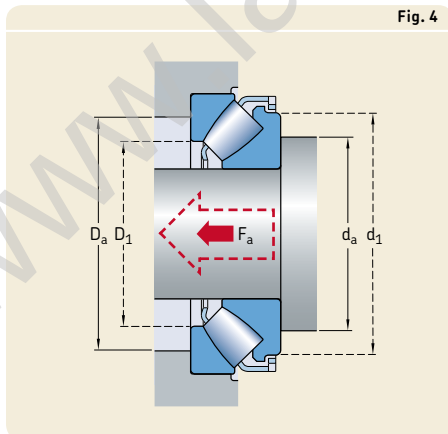
The abutment dimensions $d_{a \min}$ and $D_{a \max}$ listed in the product tables apply for axial bearing loads $F_a \leq 0,1 C_0$. If the bearings are subjected to heavier loads, it may be necessary to support the shaft and housing washers over their entire side faces ($d_a = d_1$ and $D_a = D_1$). For heavy loads, where $P > 0,1 C_0$, the shaft washer bore must be fully supported by the shaft, preferably by an interference fit. Even the housing washer should be radially supported ($\rightarrow$ fig. 4).

For additional information about dimensioning washer supports, contact the SKF application engineering service.

Recessed housing bore for bearings with a stamped cage

For bearings fitted with a stamped window-type steel cage, the housing bore must be recessed ($\rightarrow$ fig. 5) to prevent the cage from contacting the housing during possible misalignment. SKF recommends the following guideline values for the diameter of that recess:

- $D + 15$ mm for bearings with an outside diameter $D \leq 380$ mm
- $D + 20$ mm for bearings with an outside diameter $D > 380$ mm



Axial clearance

SKF spherical roller thrust bearings must be subjected to a minimum load (→ *Minimum load*, **page 1082**). However, at relatively slow speeds, in the zone below the blue line (→ **diagram 1**, **page 1084**) the application can be designed to operate with a small axial clearance. For these applications, bearings with a modified shaft washer (designation suffix VU029) should be used. Small axial clearance enables simple and cost-effective bearing arrangements e. g. for horizontal shaft applications at relatively slow speeds, as no external preload is necessary.

For additional information about bearing arrangements with axial clearance, contact the SKF application engineering service.

Lubrication

Generally, SKF spherical roller thrust bearings can be lubricated with oil or grease containing EP additives.

When lubricating with grease the roller end / flange contacts must be supplied with an adequate amount of grease. Depending on the application, this can be solved by filling the bearing and housing with grease, or by regular relubrication. For additional information, contact the SKF application engineering service.

Pumping effect in oil lubricated applications

Spherical roller thrust bearings create a pumping effect because of their internal design. The pumping effect creates a flow from the small to the large roller end face that can be taken advantage of in oil lubricated applications. The pumping action occurs in applications where the shaft is vertical (→ **fig. 6**) or horizontal (→ **fig. 7**) and should be considered when selecting the type of lubricant and sealing arrangement.

For high-speed applications that use bearings with a machined cage, SKF recommends using the oil injection lubrication method (→ **fig. 8**).

For additional information about lubricating spherical roller thrust bearings, contact the SKF application engineering service.

Fig. 6

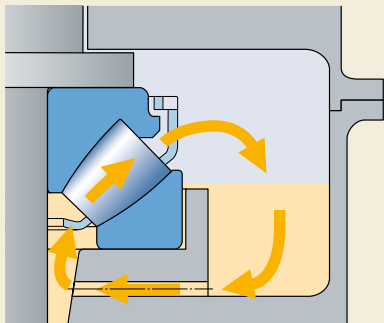


Fig. 7

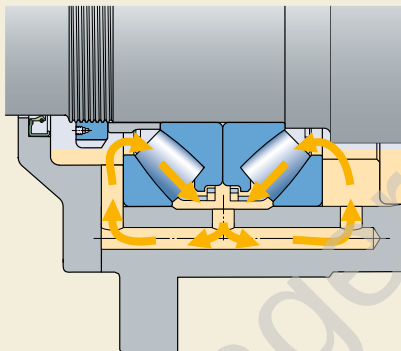
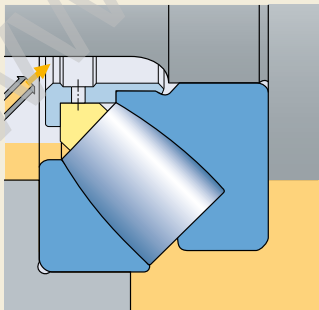


