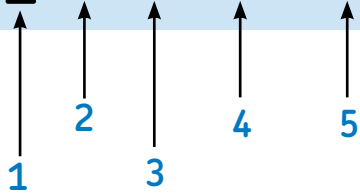




# Self-aligning ball bearings

1220 — K M C3 W64



## 1. Internal design:

- Standard internal design
- E** Optimized internal design

## 2. Variations:

- K** Bearing with 1 to 12 tapered bore
- 2RS1** Contact seal of acrylonitrile butadiene rubber (NBR) with sheet steel backing on both sides of bearing

## 3. Cage designs:

- TN9** Injection molded polyamide PA66 cage with glass fiber reinforcement
- M** Machined brass cage
- Pressed steel cage (standard)
- TN** Injection molded polyamide PA66 cage

## 4. Clearance:

- C2** Radial internal clearance < Normal
- (C0)\*** Normal radial internal clearance
- C3** Radial internal clearance > Normal
- C4** Radial internal clearance > C3

\*Not marked on bearing or package

## 5. Lubrication:

- W64** Solid Oil lubricants

## Technical features

<b>Boundary dimensions</b>	In accordance with ISO 15																		
<b>Tolerances</b>	ABEC 1, ISO 492																		
<b>Max. temperature</b>	248° F (120° C) for open bearings only																		
<b>Misalignment</b>	<table> <tr> <td>Series 108, 126, 127, 129, 135</td> <td>3.0 degrees</td> </tr> <tr> <td>Series 12 (E)</td> <td>2.5 degrees</td> </tr> <tr> <td>Series 13 (E)</td> <td>3.0 degrees</td> </tr> <tr> <td>Series 22 (E)</td> <td>2.5 degrees</td> </tr> <tr> <td>Series 22 E-2RS1</td> <td>1.5 degrees</td> </tr> <tr> <td>Series 23 (E)</td> <td>3.0 degrees</td> </tr> <tr> <td>Series 23 E-2RS1</td> <td>1.5 degrees</td> </tr> <tr> <td>Series 112 (E)</td> <td>2.5 degrees</td> </tr> <tr> <td>Series 130, 139</td> <td>3.0 degrees</td> </tr> </table>	Series 108, 126, 127, 129, 135	3.0 degrees	Series 12 (E)	2.5 degrees	Series 13 (E)	3.0 degrees	Series 22 (E)	2.5 degrees	Series 22 E-2RS1	1.5 degrees	Series 23 (E)	3.0 degrees	Series 23 E-2RS1	1.5 degrees	Series 112 (E)	2.5 degrees	Series 130, 139	3.0 degrees
Series 108, 126, 127, 129, 135	3.0 degrees																		
Series 12 (E)	2.5 degrees																		
Series 13 (E)	3.0 degrees																		
Series 22 (E)	2.5 degrees																		
Series 22 E-2RS1	1.5 degrees																		
Series 23 (E)	3.0 degrees																		
Series 23 E-2RS1	1.5 degrees																		
Series 112 (E)	2.5 degrees																		
Series 130, 139	3.0 degrees																		
<b>Cage material</b>																			
<b>Standard</b>	Polyamide (TN) Glass fiber reinforced polyamide (TN9)																		
<b>Optional</b>	Machined brass (M) for large bearings																		
<b>Axial load – max</b> for adapter sleeve mounting	$F_{ap} = 3 \times B \times d$ where $B$ = bearing width in mm $d$ = bearing bore in mm $F_{ap}$ = axial load in Newtons																		
<b>Seals</b>	2RS1 synthetic rubber (NBR) seals																		
<b>Grease</b>	Lithium soap with mineral oil																		



*Self-aligning ball bearing (open design)  
(data tables on page 96)*



*Self-aligning ball bearing (sealed design)  
(data tables on page 100)*

## Introduction

Self-aligning ball bearings have two rows of balls with a common sphered raceway in the outer ring. This feature gives the bearings their self-aligning property, permitting angular misalignment of the shaft relative to the housing. Therefore, they are particularly suitable for applications where misalignment can arise from errors in mounting or from shaft deflection.

For applications where the load carrying capacity of self-aligning ball bearings is insufficient; spherical roller bearings, which have the same self-aligning property, should be used.

SKF self-aligning ball bearings of the E design have higher load carrying capacity than bearings of the original standard design because of improvements to the internal design. This makes them suitable for a wider range of applications than their predecessors; i.e., the same size of bearing can be used to carry heavier loads, or if the loads remain the same, operational reliability is enhanced and bearing life is longer. Self-aligning ball bearings of the E design are fitted with a glass fiber reinforced polyamide PA66 cage (TN9) as standard.

SKF self-aligning ball bearings are available in several designs of which the most common are shown in this catalog:

- Basic open (unsealed) design bearings
- Bearings with seals on both sides

## Basic design

Self-aligning ball bearings of the basic design are available with a cylindrical bore as well as with a tapered bore (taper 1:12).

For self-aligning ball bearings with a tapered bore, SKF supplies appropriate adapter sleeves with which the bearings can be secured simply and rapidly to smooth or stepped shafts. The adapter sleeves are supplied complete with nut and locking device. Additional information can be found in the Split Pillow Block sections (inch and metric) under "Mounted Accessories".

## Variations

### Sealed bearings

SKF self-aligning ball bearings are also available in a sealed (2RS1) version with rubbing seals on both sides. The seals are made of oil and acrylonitrile butadiene rubber (NBR) and have a sheet steel reinforcement. The operating temperature range for the seal material is  $-40^{\circ}$  to  $+248^{\circ}$  F ( $-40^{\circ}$  to  $+120^{\circ}$  C). The outside diameter of the seal is retained in a recess in the outer ring giving a tight seal without deformation, while the lip of the seal exerts a slight pressure against a recess in the inner ring shoulder.

