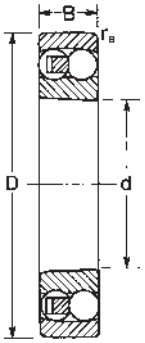


Self-aligning bearings have two rows of balls with a common sphered raceway in the outer ring. This gives the bearings their self-aligning property, permitting angular misalignment of the shaft relative to the housing. They are therefore particularly suitable for applications where misalignment can arise from errors in mounting or from shaft deflection. In addiiton, non-sealed self-aligning ball bearings have the lowest friction of any bearing type.

Bearing sizes having the E suffix have higher load ratings than the original standard design because of improvements in internal construction. They are supplied with a glass fiber reinforced, 6.6 polyamide cage as standard. Machined brass or pressed steel cages are supplied on other sizes.

Series	Page
100	**67**
1200, 1200E	**67**
1300, 1300E	**68**
1400	**68**
2200, 2200E	**69**
2300, 2300E	**69**
1200K, 1200EK—Tapered Bore	**70**
1300K, 1300EK—Tapered Bore	**70**
2200K, 2200EK—Tapered Bore	**71**
2300K, 2300EK—Tapered Bore	**71**
1200K, 1200EK—Tapered Bore with Adapter Sleeve	**72**
1300K, 1300EK—Tapered Bore with Adapter Sleeve	**72**
2200K, 2200EK—Tapered Bore with Adapter Sleeve	**73**
2300K, 2300EK—Tapered Bore with Adapter Sleeve	**73**
2200E2RS1—Two Seals	**74**
2300E2RS1—Two Seals	**74**
2200E2RS1K—Two Seals and Tapered Bore	**74**
11200E—Extended Inner Ring	**75**
11300E—Extended Inner Ring	**75**
Internal Clearance	**76**
Allowable Angular Misalignment	**76**
Equivalent Load and Life	**77**
Life Calculation Examples	**77**
Minimum Required Radial Load	**77**
Ball Protrusion Beyond Bearing Face	**79**
Mounting Procedure	**80**

Basic Design

Self-aligning bearings of the basic design are available with both a cylindrical bore and a tapered bore with a 1:12 taper. Tapered bore bearings are furnished with adapter sleeves, including nut and lock washer, with which the bearings can be secured to smooth or stepped shafts. They are identified by suffix letter K.

Sealed Bearings

Self-aligning bearings with cylindrical and tapered bores are available with contact seals on both sides, identified by the suffix 2RS1. The seals are made of oil and wear resistant synthetic rubber reinforced by a steel insert. The operating temperature range for the seals, with a suitable grease, is -40˚C to 120˚C (-40˚F to 248˚F). Sealed bearings are supplied with a lithium base grease suitable for an operating temperature range of -30˚C to 110˚C (-22˚F to 230˚F).

Sealed bearings with a tapered bore require a special adapter sleeve and lockwasher identified by the suffix letter C. The lockwashers have a circular beading on the side facing the bearing to prevent interference with the seal.

Extended Inner Ring Bearings

Self-aligning bearings with an extended inner ring are used in applications employing commercial ground shafting. A special bore tolerance allows easy mounting and dismounting.

These bearings 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 used in pairs, the slots on the inner ring must either be adjacent or at the outboard positions to provide shaft location in both directions.

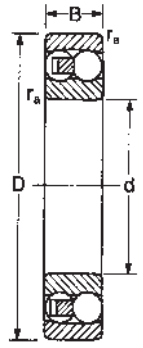
Tolerances

Self-aligning bearings are manufactured to ABEC-1 tolerances as shown on page 241. The exceptions are the bore and inner ring width on extended inner ring bearings, which are manufactured to the tolerances shown in the table below.

All tolerances in ten thousandths inches (.0001) and micrometers (um).

Note: Top figure is inch, bottom is micrometer.

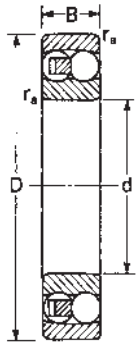
Bore Diameter (mm) Over	Incl	Bore Diameter Tolerance		Bore Out-of Round (Max)	Inner Ring Width
2.5	10	+3	–3	6	–130
		+8	–8	14	–330
10	18	+3	–3	6	–130
		+8	–8	14	–330
18	30	+4	–4	7	–130
		+10	–10	17	–330
30	50	+5	–5	8	–153
		+12	–12	21	–390
50	80	+6	–6	10	–181
		+15	–15	26	–460



Cylindrical bore

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
135	5	**.1969**	19	**.7480**	6	**.2362**	.30	**.012**	.33	1.9	3	2	2 510	**564**	480	**108**	32 000	38 000
126	6	**.2362**	19	**.7480**	6	**.2362**	.30	**.012**	.33	1.9	3	2	2 510	**564**	480	**108**	32 000	38 000
127	7	**.2756**	22	**.8661**	7	**.2756**	.30	**.012**	.33	1.9	3	2	2 650	**596**	560	**126**	30 000	36 000
108	8	**.3150**	22	**.8661**	7	**.2756**	.30	**.012**	.33	1.9	3	2	2 650	**596**	560	**126**	30 000	36 000
129	9	**.3543**	26	**1.0236**	8	**.3150**	.60	**.024**	.33	1.9	3	2	3 900	**877**	815	**183**	26 000	32 000
1200E	10	**.3937**	30	**1.1811**	9	**.3543**	.60	**.024**	.33	1.9	3	2	5 530	**1 240**	1 180	**265**	24 000	30 000
1201E	12	**.4724**	32	**1.2598**	10	**.3937**	.60	**.024**	.33	1.9	3	2	6 240	**1 400**	1 430	**321**	22 000	28 000
1202E	15	**.5906**	35	**1.3780**	11	**.4331**	.60	**.024**	.33	1.9	3	2	7 410	**1 670**	1 760	**396**	19 000	24 000
1203E	17	**.6693**	40	**1.5748**	12	**.4724**	.60	**.024**	.31	2	3.1	2.2	8 840	**1 990**	2 200	**495**	18 000	22 000
1204E	20	**.7874**	47	**1.8504**	14	**.5512**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	15 000	18 000
1205E	25	**.9843**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	13 000	16 000
1206E	30	**1.1811**	62	**2.4409**	16	**.6299**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	10 000	13 000
1207E	35	**1.3780**	72	**2.8346**	17	**.6693**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	9 000	11 000
1208E	40	**1.5748**	80	**3.1496**	18	**.7087**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	8 500	10 000
1209E	45	**1.7717**	85	**3.3465**	19	**.7480**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	7 500	9 000
1210E	50	**1.9685**	90	**3.5433**	20	**.7874**	1.0	**.039**	.21	3	4.6	3.2	26 500	**5 960**	9 150	**2 060**	7 000	8 500
1211E	55	**2.1654**	100	**3.9370**	21	**.8268**	1.5	**.059**	.19	3.3	5.1	3.6	27 600	**6 210**	10 600	**2 380**	6 300	7 500
1212E	60	**2.3622**	110	**4.3307**	22	**.8661**	1.5	**.059**	.19	3.3	5.1	3.6	31 200	**7 010**	12 200	**2 740**	5 600	6 700
1213E	65	**2.5591**	120	**4.7244**	23	**.9055**	1.5	**.059**	.18	3.5	5.4	3.6	35 100	**7 890**	14 000	**3 150**	5 300	6 300
1214	70	**2.7559**	125	**4.9213**	24	**.9449**	1.5	**.059**	.18	3.5	5.4	3.6	34 500	**7 760**	13 700	**3 080**	5 000	6 000
1215	75	**2.9528**	130	**5.1181**	25	**.9843**	1.5	**.059**	.17	3.7	5.7	4	39 000	**8 770**	15 600	**3 510**	4 800	5 600
1216	80	**3.1496**	140	**5.5118**	26	**1.0236**	2.0	**.079**	.16	3.9	6.1	4	39 700	**8 930**	17 000	**3 820**	4 500	5 300
1217	85	**3.3465**	150	**5.9055**	28	**1.1024**	2.0	**.079**	.17	3.7	5.7	4	48 800	**11 000**	20 800	**4 680**	4 000	4 800
1218	90	**3.5433**	160	**6.2992**	30	**1.1811**	2.0	**.079**	.17	3.7	5.7	4	57 200	**12 900**	23 600	**5 310**	3 800	4 500
1219	95	**3.7402**	170	**6.6929**	32	**1.2598**	2.0	**.079**	.17	3.7	5.7	4	63 700	**14 300**	27 000	**6 070**	3 600	4 300
1220	100	**3.9370**	180	**7.0866**	34	**1.3386**	2.0	**.079**	.17	3.7	5.7	4	68 900	**15 500**	30 000	**6 740**	3 400	4 000
1221	105	**4.1339**	190	**7.4803**	36	**1.4173**	2.0	**.079**	.17	3.7	5.7	4	74 100	**16 700**	32 500	**7 310**	3 200	3 800
1222	110	**4.3307**	200	**7.8740**	38	**1.4961**	2.0	**.079**	.17	3.7	5.7	4	88 400	**19 900**	39 000	**8 770**	3 000	3 600
1224	120	**4.7244**	215	**8.4646**	42	**1.6535**	2.0	**.079**	.19	3.3	5.1	3.6	119 000	**26 800**	53 000	**11 900**	2 800	3 400
1226	130	**5.1181**	230	**9.0551**	46	**1.8110**	2.5	**.098**	.19	3.3	5.1	3.6	127 000	**28 600**	58 500	**13 200**	2 600	3 200

