

The MRC conrad ball bearing is a single-row radial deep groove bearing with no filling notches. It can carry significant radial loads, and, because of the uninterrupted raceway grooves and the high degree of conformity between balls and raceways, it can carry substantial thrust loads in either direction, even at very high speeds. Single-row deep groove ball bearings are offered open or with single or double shields or seals, as well as with snap rings in various combinations.

Cage Types and Materials

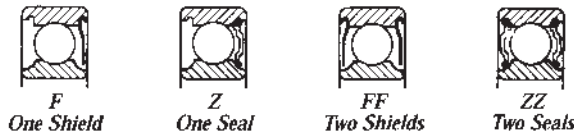
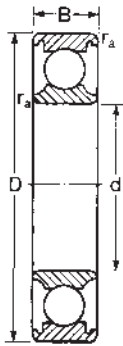
This type of bearing is supplied with a pressed steel cage as standard; however, for special requirements, it can be supplied with a two-piece riveted machined cage of phenolic composition or bronze material.

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30 Series

Extra Small Size

MRC Bearing Services



These single-row radial conrad-type bearings have 4 mm to 9 mm bores (approximately $\frac{5}{32}$ " to $\frac{3}{8}$ "), and are designed for very small shafts. They are suitable for high speed fractional horsepower motors and small turbines. MRC offers open, shielded, and sealed types. Some sizes are available in stainless steel. 30 Series supplied with ABMA CO radial clearance unless otherwise specified.

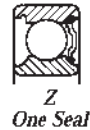
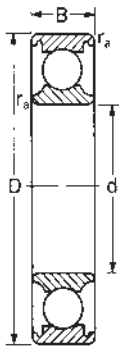
MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		Basic Radial Load Rating				Speed Rating ²⁾				
	d	in	D	in	B	in	r _a	in	ZD ²		Dynamic C ³⁾		Static C ₀		Open and Shielded Grease	Shielded Oil	Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
34	4	.1575	16	.6299	5	.1969	.30	.012	45	.07	1 470	330	600	135	43 000	50 000	30 000
35	5	.1969	19	.7480	6	.2362	.30	.012	96	.15	2 210	497	950	214	36 000	43 000	26 000
36	6	.2362	19	.7480	6	.2362	.30	.012	96	.15	2 210	497	950	214	36 000	43 000	26 000
37	7	.2756	22	.8661	7	.2756	.30	.012	110	.17	3 250	731	1 360	306	36 000	43 000	23 000
38	8	.3150	22	.8661	7	.2756	.30	.012	110	.17	3 250	731	1 360	306	36 000	43 000	23 000
39	9	.3543	26	1.0236	8	.3150	.64	.025	161	.25	4 620	1 040	1 960	441	28 000	34 000	20 000

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.



R series bearings are single-row radial conrad-type bearings that are available in inch sizes for shafts from 1/8" to 1 1/2" in diameter. Open, shielded, and sealed types are available, and many sizes are available in stainless steel. R Series supplied with ABMA CO radial clearance unless otherwise specified.

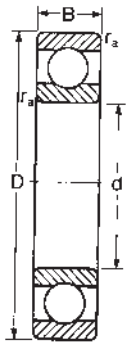
MRC Bearing Number	Bore d		Outside Diameter D		Width B						Basic Radial Load Rating				Speed Rating ²⁾				
					Plain		Shielded or Sealed		Fillet Radius ¹⁾ r _a		ZD ²⁾		Dynamic C ₃		Static C ₀		Open and Shielded Grease	Shielded Oil	Single and Double Sealed Grease
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	N	lbf	N	lbf	RPM	RPM	RPM
R-2	3.2	.1250	9.5	.3750	4.0	.1562	4.0	.1562	.30	.012	19	.03	312	70	120	27	75 000	91 000	52 000
R-2-A	3.2	.1250	12.7	.5000	4.4	.1719	4.4	.1719	.30	.012	19	.03	312	70	120	27	75 000	91 000	52 000
R-3	4.8	.1875	12.7	.5000	4.0	.1562	5.0	.1960	.30	.012	39	.06	956	215	490	110	57 000	69 000	40 000
R-4	6.4	.2500	15.9	.6250	5.0	.1960	5.0	.1960	.30	.012	45	.07	1 480	332	620	139	44 000	54 000	31 000
R-4-A	6.4	.2500	19.1	.7500	5.6	.2188	7.1	.2812	.41	.016	71	.11	2 810	632	1 160	261	39 000	48 000	27 000
R-6	9.5	.3750	22.2	.8750	5.6	.2188	7.1	.2812	.41	.016	110	.17	3 320	746	1 340	301	31 000	38 000	21 000
R-8	12.7	.5000	28.6	1.1250	6.4	.2500	7.9	.3125	.41	.016	181	.28	5 070	1 140	2 400	540	24 000	29 000	16 000
R-10	15.9	.6250	34.9	1.3750	7.1	.2812	8.7	.3438	.79	.031	226	.35	6 050	1 360	3 250	731	18 000	22 000	13 000
R-12	19.1	.7500	41.3	1.6250	7.9	.3125	11.1	.4375	.79	.031	361	.56	9 360	2 100	5 100	1 150	16 000	19 000	11 000
R-14	22.2	.8750	47.6	1.8750	9.5	.3750	12.7	.5000	.79	.031	406	.63	10 100	2 270	5 850	1 320	14 000	17 000	9 600
R-16	25.4	1.0000	50.8	2.0000	9.5	.3750	12.7	.5000	.79	.031	406	.63	10 100	2 270	6 000	1 350	13 000	16 000	9 000
R-18	28.6	1.1250	54.0	2.1250	9.5	.3750	12.7	.5000	.79	.031	510	.79	12 500	2 810	7 500	1 690	11 000	14 000	7 900
R-20	31.8	1.2500	57.2	2.2500	9.5	.3750	12.7	.5000	.79	.031	613	.95	14 000	3 150	9 300	2 090	11 000	13 000	7 500
R-24	38.1	1.5000	66.7	2.6250	11.1	.4375	14.3	.5625	.79	.031	755	1.17	16 800	3 780	11 800	2 650	9 000	11 000	6 200

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.



1800-S Series bearings are single-row radial conrad-type bearings that can accommodate light radial loads, two-directional thrust loads, or a combination of both. They are designed for applications where space or weight is very limited.

The 1800-S Series is supplied with an ABMA CO Radial internal clearance unless otherwise specified.