The sealed bearings are supplied as standard filled with a lithium base grease which is suitable for the operating temperature range  $-22^{\circ}$  to  $+230^{\circ}$  F ( $-30^{\circ}$  to  $+110^{\circ}$  C). The bearings are lubricated for life and are maintenance free. **They should not be heated at temperatures greater than  $250^{\circ}$  F ( $120^{\circ}$  C) prior to mounting and must on no account be washed.**

SKF self-aligning ball bearings with seals are available with a cylindrical bore or with a tapered bore, the taper being 1:12 as for the basic bearings.

## Special solutions for bearings with extended inner ring

Self-aligning ball bearings with extended inner ring (series 11200) are used for applications employing commercial ground shafting. The special bore tolerance of these bearings allows easy mounting and dismantling.

Self-aligning ball bearings with extended inner ring are located axially by pins or shouldered screws which engage in a slot at one side of the inner ring. The pins or screws also prevent the inner ring from turning on the shaft. When these bearings are used in pairs, the slots of the inner rings must either be adjacent or at the outboard positions. Otherwise, the shaft will be located in one direction only.

**Details on these special solution products are available in other SKF publications, which can be supplied upon request.**

## Product highlights

### Optimum performance

SKF self-aligning ball bearings have been designed to provide optimum performance in a wide range of machinery and equipment applications. They are particularly suitable for applications where misalignment can arise from errors in shaft and housing alignment or shaft deflection and where high speed is a requirement.

### Capacity for resistance-free, self-alignment

In the event of minor angular misalignment, the problems which beset many other bearing types do not occur – allowing for increased operational life, lower friction and temperature, less wear and noise during operation, and reduced stress on both the cages and lubricants.

### Sealed bearings – greased for life

SKF self-aligning ball bearings are available with contact seals on both sides which protect the bearing from contaminants during handling and operation. This allows for longer bearing service life, is environmentally friendly, and requires no relubrication – making the bearing maintenance free.

### Large product assortment

Available in a wide range (5 to 130 mm bore diameter), the basic SKF design is available with a choice of seals, cage materials, and extended inner rings.

### Application flexibility

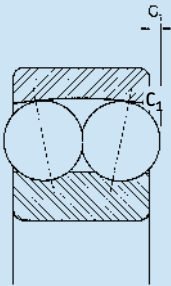
Self-aligning bearings are used in high speed applications where alignments may be a problem and running accuracy is required. Examples include fans and blowers, textile equipment and general conveyor equipment.

# Introduction

## Special feature

Self-aligning ball bearings of series 12 (K) and 13 (K) have balls which protrude somewhat from the bearing; the actual values are given in the adjacent table. This should be remembered when designing adjacent components.

### Protrusion of balls from bearing side faces



Bearing	Protrusion C1	
	mm	in
1224(K)	1.3	0.0512
1226	1.4	0.0551
1318(K)	1.1	0.0433
1319(K)	1.5	0.0591
1320(K)	2.5	0.0984
1322(K)	2.6	0.1024

## Clearance

### Radial internal clearance

SKF self-aligning ball bearings are produced with Normal radial internal clearance (CN or CO, not marked on bearing) as standard. Radial clearance selection is based on factors such as high speed, operating temperature, shaft fits and axial movement limitations. Bearings with a tapered bore are normally supplied with a C3 radial internal clearance (marked on the bearing). Bearings having clearances that are greater than (C3 or C4) or less than (C2) Normal are available on request.

The clearance values are given in **Table 1**. They are valid for unmounted bearings without measuring load, and conform to ISO 5753-1991.

## Loads

### Equivalent dynamic bearing loads

$$P = F_r + Y_1 F_a \text{ where } F_a / F_r \leq e$$

$$P = 0.65 F_r + Y_2 F_a \text{ when } F_a / F_r > e$$

Values of factors  $e$ ,  $Y_1$  and  $Y_2$  for each individual bearing are given in the bearing **Table 2**, page 96.

## Minimum load

**In order to provide satisfactory operation of all ball and roller bearings they must always be subjected to a given minimum load.** This is also true of self-aligning ball bearings, particularly if they run at high speeds where the inertia forces of the balls and cage, and the friction in the lubricant can have a detrimental influence on the rolling conditions in the bearing and may cause damaging sliding movements to occur between the balls and the raceways.

The requisite minimum radial load to be applied in such cases can be determined by using the Interactive Engineering catalog on the SKF website [www.skf.com](http://www.skf.com) or by contacting SKF Applications Engineering. However, the weight of the components supported by the bearing, together with the external forces, often exceeds the requisite minimum load. If this is not the case, an additional radial load must be applied to the bearing; for example, by increasing belt tension or similar means.

## Mounting bearings with tapered bore

Bearings with a tapered bore are always mounted with an interference fit on the shaft, adapter sleeve or withdrawal sleeve. As a measure of the degree of interference of the fit, either the reduction in radial internal clearance of the bearing or the axial displacement of the inner ring on the tapered bearing seating can be used.

The mounting of self-aligning ball bearings with tapered bore calls for experience and skill as they have a relatively small internal clearance, and a reliable measurement of the clearance reduction is not always possible. There are specific mounting instructions for these bearings in the SKF Bearing Installation and Maintenance Guide (140-710) or by visiting the SKF website [www.skf.com/mount](http://www.skf.com/mount) for exact mounting instructions.

## Frequency vibration data

Frequency vibration data is available on the SKF website [www.skf.com](http://www.skf.com) under Knowledge Centre/ Engineering tools and CAD, or by contacting SKF Applications Engineering.