Fig. 8



Mounting

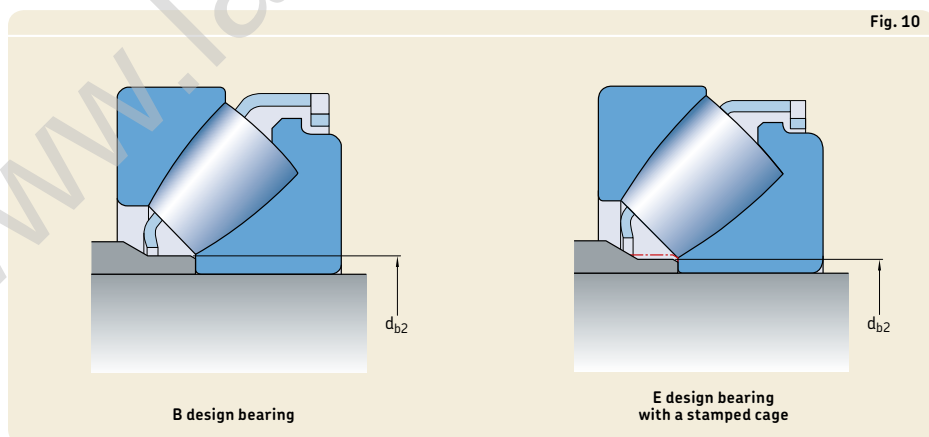
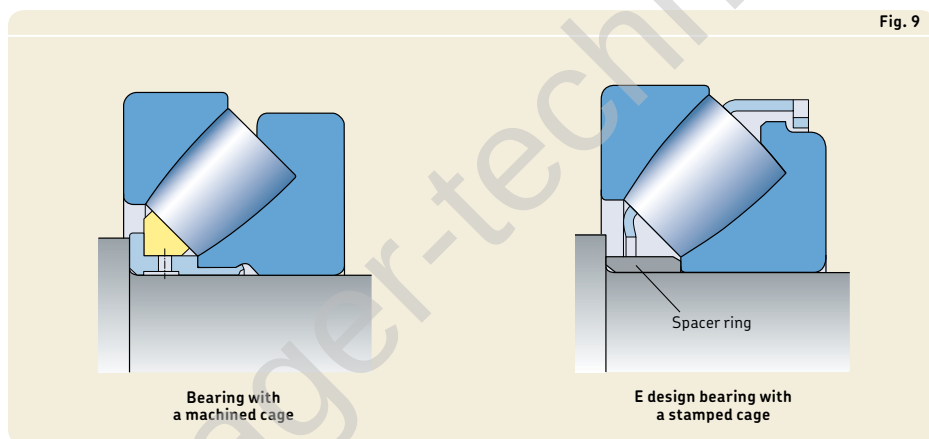
SKF spherical roller thrust bearings are separable, making it possible to mount the housing washer separately from the shaft washer, cage and roller assembly.

When a spherical roller thrust bearing with a machined cage is to be replaced by an E design bearing with a stamped window-type steel cage, and axial forces are transmitted via the cage guiding sleeve, a spacer ring must be inserted between the shaft abutment and the shaft washer (→ **fig. 9**).