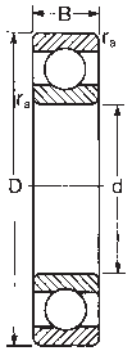
MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius ¹⁾ r _a		Basic Radial Load Rating						Speed Rating ²⁾		
									Dynamic C ³⁾			Static C ₀			Open and Shielded Grease		Single and Double Sealed Grease
									N	lbf	N	lbf	RPM	RPM	RPM		
1800S	10	.3937	19	.7480	5	.1969	.30	.012	62	.10	1 820	410	930	209	36 000	43 000	20 000
1801S	12	.4724	21	.8268	5	.1969	.30	.012	68	.11	1 900	427	1 040	234	32 000	38 000	19 000
1802S	15	.5906	24	.9449	5	.1969	.30	.012	80	.12	2 080	468	1 250	281	28 000	34 000	17 000
1803S	17	.6693	26	1.0236	5	.1969	.30	.012	91	.14	2 250	505	1 460	328	24 000	30 000	16 000
1804S	20	.7874	32	1.2598	7	.2756	.30	.012	141	.22	3 510	790	2 240	504	19 000	24 000	13 000
1805S	25	.9843	37	1.4567	7	.2756	.30	.012	184	.28	4 360	980	2 900	652	17 000	20 000	11 000
1806S	30	1.1811	42	1.6535	7	.2756	.30	.012	208	.32	4 490	1 010	3 400	764	15 000	18 000	9 500
1807S	35	1.3780	47	1.8504	7	.2756	.30	.012	233	.36	4 750	1 070	3 800	854	13 000	16 000	8 000
1808S	40	1.5748	52	2.0472	7	.2756	.30	.012	257	.40	4 940	1 110	4 150	933	11 000	14 000	7 500
1809S	45	1.7717	58	2.2835	7	.2756	.30	.012	315	.49	6 050	1 360	5 100	1 150	9 500	12 000	6 700
1810S	50	1.9685	65	2.5591	7	.2756	.30	.012	347	.54	6 240	1 400	5 500	1 240	9 000	11 000	6 000
1811S	55	2.1654	72	2.8346	9	.3543	.30	.012	454	.70	8 320	1 870	7 350	1 650	8 500	10 000	5 180
1812S	60	2.3622	78	3.0709	10	.3937	.30	.012	499	.77	8 710	1 960	8 000	1 800	7 500	9 000	4 800
1813S	65	2.5591	85	3.3465	10	.3937	.60	.025	679	1.05	11 700	2 630	11 000	2 470	7 000	8 500	4 500
1814S	70	2.7559	90	3.5433	10	.3937	.60	.025	741	1.15	12 100	2 720	11 800	2 650	6 700	8 000	4 300
1815S	75	2.9528	95	3.7402	10	.3937	.60	.025	803	1.24	12 500	2 810	12 900	2 900	6 300	7 500	4 000
1816S	80	3.1496	100	3.9370	10	.3937	.60	.025	864	1.32	13 000	2 920	13 700	3 080	6 000	7 000	3 600
1817S	85	3.3465	110	4.3307	13	.5118	1.0	.040	1 230	1.90	19 500	4 380	19 600	4 410	5 300	6 300	3 400
1818S	90	3.5433	115	4.5276	13	.5118	1.0	.040	1 280	1.98	19 500	4 380	20 400	4 590	5 300	6 300	3 200
1819S	95	3.7402	120	4.7244	13	.5118	1.0	.040	1 330	2.06	19 900	4 470	21 200	4 770	5 000	6 000	3 000
1820S	100	3.9370	125	4.9213	13	.5118	1.0	.040	1 380	2.14	20 300	4 560	22 000	4 950	4 800	5 600	3 000
1821S	105	4.1339	130	5.1181	13	.5118	1.0	.040	1 480	2.29	20 800	4 680	23 600	5 310	4 500	5 300	2 800
1822S	110	4.3307	140	5.5118	16	.6299	1.0	.040	1 910	2.95	28 100	6 320	30 500	6 860	4 300	5 000	2 600
1824S ⁴⁾	120	4.7244	150	5.9055	16	.6299	1.0	.040	2 060	3.19	29 100	6 540	32 500	7 310	3 800	4 500	2 400
1826S ⁴⁾	130	5.1181	165	6.4961	18	.7087	1.0	.040	2 660	4.13	37 700	8 480	43 000	9 670	3 600	4 300	2 200
1828S ⁴⁾	140	5.5118	175	6.8898	18	.7087	1.0	.040	2 870	4.46	39 000	8 770	46 500	10 500	3 400	4 000	2 000
1830S ⁴⁾	150	5.9055	190	7.4803	20	.7874	1.0	.040	3 540	5.49	48 800	11 000	57 000	12 800	3 000	3 600	
1832S ⁴⁾	160	6.2992	200	7.8740	20	.7874	1.0	.040	3 690	5.71	49 400	11 100	60 000	13 500	2 800	3 400	
1834S ⁴⁾	170	6.6929	215	8.4646	22	.8661	1.0	.040	4 550	7.06	61 800	13 900	73 500	16 500	2 600	3 200	
1836S ⁴⁾	180	7.0866	225	8.8583	22	.8661	1.0	.040	4 730	7.34	62 400	14 000	76 500	17 200	2 400	3 000	
1838S ⁴⁾	190	7.4803	240	9.4488	24	.9449	1.5	.060	5 690	8.81	74 100	16 700	91 500	20 600	2 200	2 800	
1840S ⁴⁾	200	7.8740	250	9.8425	24	.9449	1.5	.060	5 910	9.17	76 100	17 100	95 000	21 400	2 200	2 800	
1844S ⁴⁾	220	8.6614	270	10.6299	24	.9449	1.5	.060	6 370	9.87	78 000	17 500	102 000	22 900	1 900	2 400	
1848S ⁴⁾	240	9.4488	300	11.8110	28	1.1024	2.0	.080	8 670	13.4	108 000	24 300	140 000	31 500	1 800	2 200	
1852S ⁴⁾	260	10.2362	320	12.5984	28	1.1024	2.0	.080	9 330	14.5	111 000	25 000	150 000	33 700	1 700	2 000	
1856S ⁴⁾	280	11.0236	350	13.7795	33	1.2992	2.0	.080	11 500	17.8	138 000	31 000	183 000	41 100	1 600	1 900	
1860S ⁴⁾	300	11.8110	380	14.9606	38	1.4961	2.0	.080	14 200	22.0	172 000	38 700	228 000	51 300	1 400	1 700	
1864S ⁴⁾	320	12.5984	400	15.7480	38	1.4961	2.0	.080	14 700	22.9	172 000	38 700	236 000	53 100	1 300	1 600	
1868S ⁴⁾	340	13.3858	420	16.5354	38	1.4961	2.0	.080	15 900	24.6	178 000	40 000	255 000	57 300	1 200	1 500	
1872S ⁴⁾	360	14.1732	440	17.3228	38	1.4961	2.0	.080	16 400	25.5	182 000	40 900	260 000	58 500	1 100	1 400	
1876S ⁴⁾	380	14.9606	480	18.8976	46	1.8110	2.0	.080	22 700	35.3	242 000	54 400	365 000	82 100	1 000	1 300	
1880S ⁴⁾	400	15.7480	500	19.6850	46	1.8110	2.0	.080	23 700	36.7	247 000	55 500	380 000	85 400	1 000	1 300	
1884S ⁴⁾	420	16.5354	520	20.4724	46	1.8110	2.0	.080	24 600	38.1	251 000	56 400	390 000	87 700	950	1 200	
1888S ⁴⁾	440	17.3228	540	21.2598	46	1.8110	2.0	.080	25 500	39.5	255 000	57 300	405 000	91 000	900	1 100	
1892S ⁴⁾	460	18.1102	580	22.8346	56	2.2047	2.5	.100	33 300	51.7	312 000	70 100	530 000	119 000	900	1 100	
1896S ⁴⁾	480	18.8976	600	23.6220	56	2.2047	2.5	.100	34 700	53.7	325 000	73 100	560 000	126 000	850	1 000	