Table 1

## Radial internal clearance of self-aligning ball bearings

Bore diameter d		Radial internal clearance															
		C2				Normal				C3				C4			
over	incl.	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
mm		µm		in		µm		in		µm		in		µm		in	
<b>Bearings with cylindrical bore</b>																	
2.5	6	1	8	0.0000	0.0003	5	15	0.0002	0.0006	10	20	0.0004	0.0008	15	25	0.0006	0.0010
6	10	2	9	0.0001	0.0004	6	17	0.0002	0.0007	12	25	0.0005	0.0010	19	33	0.0007	0.0013
10	14	2	10	0.0001	0.0004	6	19	0.0002	0.0007	13	26	0.0005	0.0010	21	35	0.0008	0.0014
14	18	3	12	0.0001	0.0005	8	21	0.0003	0.0008	15	28	0.0006	0.0011	23	37	0.0009	0.0015
18	24	4	14	0.0002	0.0006	10	23	0.0004	0.0009	17	30	0.0007	0.0012	25	39	0.0010	0.0015
24	30	5	16	0.0002	0.0006	11	24	0.0004	0.0009	19	35	0.0007	0.0014	29	46	0.0011	0.0018
30	40	6	18	0.0002	0.0007	13	29	0.0005	0.0011	23	40	0.0009	0.0016	34	53	0.0013	0.0021
40	50	6	19	0.0002	0.0007	14	31	0.0006	0.0012	25	44	0.0010	0.0017	37	57	0.0015	0.0022
50	65	7	21	0.0003	0.0008	16	36	0.0006	0.0014	30	50	0.0012	0.0020	45	69	0.0018	0.0027
65	80	8	24	0.0003	0.0009	18	40	0.0007	0.0016	35	60	0.0014	0.0024	54	83	0.0021	0.0033
80	100	9	27	0.0004	0.0011	22	48	0.0009	0.0019	42	70	0.0017	0.0028	64	96	0.0025	0.0038
100	120	10	31	0.0004	0.0012	25	56	0.0010	0.0022	50	83	0.0020	0.0033	75	114	0.0030	0.0045
120	140	10	38	0.0004	0.0015	30	68	0.0012	0.0027	60	100	0.0024	0.0039	90	135	0.0035	0.0053
<b>Bearings with tapered bore</b>																	
18	24	7	17	0.0003	0.0007	13	26	0.0005	0.0010	20	33	0.0008	0.0013	28	42	0.0011	0.0017
24	30	9	20	0.0004	0.0008	15	28	0.0006	0.0011	23	39	0.0009	0.0015	33	50	0.0013	0.0020
30	40	12	24	0.0005	0.0009	19	35	0.0007	0.0014	29	46	0.0011	0.0018	40	59	0.0016	0.0023
40	50	14	27	0.0006	0.0011	22	39	0.0009	0.0015	33	52	0.0013	0.0020	45	65	0.0018	0.0026
50	65	18	32	0.0007	0.0013	27	47	0.0011	0.0019	41	61	0.0016	0.0024	56	80	0.0022	0.0031
65	80	23	39	0.0009	0.0015	35	57	0.0014	0.0022	50	75	0.0020	0.0030	69	98	0.0027	0.0039
80	100	29	47	0.0011	0.0019	42	68	0.0017	0.0027	62	90	0.0024	0.0035	84	116	0.0033	0.0046
100	120	35	56	0.0014	0.0022	50	81	0.0020	0.0032	75	108	0.0030	0.0043	100	139	0.0039	0.0055

# Introduction

Table 2

## Calculation factors for self-aligning ball bearings

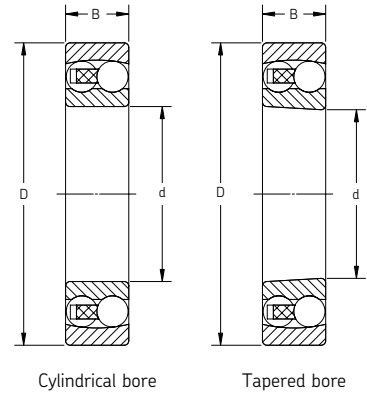
Designation	Calculation factors		
	e	Y1	Y2
<b>Bearings with cylindrical bore</b>			
126	0.33	1.9	3.0
127	0.33	1.9	3.0
129	0.33	1.9	3.0
1200 E	0.33	1.9	3.0
1201 E	0.33	1.9	3.0
1202 E	0.33	1.9	3.0
1203 E	0.31	2.0	3.1
1204 E	0.30	2.1	3.3
1205 E	0.28	2.2	3.5
1206 E	0.25	2.5	3.9
1207 E	0.23	2.7	4.2
1208 E	0.22	2.9	4.5
1209 E	0.21	3.0	4.6
1210 E	0.21	3.0	4.6
1211 E	0.19	3.3	5.1
1212 E	0.19	3.3	5.1
1213 E	0.18	3.5	5.4
1214 E	0.18	3.5	5.4
1215	0.17	3.7	5.7
1216	0.16	3.9	6.1
1217	0.17	3.7	5.7
1218	0.17	3.7	5.7
1219	0.17	3.7	5.7
1220	0.17	3.7	5.7
1221	0.17	3.7	5.7
1222	0.17	3.7	5.7
1224	0.19	3.3	5.1
1226	0.19	3.3	5.1
135	0.33	1.9	3.0
1301 E	0.35	1.8	2.8
1302 E	0.31	2.0	3.1
1303 E	0.30	2.1	3.3
1304 E	0.28	2.2	3.5
1305 E	0.28	2.2	3.5
1306 E	0.25	2.5	3.9
1307 E	0.25	2.5	3.9
1308 E	0.23	2.7	4.2
1309 E	0.23	2.7	4.2
1310 E	0.24	2.6	4.1
1311 E	0.23	2.7	4.2
1312 E	0.22	2.9	4.5
1313 E	0.22	2.9	4.5
1314	0.22	2.9	4.5
1315	0.22	2.9	4.5
1316	0.22	2.9	4.5
1317	0.22	2.9	4.5
1318	0.22	2.9	4.5
1319	0.23	2.7	4.2
1320	0.23	2.7	4.2
1322	0.22	2.9	4.5