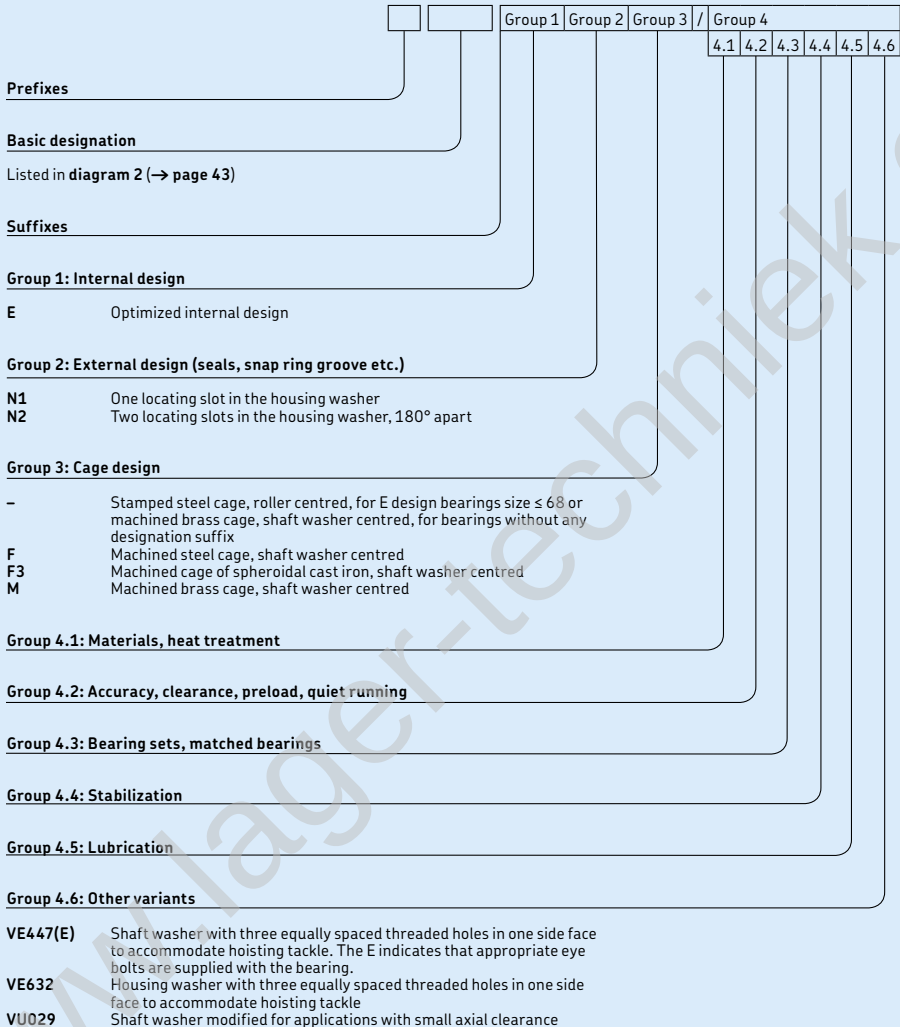
If an earlier B design SKF bearing, mounted with a spacer ring, is to be replaced, the spacer ring generally needs to be modified (→ **fig. 10**). The diameter d_{b2} (→ **product**

tables) of the spacer ring needs to be reduced for almost all bearing sizes.

The spacer ring must be hardened and its side faces should be ground. Appropriate spacer ring dimensions for SKF spherical roller thrust bearings are listed in the product tables.