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel cage for 1800S through 1828S and 1834S and 1856S. All others for outer land guided machined bronze. The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

⁴⁾ Typically non-stocked sizes, please check availability before designing into equipment.



1900-S Series bearings are single-row radial conrad-type bearings that can accommodate light radial loads, two-directional thrust loads, or a combination of both. They are designed for applications where a lack of space or limitations on weight require a bearing with a thinner section than 100-KS Series bearings. Some sizes are available with shields or seals.

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius ¹⁾ r _a		Basic Radial Load Rating				Speed Rating ²⁾				
									ZD ²⁾		Dynamic C ³⁾		Static C ₀		Open and Shielded Oil		Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
1900S	10	.3937	22	.8661	6	.2362	.30	.012	84	.13	2 510	565	1 120	252	34 000	40 000	19 000
1901S	12	.4724	24	.9449	6	.2362	.30	.012	103	.16	2 910	655	1 500	337	30 000	36 000	18 000
1902S	15	.5906	28	1.1024	7	.2756	.30	.012	142	.22	4 030	906	2 040	459	24 000	30 000	16 000
1903S	17	.6693	30	1.1811	7	.2756	.30	.012	155	.24	4 360	980	2 320	522	22 000	28 000	14 000
1904S	20	.7874	37	1.4567	9	.3543	.30	.012	252	.39	6 370	1 430	3 650	821	18 000	22 000	12 000
1905S	25	.9843	42	1.6535	9	.3543	.30	.012	271	.42	6 630	1 490	4 150	933	16 000	19 000	10 000
1906S	30	1.1811	47	1.8504	9	.3543	.30	.012	317	.49	7 280	1 640	5 000	1 120	14 000	17 000	8 500
1907S	35	1.3780	55	2.1654	10	.3937	.64	.025	432	.67	9 560	2 150	6 800	1 530	11 000	14 000	7 500
1908S	40	1.5748	62	2.4409	12	.4724	.64	.025	637	.99	13 800	3 100	10 000	2 250	10 000	13 000	6 700
1909S	45	1.7717	68	2.6772	12	.4724	.64	.025	683	1.06	14 000	3 150	10 800	2 430	9 000	11 000	6 000
1910S	50	1.9685	72	2.8346	12	.4724	.64	.025	728	1.13	14 600	3 280	11 800	2 650	8 500	10 000	5 600
1911S	55	2.1654	80	3.1496	13	.5118	1.0	.040	864	1.34	16 500	3 710	14 000	3 150	8 000	9 500	5 000
1912S	60	2.3622	85	3.3465	13	.5118	1.0	.040	864	1.34	16 500	3 710	14 300	3 210	7 500	9 000	4 500
1913S	65	2.5591	90	3.5433	13	.5118	1.0	.040	968	1.50	17 400	3 910	16 000	3 600	6 700	8 000	4 300
1914S	70	2.7559	100	3.9370	16	.6299	1.0	.040	1 300	2.01	23 800	5 350	21 200	4 770	6 300	7 500	4 000
1915S	75	2.9528	105	4.1339	16	.6299	1.0	.040	1 370	2.13	24 200	5 440	22 400	5 040	6 000	7 000	3 600
1916S	80	3.1496	110	4.3307	16	.6299	1.0	.040	1 450	2.25	25 100	5 640	24 000	5 400	5 600	6 700	3 400
1917S	85	3.3465	120	4.7244	18	.7087	1.0	.040	1 810	2.81	31 900	7 170	30 000	6 740	5 300	6 300	3 200
1918S	90	3.5433	125	4.9213	18	.7087	1.0	.040	1 920	2.97	32 500	7 310	31 500	7 080	5 000	6 000	3 100
1919S	95	3.7402	130	5.1181	18	.7087	1.0	.040	2 025	3.14	33 800	7 600	33 500	7 530	4 800	5 600	2 900
1920S	100	3.9370	140	5.5118	20	.7874	1.0	.040	2 550	3.96	42 300	9 510	41 500	9 330	4 500	5 300	2 700
1921S	105	4.1339	145	5.7087	20	.7874	1.0	.040	2 770	4.18	44 200	9 940	44 000	9 890	4 300	5 000	2 600
1922S	110	4.3307	150	5.9055	20	.7874	1.0	.040	2 770	4.18	43 600	9 800	44 000	9 890	4 000	4 800	2 500
1924S	120	4.7244	165	6.4961	22	.8661	1.0	.040	3 460	5.36	55 300	12 400	57 000	12 800	3 600	4 300	2 300
1926S ⁴⁾	130	5.1181	180	7.0866	24	.9449	1.5	.060	4 100	6.35	65 000	14 600	67 000	15 100	3 400	4 000	2 100
1928S ⁴⁾	140	5.5118	190	7.4803	24	.9449	1.5	.060	4 320	6.70	66 300	14 900	71 000	16 000	3 200	3 800	2 000
1930S ⁴⁾	150	5.9055	210	8.2677	28	1.1024	2.0	.080	5 670	8.78	88 400	19 900	93 000	20 900	2 800	3 400	1 800
1932S ⁴⁾	160	6.2992	220	8.6614	28	1.1024	2.0	.080	6 000	9.30	92 300	20 700	98 000	22 000	2 600	3 200	1 700
1934S ⁴⁾	170	6.6929	230	9.0551	28	1.1024	2.0	.080	6 330	9.82	93 600	21 000	104 000	23 400	2 400	3 000	1 600
1936S ⁴⁾	180	7.0866	250	9.8425	33	1.2992	2.0	.080	8 060	12.5	119 000	26 800	132 000	29 700	2 200	2 800	1 500
1938S ⁴⁾	190	7.4803	260	10.2362	33	1.2992	2.0	.080	8 060	12.5	117 000	26 300	134 000	30 100	2 200	2 800	1 400
1940S ⁴⁾	200	7.8740	280	11.0236	38	1.4961	2.0	.080	10 200	15.8	148 000	33 300	166 000	37 300	2 000	2 600	1 300
1944S ⁴⁾	220	8.6614	300	11.8110	38	1.4961	2.0	.080	10 800	16.7	151 000	33 900	176 000	39 600	1 900	2 400	1 200
1948S ⁴⁾	240	9.4488	320	12.5984	38	1.4961	2.0	.080	11 900	18.5	159 000	35 800	196 000	44 100	1 800	2 200	1 100
1952S ⁴⁾	260	10.2362	360	14.1732	46	1.8110	2.0	.080	16 400	25.4	212 000	47 700	270 000	60 700	1 600	1 900	1 000
1956S ⁴⁾	280	11.0236	380	14.9606	46	1.8110	2.0	.080	17 300	26.8	216 000	48 600	285 000	64 100	1 500	1 800	950
1960S ⁴⁾	300	11.8110	420	16.5354	56	2.2047	3.0	.120	22 700	35.1	270 000	60 700	375 000	84 300	1 300	1 600	800
1964S ⁴⁾	320	12.5984	440	17.3228	56	2.2047	3.0	.120	24 000	37.2	276 000	62 100	390 000	87 700	1 200	1 500	750
1968S ⁴⁾	340	13.3858	460	18.1102	56	2.2047	3.0	.120	25 300	39.3	281 000	63 200	415 000	93 300	1 100	1 400	700
1972S ⁴⁾	360	14.1732	480	18.8976	56	2.2047	3.0	.120	26 700	41.3	291 000	65 400	440 000	98 900	1 100	1 400	700
1976S ⁴⁾	380	14.9606	520	20.4724	65	2.5591	4.0	.160	32 400	50.2	338 000	76 000	530 000	119 000	1 000	1 300	650
1980S ⁴⁾	400	15.7480	540	21.2598	65	2.5591	4.0	.160	34 100	52.8	345 000	77 000	560 000	126 000	950	1 200	600
1984S ⁴⁾	420	16.5354	560	22.0472	65	2.5591	4.0	.160	35 800	55.5	351 000	78 900	585 000	132 000	900	1 100	550
1988S ⁴⁾	440	17.3228	600	23.6220	74	2.9134	4.0	.160	43 100	66.8	410 000	92 200	710 000	160 000	900	1 100	550
1992S ⁴⁾	460	18.1102	620	24.4094	74	2.9134	4.0	.160	45 400	70.3	423 000	95 100	750 000	169 000	850	1 000	550