Table 2

Calculation factors for self-aligning ball bearings

Designation	Calculation factors		
	e	Y1	Y2
<b>Bearings with cylindrical bore</b>			
1412	0.33	1.90	3.0
2200 E	0.54	1.15	1.8
2201 E	0.50	1.25	2.0
2202 E	0.43	1.50	2.3
2203 E	0.43	1.50	2.3
2204 E	0.40	1.60	2.4
2205 E	0.35	1.80	2.8
2206 E	0.33	1.90	3.0
2207 E	0.31	2.00	3.1
2208 E	0.28	2.20	3.5
2209 E	0.26	2.40	3.7
2210 E	0.23	2.70	4.2
2211 E	0.23	2.70	4.2
2212 E	0.24	2.60	4.1
2213 E	0.24	2.60	4.1
2214	0.27	2.30	3.6
2215 E	0.22	2.90	4.5
2216 E	0.22	2.90	4.5
2217	0.25	2.50	3.9
2218	0.27	2.30	3.6
2219	0.27	2.30	3.6
2220	0.27	2.30	3.6
2221	0.28	2.20	3.5
2222	0.28	2.20	3.5
2301	0.60	1.05	1.6
2302	0.52	1.20	1.9
2303	0.52	1.20	1.9
2304	0.52	1.20	1.9
2305 E	0.44	1.40	2.2
2306	0.44	1.40	2.2
2307 E	0.46	1.35	2.1
2308 E	0.40	1.60	2.4
2309 E	0.33	1.90	3.0
2310	0.43	1.50	2.3
2311	0.40	1.60	2.4
2312	0.33	1.90	3.0
2313	0.37	1.70	2.6
2314	0.37	1.70	2.6
2315	0.37	1.70	2.6
2316	0.37	1.70	2.6
2317	0.37	1.70	2.6
2318	0.37	1.70	2.6
2319	0.37	1.70	2.6
2320	0.37	1.70	2.6
2322	0.37	1.70	2.6

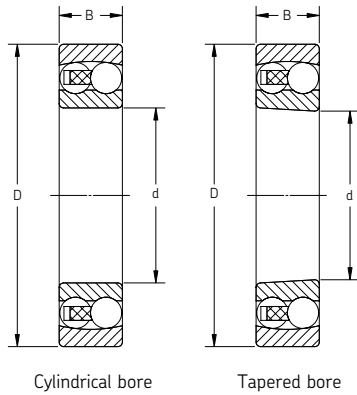
Double row  
 Open, cylindrical and tapered bore  
 Series: 126 – 1226 M  
 Size: 6 mm – 130 mm  
 0.2362 in – 5.1181 in



Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation		Mass	
	Bore d		Outside diameter D		Width B		Dynamic C		Static C <sub>0</sub>		Refer- ence speed	Limiting speed	kg	lb	Tapered bore	Adapter sleeve	kg	lb
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min						
126	6	0.2362	19	0.7480	6	0.2362	2 510	560	480	110	70 000	45 000	0.01	0.02	-	-	-	-
127	7	0.2756	22	0.8661	7	0.2756	2 650	600	560	130	63 000	40 000	0.01	0.03	-	-	-	-
108	8	0.3150	22	0.8661	7	0.2756	2 650	600	560	130	60 000	40 000	0.01	0.03	-	-	-	-
129	9	0.3543	26	1.0236	8	0.3150	3 900	880	820	180	60 000	38 000	0.02	0.05	-	-	-	-
1200 E	10	0.3937	30	1.1811	9	0.3543	5 530	1 240	1 180	270	56 000	36 000	0.03	0.07	-	-	-	-
1201 E	12	0.4724	32	1.2598	10	0.3937	6 240	1 400	1 430	320	50 000	32 000	0.04	0.09	-	-	-	-
1202 E	15	0.5906	35	1.3780	11	0.4331	7 410	1 670	1 760	400	45 000	28 000	0.05	0.11	-	-	-	-
1203 E	17	0.6693	40	1.5748	12	0.4724	8 840	1 990	2 200	490	38 000	24 000	0.07	0.16	-	-	-	-
1204 E	20	0.7874	47	1.8504	14	0.5512	12 700	2 850	3 400	760	32 000	20 000	0.12	0.26	1204 EK	H 204	0.0	0.1
1205 E	25	0.9843	52	2.0472	15	0.5906	14 300	3 210	4 000	900	28 000	18 000	0.14	0.31	1205 EK	H 205	0.1	0.1
1206 E	30	1.1811	62	2.4409	16	0.6299	15 600	3 510	4 650	1 040	24 000	15 000	0.22	0.49	1206 EK	H 206	0.1	0.2
1207 E	35	1.3780	72	2.8346	17	0.6693	19 000	4 270	6 000	1 350	20 000	13 000	0.32	0.71	1207 EK	H 207	0.1	0.3
1208 E	40	1.5748	80	3.1496	18	0.7087	19 900	4 470	6 950	1 560	18 000	11 000	0.42	0.93	1208 EK	H 208	0.2	0.3
1209 E	45	1.7717	85	3.3465	19	0.7480	22 900	5 150	7 800	1 750	17 000	11 000	0.47	1.04	1209 EK	H 209	0.2	0.4
1210 E	50	1.9685	90	3.5433	20	0.7874	26 500	5 960	9 150	2 060	16 000	10 000	0.53	1.17	1210 EK	H 210	0.2	0.5
1211 E	55	2.1654	100	3.9370	21	0.8268	27 600	6 200	10 600	2 380	14 000	9 000	0.71	1.57	1211 EK	H 211	0.3	0.6
1212 E	60	2.3622	110	4.3307	22	0.8661	31 200	7 010	12 200	2 740	12 000	8 500	0.90	1.98	1212 EK	H 212	0.3	0.7
1213 E	65	2.5591	120	4.7244	23	0.9055	35 100	7 890	14 000	3 150	11 000	7 000	1.15	2.54	1213 EK	H 213	0.4	0.8
1214 E	70	2.7559	125	4.9213	24	0.9449	35 800	8 040	14 600	3 280	11 000	7 000	1.25	2.76	-	-	-	-
1215	75	2.9528	130	5.1181	25	0.9843	39 000	8 760	15 600	3 510	10 000	6 700	1.35	2.98	1215 K	H 215	0.7	1.5
1216	80	3.1496	140	5.5118	26	1.0236	39 700	8 920	17 000	3 820	9 500	6 000	1.65	3.64	1216 K	H 216	0.8	1.8
1217	85	3.3465	150	5.9055	28	1.1024	48 800	10 970	20 800	4 670	9 000	5 600	2.05	4.52	1217 K	H 217	1.0	2.2
1218	90	3.5433	160	6.2992	30	1.1811	57 200	12 850	23 600	5 300	8 500	5 300	2.50	5.51	1218 K	H 218	1.1	2.5
1219	95	3.7402	170	6.6929	32	1.2598	63 700	14 310	27 000	6 070	8 000	5 000	3.10	6.84	1219 K	H 219	1.2	2.7
1220	100	3.9370	180	7.0866	34	1.3386	68 900	15 480	30 000	6 740	7 500	4 800	3.70	8.16	1220 K	H 220	1.5	3.3
1222	110	4.3307	200	7.8740	38	1.4961	88 400	19 870	39 000	8 760	6 700	4 300	5.15	11.36	1222 K	H 222	1.9	4.1
1224 M	120	4.7244	215	8.4646	42	1.6535	119 000	26 740	53 000	11 910	6 300	4 000	6.75	14.88	1224 KM	H 3024	1.9	4.2
1226 M	130	5.1181	230	9.0551	46	1.8110	127 000	28 540	58 500	13 150	5 600	3 600	8.30	18.30	1226 KM	H 3026	2.8	6.1