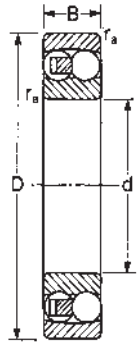
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Cylindrical Bore

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
1301E	12	**.4724**	37	**1.4567**	12	**.4724**	1.0	**.039**	.35	1.8	2.8	1.8	9 360	**2 100**	2 160	**486**	18 000	22 000
1302E	15	**.5906**	42	**1.6535**	13	**.5118**	1.0	**.039**	.31	2	3.1	2.2	10 800	**2 430**	2 600	**585**	17 000	20 000
1303E	17	**.6693**	47	**1.8504**	14	**.5512**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	14 000	17 000
1304E	20	**.7874**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	12 000	15 000
1305E	25	**.9843**	62	**2.4409**	17	**.6693**	1.0	**.039**	.28	2.2	3.5	2.5	19 000	**4 270**	5 400	**1 210**	9 500	12 000
1306E	30	**1.1811**	72	**2.8346**	19	**.7480**	1.0	**.039**	.25	2.5	3.9	2.5	22 500	**5 060**	6 800	**1 530**	9 000	11 000
1307E	35	**1.3780**	80	**3.1496**	21	**.8268**	1.5	**.059**	.25	2.5	3.9	2.5	26 500	**5 960**	8 500	**1 910**	7 500	9 000
1308E	40	**1.5748**	90	**3.5433**	23	**.9055**	1.5	**.059**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 700	8 000
1309E	45	**1.7717**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 300	7 500
1310E	50	**1.9685**	110	**4.3307**	27	**1.0630**	2.0	**.079**	.24	2.6	4.1	2.8	43 600	**9 800**	14 000	**3 150**	5 600	6 700
1311E	55	**2.1654**	120	**4.7244**	29	**1.1417**	2.0	**.079**	.23	2.7	4.2	2.8	50 700	**11 400**	18 000	**4 050**	5 000	6 000
1312E	60	**2.3622**	130	**5.1181**	31	**1.2205**	2.0	**.079**	.23	2.7	4.2	2.8	58 500	**13 200**	22 000	**4 950**	4 500	5 300
1313E	65	**2.5591**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 300	5 000
1314	70	**2.7559**	150	**5.9055**	35	**1.3780**	2.0	**.079**	.22	2.9	4.5	2.8	74 100	**16 700**	27 500	**6 180**	4 000	4 800
1315	75	**2.9528**	160	**6.2992**	37	**1.4567**	2.0	**.079**	.22	2.9	4.5	2.8	79 300	**17 800**	30 000	**6 740**	3 800	4 500
1316	80	**3.1496**	170	**6.6929**	39	**1.5354**	2.0	**.079**	.22	2.9	4.5	2.8	88 400	**19 900**	33 500	**7 530**	3 600	4 300
1317	85	**3.3465**	180	**7.0866**	41	**1.6142**	2.5	**.098**	.22	2.9	4.5	2.8	97 500	**21 900**	38 000	**8 540**	3 400	4 000
1318	90	**3.5433**	190	**7.4803**	43	**1.6929**	2.5	**.098**	.22	2.9	4.5	2.8	117 000	**26 300**	44 000	**9 890**	3 200	3 800
1319	95	**3.7402**	200	**7.8740**	45	**1.7717**	2.5	**.098**	.23	2.7	4.2	2.8	133 000	**29 900**	51 000	**11 500**	3 000	3 600
1320	100	**3.9370**	215	**8.4646**	47	**1.8504**	2.5	**.098**	.23	2.7	4.2	2.8	143 000	**32 200**	57 000	**12 800**	2 800	3 400
1322	110	**4.3307**	240	**9.4488**	50	**1.9685**	2.5	**.098**	.22	2.9	4.5	2.8	163 000	**36 600**	72 000	**16 200**	2 400	3 000
1406	30	**1.1811**	90	**3.5433**	28	**1.1024**	1.5	**.059**	.40	1.6	2.4	1.6	59 200	**13 300**	17 000	**3 820**	6 700	8 000
1407	35	**1.3780**	100	**3.9370**	30	**1.1811**	1.5	**.059**	.37	1.7	2.6	1.8	62 400	**14 000**	18 000	**4 050**	6 300	7 500
1408	40	**1.5748**	110	**4.3307**	33	**1.2992**	2.0	**.079**	.35	1.8	2.8	1.8	76 100	**17 100**	23 600	**5 310**	5 300	6 300
1409	45	**1.7717**	120	**4.7244**	35	**1.3780**	2.0	**.079**	.35	1.8	2.8	1.8	88 400	**19 900**	27 500	**6 180**	5 000	6 000
1410	50	**1.9685**	130	**5.1181**	37	**1.4567**	2.0	**.079**	.35	1.8	2.8	1.8	101 000	**22 700**	32 000	**7 190**	4 800	5 600
1411	55	**2.1654**	140	**5.5118**	40	**1.5748**	2.0	**.079**	.33	1.9	3	2	111 000	**25 000**	36 500	**8 210**	4 300	5 000
1412	60	**2.3622**	150	**5.9055**	42	**1.6535**	2.0	**.079**	.33	1.9	3	2	125 000	**28 100**	41 500	**9 330**	3 800	4 500

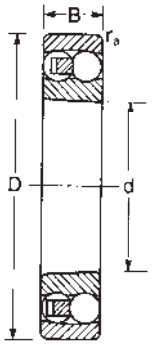
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Cylindrical bore