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

⁴⁾ Typically non-stocked sizes, please check availability before designing into equipment.

The 100-S Narrow-type Light Series is made up of single-row radial conrad-type bearings with bores ranging from 10 mm to 95 mm.



NOTE: This series is obsolete but is still manufactured in a few sizes for replacement parts, please check availability before designing into equipment.

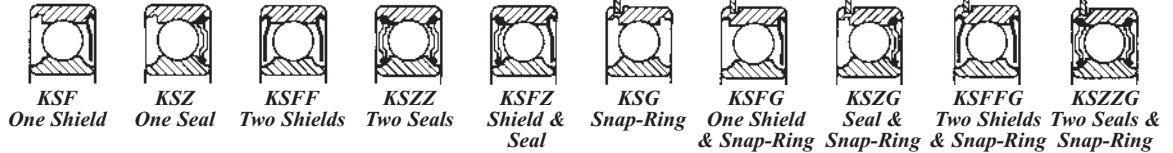
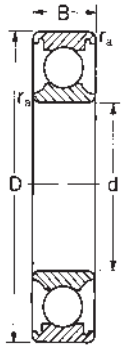
MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius ¹⁾ r _a		Basic Radial Load Rating						Speed Rating ²⁾	
									ZD ²⁾		Dynamic C ³⁾		Static C ₀		Open and Shielded	
	mm	in	mm	in	mm	in	mm	in	mm	in	N	lbf	N	lbf	Grease RPM	Oil RPM
102-S	10	.3937	32	1.2598	9	.3543	.51	.02	181	.28	5 200	1 170	2 450	551	24 000	29 000
103-S	15	.5906	37	1.4567	9	.3543	.51	.02	284	.44	7 800	1 750	3 550	798	21 000	26 000
104-S	20	.7874	42	1.6535	9	.3543	.51	.02	361	.56	9 360	2 100	5 100	1 150	17 000	21 000
105-S	25	.9843	52	2.0472	9	.3543	1.0	.04	458	.71	12 100	2 710	6 700	1 510	14 000	17 000
106-S	30	1.1811	62	2.4409	10	.3937	1.0	.04	632	.98	15 600	3 500	9 300	2 090	11 000	14 000
107-S	35	1.3780	70	2.7559	10	.3937	1.0	.04	755	1.17	16 800	3 780	11 600	2 610	10 000	12 000
108-S	40	1.5748	80	3.1496	11	.4331	1.0	.04	819	1.27	18 200	4 100	12 900	2 900	9 000	11 000
109-S	45	1.7717	85	3.3465	11	.4331	1.0	.04	1 010	1.56	19 800	4 450	16 300	3 670	8 000	9 700
110-S	50	1.9685	90	3.5433	11	.4331	1.0	.04	1 010	1.56	19 900	4 470	16 600	3 730	7 400	9 000
111-S	55	2.1654	100	3.9370	12	.4724	1.0	.04	1 220	1.89	23 400	5 260	20 000	4 500	6 800	8 300
112-S	60	2.3622	105	4.1339	12	.4724	1.0	.04	1 450	2.25	27 000	6 080	23 600	5 300	6 100	7 400
113-S	65	2.5591	115	4.5276	14	.5512	1.0	.04	1 450	2.25	27 000	6 080	23 600	5 300	6 100	7 400
114-S	70	2.7559	120	4.7244	14	.5512	1.0	.04	1 700	2.64	31 200	7 010	28 000	6 300	5 400	6 600
115-S	75	2.9528	130	5.1181	16	.6299	1.5	.06	2 260	3.50	42 300	9 520	36 000	8 090	5 100	6 200
116-S	80	3.1496	135	5.3150	16	.6299	1.5	.06	2 420	3.75	44 200	9 940	39 000	8 770	4 800	5 900
117-S	85	3.3465	145	5.7087	18	.7087	1.5	.06	2 850	4.42	52 700	11 800	45 500	10 200	4 500	5 500
118-S	90	3.5433	150	5.9055	18	.7087	1.5	.06	2 850	4.42	52 700	11 800	46 500	10 500	4 300	5 200
119-S	95	3.7402	160	6.2992	20	.7874	1.5	.06	3 530	5.47	63 700	14 300	57 000	12 800	4 000	4 900

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.