Consult SKF USA Inc. prior to design change or order placement.

Double row  
Open, cylindrical and tapered bore  
Series: 135 – 1322 M  
Size: 5 mm – 110 mm  
0.1969 in – 4.3307 in



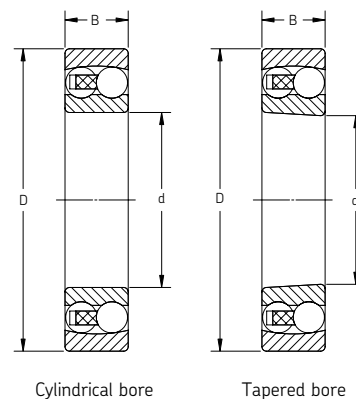
Cylindrical bore

Tapered bore

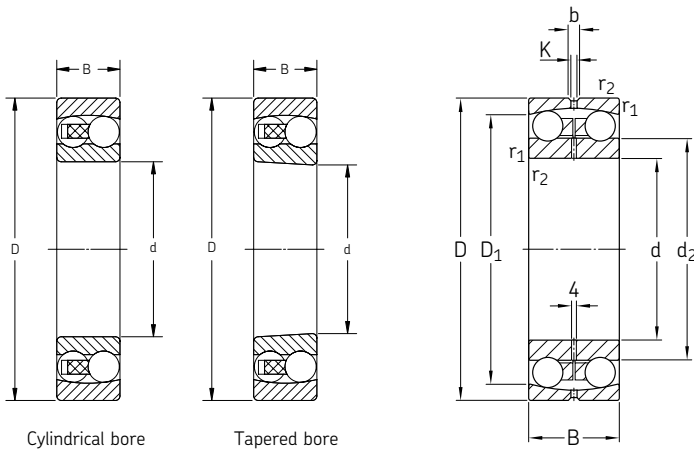
Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation		Mass	
	Bore		Outside diameter		Width		Dynamic		Static		Refer- ence speed	Limiting speed	kg	lb	Tapered Adapter		kg	lb
	d		D		B		C	C <sub>0</sub>	bore	sleeve								
mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min							
135	5	0.1969	19	0.7480	6	0.2362	2 510	560	480	110	63 000	45 000	0.01	0.02	-	-	-	-
1301 E	12	0.4724	37	1.4567	12	0.4724	9 360	2 100	2 160	490	40 000	28 000	0.07	0.15	-	-	-	-
1302 E	15	0.5906	42	1.6535	13	0.5118	10 800	2 430	2 600	580	34 000	24 000	0.09	0.21	-	-	-	-
1303 E	17	0.6693	47	1.8504	14	0.5512	12 700	2 850	3 400	760	28 000	20 000	0.12	0.26	-	-	-	-
1304 E	20	0.7874	52	2.0472	15	0.5906	14 300	3 210	4 000	900	26 000	18 000	0.16	0.35	-	-	-	-
1305 E	25	0.9843	62	2.4409	17	0.6693	19 000	4 270	5 400	1 210	22 000	15 000	0.26	0.57	1305 EK	H 305	0.1	0.2
1306 E	30	1.1811	72	2.8346	19	0.7480	22 500	5 060	6 800	1 530	19 000	13 000	0.39	0.86	1306 EK	H 306	0.1	0.2
1307 E	35	1.3780	80	3.1496	21	0.8268	26 500	5 960	8 500	1 910	16 000	11 000	0.51	1.12	1307 EK	H 307	0.1	0.3
1308 E	40	1.5748	90	3.5433	23	0.9055	33 800	7 600	11 200	2 520	14 000	9 500	0.68	1.50	1308 EK	H 308	0.2	0.4
1309 E	45	1.7717	100	3.9370	25	0.9843	39 000	8 760	13 400	3 010	12 000	8 500	0.96	2.12	1309 EK	H 309	0.2	0.5
1310 E	50	1.9685	110	4.3307	27	1.0630	43 600	9 800	14 000	3 150	12 000	8 000	1.20	2.65	1310 EK	H 310	0.3	0.6
1311 E	55	2.1654	120	4.7244	29	1.1417	50 700	11 390	18 000	4 040	11 000	7 500	1.60	3.53	1311 EK	H 311	0.3	0.7
1312 E	60	2.3622	130	5.1181	31	1.2205	58 500	13 150	22 000	4 940	9 000	6 300	1.95	4.30	1312 EK	H 312	0.4	0.8
1313 E	65	2.5591	140	5.5118	33	1.2992	65 000	14 610	25 500	5 730	8 500	6 000	2.45	5.40	1313 EK	H 313	0.4	0.9
1314	70	2.7559	150	5.9055	35	1.3780	74 100	16 650	27 500	6 180	8 500	6 000	3.00	6.62	-	-	-	-
1315	75	2.9528	160	6.2992	37	1.4567	79 300	17 820	30 000	6 740	8 000	5 600	3.55	7.83	1315 K	H 315	0.8	1.8
1316	80	3.1496	170	6.6929	39	1.5354	88 400	19 870	33 500	7 530	7 500	5 300	4.20	9.26	1316 K	H 316	1.0	2.2
1317	85	3.3465	180	7.0866	41	1.6142	97 500	21 910	38 000	8 540	7 000	4 800	5.00	11.03	1317 K	H 317	1.1	2.5
1318	90	3.5433	190	7.4803	43	1.6929	117 000	26 290	44 000	9 890	6 700	4 500	5.80	12.79	1318 K	H 318	1.3	3.0
1319	95	3.7402	200	7.8740	45	1.7717	133 000	29 890	51 000	11 460	6 300	4 300	6.70	14.77	1319 K	H 319	1.4	3.1
1320	100	3.9370	215	8.4646	47	1.8504	143 000	32 130	57 000	12 810	6 000	4 000	8.30	18.30	1320 K	H 320	1.7	3.7
1322 M	110	4.3307	240	9.4488	50	1.9685	163 000	36 630	72 000	16 180	5 300	3 600	12.00	26.46	1322 KM	H 322	2.2	4.8