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
2200E	10	**.3937**	30	**1.1811**	14	**.5512**	.60	**.024**	.54	1.15	1.8	1.3	8 060	**1 810**	1 730	**389**	22 000	28 000
2201E	12	**.4724**	32	**1.2598**	14	**.5512**	.60	**.024**	.50	1.25	2	1.3	8 520	**1 920**	1 900	**427**	20 000	26 000
2202E	15	**.5906**	35	**1.3780**	14	**.5512**	.60	**.024**	.43	1.5	2.3	1.6	8 710	**1 960**	2 040	**459**	18 000	22 000
2203E	17	**.6693**	40	**1.5748**	16	**.6299**	.60	**.024**	.43	1.5	2.3	1.6	10 600	**2 380**	2 550	**573**	17 000	20 000
2204E	20	**.7874**	47	**1.8504**	18	**.7087**	1.0	**.039**	.40	1.6	2.4	1.6	16 800	**3 780**	4 150	**933**	14 000	17 000
2205E	25	**.9843**	52	**2.0472**	18	**.7087**	1.0	**.039**	.35	1.8	2.8	1.8	16 800	**3 780**	4 400	**989**	11 000	14 000
2206E	30	**1.1811**	62	**2.4409**	20	**.7874**	1.0	**.039**	.33	1.9	3	2	23 800	**5 350**	6 700	**1 510**	9 500	12 000
2207E	35	**1.3780**	72	**2.8346**	23	**.9055**	1.0	**.039**	.31	2	3.1	2.2	30 700	**6 900**	8 800	**1 980**	8 500	10 000
2208E	40	**1.5748**	80	**3.1496**	23	**.9055**	1.0	**.039**	.28	2.2	3.5	2.5	31 900	**7 170**	10 000	**2 250**	7 500	9 000
2209E	45	**1.7717**	85	**3.3465**	23	**.9055**	1.0	**.039**	.26	2.4	3.7	2.5	32 500	**7 310**	10 600	**2 380**	7 000	8 500
2210E	50	**1.9685**	90	**3.5433**	23	**.9055**	1.0	**.039**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 300	7 500
2211E	55	**2.1654**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 000	7 000
2212E	60	**2.3622**	110	**4.3307**	28	**1.1024**	1.5	**.059**	.24	2.6	4.1	2.8	48 800	**11 000**	17 000	**3 820**	5 300	6 300
2213E	65	**2.5591**	120	**4.7244**	31	**1.2205**	1.5	**.059**	.24	2.6	4.1	2.8	57 200	**12 900**	20 000	**4 500**	5 000	6 000
2214	70	**2.7559**	125	**4.9213**	31	**1.2205**	1.5	**.059**	.27	2.3	3.6	2.5	44 200	**9 940**	17 000	**3 820**	4 800	5 600
2215	75	**2.9528**	130	**5.1181**	31	**1.2205**	1.5	**.059**	.25	2.5	3.9	2.5	44 200	**9 940**	18 000	**4 050**	4 500	5 300
2216E	80	**3.1496**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 000	4 800
2217	85	**3.3465**	150	**5.9055**	36	**1.4173**	2.0	**.079**	.25	2.5	3.9	2.5	58 500	**13 200**	23 600	**5 310**	3 800	4 500
2218	90	**3.5433**	160	**6.2992**	40	**1.5748**	2.0	**.079**	.27	2.3	3.6	2.5	70 200	**15 800**	28 500	**6 410**	3 600	4 300
2219	95	**3.7402**	170	**6.6929**	43	**1.6929**	2.0	**.079**	.27	2.3	3.6	2.5	83 200	**18 700**	34 500	**7 760**	3 400	4 000
2220	100	**3.9370**	180	**7.0866**	46	**1.8110**	2.0	**.079**	.27	2.3	3.6	2.5	97 500	**21 900**	40 500	**9 110**	3 200	3 800
2221	105	**4.1339**	190	**7.4803**	50	**1.9685**	2.0	**.079**	.28	2.2	3.5	2.5	108 000	**24 300**	45 000	**10 100**	3 000	3 600
2222	110	**4.3307**	200	**7.8740**	53	**2.0866**	2.0	**.079**	.28	2.2	3.5	2.5	124 000	**27 900**	52 000	**11 700**	2 800	3 400
2301	12	**.4724**	37	**1.4567**	17	**.6693**	1.0	**.039**	.60	1.05	1.6	1.1	11 700	**2 630**	2 700	**607**	17 000	20 000
2302	15	**.5906**	42	**1.6535**	17	**.6693**	1.0	**.039**	.52	1.2	1.9	1.3	11 900	**2 680**	2 900	**652**	15 000	18 000
2303	17	**.6693**	47	**1.8504**	19	**.7480**	1.0	**.039**	.52	1.2	1.9	1.3	14 600	**3 280**	3 550	**798**	13 000	16 000
2304	20	**.7874**	52	**2.0472**	21	**.8268**	1.0	**.039**	.52	1.2	1.9	1.3	18 200	**4 090**	4 750	**1 070**	11 000	14 000
2305	25	**.9843**	62	**2.4409**	24	**.9449**	1.0	**.039**	.48	1.3	2	1.4	24 200	**5 440**	6 550	**1 470**	9 500	12 000
2306	30	**1.1811**	72	**2.8346**	27	**1.0630**	1.0	**.039**	.44	1.4	2.2	1.4	31 200	**7 010**	8 800	**1 980**	8 500	10 000
2307E	35	**1.3780**	80	**3.1496**	31	**1.2205**	1.5	**.059**	.46	1.35	2.1	1.4	39 700	**8 930**	11 200	**2 520**	7 000	8 500
2308E	40	**1.5748**	90	**3.5433**	33	**1.2992**	1.5	**.059**	.40	1.6	2.4	1.6	54 000	**12 100**	16 000	**3 600**	6 300	7 500
2309E	45	**1.7717**	100	**3.9370**	36	**1.4173**	1.5	**.059**	.33	1.9	3	2	63 700	**14 300**	19 300	**4 340**	5 600	6 700
2310	50	**1.9685**	110	**4.3307**	40	**1.5748**	2.0	**.079**	.43	1.5	2.3	1.6	63 700	**14 300**	20 000	**4 500**	5 300	6 300
2311	55	**2.1654**	120	**4.7244**	43	**1.6929**	2.0	**.079**	.40	1.6	2.4	1.6	76 100	**17 100**	24 000	**5 400**	4 800	5 600
2312	60	**2.3622**	130	**5.1181**	46	**1.8110**	2.0	**.079**	.33	1.9	3	2	87 100	**19 600**	28 500	**6 410**	4 500	5 300
2313	65	**2.5591**	140	**5.5118**	48	**1.8898**	2.0	**.079**	.37	1.7	2.6	1.8	95 600	**21 500**	32 500	**7 310**	4 000	4 800
2314	70	**2.7559**	150	**5.9055**	51	**2.0079**	2.0	**.079**	.37	1.7	2.6	1.8	111 000	**25 000**	37 500	**8 430**	3 800	4 500
2315	75	**2.9528**	160	**6.2992**	55	**2.1654**	2.0	**.079**	.37	1.7	2.6	1.8	124 000	**27 900**	43 000	**9 670**	3 400	4 000
2316	80	**3.1496**	170	**6.6929**	58	**2.2835**	2.0	**.079**	.37	1.7	2.6	1.8	135 000	**30 400**	49 000	**11 000**	3 200	3 800
2317	85	**3.3465**	180	**7.0866**	60	**2.3622**	2.5	**.098**	.37	1.7	2.6	1.8	140 000	**31 500**	51 000	**11 500**	3 000	3 600
2318	90	**3.5433**	190	**7.4803**	64	**2.5197**	2.5	**.098**	.37	1.7	2.6	1.8	153 000	**34 400**	57 000	**12 800**	2 800	3 400
2319	95	**3.7402**	200	**7.8740**	67	**2.6378**	2.5	**.098**	.37	1.7	2.6	1.8	165 000	**37 100**	64 000	**14 400**	2 600	3 200
2320	100	**3.9370**	215	**8.4646**	73	**2.8740**	2.5	**.098**	.37	1.7	2.6	1.8	190 000	**42 700**	80 000	**18 000**	2 400	3 000
2322	110	**4.3307**	240	**9.4488**	80	**3.1496**	2.5	**.098**	.37	1.7	2.6	1.8	216 000	**48 600**	95 000	**21 400**	2 200	2 800

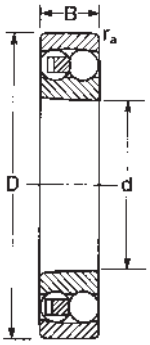
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Tapered bore
taper 1:12 on diameter

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
1204EK	20	**.7874**	47	**1.8504**	14	**.5512**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	15 000	18 000
1205EK	25	**.9843**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	13 000	16 000
1206EK	30	**1.1811**	62	**2.4409**	16	**.6299**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	10 000	13 000
1207EK	35	**1.3780**	72	**2.8346**	17	**.6693**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	9 000	11 000
1208EK	40	**1.5748**	80	**3.1496**	18	**.7087**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	8 500	10 000
1209EK	45	**1.7717**	85	**3.3465**	19	**.7480**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	7 500	9 000
1210EK	50	**1.9685**	90	**3.5433**	20	**.7874**	1.0	**.039**	.21	3	4.6	3.2	26 500	**5 960**	9 150	**2 060**	7 000	8 500
1211EK	55	**2.1654**	100	**3.9370**	21	**.8268**	1.5	**.059**	.19	3.3	5.1	3.6	27 600	**6 210**	10 600	**2 380**	6 300	7 500
1212EK	60	**2.3622**	110	**4.3307**	22	**.8661**	1.5	**.059**	.19	3.3	5.1	3.6	31 200	**7 010**	12 200	**2 740**	5 600	6 700
1213EK	65	**2.5591**	120	**4.7244**	23	**.9055**	1.5	**.059**	.18	3.5	5.4	3.6	35 100	**7 890**	14 000	**3 150**	5 300	6 300
1215K	75	**2.9528**	130	**5.1181**	25	**.9843**	1.5	**.059**	.17	3.7	5.7	4	39 000	**8 770**	15 600	**3 510**	4 800	5 600
1216K	80	**3.1496**	140	**5.5118**	26	**1.0236**	2.0	**.079**	.16	3.9	6.1	4	39 700	**8 930**	17 000	**3 820**	4 500	5 300
1217K	85	**3.3465**	150	**5.9055**	28	**1.1024**	2.0	**.079**	.17	3.7	5.7	4	48 800	**11 000**	20 800	**4 680**	4 000	4 800
1218K	90	**3.5433**	160	**6.2992**	30	**1.1811**	2.0	**.079**	.17	3.7	5.7	4	57 200	**12 900**	23 600	**5 310**	3 800	4 500
1219K	95	**3.7402**	170	**6.6929**	32	**1.2598**	2.0	**.079**	.17	3.7	5.7	4	63 700	**14 300**	27 000	**6 070**	3 600	4 300
1220K	100	**3.9370**	180	**7.0866**	34	**1.3386**	2.0	**.079**	.17	3.7	5.7	4	68 900	**15 500**	30 000	**6 740**	3 400	4 000
1221K	105	**4.1339**	190	**7.4803**	36	**1.4173**	2.0	**.079**	.17	3.7	5.7	4	74 100	**16 700**	32 500	**7 310**	3 200	3 800
1222K	110	**4.3307**	200	**7.8740**	38	**1.4961**	2.0	**.079**	.17	3.7	5.7	4	88 400	**19 900**	39 000	**8 770**	3 000	3 600
1224K	120	**4.7244**	215	**8.4646**	42	**1.6535**	2.0	**.079**	.19	3.3	5.1	3.6	11 900	**26 800**	53 000	**11 900**	2 800	3 400
1304EK	20	**.7874**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	12 000	15 000
1305EK	25	**.9843**	62	**2.4409**	17	**.6693**	1.0	**.039**	.28	2.2	3.5	2.5	19 000	**4 270**	5 400	**1 210**	9 500	12 000
1306EK	30	**1.1811**	72	**2.8346**	19	**.7480**	1.0	**.039**	.25	2.5	3.9	2.5	22 500	**5 060**	6 800	**1 530**	9 000	11 000
1307EK	35	**1.3780**	80	**3.1496**	21	**.8268**	1.5	**.059**	.25	2.5	3.9	2.5	26 500	**5 960**	8 500	**1 910**	7 500	9 000
1308EK	40	**1.5748**	90	**3.5433**	23	**.9055**	1.5	**.059**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 700	8 000
1309EK	45	**1.7717**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 300	7 500
1310EK	50	**1.9685**	110	**4.3307**	27	**1.0630**	2.0	**.079**	.24	2.6	4.1	2.8	43 600	**9 800**	14 000	**3 150**	5 600	6 700
1311EK	55	**2.1654**	120	**4.7244**	29	**1.1417**	2.0	**.079**	.23	2.7	4.2	2.8	50 700	**11 400**	18 000	**4 050**	5 000	6 000
1312EK	60	**2.3622**	130	**5.1181**	31	**1.2205**	2.0	**.079**	.23	2.7	4.2	2.8	58 500	**13 200**	22 000	**4 950**	4 500	5 300
1313EK	65	**2.5591**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 300	5 000
1315K	75	**2.9528**	160	**6.2992**	37	**1.4567**	2.0	**.079**	.22	2.9	4.5	2.8	79 300	**17 800**	30 000	**6 740**	3 800	4 500
1316K	80	**3.1496**	170	**6.6929**	39	**1.5354**	2.0	**.079**	.22	2.9	4.5	2.8	88 400	**19 900**	33 500	**7 530**	3 600	4 300
1317K	85	**3.3465**	180	**7.0866**	41	**1.6142**	2.5	**.098**	.22	2.9	4.5	2.8	97 500	**21 900**	38 000	**8 540**	3 400	4 000
1318K	90	**3.5433**	190	**7.4803**	43	**1.6929**	2.5	**.098**	.22	2.9	4.5	2.8	117 000	**26 300**	44 000	**9 890**	3 200	3 800
1319K	95	**3.7402**	200	**7.8740**	45	**1.7717**	2.5	**.098**	.23	2.7	4.2	2.8	133 000	**29 900**	51 000	**11 500**	3 000	3 600
1320K	100	**3.9370**	215	**8.4646**	47	**1.8504**	2.5	**.098**	.23	2.7	4.2	2.8	143 000	**32 200**	57 000	**12 800**	2 800	3 400
1322K	110	**4.3307**	240	**9.4488**	50	**1.9685**	2.5	**.098**	.22	2.9	4.5	2.8	163 000	**36 600**	72 000	**16 200**	2 400	3 000