The 100-KS Extra Light Series consists of single-row radial conrad-type bearings made with bores from 10 mm to 320 mm for light to moderate radial loads, two-directional thrust loads, or a combination of both, where space is somewhat limited. This series is available in plain, shielded, or sealed types, as well as with snap-rings.

MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		Basic Radial Load Rating				Speed Rating ²⁾				
	d	in	D	in	B	in	r _a	in	ZD ²		Dynamic C ³⁾		Static C ₀		Open and Shielded Grease	Shielded Oil	Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
100-KS	10	.3937	26	1.0236	8	.3150	.30	.012	181	.28	4 620	1 040	1 960	440	30 000	36 000	19 000
101-KS	12	.4724	28	1.1024	8	.3150	.30	.012	181	.28	5 070	1 140	2 360	530	26 000	32 000	17 000
102-KS	15	.5906	32	1.2598	9	.3543	.30	.012	206	.32	5 590	1 260	2 850	640	22 000	28 000	14 000
103-KS	17	.6693	35	1.3780	10	.3937	.30	.012	226	.35	6 050	1 360	3 250	730	19 000	24 000	13 000
104-KS	20	.7874	42	1.6535	12	.4724	.64	.025	361	.56	9 360	2 100	5 000	1 120	17 000	20 000	11 000
105-KS	25	.9843	47	1.8504	12	.4724	.64	.025	458	.71	11 200	2 520	6 550	1 470	15 000	18 000	9 500
106-KS	30	1.1811	55	2.1654	13	.5118	1.0	.04	561	.87	13 300	2 990	8 300	1 870	12 000	15 000	8 000
107-KS	35	1.3780	62	2.4409	14	.5512	1.0	.04	691	1.07	15 800	3 570	10 200	2 290	10 000	13 000	7 000
108-KS	40	1.5748	68	2.6772	15	.5906	1.0	.04	909	1.41	20 800	4 680	11 600	2 610	9 500	12 000	6 300
109-KS	45	1.7717	75	2.9528	16	.6299	1.0	.04	1 090	1.69	23 400	5 270	16 600	3 730	9 000	11 000	5 600
110-KS	50	1.9685	80	3.1496	16	.6299	1.0	.04	1 180	1.83	24 700	5 560	18 000	4 050	8 500	10 000	5 000
111-KS	55	2.1654	90	3.5433	18	.7087	1.0	.04	1 390	2.16	28 100	6 320	21 600	4 880	7 500	9 000	4 500
112-KS	60	2.3622	95	3.7402	18	.7087	1.0	.04	1 610	2.49	32 500	7 310	25 000	5 620	6 700	8 000	4 300
113-KS	65	2.5591	100	3.9370	18	.7087	1.0	.04	1 730	2.68	33 800	7 600	27 000	6 070	6 300	7 500	4 000
114-KS	70	2.7559	110	4.3307	20	.7874	1.0	.04	2 100	3.25	41 000	9 220	32 500	7 310	6 000	7 000	3 600
115-KS	75	2.9528	115	4.5276	20	.7874	1.0	.04	2 260	3.50	42 300	9 510	35 500	7 970	5 600	6 700	3 400
116-KS	80	3.1496	125	4.9213	22	.8661	1.0	.04	2 650	4.11	50 700	11 400	41 500	9 330	5 300	6 300	3 200
117-KS	85	3.3465	130	5.1181	22	.8661	1.0	.04	2 860	4.43	52 700	11 800	45 000	10 100	5 000	6 000	3 000
118-KS	90	3.5433	140	5.5118	24	.9449	1.5	.06	3 280	5.08	61 800	13 900	51 000	11 500	4 800	5 600	2 800
119-KS	95	3.7402	145	5.7087	24	.9449	1.5	.06	3 530	5.47	63 700	14 300	54 000	12 100	4 500	5 300	2 800
120-KS	100	3.9370	150	5.9055	24	.9449	1.5	.06	3 530	5.47	63 700	14 300	54 000	12 100	4 300	5 000	2 600
121-KS	105	4.1339	160	6.2992	26	1.0236	2.0	.08	4 330	6.72	79 300	17 800	65 500	14 700	4 000	4 800	2 400
122-KS	110	4.3307	170	6.6929	28	1.1024	2.0	.08	4 660	7.23	81 800	18 400	73 500	16 500	3 800	4 500	2 400
124-KS	120	4.7244	180	7.0866	28	1.1024	2.0	.08	5 000	7.75	85 200	19 100	80 000	18 000	3 400	4 000	2 200
126-KS	130	5.1181	200	7.8740	33	1.2992	2.0	.08	5 960	9.24	106 000	23 800	100 000	22 500	3 200	3 800	2 000
128-KS ⁴⁾	140	5.5118	210	8.2677	33	1.2992	2.0	.08	6 900	10.7	111 000	25 000	108 000	24 300	3 000	3 600	1 800
130-KS ⁴⁾	150	5.9055	225	8.8583	35	1.3780	2.0	.08	8 385	13.0	125 000	28 100	125 000	28 100	2 600	3 200	1 700
132-KS ⁴⁾	160	6.2992	240	9.4488	38	1.4961	2.0	.08	9 030	14.0	143 000	32 100	143 000	32 100	2 400	3 000	1 600
134-KS ⁴⁾	170	6.6929	260	10.2362	42	1.6535	2.0	.08	11 800	18.3	168 000	37 800	173 000	38 900	2 200	2 800	1 500
136-KS ⁴⁾	180	7.0866	280	11.0236	46	1.8110	2.0	.08	11 400	17.7	190 000	42 700	200 000	45 000	2 000	2 600	1 400
138-KS ⁴⁾	190	7.4803	290	11.4173	46	1.8110	2.0	.08	13 400	20.8	195 000	43 800	216 000	48 600	2 000	2 600	1 400
140-KS ⁴⁾	200	7.8740	310	12.2047	51	2.0079	2.0	.08	15 900	24.6	216 000	48 600	245 000	55 100	1 900	2 400	1 300
144-KS ⁴⁾	220	8.6614	340	13.3868	56	2.2047	2.5	.10	18 600	28.9	247 000	55 500	290 000	65 200	1 800	2 200	1 100
148-KS ⁴⁾	240	9.4488	360	14.1732	56	2.2047	2.5	.10	19 500	30.2	255 000	57 300	315 000	70 800	1 700	2 000	1 000
152-KS ⁴⁾	260	10.2362	400	15.7480	65	2.5591	3.0	.12	23 900	37.0	291 000	65 400	375 000	84 300	1 500	1 800	940
156-KS ⁴⁾	280	11.0236	420	16.5354	65	2.5591	3.0	.12	25 700	39.9	302 000	67 900	405 000	91 000	1 400	1 700	890
160-KS ⁴⁾	300	11.8110	460	18.1102	74	2.9134	3.0	.12	31 700	49.2	358 000	80 500	500 000	112 000	1 200	1 500	780
164-KS ⁴⁾	320	12.5984	480	18.8976	74	2.9134	3.0	.12	34 000	52.7	371 000	83 400	540 000	121 000	1 100	1 400	730