Consult SKF USA Inc. prior to design change or order placement.

Double row  
 Open, cylindrical and tapered bore  
 Series: 2200 E – 2222  
 Size: 10 mm – 110 mm  
 0.3937 in – 4.3307 in



Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation		Mass	
	Bore		Outside diameter		Width		Dynamic		Static		Refer- ence speed	Limiting speed	kg	lb	Tapered bore	Adapter sleeve	kg	lb
	d		D		B		C		C <sub>0</sub>									
mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min							
2200 E	10	0.3937	30	1.1811	14	0.5512	8 060	1 810	1 730	390	50 000	34 000	0.05	0.10	-	-	-	-
2201 E	12	0.4724	32	1.2598	14	0.5512	8 520	1 910	1 900	430	45 000	30 000	0.05	0.12	-	-	-	-
2202 E	15	0.5906	35	1.3780	14	0.5512	8 710	1 960	2 040	460	38 000	26 000	0.06	0.13	-	-	-	-
2203 E	17	0.6693	40	1.5748	16	0.6299	10 600	2 380	2 550	570	34 000	24 000	0.09	0.19	-	-	-	-
2204 E	20	0.7874	47	1.8504	18	0.7087	16 800	3 780	4 150	930	28 000	20 000	0.14	0.31	-	-	-	-
2205 E	25	0.9843	52	2.0472	18	0.7087	16 800	3 780	4 400	990	26 000	18 000	0.16	0.35	2205 EK	H 305	0.1	0.2
2206 E	30	1.1811	62	2.4409	20	0.7874	23 800	5 350	6 700	1 510	22 000	15 000	0.26	0.57	2206 EK	H 306	0.1	0.2
2207 E	35	1.3780	72	2.8346	23	0.9055	30 200	6 790	8 800	1 980	18 000	12 000	0.40	0.88	2207 EK	H 307	0.1	0.3
2208 E	40	1.5748	80	3.1496	23	0.9055	31 900	7 170	10 000	2 250	16 000	11 000	0.51	1.12	2208 EK	H 308	0.2	0.4
2209 E	45	1.7717	85	3.3465	23	0.9055	32 500	7 300	10 600	2 380	15 000	10 000	0.55	1.21	2209 EK	H 309	0.2	0.5
2210 E	50	1.9685	90	3.5433	23	0.9055	33 800	7 600	11 200	2 520	14 000	9 500	0.60	1.32	2210 EK	H 310	0.3	0.6
2211 E	55	2.1654	100	3.9370	25	0.9843	39 000	8 760	13 400	3 010	12 000	8 500	0.81	1.79	2211 EK	H 311	0.3	0.7
2212 E	60	2.3622	110	4.3307	28	1.1024	48 800	10 970	17 000	3 820	11 000	8 000	1.10	2.43	2212 EK	H 312	0.4	0.8
2213 E	65	2.5591	120	4.7244	31	1.2205	57 200	12 850	20 000	4 490	10 000	7 000	1.45	3.20	2213 EK	H 313	0.4	0.9
2214	70	2.7559	125	4.9213	31	1.2205	44 200	9 930	17 000	3 820	10 000	6 700	1.50	3.31	-	-	-	-
2215 E	75	2.9528	130	5.1181	31	1.2205	58 500	13 150	22 000	4 940	9 000	6 300	1.60	3.53	2215 EK	H 315	0.8	1.8
2216 E	80	3.1496	140	5.5118	33	1.2992	65 000	14 610	25 500	5 730	8 500	6 000	2.00	4.41	2216 EK	H 316	1.0	2.2
2217	85	3.3465	150	5.9055	36	1.4173	58 500	13 150	23 600	5 300	8 000	5 600	2.50	5.51	2217 K	H 317	1.1	2.5
2218	90	3.5433	160	6.2992	40	1.5748	70 200	15 780	28 500	6 400	7 500	5 300	3.40	7.50	2218 K	H 318	1.3	3.0
2219	95	3.7402	170	6.6929	43	1.6929	83 200	18 700	34 500	7 750	7 000	5 000	4.10	9.04	2219 K	H 319	1.4	3.1
2220	100	3.9370	180	7.0866	46	1.8110	97 500	21 910	40 500	9 100	6 700	4 800	5.00	11.03	2220 K	H 320	1.7	3.7
2222	110	4.3307	200	7.8740	53	2.0866	124 000	27 870	52 000	11 690	6 000	4 300	7.10	15.66	2222 K	H 322	2.2	4.8