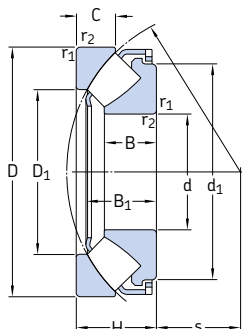


Designation system



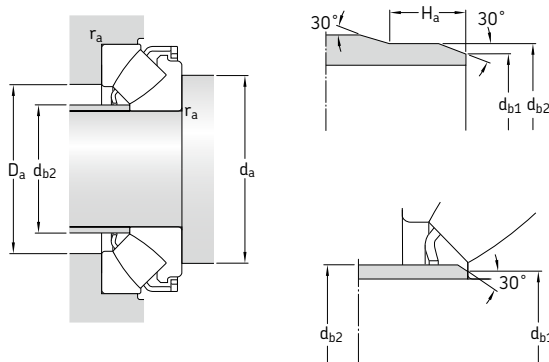
13.1 Spherical roller thrust bearings

d 60 – 170 mm



Principal dimensions			Basic load ratings		Fatigue load limit	Minimum load factor	Speed ratings		Mass	Designation
d	D	H	C	C ₀	P _u	A	Reference speed	Limiting speed		
mm					kN	–	r/min		kg	–
60	130	42	390	915	114	0,08	2 800	5 000	2,6	* 29412 E
65	140	45	455	1 080	137	0,11	2 600	4 800	3,2	* 29413 E
70	150	48	520	1 250	153	0,15	2 400	4 300	3,9	* 29414 E
75	160	51	600	1 430	173	0,19	2 400	4 000	4,7	* 29415 E
80	170	54	670	1 630	193	0,25	2 200	3 800	5,6	* 29416 E
85	150	39	380	1 060	129	0,11	2 400	4 000	2,75	* 29317 E
	180	58	735	1 800	212	0,31	2 000	3 600	6,75	* 29417 E
90	155	39	400	1 080	132	0,11	2 400	4 000	2,85	* 29318 E
	190	60	815	2 000	232	0,38	1 900	3 400	7,75	* 29418 E
100	170	42	465	1 290	156	0,16	2 200	3 600	3,65	* 29320 E
	210	67	980	2 500	275	0,59	1 700	3 000	10,5	* 29420 E
110	190	48	610	1 730	204	0,28	1 900	3 200	5,3	* 29322 E
	230	73	1 180	3 000	325	0,86	1 600	2 800	13,5	* 29422 E
120	210	54	765	2 120	245	0,43	1 700	2 800	7,35	* 29324 E
	250	78	1 370	3 450	375	1,1	1 500	2 600	17,5	* 29424 E
130	225	58	865	2 500	280	0,59	1 600	2 600	9	* 29326 E
	270	85	1 560	4 050	430	1,6	1 300	2 400	22	* 29426 E
140	240	60	980	2 850	315	0,77	1 500	2 600	10,5	* 29328 E
	280	85	1 630	4 300	455	1,8	1 300	2 400	23	* 29428 E
150	215	39	408	1 600	180	0,24	1 800	2 800	4,3	29230 E
	250	60	1 000	2 850	315	0,77	1 500	2 400	11	* 29330 E
	300	90	1 860	5 100	520	2,5	1 200	2 200	28	* 29430 E
160	270	67	1 180	3 450	375	1,1	1 300	2 200	14,5	* 29332 E
	320	95	2 080	5 600	570	3	1 100	2 000	32	* 29432 E
170	280	67	1 200	3 550	365	1,2	1 300	2 200	15	* 29334 E
	340	103	2 360	6 550	640	4,1	1 100	1 900	44,5	* 29434 E

* SKF Explorer bearing



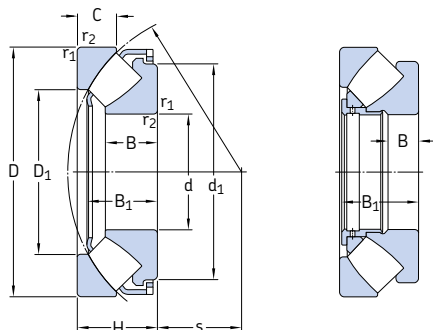
Dimensions

Abutment and fillet dimensions

d	d ₁	D ₁	B	B ₁	C	r _{1,2}	s	d _a	d _{b1}	d _{b2}	H _a	D _a	r _a
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
60	112	85,5	27	36,7	21	1,5	38	90	67	67	–	107	1,5
65	120	91,5	29,5	39,8	22	2	42	100	72	72	–	117	2
70	129	99	31	41	23,8	2	44,8	105	77,5	77,5	–	125	2
75	138	106	33,5	45,7	24,5	2	47	115	82,5	82,5	–	133	2
80	147	113	35	48,1	26,5	2,1	50	120	88	88	–	141	2
85	134	110	24,5	33,8	20	1,5	50	115	90	90	–	129	1,5
	155	121	37	51,1	28	2,1	54	130	94	94	–	151	2
90	138	115	24,5	34,5	19,5	1,5	53	120	95	95	–	134	1,5
	164	128	39	54	28,5	2,1	56	135	99	99	–	158	2
100	152	128	26,2	36,3	20,5	1,5	58	130	107	107	–	147	1,5
	182	142	43	57,3	32	3	62	150	110	110	–	175	2,5
110	171	140	30,3	41,7	24,8	2	63,8	145	117	117	–	164	2
	199	156	47	64,7	34,7	3	69	165	120,5	129	–	193	2,5
120	188	155	34	48,2	27	2,1	70	160	128	128	–	181	2
	216	171	50,5	70,3	36,5	4	74	180	132	142	–	209	3
130	203	166	36,7	50,6	30,1	2,1	75,6	175	138	143	–	194	2
	234	185	54	76	40,9	4	81	195	142,5	153	–	227	3
140	216	177	38,5	54	30	2,1	82	185	148	154	–	208	2
	245	195	54	75,6	41	4	86	205	153	162	–	236	3
150	200	176	24	34,3	20,5	1,5	82	180	154	154	14	193	1,5
	223	190	38	54,9	28	2,1	87	195	158	163	–	219	2
	262	208	58	80,8	43,4	4	92	220	163	175	–	253	3
160	243	203	42	60	33	3	92	210	169	176	–	235	2,5
	279	224	60,5	84,3	45,5	5	99	235	175	189	–	270	4
170	251	215	42,2	61,1	30,5	3	96	220	178	188	–	245	2,5
	297	236	65,5	91,2	50	5	104	250	185	199	–	286	4