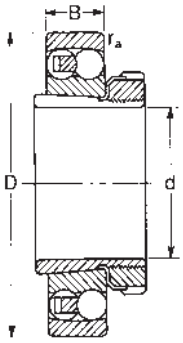
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Tapered bore
taper 1:12 on diameter

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
2205EK	25	**.9843**	52	**2.0472**	18	**.7087**	1.0	**.039**	.35	1.8	2.8	1.8	16 800	**3 780**	4 400	**989**	11 000	14 000
2206EK	30	**1.1811**	62	**2.4409**	20	**.7874**	1.0	**.039**	.33	1.9	3	2	23 800	**5 350**	6 700	**1 510**	9 500	12 000
2207EK	35	**1.3780**	72	**2.8346**	23	**.9055**	1.0	**.039**	.31	2	3.1	2.2	30 700	**6 900**	8 800	**1 980**	8 500	10 000
2208EK	40	**1.5748**	80	**3.1496**	23	**.9055**	1.0	**.039**	.28	2.2	3.5	2.5	31 900	**7 170**	10 000	**2 250**	7 500	9 000
2209EK	45	**1.7717**	85	**3.3465**	23	**.9055**	1.0	**.039**	.26	2.4	3.7	2.5	32 500	**7 310**	10 600	**2 380**	7 000	8 500
2210EK	50	**1.9685**	90	**3.5433**	23	**.9055**	1.0	**.039**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 300	7 500
2211EK	55	**2.1654**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 000	7 000
2212EK	60	**2.3622**	110	**4.3307**	28	**1.1024**	1.5	**.059**	.24	2.6	4.1	2.8	48 800	**11 000**	17 000	**3 820**	5 300	6 300
2213EK	65	**2.5591**	120	**4.7244**	31	**1.2205**	1.5	**.059**	.24	2.6	4.1	2.8	57 200	**12 900**	20 000	**4 500**	5 000	6 000
2215K	75	**2.9528**	130	**5.1181**	31	**1.2205**	1.5	**.059**	.25	2.5	3.9	2.5	44 200	**9 940**	18 000	**4 050**	4 500	5 300
2216EK	80	**3.1496**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 000	4 800
2217K	85	**3.3465**	150	**5.9055**	36	**1.4173**	2.0	**.079**	.25	2.5	3.9	2.5	58 500	**13 200**	23 600	**5 310**	3 800	4 500
2218K	90	**3.5433**	160	**6.2992**	40	**1.5748**	2.0	**.079**	.27	2.3	3.6	2.5	70 200	**15 800**	28 500	**6 410**	3 600	4 300
2219K	95	**3.7402**	170	**6.6929**	43	**1.6929**	2.0	**.079**	.27	2.3	3.6	2.5	83 200	**18 700**	34 500	**7 760**	3 400	4 000
2220K	100	**3.9370**	180	**7.0866**	46	**1.8110**	2.0	**.079**	.27	2.3	3.6	2.5	97 500	**21 900**	40 500	**9 110**	3 200	3 800
2221K	105	**4.1339**	190	**7.4803**	50	**1.9685**	2.0	**.079**	.28	2.2	3.5	2.5	108 000	**24 300**	45 000	**10 100**	3 000	3 600
2222K	110	**4.3307**	200	**7.8740**	53	**2.0866**	2.0	**.079**	.28	2.2	3.5	2.5	124 000	**27 900**	52 000	**11 700**	2 800	3 400
2305K	25	**.9843**	62	**2.4409**	24	**.9449**	1.0	**.039**	.48	1.3	2	1.4	24 200	**5 440**	6 550	**1 470**	9 500	12 000
2306K	30	**1.1811**	72	**2.8346**	27	**1.0630**	1.0	**.039**	.44	1.4	2.2	1.4	31 200	**7 010**	8 800	**1 980**	8 500	10 000
2307EK	35	**1.3780**	80	**3.1496**	31	**1.2205**	1.5	**.059**	.46	1.35	2.1	1.4	39 700	**8 930**	11 200	**2 520**	7 000	8 500
2308EK	40	**1.5748**	90	**3.5433**	33	**1.2992**	1.5	**.059**	.40	1.6	2.4	1.6	54 000	**12 100**	16 000	**3 600**	6 300	7 500
2309EK	45	**1.7717**	100	**3.9370**	36	**1.4173**	1.5	**.059**	.33	1.9	3	2	63 700	**14 300**	19 300	**4 340**	5 600	6 700
2310K	50	**1.9685**	110	**4.3307**	40	**1.5748**	2.0	**.079**	.43	1.5	2.3	1.6	63 700	**14 300**	20 000	**4 500**	5 300	6 300
2311K	55	**2.1654**	120	**4.7244**	43	**1.6929**	2.0	**.079**	.40	1.6	2.4	1.6	76 100	**17 100**	24 000	**5 400**	4 800	5 600
2312K	60	**2.3622**	130	**5.1181**	46	**1.8110**	2.0	**.079**	.33	1.9	3	2	87 100	**19 600**	28 500	**6 410**	4 500	5 300
2313K	65	**2.5591**	140	**5.5118**	48	**1.8898**	2.0	**.079**	.37	1.7	2.6	1.8	95 600	**21 500**	32 500	**7 310**	4 000	4 800
2315K	75	**2.9528**	160	**6.2992**	55	**2.1654**	2.0	**.079**	.37	1.7	2.6	1.8	124 000	**27 900**	43 000	**9 670**	3 400	4 000
2316K	80	**3.1496**	170	**6.6929**	58	**2.2835**	2.0	**.079**	.37	1.7	2.6	1.8	135 000	**30 400**	49 000	**11 000**	3 200	3 800
2317K	85	**3.3465**	180	**7.0866**	60	**2.3622**	2.5	**.098**	.37	1.7	2.6	1.8	140 000	**31 500**	51 000	**11 500**	3 000	3 600
2318K	90	**3.5433**	190	**7.4803**	64	**2.5197**	2.5	**.098**	.37	1.7	2.6	1.8	153 000	**34 400**	57 000	**12 800**	2 800	3 400
2319K	95	**3.7402**	200	**7.8740**	67	**2.6378**	2.5	**.098**	.37	1.7	2.6	1.8	165 000	**37 100**	64 000	**14 400**	2 600	3 200
2320K	100	**3.9370**	215	**8.4646**	73	**2.8740**	2.5	**.098**	.37	1.7	2.6	1.8	190 000	**42 700**	80 000	**18 000**	2 400	3 000
2322K	110	**4.3307**	240	**9.4488**	80	**3.1496**	2.5	**.098**	.37	1.7	2.6	1.8	216 000	**48 600**	95 000	**21 400**	2 200	2 800

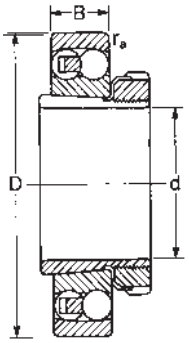
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Tapered Bore
Taper 1:12 on Dia.