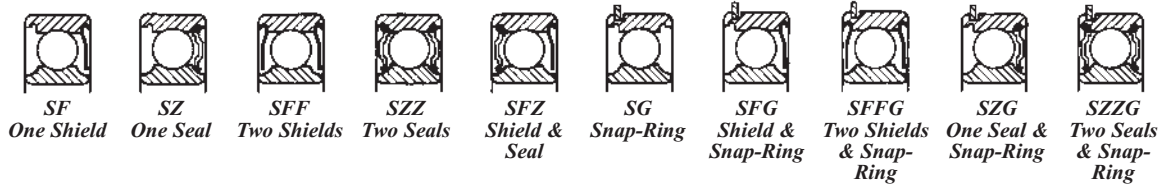
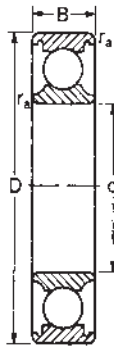
¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

⁴⁾ Typically non-stocked sizes, please check availability before designing into equipment.



200-S Light Series bearings are single-row radial conrad-type bearings made with bores from 10 mm to 120 mm. They are used in applications with moderate to heavy radial loads, two-directional thrust loads, or a combination of both.

MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		Basic Radial Load Rating				Speed Rating ²⁾				
	d	in	D	in	B	in	r _a	in	ZD ²		Dynamic C ₃		Static C ₀		Open and Shielded Grease Oil		Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
200-S	10	.3937	30	1.1811	9	.3543	.64	.025	181	.28	5 070	1 140	2 360	531	24 000	30 000	17 000
201-S	12	.4724	32	1.2598	10	.3937	.64	.025	252	.39	6 890	1 550	3 100	697	22 000	28 000	15 000
202-S	15	.5906	35	1.3780	11	.4331	.64	.025	290	.45	7 800	1 750	3 250	843	19 000	24 000	13 000
203-S	17	.6693	40	1.5748	12	.4724	.64	.025	361	.56	9 560	2 150	4 750	1 070	17 000	20 000	12 000
204-S	20	.7874	47	1.8504	14	.5512	1.0	.04	503	.78	12 700	2 860	6 550	1 470	15 000	18 000	10 000
205-S	25	.9843	52	2.0472	15	.5906	1.0	.04	568	.88	14 000	3 150	7 800	1 750	12 000	15 000	8 500
206-S	30	1.1811	62	2.4409	16	.6299	1.0	.04	819	1.27	19 500	4 380	11 200	2 520	10 000	13 000	7 500
207-S	35	1.3780	72	2.8346	17	.6693	1.0	.04	1 110	1.72	25 500	5 730	15 300	3 440	9 000	11 000	6 300
208-S	40	1.5748	80	3.1496	18	.7087	1.0	.04	1 360	2.11	30 700	6 900	19 000	4 270	8 500	10 000	5 600
209-S	45	1.7717	85	3.3465	19	.7480	1.0	.04	1 510	2.35	33 200	7 460	21 600	4 860	7 500	9 000	5 000
210-S	50	1.9685	90	3.5433	20	.7874	1.0	.04	1 610	2.50	35 100	7 890	23 200	5 220	7 000	8 500	4 800
211-S	55	2.1654	100	3.9370	21	.8268	1.5	.06	2 040	3.16	43 600	9 800	29 000	6 520	6 300	7 500	4 300
212-S	60	2.3622	110	4.3307	22	.8661	1.5	.06	2 280	3.53	47 500	10 700	32 500	7 310	6 000	7 000	4 000
213-S	65	2.5591	120	4.7244	23	.9055	1.5	.06	2 770	4.30	55 900	12 600	40 500	9 110	5 300	6 300	3 600
214-S	70	2.7559	125	4.9213	24	.9449	1.5	.06	3 060	5.18	60 500	13 600	45 000	10 100	5 000	6 000	3 400
215-S	75	2.9528	130	5.1181	25	.9843	1.5	.06	3 350	5.20	66 300	14 900	49 000	11 000	4 800	5 600	3 200
216-S	80	3.1496	140	5.5118	26	1.0236	2.0	.08	3 630	5.63	72 800	16 400	53 000	11 900	4 500	5 300	3 000
217-S	85	3.3465	150	5.9055	28	1.1024	2.0	.08	4 260	6.60	83 200	18 700	64 000	14 400	4 300	5 000	2 800
218-S	90	3.5433	160	6.2992	30	1.1811	2.0	.08	5 050	7.83	95 600	21 500	73 500	16 500	3 800	4 500	2 600
219-S	95	3.7402	170	6.6929	32	1.2598	2.0	.08	5 670	8.79	108 000	24 300	81 500	18 300	3 600	4 300	2 400
220-S	100	3.9370	180	7.0866	34	1.3386	2.0	.08	6 450	10.00	124 000	27 900	93 000	20 900	3 400	4 000	2 400
221-S	105	4.1339	190	7.4803	36	1.4173	2.0	.08	7 280	11.3	133 000	29 900	104 000	23 400	3 200	3 800	2 200
222-S	110	4.3307	200	7.8740	38	1.4961	2.0	.08	8 190	12.7	143 000	32 100	118 000	26 500	3 000	3 600	2 000
224-S	120	4.7244	215	8.4646	40	1.5748	2.0	.08	8 970	13.9	146 000	32 800	118 000	26 500	2 800	3 400	1 900