13.1 Spherical roller thrust bearings

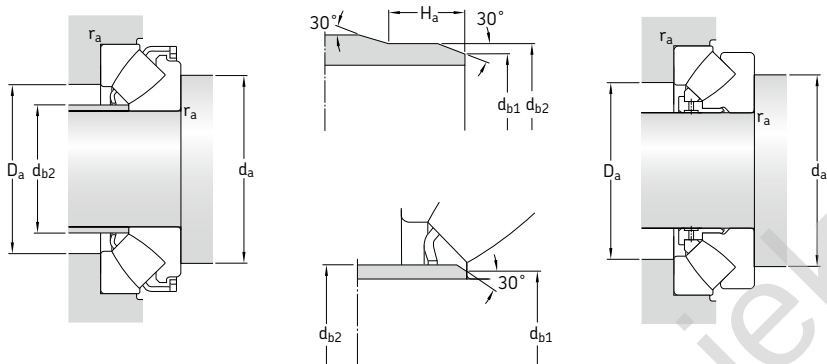
d 180 – 340 mm



E design

Principal dimensions			Basic load ratings		Fatigue load limit	Minimum load factor	Speed ratings		Mass	Designation
d	D	H	C	C ₀	P _u	A	Reference speed	Limiting speed		
mm			kN		kN	–	r/min		kg	–
180	250	42	495	2 040	212	0,4	1 600	2 600	5,8	29236 E
	300	73	1 430	4 300	440	1,8	1 200	2 000	19,5	* 29336 E
	360	109	2 600	7 350	710	5,1	1 000	1 800	52,5	* 29436 E
190	320	78	1 630	4 750	490	2,1	1 100	1 900	23,5	* 29338 E
	380	115	2 850	8 000	765	6,1	950	1 700	60,5	* 29438 E
200	280	48	656	2 650	285	0,67	1 400	2 200	9,3	29240 E
	340	85	1 860	5 500	550	2,9	1 000	1 700	28,5	* 29340 E
	400	122	3 200	9 000	850	7,7	850	1 600	72	* 29440 E
220	300	48	690	3 000	310	0,86	1 300	2 200	10	29244 E
	360	85	2 000	6 300	610	3,8	1 000	1 700	31	* 29344 E
	420	122	3 350	9 650	900	8,8	850	1 500	75	* 29444 E
240	340	60	799	3 450	335	1,1	1 100	1 800	16,5	29248
	380	85	2 040	6 550	630	4,1	1 000	1 600	35,5	* 29348 E
	440	122	3 400	10 200	930	9,9	850	1 500	80	* 29448 E
260	360	60	817	3 650	345	1,3	1 100	1 700	18,5	29252
	420	95	2 550	8 300	780	6,5	850	1 400	49	* 29352 E
	480	132	4 050	12 900	1 080	16	750	1 300	105	* 29452 E
280	380	60	863	4 000	375	1,5	1 000	1 700	19,5	29256
	440	95	2 550	8 650	800	7,1	850	1 400	53	* 29356 E
	520	145	4 900	15 300	1 320	22	670	1 200	135	* 29456 E
300	420	73	1 070	4 800	465	2,2	900	1 400	30,5	29260
	480	109	3 100	10 600	930	11	750	1 200	75	* 29360 E
	540	145	5 000	16 600	1 340	24	670	1 200	140	* 29460 E
320	440	73	1 110	5 100	465	2,5	850	1 400	33	29264
	500	109	3 350	11 200	1 000	12	750	1 200	78	* 29364 E
	580	155	5 700	19 000	1 530	32	600	1 100	175	* 29464 E
340	460	73	1 130	5 400	480	2,8	850	1 300	33,5	29268
	540	122	2 710	11 000	950	11	600	1 100	105	29368
	620	170	6 700	22 400	1 760	46	560	1 000	220	* 29468 E