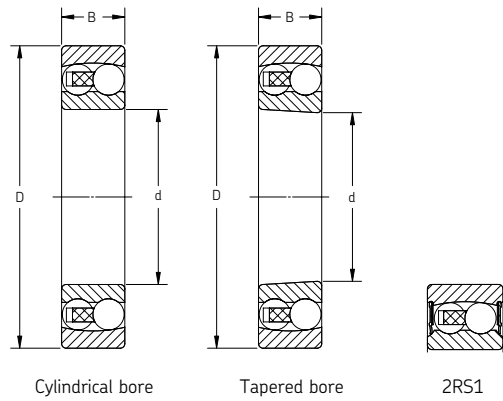
Double row  
Open, cylindrical and tapered bore  
Series: 2301 – 2320 M  
Size: 12 mm – 100 mm  
0.4724 in – 3.9370 in

Series: 13030 – 13948  
Size: 150 mm – 240 mm  
5.9055 in – 9.4488 in

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation	Mass		
	Bore d		Outside diameter D		Width B		Dynamic C		Static C <sub>0</sub>		Refer- ence speed	Limiting speed	kg	lb		Tapered bore	Adapter sleeve	kg
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb			kg	lb
2301	12	0.4724	37	1.4567	17	0.6693	11 700	2 630	2 700	610	38 000	28 000	0.10	0.21	-	-	-	-
2302	15	0.5906	42	1.6535	17	0.6693	11 900	2 670	2 900	650	32 000	24 000	0.12	0.26	-	-	-	-
2303	17	0.6693	47	1.8504	19	0.7480	14 300	3 210	3 550	800	30 000	22 000	0.18	0.40	-	-	-	-
2304	20	0.7874	52	2.0472	21	0.8268	18 200	4 090	4 750	1 070	26 000	19 000	0.22	0.49	-	-	-	-
2305 E	25	0.9843	62	2.4409	24	0.9449	27 000	6 070	7 100	1 600	22 000	16 000	0.34	0.75	2305 EK	H 2305	0.1	0.2
2306	30	1.1811	72	2.8346	27	1.0630	31 200	7 010	8 800	1 980	18 000	13 000	0.50	1.10	2306 K	H 2306	0.1	0.3
2307 E	35	1.3780	80	3.1496	31	1.2205	39 700	8 920	11 200	2 520	16 000	12 000	0.68	1.50	2307 EK	H 2307	0.2	0.4
2308 E	40	1.5748	90	3.5433	33	1.2992	54 000	12 130	16 000	3 600	14 000	10 000	0.93	2.05	2308 EK	H 2308	0.2	0.5
2309 E	45	1.7717	100	3.9370	36	1.4173	63 700	14 310	19 300	4 340	13 000	9 000	1.25	2.76	2309 EK	H 2309	0.3	0.6
2310	50	1.9685	110	4.3307	40	1.5748	63 700	14 310	20 000	4 490	14 000	9 500	1.65	3.64	2310 K	H 2310	0.3	0.8
2311	55	2.1654	120	4.7244	43	1.6929	76 100	17 100	24 000	5 390	11 000	7 500	2.10	4.63	2311 K	H 2311	0.4	0.9
2312	60	2.3622	130	5.1181	46	1.8110	87 100	19 570	28 500	6 400	9 500	7 000	2.60	5.73	2312 K	H 2312	0.5	1.0
2313	65	2.5591	140	5.5118	48	1.8898	95 600	21 480	32 500	7 300	9 000	6 300	3.25	7.17	2313 K	H 2313	0.5	1.1
2314	70	2.7559	150	5.9055	51	2.0079	111 000	24 940	37 500	8 430	8 000	6 000	3.90	8.60	-	-	-	-
2315	75	2.9528	160	6.2992	55	2.1654	124 000	27 870	43 000	9 660	7 500	5 600	4.70	10.36	2315 K	H 2315	1.0	2.2
2316	80	3.1496	170	6.6929	58	2.2835	135 000	30 340	49 000	11 010	7 000	5 300	6.10	13.45	2316 K	H 2316	1.2	2.7
2317 M	85	3.3465	180	7.0866	60	2.3622	140 000	31 460	51 000	11 460	6 700	4 800	7.05	15.55	2317 KM	H 2317	1.4	3.1
2318	90	3.5433	190	7.4803	64	2.5197	151 000	33 930	57 000	12 810	6 300	4 500	8.45	18.63	2318 K	H 2318	1.7	3.7
2319 M	95	3.7402	200	7.8740	67	2.6378	165 000	37 080	64 000	14 380	6 000	4 500	9.80	21.61	2319 KM	H 2319	1.8	4.0
2320	100	3.9370	215	8.4646	73	2.8740	190 000	42 700	80 000	17 980	5 600	4 000	12.50	27.56	2320 K	H 2320	2.1	4.6
13 030	150	5.9055	225	8.8583	56	2.2047	57 200	12 850	23 600	5 300	5 600	3 400	7.50	16.54	-	-	-	-
13 036	180	7.0866	280	11.0236	74	2.9134	95 600	21 480	40 000	8 990	4 500	2 800	16.00	35.28	-	-	-	-
13 940	200	7.8740	280	11.0236	60	2.3622	60 500	13 600	29 000	6 520	4 300	2 600	10.70	23.59	-	-	-	-
13 944	220	8.6614	300	11.8110	60	2.3622	60 500	13 600	30 500	6 850	3 800	2 400	11.00	24.26	-	-	-	-
13 948	240	9.4488	320	12.5984	60	2.3622	60 500	13 600	32 000	7 190	3 800	2 200	11.30	24.92	-	-	-	-

Consult SKF USA Inc. prior to design change or order placement.