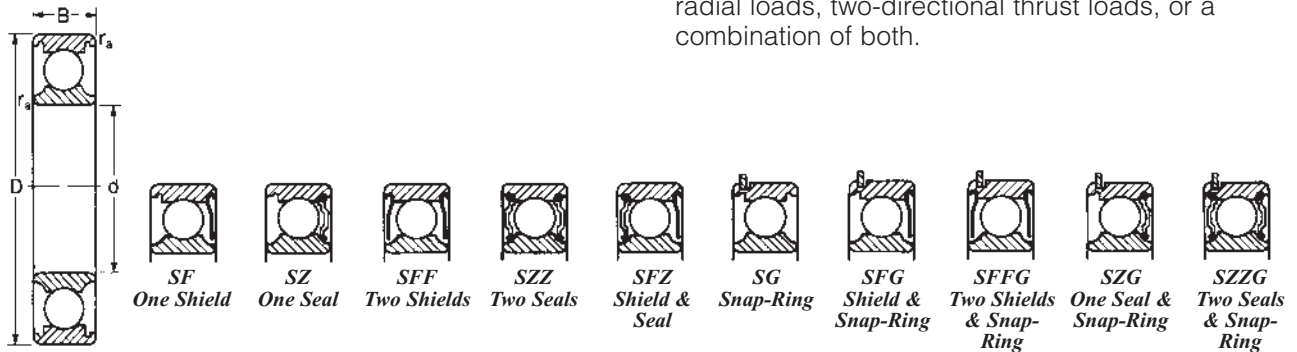
¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

300-S Medium Series bearings are used with heavy radial loads, two-directional thrust loads, or a combination of both.



MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		Basic Radial Load Rating				Speed Rating ²⁾				
	d	mm	D	mm	B	mm	r _a	r _s	ZD ²		Dynamic C ³⁾		Static C ₀		Open and Shielded Grease	Shielded Oil	Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
300-S	10	.3937	35	1.3780	11	.4331	.64	.025	303	.47	8 060	1 810	3 400	764	20 000	26 000	15 000
301-S	12	.4724	37	1.4567	12	.4724	1.0	.04	381	.59	9 750	2 190	4 150	933	19 000	24 000	14 000
302-S	15	.5906	42	1.6535	13	.5118	1.0	.04	439	.68	11 400	2 560	5 400	1 210	17 000	20 000	12 000
303-S	17	.6693	47	1.8504	14	.5512	1.0	.04	535	.83	13 500	3 030	6 550	1 470	16 000	19 000	11 000
304-S	20	.7874	52	2.0472	15	.5906	1.0	.04	632	.98	15 900	3 570	7 800	1 750	13 000	16 000	9 500
305-S	25	.9843	62	2.4409	17	.6693	1.0	.04	864	1.34	21 200	4 760	10 800	2 430	11 000	14 000	7 500
306-S	30	1.1811	72	2.8346	19	.7480	1.0	.04	1 210	1.88	28 100	6 320	16 000	3 600	9 000	11 000	6 300
307-S	35	1.3780	80	3.1496	21	.8268	1.5	.06	1 460	2.26	33 200	7 460	19 000	4 270	8 500	10 000	6 000
308-S	40	1.5748	90	3.5433	23	.9055	1.5	.06	1 820	2.82	41 000	9 220	24 000	5 400	7 500	9 000	5 000
309-S	45	1.7717	100	3.9370	25	.9843	1.5	.06	2 440	3.62	52 700	11 900	31 500	7 080	6 700	8 000	4 500
310-S	50	1.9685	110	4.3307	27	1.0630	2.0	.08	2 900	4.50	61 800	13 900	38 000	8 540	6 300	7 500	4 300
311-S	55	2.1654	120	4.7244	29	1.1417	2.0	.08	3 410	5.28	71 500	16 100	45 000	10 100	5 600	6 700	3 800
312-S	60	2.3622	130	5.1181	31	1.2205	2.0	.08	3 950	6.13	81 900	18 400	52 000	11 700	5 000	6 000	3 400
313-S	65	2.5591	140	5.5118	33	1.2992	2.0	.08	4 540	7.03	92 300	20 800	60 000	13 500	4 800	5 600	3 200
314-S	70	2.7559	150	5.9055	35	1.3780	2.0	.08	5 160	8.00	104 000	23 400	68 000	15 300	4 500	5 300	3 000
315-S	75	2.9528	160	6.2992	37	1.4567	2.0	.08	5 820	9.03	114 000	25 600	76 500	17 200	4 300	5 000	2 800
316-S	80	3.1496	170	6.6929	39	1.5354	2.0	.08	6 515	10.1	124 000	27 900	86 500	19 400	3 800	4 500	2 600
317-S	85	3.3465	180	7.0866	41	1.6142	2.5	.10	7 290	11.3	133 000	29 900	96 500	21 700	3 600	4 300	2 400
318-S	90	3.5433	190	7.4803	43	1.6929	2.5	.10	8 060	12.5	143 000	32 100	108 000	24 300	3 400	4 000	2 400
319-S	95	3.7402	200	7.8740	45	1.7717	2.5	.10	8 900	13.8	153 000	34 400	118 000	26 500	3 200	3 800	2 200
320-S	100	3.9370	215	8.4646	47	1.8504	2.5	.10	10 600	16.5	174 000	39 100	140 000	31 500	3 000	3 600	2 100
321-S	105	4.1339	225	8.8583	49	1.9291	2.5	.10	11 600	18.0	182 000	40 800	153 000	34 400	2 800	3 400	2 000
322-S	110	4.3307	240	9.4488	50	1.9685	2.5	.10	13 600	21.1	203 000	45 600	180 000	40 500	2 600	3 200	1 800
324-S	120	4.7244	260	10.2362	55	2.1654	2.5	.10	13 600	21.1	208 000	46 700	186 000	41 800	2 400	3 000	—

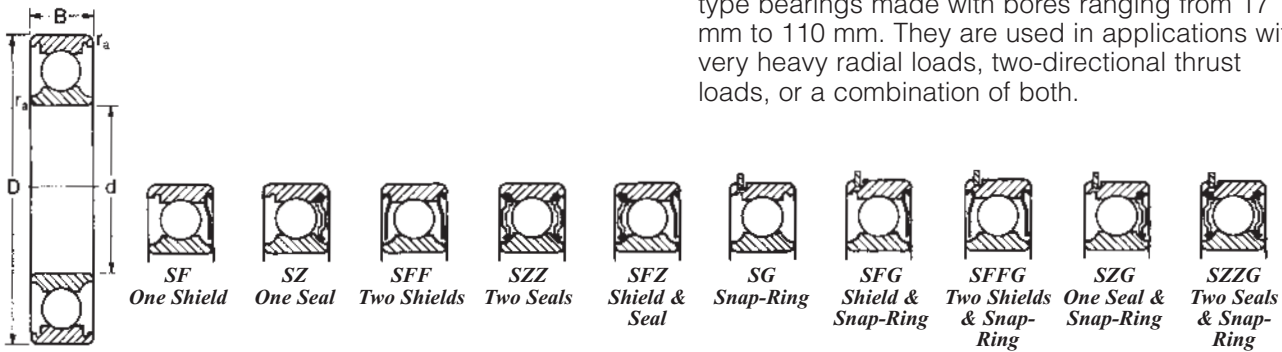
¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33⅓ RPM.