* SKF Explorer bearing



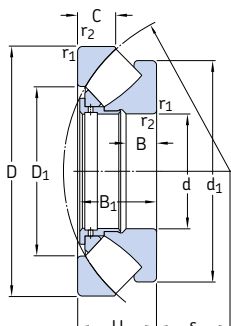
Dimensions

Abutment and fillet dimensions

d	d ₁	D ₁	B	B ₁	C	r _{1,2}	s	d _a	d _{b1}	d _{b2}	H _a	D _a	r _a
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
180	234 270 315	208 227 250	26 46 69,5	36,9 66,2 96,4	22 35,5 53	1,5 3 5	97 103 110	210 235 265	187 189 196	187 195 210	14 – –	226 262 304	1,5 2,5 4
190	285 332	244 265	49 73	71,3 101	36 55,5	4 5	110 117	250 280	200 207	211 223	– –	280 321	3 4
200	260 304 350	233 257 278	30 53,5 77	43,4 76,7 107,1	24 40 59,4	2 4 5	108 116 122	235 265 295	206 211 217,5	207 224 234	17 – –	253 297 337	2 3 4
220	280 326 371	252 274 300	30 55 77	43,4 77,7 107,4	24,5 41 58,5	2 4 6	117 125 132	255 285 315	224,5 229 238	227 240 254	17 – –	271 316 358	2 3 5
240	330 345 391	283 296 322	37,5 54 76	57 77,8 107,1	30 40,5 59	2,1 4 6	130 135 142	290 305 335	– 249 258	– 259 276	– – –	308 336 378	2 3 5
260	350 382 427	302 324 346	37,5 61 86	57 86,6 119	30 46 63	2,1 5 6	139 148 154	310 335 365	– 273 278	– 286 296	– – –	326 370 412	2 4 5
280	370 401 464	323 343 372	37,5 62 95	57 86,7 129,9	30,5 45,5 70	2,1 5 6	150 158 166	325 355 395	– 293 300	– 305 320	– – –	347 390 446	2 4 5
300	405 434 485	353 372 392	42,5 70 95	69 98,9 130,3	38 51 70,5	3 5 6	162 168 175	360 385 415	– 313 319	– 329 340	– – –	380 423 465	2,5 4 5
320	430 454 520	372 391 422	42,7 68 102	69 97,8 139,4	38 53 74,5	3 5 7,5	172 180 191	380 405 450	– 332 344	– 347 367	– – –	400 442 500	2,5 4 6
340	445 520 557	395 428 445	43 76 112	69 117 151,4	37,5 59,5 84	3 5 7,5	183 192 201	400 440 475	– – 363	– – 386	– – –	422 479 530	2,5 4 6