MRC Bearing Number	Adapter Sleeve	Bore d mm	Bore d in	Outside Diameter D mm	Outside Diameter D in	Width B mm	Width B in	Fillet Radius[1] r_a mm	Fillet Radius[1] r_a in	Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2] N	Dynamic C[2] lbf	Static C_0 N	Static C_0 lbf	Speed Rating Grease RPM	Speed Rating Oil RPM
1204EK	**H204**	17	**.6693**	47	**1.8504**	14	**.5512**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	15 000	18 000
1205EK	**H205**	20	**.7874**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	13 000	16 000
1206EK	**H206**	25	**.9843**	62	**2.4409**	16	**.6299**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	10 000	13 000
1207EK	**H207**	30	**1.1811**	72	**2.8346**	17	**.6693**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	9 000	11 000
1208EK	**H208**	35	**1.3780**	80	**3.1496**	18	**.7087**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	8 500	10 000
1209EK	**H209**	40	**1.5748**	85	**3.3465**	19	**.7480**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	7 500	9 000
1210EK	**H210**	45	**1.7717**	90	**3.5433**	20	**.7874**	1.0	**.039**	.21	3	4.6	3.2	26 500	**5 960**	9 150	**2 060**	7 000	8 500
1211EK	**H211**	50	**1.9685**	100	**3.9370**	21	**.8268**	1.5	**.059**	.19	3.3	5.1	3.6	27 600	**6 210**	10 600	**2 380**	6 300	7 500
1212EK	**H212**	55	**2.1654**	110	**4.3307**	22	**.8661**	1.5	**.059**	.19	3.3	5.1	3.6	31 200	**7 010**	12 200	**2 740**	5 600	6 700
1213EK	**H213**	60	**2.3622**	120	**4.7244**	23	**.9055**	1.5	**.059**	.18	3.5	5.4	3.6	35 100	**7 890**	14 000	**3 150**	5 300	6 300
1215K	**H215**	65	**2.5591**	130	**5.1181**	25	**.9843**	1.5	**.059**	.17	3.7	5.7	4	39 000	**8 770**	15 600	**3 510**	4 800	5 600
1216K	**H216**	70	**2.7559**	140	**5.5118**	26	**1.0236**	2.0	**.079**	.16	3.9	6.1	4	39 700	**8 930**	17 000	**3 820**	4 500	5 300
1217K	**H217**	75	**2.9528**	150	**5.9055**	28	**1.1024**	2.0	**.079**	.17	3.7	5.7	4	48 800	**11 000**	20 800	**4 680**	4 000	4 800
1218K	**H218**	80	**3.1496**	160	**6.2992**	30	**1.1811**	2.0	**.079**	.17	3.7	5.7	4	57 200	**12 900**	23 600	**5 310**	3 800	4 500
1219K	**H219**	85	**3.3465**	170	**6.6929**	32	**1.2598**	2.0	**.079**	.17	3.7	5.7	4	63 700	**14 300**	27 000	**6 070**	3 600	4 300
1220K	**H220**	90	**3.5433**	180	**7.0866**	34	**1.3386**	2.0	**.079**	.17	3.7	5.7	4	68 900	**15 500**	30 000	**6 740**	3 400	4 000
1221K	**H221**	95	**3.7402**	190	**7.4803**	36	**1.4173**	2.0	**.079**	.17	3.7	5.7	4	74 100	**16 700**	32 500	**7 310**	3 200	3 800
1222K	**H222**	100	**3.9370**	200	**7.8740**	38	**1.4961**	2.0	**.079**	.17	3.7	5.7	4	88 400	**19 900**	39 000	**8 770**	3 000	3 600
1224K	**H3024**	110	**4.3307**	215	**8.4646**	42	**1.6535**	2.0	**.079**	.19	3.3	5.1	3.6	119 000	**26 800**	53 000	**11 900**	2 800	3 400
1304EK	**H304**	17	**.6693**	52	**2.0472**	15	**.5906**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	12 000	14 000
1305EK	**H305**	20	**.7874**	62	**2.4409**	17	**.6693**	1.0	**.039**	.28	2.2	3.5	2.5	19 000	**4 270**	5 400	**1 210**	9 500	12 000
1306EK	**H306**	25	**.9843**	72	**2.8346**	19	**.7480**	1.0	**.039**	.25	2.5	3.9	2.5	22 500	**5 060**	6 800	**1 530**	9 000	11 000
1307EK	**H307**	30	**1.1811**	80	**3.1496**	21	**.8268**	1.5	**.059**	.25	2.5	3.9	2.5	26 500	**5 960**	8 500	**1 910**	7 500	9 000
1308EK	**H308**	35	**1.3780**	90	**3.5433**	23	**.9055**	1.5	**.059**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 700	8 000
1309EK	**H309**	40	**1.5748**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 300	7 500
1310EK	**H310**	45	**1.7717**	110	**4.3307**	27	**1.0630**	2.0	**.079**	.24	2.6	4.1	2.8	43 600	**9 800**	14 000	**3 150**	5 600	6 700
1311EK	**H311**	50	**1.9685**	120	**4.7244**	29	**1.1417**	2.0	**.079**	.23	2.7	4.2	2.8	50 700	**11 400**	18 000	**4 050**	5 000	6 000
1312EK	**H312**	55	**2.1654**	130	**5.1181**	31	**1.2205**	2.0	**.079**	.23	2.7	4.2	2.8	58 500	**13 200**	22 000	**4 950**	4 500	5 300
1313EK	**H313**	60	**2.3622**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 300	5 000
1315K	**H315**	65	**2.5591**	160	**6.2992**	37	**1.4567**	2.0	**.079**	.22	2.9	4.5	2.8	79 300	**17 800**	30 000	**6 740**	3 800	4 500
1316K	**H316**	70	**2.7559**	170	**6.6929**	39	**1.5354**	2.0	**.079**	.22	2.9	4.5	2.8	88 400	**19 900**	33 500	**7 530**	3 600	4 300
1317K	**H317**	75	**2.9528**	180	**7.0866**	41	**1.6142**	2.5	**.098**	.22	2.9	4.5	2.8	97 500	**21 900**	38 000	**8 540**	3 400	4 000
1318K	**H318**	80	**3.1496**	190	**7.4803**	43	**1.6929**	2.5	**.098**	.22	2.9	4.5	2.8	117 000	**26 300**	44 000	**9 890**	3 200	3 800
1319K	**H319**	85	**3.3465**	200	**7.8740**	45	**1.7717**	2.5	**.098**	.23	2.7	4.2	2.8	133 000	**29 900**	51 000	**11 500**	3 000	3 600
1320K	**H320**	90	**3.5433**	215	**8.4646**	47	**1.8504**	2.5	**.098**	.23	2.7	4.2	2.8	143 000	**32 200**	57 000	**12 800**	2 800	3 400
1322K	**H322**	100	**3.9370**	240	**9.4488**	50	**1.9685**	2.5	**.098**	.22	2.9	4.5	2.8	163 000	**36 600**	72 000	**16 200**	2 400	3 000

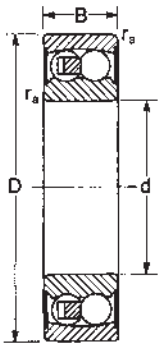
[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



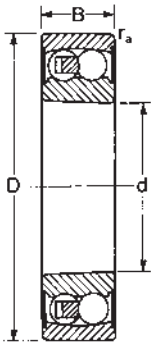
Tapered Bore
Taper 1:12 on Dia.