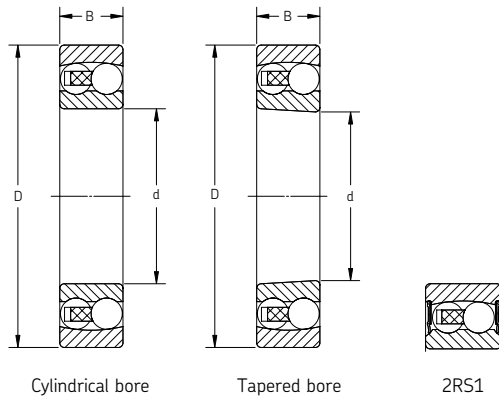
Double row  
 Sealed, cylindrical and tapered bore  
 Series: 2200 E 2RS1 – 2214 E 2RS1  
 Size: 10 mm – 70 mm  
 0.3937 in – 2.7559 in



Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation		Mass	
	Bore d		Outside diameter D		Width B		Dynamic C		Static C <sub>0</sub>		Refer-ence speed	Limiting speed	kg	lb	Tapered bore	Adapter sleeve	kg	lb
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min						
2200 E-2RS1TN9	10	0.3937	30	1.1811	14	0.5512	5530	1 240	1 180	270	5 530	17 000	0.048	0.11	-	-	-	-
2201 E-2RS1TN9	12	0.4724	32	1.2598	14	0.5512	6240	1 400	1 430	320	6 240	16 000	0.053	0.12	-	-	-	-
2202 E-2RS1TN9	15	0.5906	35	1.3780	14	0.5512	7410	1 670	1 760	400	7 410	14 000	0.058	0.13	-	-	-	-
2203 E-2RS1TN9	17	0.6693	40	1.5748	16	0.6299	8840	1 990	2 200	490	8 840	12 000	0.089	0.20	-	-	-	-
2204 E-2RS1TN9	20	0.7874	47	1.8504	18	0.7087	12700	2 850	3 400	760	12 700	10 000	0.14	0.31	-	-	-	-
2205 E-2RS1TN9	25	0.9843	52	2.0472	18	0.7087	14300	3 210	4 000	900	14 300	9 000	0.16	0.35	2205 E-2RS1K	H 305 E	0.07	0.20
2206 E-2RS1TN9	30	1.1811	62	2.4409	20	0.7874	15600	3 510	4 650	1 040	15 600	7 500	0.26	0.57	2206 E-2RS1K	H 306 E	0.10	0.30
2207 E-2RS1TN9	35	1.3780	72	2.8346	23	0.9055	19000	4 270	6 000	1 350	19 000	6 300	0.41	0.90	2207 E-2RS1K	H 307 E	0.14	0.40
2208 E-2RS1TN9	40	1.5748	80	3.1496	23	0.9055	19900	4 470	6 950	1 560	19 900	5 600	0.5	1.10	2208 E-2RS1K	H 308 E	0.17	0.40
2209 E-2RS1TN9	45	1.7717	85	3.3465	23	0.9055	22900	5 150	7 800	1 750	22 900	5 300	0.53	1.17	2209 E-2RS1K	H 309 E	0.23	0.60
2210 E-2RS1TN9	50	1.9685	90	3.5433	23	0.9055	22900	5 150	8 150	1 830	22 900	4 800	0.57	1.26	2210 E-2RS1K	H 310 E	0.27	0.60
2211 E-2RS1TN9	55	2.1654	100	3.9370	25	0.9843	27600	6 200	10 600	2 380	27 600	4 300	0.79	1.74	2211 E-2RS1K	H 311 E	0.32	0.80
2212 E-2RS1TN9	60	2.3622	110	4.3307	28	1.1024	31200	7 010	12 200	2 740	31 200	3 800	1.05	2.32	2212 E-2RS1K	H 312 E	-	-
2213 E-2RS1TN9	65	2.5591	120	4.7244	31	1.2205	35100	7 890	14 000	3 150	35 100	3 600	1.4	3.09	2213 E-2RS1K	H 313 E	0.42	1.00
2214 E-2RS1TN9	70	2.7559	125	4.9213	31	1.2205	35800	8 040	14 600	3 280	35 800	3 400	1.45	3.20	-	-	-	-

Consult SKF USA Inc. prior to design change or order placement.

Double row  
Sealed, cylindrical and tapered bore  
Series: 2302 E 2RS1 – 2310 E 2RS1  
Size: 15 mm – 50 mm  
0.5906 in – 1.9685 in



Designation	Principal dimensions						Basic load ratings				Speed rating		Mass		Designation		Mass	
	Bore d		Outside diameter D		Width B		Dynamic C		Static C <sub>0</sub>		Refer-ence speed	Limiting speed	kg	lb	Tapered bore	Adapter sleeve	kg	lb
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min						
2302 E-2RS1TN9	15	0.5906	42	1.6535	17	0.6693	10800	2 430	2 600	580	10 800	12 000	0.11	0.24	-	-	-	-
2303 E-2RS1TN9	17	0.6693	47	1.8504	19	0.7480	12700	2 850	3 400	760	12 700	11 000	0.16	0.35	-	-	-	-
2304 E-2RS1TN9	20	0.7874	52	2.0472	21	0.8268	14300	3 210	4 000	900	14 300	9 000	0.21	0.46	-	-	-	-
2305 E-2RS1TN9	25	0.9843	62	2.4409	24	0.9449	19000	4 270	5 400	1 210	19 000	7 500	0.34	0.75	2305 E-2RS1K	H 2305	-	-
2306 E-2RS1TN9	30	1.1811	72	2.8346	27	1.0630	22500	5 060	6 800	1 530	22 500	6 700	0.51	1.12	2306 E-2RS1K	H 2306	-	-
2307 E-2RS1TN9	35	1.3780	80	3.1496	31	1.2205	26500	5 960	8 500	1 910	26 500	5 600	0.7	1.54	2307 E-2RS1K	H 2307 E	-	-
2308 E-2RS1TN9	40	1.5748	90	3.5433	33	1.2992	33800	7 600	11 200	2 520	33 800	5 000	0.96	2.12	2308 E-2RS1K	H 2309	-	-
2309 E-2RS1TN9	45	1.7717	100	3.9370	36	1.4173	39000	8 760	13 400	3 010	39 000	4 500	1.3	2.87	2309 E-2RS1K	H 2309	-	-
2310 E-2RS1TN9	50	1.9685	110	4.3307	40	1.5748	43600	9 800	14 000	3 150	43 600	4 000	1.65	3.64	2310 E-2RS1K	H 2310	-	-

Consult SKF USA Inc. prior to design change or order placement.

# Notes