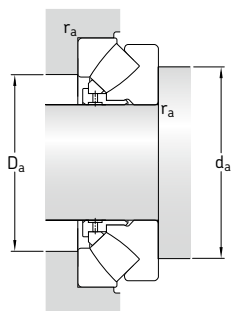
13.1 Spherical roller thrust bearings

d 360 – 560 mm



Principal dimensions			Basic load ratings		Fatigue load limit	Minimum load factor	Speed ratings		Mass	Designation
d	D	H	C	C ₀	P _u	A	Reference speed	Limiting speed		
mm			kN		kN	–	r/min		kg	–
360	500	85	1 460	6 800	585	4,4	750	1 200	52	29272
	560	122	2 760	11 600	980	13	600	1 100	110	29372
	640	170	6 200	21 200	1 630	41	560	950	230	* 29472 EM
380	520	85	1 580	7 650	655	5,6	700	1 100	53	29276
	600	132	3 340	14 000	1 160	19	530	1 000	140	29376
	670	175	6 800	24 000	1 860	53	530	900	260	* 29476 EM
400	540	85	1 610	8 000	695	6,1	700	1 100	55,5	29280
	620	132	3 450	14 600	1 200	20	530	950	150	29380
	710	185	7 650	26 500	1 960	62	480	850	310	* 29480 EM
420	580	95	1 990	9 800	815	9,1	630	1 000	75,5	29284
	650	140	3 740	16 000	1 290	24	500	900	170	29384
	730	185	7 800	27 500	2 080	69	480	850	325	* 29484 EM
440	600	95	2 070	10 400	850	10	630	1 000	78	29288
	680	145	5 200	19 300	1 560	34	530	850	180	* 29388 EM
	780	206	9 000	32 000	2 320	91	430	750	410	* 29488 EM
460	620	95	2 070	10 600	865	11	600	950	81	29292
	710	150	4 310	19 000	1 500	34	450	800	215	29392
	800	206	9 300	33 500	2 450	100	430	750	425	* 29492 EM
480	650	103	2 350	11 800	950	13	560	900	98	29296
	730	150	4 370	19 600	1 530	36	450	800	220	29396
	850	224	9 550	39 000	2 800	140	340	670	550	29496 EM
500	670	103	2 390	12 500	1 000	15	560	900	100	292/500
	750	150	4 490	20 400	1 560	40	430	800	235	293/500
	870	224	9 370	40 000	2 850	150	340	670	560	294/500 EM
530	710	109	3 110	15 300	1 220	22	530	850	115	292/530 EM
	800	160	5 230	23 600	1 800	53	400	750	270	293/530
	920	236	10 500	44 000	3 100	180	320	630	650	294/530 EM
560	750	115	2 990	16 000	1 220	24	480	800	140	292/560
	980	250	12 000	51 000	3 550	250	300	560	810	294/560 EM

* SKF Explorer bearing



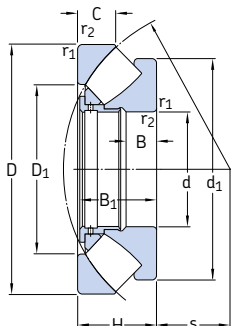
Dimensions

Abutment and fillet dimensions

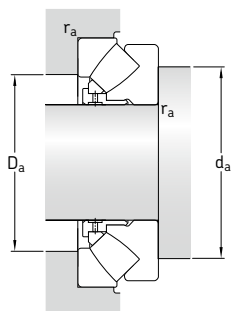
d	d ₁ ~	D ₁ ~	B	B ₁	C	r _{1,2} min.	s	d _a min.	D _a max.	r _a max.
mm								mm		
360	485	423	49,5	81	44	4	195	430	453	3
	540	448	76	117	59,5	5	202	460	500	4
	580	474	109	164	83,5	7,5	210	495	550	6
380	505	441	53,5	81	42	4	202	450	473	3
	580	477	83,5	127	63,5	6	216	495	535	5
	610	494	114	168	87,5	7,5	222	525	580	6
400	526	460	53	81	42,2	4	212	470	493	3
	596	494	83	127	64	6	225	510	550	5
	645	525	120	178	89,5	7,5	234	550	615	6
420	564	489	61	91	46	5	225	500	525	4
	626	520	88	135	67,5	6	235	535	580	5
	665	545	121	178	90,5	7,5	244	575	635	6
440	585	508	61	91	46,5	5	235	520	545	4
	626	540	91	140	70,5	6	249	560	605	5
	710	577	133	199	101	9,5	257	605	675	8
460	605	530	61,5	91	46	5	245	540	565	4
	685	567	94	144	72,5	6	257	585	630	5
	730	596	133	199	101,5	9,5	268	630	695	8
480	635	556	62,5	99	53,5	5	259	570	595	4
	705	591	93	144	73,5	6	270	610	655	5
	770	625	147	216	108	9,5	280	660	735	8
500	654	574	62,5	99	53,5	5	268	585	615	4
	725	611	92,5	144	74	6	280	630	675	5
	795	648	145	216	110	9,5	290	685	755	8
530	675	608	66	105	56	5	285	620	655	4
	772	648	102,5	154	76	7,5	295	670	715	6
	840	686	152	228	116	9,5	308	725	800	8
560	732	644	68	111	61	5	302	655	685	4
	890	727	165	241	122	12	328	770	850	10