MRC Bearing Number	Adapter Sleeve	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease	Oil
		mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM	RPM
2205EK	**H305**	20	**.7874**	52	**2.0472**	18	**.7087**	1.0	**.039**	.35	1.8	2.8	1.8	16 800	**3 780**	4 400	**989**	11 000	14 000
2206EK	**H306**	25	**.9843**	62	**2.4409**	20	**.7874**	1.0	**.039**	.33	1.9	3	2	23 800	**5 350**	6 700	**1 510**	9 500	12 000
2207EK	**H307**	30	**1.1811**	72	**2.8346**	23	**.9055**	1.0	**.039**	.31	2	3.1	2.2	30 700	**6 900**	8 800	**1 980**	8 500	10 000
2208EK	**H308**	35	**1.3780**	80	**3.1496**	23	**.9055**	1.0	**.039**	.28	2.2	3.5	2.5	31 900	**7 170**	10 000	**2 250**	7 500	9 000
2209EK	**H309**	40	**1.5748**	85	**3.3465**	23	**.9055**	1.0	**.039**	.26	2.4	3.7	2.5	32 500	**7 310**	10 600	**2 380**	7 000	8 500
2210EK	**H310**	45	**1.7717**	90	**3.5433**	23	**.9055**	1.0	**.039**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	6 300	7 500
2211EK	**H311**	50	**1.9685**	100	**3.9370**	25	**.9843**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	6 000	7 000
2212EK	**H312**	55	**2.1654**	110	**4.3307**	28	**1.1024**	1.5	**.059**	.24	2.6	4.1	2.8	48 800	**11 000**	17 000	**3 820**	5 300	6 300
2213EK	**H313**	60	**2.3622**	120	**4.7244**	31	**1.2205**	1.5	**.059**	.24	2.6	4.1	2.8	57 200	**12 900**	20 000	**4 500**	5 000	6 000
2215K	**H315**	65	**2.5591**	130	**5.1181**	31	**1.2205**	1.5	**.059**	.25	2.5	3.9	2.5	44 200	**9 940**	18 000	**4 050**	4 500	5 300
2216EK	**H316**	70	**2.7559**	140	**5.5118**	33	**1.2992**	2.0	**.079**	.22	2.9	4.5	2.8	65 000	**14 600**	25 500	**5 730**	4 000	4 800
2217K	**H317**	75	**2.9528**	150	**5.9055**	36	**1.4173**	2.0	**.079**	.25	2.5	3.9	2.5	58 500	**13 200**	23 600	**5 310**	3 800	4 500
2218K	**H318**	80	**3.1496**	160	**6.2992**	40	**1.5748**	2.0	**.079**	.27	2.3	3.6	2.5	70 200	**15 800**	28 500	**6 410**	3 600	4 300
2219K	**H319**	85	**3.3465**	170	**6.6929**	43	**1.6929**	2.0	**.079**	.27	2.3	3.6	2.5	83 200	**18 700**	34 500	**7 760**	3 400	4 000
2220K	**H320**	90	**3.5433**	180	**7.0866**	46	**1.8110**	2.0	**.079**	.27	2.3	3.6	2.5	97 500	**21 900**	40 500	**9 110**	3 200	3 800
2221K	**H321**	95	**3.7402**	190	**7.4803**	50	**1.9685**	2.0	**.079**	.28	2.2	3.5	2.5	108 000	**24 300**	45 000	**10 100**	3 000	3 600
2222K	**H322**	100	**3.9370**	200	**7.8740**	53	**2.0866**	2.0	**.079**	.28	2.2	3.5	2.5	124 000	**27 900**	52 000	**11 700**	2 800	3 400
2305K	**H2305**	20	**.7874**	62	**2.4409**	24	**.9449**	1.0	**.039**	.48	1.3	2	1.4	24 200	**5 440**	6 550	**1 470**	9 500	12 000
2306K	**H2306**	25	**.9843**	72	**2.8346**	27	**1.0630**	1.0	**.039**	.44	1.4	2.2	1.4	31 200	**7 010**	8 800	**1 980**	8 500	10 000
2307EK	**H2307**	30	**1.1811**	80	**3.1496**	31	**1.2205**	1.5	**.059**	.46	1.35	2.1	1.4	39 700	**8 930**	11 200	**2 520**	7 000	8 500
2308EK	**H2308**	35	**1.3780**	90	**3.5433**	33	**1.2992**	1.5	**.059**	.40	1.6	2.4	1.6	54 000	**12 100**	16 000	**3 600**	6 300	7 500
2309EK	**H2309**	40	**1.5748**	100	**3.9370**	36	**1.4173**	1.5	**.059**	.33	1.9	3	2	63 700	**14 300**	19 300	**4 340**	5 600	6 700
2310K	**H2310**	45	**1.7717**	110	**4.3307**	40	**1.5748**	2.0	**.079**	.43	1.5	2.3	1.6	63 700	**14 300**	20 000	**4 500**	5 300	6 300
2311K	**H2311**	50	**1.9685**	120	**4.7244**	43	**1.6929**	2.0	**.079**	.40	1.6	2.4	1.6	76 100	**17 100**	24 000	**5 400**	4 800	5 600
2312K	**H2312**	55	**2.1654**	130	**5.1181**	46	**1.8110**	2.0	**.079**	.33	1.9	3	2	87 100	**19 600**	28 500	**6 410**	4 500	5 300
2313K	**H2313**	60	**2.3622**	140	**5.5118**	48	**1.8898**	2.0	**.079**	.37	1.7	2.6	1.8	95 600	**21 500**	32 500	**7 310**	4 000	4 800
2315K	**H2315**	65	**2.5591**	160	**6.2992**	55	**2.1654**	2.0	**.079**	.37	1.7	2.6	1.8	124 000	**27 900**	43 000	**9 670**	3 400	4 000
2316K	**H2316**	70	**2.7559**	170	**6.6929**	58	**2.2835**	2.0	**.079**	.37	1.7	2.6	1.8	135 000	**30 400**	49 000	**11 000**	3 200	3 800
2317K	**H2317**	75	**2.9528**	180	**7.0866**	60	**2.3622**	2.5	**.098**	.37	1.7	2.6	1.8	140 000	**31 500**	51 000	**11 500**	3 000	3 600
2318K	**H2318**	80	**3.1496**	190	**7.4803**	64	**2.5197**	2.5	**.098**	.37	1.7	2.6	1.8	153 000	**34 400**	57 000	**12 800**	2 800	3 400
2319K	**H2319**	85	**3.3465**	200	**7.8740**	67	**2.6378**	2.5	**.098**	.37	1.7	2.6	1.8	165 000	**37 100**	64 000	**14 400**	2 600	3 200
2320K	**H2320**	90	**3.5433**	215	**8.4646**	73	**2.8740**	2.5	**.098**	.37	1.7	2.6	1.8	190 000	**42 700**	80 000	**18 000**	2 400	3 000
2322K	**H2322**	100	**3.9370**	240	**9.4488**	80	**3.1496**	2.5	**.098**	.37	1.7	2.6	1.8	216 000	**48 600**	95 000	**21 400**	2 200	2 800

[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



Cylindrical bore



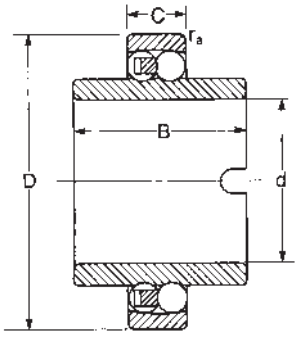
Tapered bore
taper 1:12 on diameter

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Static C_0		Speed Rating Grease
	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM
2200E2RS1	10	**.3937**	30	**1.1811**	14	**.5512**	.60	**.024**	.33	1.9	3	2	5 530	**1 240**	1 180	**265**	17 000
2201E2RS1	12	**.4724**	32	**1.2598**	14	**.5512**	.60	**.024**	.33	1.9	3	2	6 240	**1 400**	1 430	**321**	16 000
2202E2RS1	15	**.5906**	35	**1.3780**	14	**.5512**	.60	**.024**	.33	1.9	3	2	7 410	**1 670**	1 760	**396**	14 000
2203E2RS1	17	**.6693**	40	**1.5748**	16	**.6299**	.60	**.024**	.31	2	3.1	2.2	8 840	**1 990**	2 200	**495**	12 000
2204E2RS1	20	**.7874**	47	**1.8504**	18	**.7087**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	10 000
2205E2RS1	25	**.9843**	52	**2.0472**	18	**.7087**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	9 000
2206E2RS1	30	**1.1811**	62	**2.4409**	20	**.7874**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	7 500
2207E2RS1	35	**1.3780**	72	**2.8346**	23	**.9055**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	6 300
2208E2RS1	40	**1.5748**	80	**3.1496**	23	**.9055**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	5 600
2209E2RS1	45	**1.7717**	85	**3.3465**	23	**.9055**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	5 300
22102RS1	50	**1.9685**	90	**3.5433**	23	**.9055**	1.0	**.039**	.20	3.2	4.9	3.2	22 900	**5 150**	8 150	**1 830**	4 800
2211E2RS1	55	**2.1654**	100	**3.9370**	25	**.9843**	1.5	**.059**	.19	3.3	5.1	3.6	27 600	**6 210**	10 600	**2 380**	4 300
2212E2RS1	60	**2.3622**	110	**4.3307**	28	**1.1024**	1.5	**.059**	.19	3.3	5.1	3.6	31 200	**7 010**	12 200	**2 740**	3 800
2213E2RS1	65	**2.5591**	120	**4.7244**	31	**1.2205**	1.5	**.059**	.18	3.5	5.4	3.6	35 100	**7 890**	14 000	**3 150**	3 600
22142RS1	70	**2.7559**	125	**4.9213**	31	**1.2205**	1.5	**.059**	.18	3.5	5.4	3.6	34 500	**7 760**	13 700	**3 080**	3 400
2302E2RS1	15	**.5906**	42	**1.6535**	17	**.6693**	1.0	**.039**	.31	2	3.1	2.2	10 800	**2 430**	2 600	**585**	12 000
2303E2RS1	17	**.6693**	47	**1.8504**	19	**.7480**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	11 000
2304E2RS1	20	**.7874**	52	**2.0472**	21	**.8268**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	9 500
2305E2RS1	25	**.9843**	62	**2.4409**	24	**.9449**	1.0	**.039**	.28	2.2	3.5	2.5	19 000	**4 270**	5 400	**1 210**	7 500
2306E2RS1	30	**1.1811**	72	**2.8346**	27	**1.0630**	1.0	**.039**	.25	2.5	3.9	2.5	22 500	**5 060**	6 800	**1 530**	6 700
2307E2RS1	35	**1.3780**	80	**3.1496**	31	**1.2205**	1.5	**.059**	.25	2.5	3.9	2.5	26 500	**5 960**	8 500	**1 910**	5 600
2308E2RS1	40	**1.5748**	90	**3.5433**	33	**1.2992**	1.5	**.059**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	5 000
2309E2RS1	45	**1.7717**	100	**3.9370**	36	**1.4173**	1.5	**.059**	.23	2.7	4.2	2.8	39 000	**8 770**	13 400	**3 010**	4 500
2310E2RS1	50	**1.9685**	110	**4.3307**	40	**1.5748**	2.0	**.079**	.24	2.6	4.1	2.8	43 600	**9 800**	14 000	**3 150**	4 000

Tapered Bore

2205E2RS1K	25	**.9843**	52	**2.0472**	18	**.7087**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	9 000
2206E2RS1K	30	**1.1811**	62	**2.4409**	20	**.7874**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	7 500
2207E2RS1K	35	**1.3780**	72	**2.8346**	23	**.9055**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	6 300
2208E2RS1K	40	**1.5748**	80	**3.1496**	23	**.9055**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	5 600
2209E2RS1K	45	**1.7717**	85	**3.3465**	23	**.9055**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	5 300
22102RS1K	50	**1.9685**	90	**3.5433**	23	**.9055**	1.0	**.039**	.20	3.2	4.9	3.2	22 900	**5 150**	8 150	**1 830**	4 800
2211E2RS1K	55	**2.1654**	100	**3.9370**	25	**.9843**	1.5	**.059**	.19	3.3	5.1	3.6	27 600	**6 210**	10 600	**2 380**	4 300

[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.



MRC Bearing Number	Bore d		Outside Diameter D		Width C		Width B		Fillet Radius[1] r_a		Calculation Factors e	Y_1	Y_2	Y_0	Basic Radial Load Rating Dynamic C[2]		Basic Radial Load Rating Static C_0		Speed Rating Grease or Oil
	mm	in	mm	in	mm	in	mm	in	mm	in					N	lbf	N	lbf	RPM
11204E	20	**.7874**	47	**1.8504**	14	**.5512**	40	**1.575**	1.0	**.039**	.30	2.1	3.3	2.2	12 700	**2 860**	3 400	**764**	9 000
11205E	25	**.9843**	52	**2.0472**	15	**.5906**	44	**1.732**	1.0	**.039**	.28	2.2	3.5	2.5	14 300	**3 220**	4 000	**899**	8 000
11206E	30	**1.1811**	62	**2.4409**	16	**.6299**	48	**1.890**	1.0	**.039**	.25	2.5	3.9	2.5	15 600	**3 510**	4 650	**1 050**	6 700
11207E	35	**1.3780**	72	**2.8346**	17	**.6693**	52	**2.047**	1.0	**.039**	.23	2.7	4.2	2.8	19 000	**4 270**	6 000	**1 350**	5 600
11208E	40	**1.5748**	80	**3.1496**	18	**.7087**	56	**2.205**	1.0	**.039**	.22	2.9	4.5	2.8	19 900	**4 470**	6 950	**1 560**	5 000
11209E	45	**1.7717**	85	**3.3465**	19	**.7480**	58	**2.283**	1.0	**.039**	.21	3	4.6	3.2	22 900	**5 150**	7 800	**1 750**	4 500
11210E	50	**1.9685**	90	**3.5433**	20	**.7874**	58	**2.283**	1.0	**.039**	.21	3	4.6	3.2	26 500	**5 960**	9 150	**2 060**	4 300
11212E	60	**2.3622**	110	**4.3307**	22	**.8661**	62	**2.441**	1.5	**.059**	.19	3.3	5.1	3.6	31 200	**7 010**	12 200	**2 740**	3 400
11305E	25	**.9843**	62	**2.4409**	17	**.6693**	48	**1.890**	1.0	**.039**	.28	2.2	3.5	2.5	19 000	**4 270**	5 400	**1 210**	6 700
11306E	30	**1.1811**	72	**2.8346**	19	**.7480**	52	**2.047**	1.0	**.039**	.25	2.5	3.9	2.5	22 500	**5 060**	6 800	**1 530**	5 600
11307E	35	**1.3780**	80	**3.1496**	21	**.8268**	56	**2.205**	1.5	**.059**	.25	2.5	3.9	2.5	26 500	**5 960**	8 500	**1 910**	5 000
11308E	40	**1.5748**	90	**3.5433**	23	**.9055**	58	**2.283**	1.5	**.059**	.23	2.7	4.2	2.8	33 800	**7 600**	11 200	**2 520**	4 500
11310E	50	**1.9685**	110	**4.3307**	27	**1.0630**	62	**2.441**	2.0	**.079**	.24	2.6	4.1	2.8	43 600	**9 800**	14 000	**3 150**	3 600

[1] Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.
[2] Rating for one million revolutions or 500 hours at 33⅓ RPM.

Bearings with Cylindrical Bore

Bore Diameter d				C2				Normal				C3				C4			
				.001 mm		.0001 in		.001 mm		.0001 in		.001 mm		.0001 in		.001 mm		.0001 in	
Over mm	Over in	Including mm	Including in	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2.5	.0984	6	.2362	1	8	0	3	5	15	2	6	10	20	4	8	15	25	6	10
6	.2362	10	.3937	2	9	1	4	6	17	2	7	12	25	5	10	19	33	7	13
10	.3937	14	.5512	2	10	1	4	6	19	2	7	13	26	5	10	21	35	8	14
14	.5512	18	.7087	3	12	1	5	8	21	3	8	15	28	6	11	23	37	9	15
18	.7087	24	.9449	4	14	2	6	10	23	4	9	17	30	7	12	25	39	10	15
24	.9449	30	1.1811	5	16	2	6	11	24	4	9	19	35	7	14	29	46	11	18
30	1.1811	40	1.5748	6	18	2	7	13	29	5	11	23	40	9	16	34	53	13	21
40	1.5748	50	1.9685	6	19	2	7	14	31	6	12	25	44	10	17	37	57	15	22
50	1.9685	65	2.5591	7	21	3	8	16	36	6	14	30	50	12	20	45	69	18	27
65	2.5591	80	3.1496	8	24	3	9	18	40	7	16	35	60	14	24	54	83	21	33
80	3.1496	100	3.9370	9	27	4	11	22	48	9	19	42	70	17	28	64	96	25	38
100	3.9370	120	4.7244	10	31	4	12	25	56	10	22	50	83	20	33	75	114	30	45
120	4.7244	140	5.5118	10	38	4	15	30	68	12	27	60	100	24	39	90	135	35	53

Bearings with Tapered Bore

18	.7087	24	.9449	7	17	3	7	13	26	5	10	20	33	8	13	28	42	11	17
24	.9449	30	1.1811	9	20	4	8	15	28	6	11	23	39	9	15	33	50	13	20
30	1.1811	40	1.5748	12	24	5	9	19	35	7	14	26	46	10	18	40	59	16	23
40	1.5748	50	1.9685	14	27	6	11	22	39	9	15	33	52	13	20	45	65	18	26
50	1.9685	65	2.5591	18	32	7	13	27	47	11	19	41	61	16	24	56	80	22	31
65	2.5591	80	3.1496	23	39	9	15	35	57	14	22	50	75	20	30	69	98	27	39
80	3.1496	100	3.9370	29	47	11	19	42	68	17	27	62	90	24	35	84	116	33	46
100	3.9370	120	4.7244	35	56	14	22	50	81	20	32	75	108	30	43	100	139	39	75

Allowable Angular Misalignment of Self-Aligning Ball Bearings

Bearing Series	Allowable Angular Misalignment Degrees
108, 126, 127,129, 135	3
1200, 1200E	2.5
1300, 1300E	3
1400	3
2200, 2200E	2.5
2200ERS1	1.5
2300, 2300E	3
2300ERS1	1.5
11200E	2.5
11300E	3

Dynamic and static equivalent radial load and life rating

Dynamic equivalent radial load

$P = F_R + Y_1 F_A$, where $F_A/F_R \leq e$
or
$P = 0.65\ F_R + Y_2 F_A$, where $F_A/F_R > e$

P = Dynamic equivalent radial load
F_R = Radial load
F_A = Thrust load
Y_1 = Thrust load factor
Y_2 = Thrust load factor
e = Limiting factor for F_A/F_R

Y_1, Y_2 and e are given in bearing tables

Life rating

$$L10 = \left(\frac{C}{P}\right)^3 \text{ (millions of revolutions)}$$

or

$$L10_h = \frac{10^6}{60n}\left(\frac{C}{P}\right)^3 \text{ (Hours)}$$

C = Basic dynamic load rating
P = Dynamic equivalent radial load
n = Speed in RPM

Static equivalent radial load

$P_0 = F_R + Y_0 F_A$

P_0 = Static equivalent radial load
F_R = Radial load
F_A = Thrust load
Y_0 = Thrust load factor

Y_0 given in bearing tables

Dynamic equivalent radial load and life calculation examples

Bearing size: 1209E
Speed: 2000 RPM
Basic dynamic radial load rating (C) = 5150
e = 0.21
$Y_1 = 3.0$
$Y_2 = 4.6$

Case 1
Radial load (F_R) = 500
Thrust load (F_A) = 100
$F_A/F_R = 100/500 = 0.20$
Equivalent load (P) = $F_R + Y_1 F_A$
$P = 500 + 3.0 \times 100 = 800$

$$\text{Life (L10)} = \left(\frac{C}{P}\right)^3 = \left(\frac{5150}{800}\right)^3 = 266.8 \times 10^6 \text{ Rev.}$$

or

$$\text{Life (L10h)} = \frac{10^6}{60n}\left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000}\left(\frac{5150}{800}\right)^3 = 2223 \text{ Hrs}$$

Case 2
Radial load (F_R) = 500
Thrust load (F_A) = 170
$F_A/F_R = 170/500 = 0.34$
Equivalent load (P) = $0.65\ F_R + Y_2 F_A$
$P = 0.65 \times 500 + 4.6 \times 170 = 1107$

$$\text{Life (L10)} = \left(\frac{C}{P}\right)^3 = \left(\frac{5150}{1107}\right)^3 = 100.7 \times 10^6 \text{ Rev.}$$

or

$$\text{Life (L10h)} = \frac{10^6}{60n}\left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000}\left(\frac{5150}{1107}\right)^3 = 839 \text{ Hrs}$$

Minimum load
In order to provide satisfactory operation, self-aligning ball bearings, like all ball and roller bearings, must always be subjected to a given minimum load, particularly if they are to operate at high speeds or are subjected to high accelerations or rapid changes in the direction of load. Under such conditions 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 arrangement and may cause damaging sliding movements to occur between the balls and raceways.