13.1 Spherical roller thrust bearings

d 600 – 1 600 mm



Principal dimensions			Basic load ratings		Fatigue load limit	Minimum load factor	Speed ratings		Mass	Designation
d	D	H	dynamic	static	P_u	A	Reference speed	Limiting speed		
mm			kN	C_0	kN	–	r/min		kg	–
600	800	122	3 740	18 600	1 460	33	450	700	170	292/600 EM
	1030	258	13 100	56 000	4 000	300	280	530	845	294/600 EM
630	850	132	4 770	23 600	1 800	53	400	670	210	292/630 EM
	950	190	8 450	38 000	2 900	140	320	600	485	293/630 EM
	1090	280	14 400	62 000	4 150	370	260	500	1 040	294/630 EM
670	900	140	4 200	22 800	1 660	49	380	630	255	292/670
	1150	290	15 400	68 000	4 500	440	240	450	1 210	294/670 EM
710	1060	212	9 950	45 500	3 400	200	280	500	610	293/710 EM
	1220	308	17 600	76 500	5 000	560	220	430	1 500	294/710 EF
750	1000	150	6 100	31 000	2 320	91	340	560	325	292/750 EM
	1120	224	9 370	45 000	3 050	190	260	480	770	293/750
	1280	315	18 700	85 000	5 500	690	200	400	1 650	294/750 EF
800	1060	155	6 560	34 500	2 550	110	320	530	380	292/800 EM
	1180	230	9 950	49 000	3 250	230	240	450	865	293/800
	1360	335	20 200	93 000	5 850	820	190	360	2 030	294/800 EF
850	1120	160	6 730	36 000	2 550	120	300	500	425	292/850 EM
	1440	354	23 900	108 000	7 100	1 100	170	340	2 390	294/850 EF
900	1180	170	7 820	42 500	3 000	170	280	450	475	292/900 EM
	1520	372	26 700	122 000	7 200	1 400	160	300	2 650	294/900 EF
950	1250	180	8 280	45 500	3 100	200	260	430	600	292/950 EM
	1600	390	28 200	132 000	7 800	1 700	140	280	3 070	294/950 EF
1000	1670	402	31 100	140 000	8 650	1 900	130	260	3 390	294/1000 EF
1060	1400	206	10 500	58 500	3 750	330	220	360	860	292/1060 EF
	1770	426	33 400	156 000	8 500	2 300	120	240	4 280	294/1060 EF
1180	1520	206	10 900	64 000	3 750	390	220	340	950	292/1180 EF
1250	1800	330	24 800	129 000	7 500	1 600	130	240	2 770	293/1250 EF
1600	2280	408	36 800	200 000	11 800	3 800	90	160	5 380	293/1600 EF



Dimensions

Abutment and fillet dimensions

d	d ₁ ~	D ₁ ~	B	B ₁	C	r _{1,2} min.	s	d _a min.	D _a max.	r _a max.
mm								mm		
600	760 940	688 769	74 170	117 249	60 128	5 12	321 349	700 815	735 900	4 10
630	810 880 995	723 761 815	85 122 181	127 183 270	62 92 137	6 9,5 12	338 359 365	740 795 860	780 860 950	5 8 10
670	880 1045	773 864	84 188	135 280	73 141	6 15	361 387	790 905	825 1000	5 12
710	985 1110	855 917	134 199	205 298	103 149	9,5 15	404 415	890 965	960 1070	8 12
750	950 1086 1170	858 910 964	93 139 207	144 216 305	74 109 153	6 9,5 15	409 415 436	880 935 1015	925 1000 1120	5 8 12
800	1010 1146 1250	911 965 1034	97 144 213	149 222 324	77 111 165	7,5 9,5 15	434 440 462	935 995 1080	980 1060 1185	6 8 12
850	1060 1315	967 1077	95 236	154 342	82 172	7,5 15	455 507	980 1160	1030 1270	6 12
900	1136 1394	1020 1137	105 247	164 360	85 186	7,5 15	487 518	1045 1215	1100 1320	6 12
950	1185 1470	1081 1209	111 255	174 377	88 191	7,5 15	507 546	1095 1275	1155 1400	6 12
1000	1531	1270	262	389	190	15	599	1350	1490	12
1060	1325 1615	1211 1349	125 274	199 412	100 207	9,5 15	566 610	1225 1410	1290 1555	8 12
1180	1450	1331	125	199	101	9,5	625	1345	1410	8
1250	1685	1474	213	319	161	12	698	1540	1640	10
1600	2130	1885	259	395	195	19	894	1955	2090	15