The requisite minimum load to be applied to self-aligning ball bearings can be estimated using

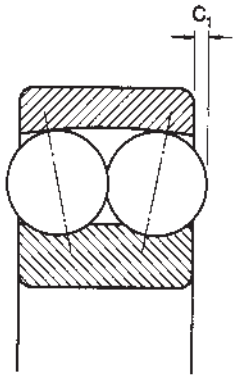
$P_{0m} = 0{,}01\ Co$

where
P_{0m} = minimum equivalent static bearing load, lbs
C_0 = basic static load rating, lbs

When starting up at low temperatures or when the lubricant is highly viscous, even greater minimum loads may be required. The weight of the components supported by the bearing, together with external forces, generally exceeds the requisite minimum load. If this is not the case, the self-aligning ball bearing must be subjected to an additional radial load, for example, by increasing belt tension or by similar means.

Ball Protrusion

Self-aligning bearings in Series 1400 and in some sizes in Series 1200, 1200K and 1300K, have ball protrusion beyond the bearing ring faces as shown in the table below. This must be considered when designing adjacent components.



Size	Protrusion (C_1) mm	inches
1224K	1.3	.051
1226	0.7	.028
1318K	1.0	.039
1319K	1.5	.059
1320K	2.5	.098
1321K	2.6	.102
1322K	2.6	.102
1406	2.2	.087
1407	2.0	.079
1408	2.0	.079
1409	2.5	.098
1410	3.0	.118
1411	2.4	.094
1412	2.8	.110

Axial load carrying capacity of bearings mounted on adapter sleeves

The ability of self-aligning ball bearings mounted on adapter sleeves on smooth shafts to carry axial loads, depends on the friction between sleeve and shaft. The approximate permissible axial load can be determined from

$F_{AP} = 3\ B\ d$

where, F_{AP} = maximum permissible axial load (N)
B = bearing width (mm)
d = bearing bore (mm)

to convert newtons (N) to pounds multiply by 0.2248

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° 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.

When mounting bearings with Normal radial internal clearance it is generally sufficient to check clearance reduction during the drive-up by turning and swivelling out the outer ring. When the bearing is properly mounted the outer ring can be easily turned but there should be a slight resistance when the ring is swivelled out. The bearing will then have the requisite interference fit. In some cases, however, the residual internal clearance may be too small for the application, and a bearing with C3 radial internal clearance should be used instead.

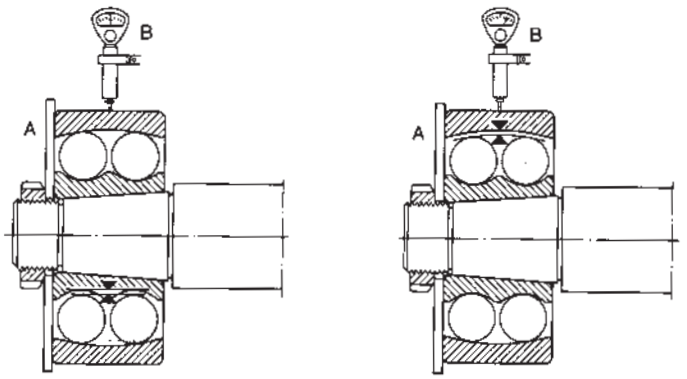
When mounting bearings with C3 clearance, the tightening angle α or the axial displacement S can be used to measure the° of interference. The procedures and values given in the following also apply to bearings with Normal clearance.

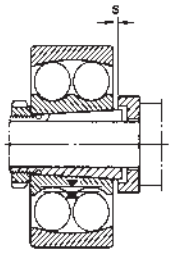
An easy method of mounting bearings on adapter sleeves is based on the tightening angle α through which the nut is turned and the procedure is described in the following. Guideline values for the tightening angle α are given in the table overleaf. Before mounting, the thread of the nut and the side face of the nut which is to abut the bearing should be smeared with a molybdenum disulphide paste or similar lubricant, and the outside diameter of the sleeve should be lightly oiled. The bearing is then pushed on to the sleeve and the nut screwed on. By turning the nut through the given angle α the bearing will be pressed up on the tapered seating of the sleeve. As the bearing has a tendency to skew when being pressed up it is advisable to reposition the hook spanner in a slot at 180° to that used for tightening and then apply a light hammer blow to the spanner. The bearing will straighten up on its seating. The nut is then removed, the locking washer inserted and the nut replaced, tightened and locked by bending down one of the tabs of the locking washer. The residual clearance of the bearing should be checked.

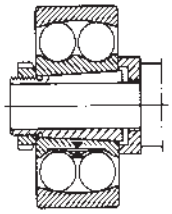
Another method which is often used to mount bearings with a tapered bore correctly and reliably is to measure the axial displacement S of the inner ring on the tapered seating. Guideline values for the requisite displacement S are given in the table overleaf.

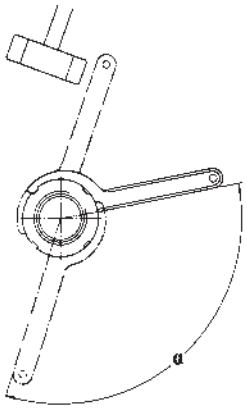
When using either of the above methods, the self-aligning ball bearings should always be pushed up on to the tapered seating until the bore of the bearing is in contact with the seating on the shaft or sleeve around its whole circumference, before the final tightening procedure is begun. A sufficiently tight fit will then be obtained and the residual clearance will correspond to the mean values given in the table.

One method of measuring the internal clearance of self-aligning ball bearings is shown in the illustrations below. A washer A is inserted between the bearing and the shaft or sleeve nut to ensure correct alignment of the outer ring with respect to the inner ring. A dial gauge B placed on the bearing outer ring can be used to measure the bearing clearance. The outer ring should be pushed upwards in the direction of the shaft.









Mounting self-aligning ball bearings with tapered bore

Bearing Bore d		Tightening Angle α	Axial Displacement S — Bearing Series 1200K		1300K		2200K		2300K		Mean Residual Clearance After Mounting — Normal		C3	
mm	in	Degrees	mm	in	mm	in	mm	in	mm	in	.001 mm	.0001 in	.001 mm	.0001 in
20	**.7874**	70	.22	**.009**	.23	**.009**	—	**—**	—	**—**	10	**4**	20	**8**
25	**.9843**	70	.22	**.009**	.23	**.009**	.22	**.009**	.23	**.009**	10	**4**	20	**8**
30	**1.1811**	70	.22	**.009**	.23	**.009**	.22	**.009**	.23	**.009**	10	**4**	20	**8**
35	**1.3780**	70	.30	**.012**	.30	**.012**	.30	**.012**	.30	**.012**	10	**4**	20	**8**
40	**1.5748**	70	.30	**.012**	.30	**.012**	.30	**.012**	.30	**.012**	10	**4**	20	**8**
45	**1.7717**	70	.31	**.012**	.34	**.013**	.31	**.012**	.33	**.013**	15	**6**	25	**10**
50	**1.9685**	70	.31	**.012**	.34	**.013**	.31	**.012**	.33	**.013**	15	**6**	25	**10**
55	**2.1654**	90	.40	**.016**	.41	**.016**	.39	**.015**	.40	**.016**	15	**6**	30	**12**
60	**2.3622**	90	.40	**.016**	.41	**.016**	.39	**.015**	.40	**.016**	15	**6**	30	**12**
65	**2.5591**	90	.40	**.016**	.41	**.016**	.39	**.015**	.40	**.016**	15	**6**	30	**12**
75	**2.9528**	120	.45	**.018**	.47	**.019**	.43	**.017**	.46	**.018**	20	**8**	40	**16**
80	**3.1496**	120	.45	**.018**	.47	**.019**	.43	**.017**	.46	**.018**	20	**8**	40	**16**
85	**3.3465**	120	.58	**.023**	.60	**.024**	.54	**.021**	.59	**.023**	20	**8**	40	**16**
90	**3.5433**	120	.58	**.023**	.60	**.024**	.54	**.021**	.59	**.023**	20	**8**	40	**16**
95	**3.7402**	120	.58	**.023**	.60	**.024**	.54	**.021**	.59	**.023**	20	**8**	40	**16**
100	**3.9370**	120	.58	**.023**	.60	**.024**	.54	**.021**	.59	**.023**	20	**8**	40	**16**
105	**4.1339**	120	.67	**.026**	—	**—**	.66	**.026**	—	**—**	25	**10**	55	**22**
110	**4.3307**	120	.67	**.026**	.70	**.028**	.66	**.026**	.69	**.027**	25	**10**	55	**22**
120	**4.7244**	120	.67	**.026**	—	**—**	—	**—**	—	**—**	25	**10**	55	**22**