This series is made up of single-row radial conrad-type bearings made with bores ranging from 17 mm to 110 mm. They are used in applications with very heavy radial loads, two-directional thrust loads, or a combination of both.



MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		ZD ²⁾		Basic Radial Load Rating				Speed Rating ²⁾			
	d	mm	D	mm	B	mm	r _a	mm	in	mm	in	Dynamic C _d ³⁾		Static C ₀		Open and Shielded Grease		Single and Double Sealed Grease
												N	lbf	N	lbf	RPM	RPM	RPM
403-S	17	.6693	62	2.4409	17	.6693	1.0	.04	968	1.50	22 900	5 150	10 800	2 430	12 000	15 000	8 500	
404-S	20	.7874	72	2.8346	19	.7480	1.0	.04	1 370	2.12	30 700	6 900	15 000	3 370	10 000	13 000	7 300	
405-S	25	.9843	80	3.1496	21	.8268	1.5	.06	1 590	2.47	35 800	8 050	19 300	4 340	9 000	11 000	6 400	
406-S	30	1.1811	90	3.5433	23	.9055	1.5	.06	1 950	3.02	43 600	9 800	23 600	5 310	8 500	10 000	5 600	
407-S	35	1.3780	100	3.9370	25	.9843	1.5	.06	2 540	3.94	55 300	12 400	31 000	6 970	7 000	8 500	4 900	
408-S	40	1.5748	110	4.3307	27	1.0630	2.0	.08	2 980	4.62	63 700	14 300	36 500	8 210	6 700	8 000	4 400	
409-S	45	1.7717	120	4.7244	29	1.1417	2.0	.08	3 710	5.75	76 100	17 100	45 000	10 100	6 000	7 000	4 000	
410-S	50	1.9685	130	5.1181	31	1.2205	2.0	.08	4 520	7.00	87 100	19 600	52 000	11 700	5 200	6 300	3 700	
411-S	55	2.1654	140	5.5118	33	1.2992	2.0	.08	5 100	7.90	99 500	22 400	62 000	13 900	5 000	6 000	3 400	
412-S	60	2.3622	150	5.9055	35	1.3780	2.0	.08	5 710	8.86	108 000	24 300	69 500	15 600	4 800	5 600	3 100	
413-S	65	2.5591	160	6.2992	37	1.4567	2.0	.08	6 370	9.87	119 000	26 800	78 000	17 500	4 500	5 300	2 900	
414-S	70	2.7559	180	7.0866	42	1.6535	2.5	.10	8 510	13.2	143 000	32 100	104 000	23 400	3 800	4 500	2 600	
415-S	75	2.9528	190	7.4803	45	1.7717	2.5	.10	9 350	14.5	153 000	34 400	114 000	25 600	3 600	4 300	2 500	
416-S	80	3.1496	200	7.8740	48	1.8898	2.5	.10	10 200	15.8	163 000	36 600	125 000	28 100	3 400	4 000	2 300	
417-S	85	3.3465	210	8.2677	52	2.0472	3.0	.12	11 000	17.1	174 000	39 100	137 000	30 800	3 200	3 800	2 200	
418-S	90	3.5433	225	8.8583	54	2.1260	3.0	.12	12 800	19.9	186 000	41 800	150 000	33 700	3 000	3 600	2 100	
419-S ⁴⁾	95	3.7402	250	9.8425	55	2.1654	3.0	.12	13 800	21.4	203 000	45 600	173 000	38 900	2 700	3 300	1 900	
420-S ⁴⁾	100	3.9370	265	10.4331	60	2.3622	3.0	.12	15 900	24.6	225 000	50 600	200 000	45 000	2 500	3 100	1 800	
421-S ⁴⁾	105	4.1339	290	11.4173	65	2.5591	3.0	.12	18 100	28.0	247 000	55 500	228 000	51 300	2 400	2 900	1 600	
422-S ⁴⁾	110	4.3307	320	12.5984	70	2.7559	3.0	.12	20 300	31.6	270 000	60 700	260 000	58 500	2 100	2 600	1 500	

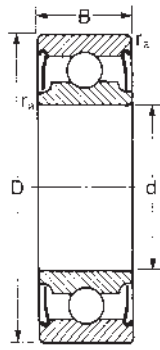
¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

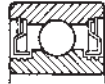
For phenolic composition cage, multiply by 1.66 for grease and 2.00 for oil. For machined bronze cage, multiply by 1.25 for grease and 1.50 for oil. For phenolic composition cage, ABEC-5 or 7, multiply by 2.30 for grease and 2.80 for oil. The speed rating adjustment factors have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

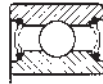
⁴⁾ Typically non-stocked sizes, please check availability before designing into equipment.



SFFC
Metal Shields



SLLC Removable
Metal Shields



SZZC Synthetic
Rubber Seals

Cartridge-type bearings have an extra large grease chamber packed with high quality lubricant. For applications where space for a lubrication system is limited or conditions demand a larger grease supply inside bearing.

Bearings designated SFFC have non-removable metal shields. Many sizes are available with removable shields (SLLC) or synthetic rubber seals (SZZC).

MRC Bearing Number	Bore		Outside Diameter		Width		Fillet Radius ¹⁾		Basic Radial Load Rating				Speed Rating ²⁾				
	d	in	D	in	B	in	r _a	in	ZD ²⁾		Dynamic C ³⁾		Static C ₀		Open and Shielded Grease	Shielded Oil	Single and Double Sealed Grease
									mm	in	N	lbf	N	lbf	RPM	RPM	RPM
200-SFFC	10	.3937	30	1.1811	14.29	9/16	.64	.025	181	.28	5 070	1 140	2 400	540	24 000	30 000	17 000
201-SFFC	12	.4724	32	1.2598	15.88	5/8	.64	.025	252	.39	6 760	1 520	3 000	674	22 000	28 000	15 000
202-SFFC	15	.5906	35	1.3780	15.88	5/8	.64	.025	290	.45	7 610	1 710	3 750	843	19 000	24 000	13 000
203-SFFC	17	.6693	40	1.5748	17.46	11/16	.64	.025	361	.56	9 560	2 150	4 500	1 010	17 000	20 000	12 000
204-SFFC	20	.7874	47	1.8504	20.64	13/16	1.0	.04	503	.78	13 000	2 920	6 700	1 510	15 000	18 000	10 000
205-SFFC	25	.9843	52	2.0472	20.64	13/16	1.0	.04	568	.88	15 100	3 390	8 150	1 830	12 000	15 000	8 500
206-SFFC	30	1.1811	62	2.4409	23.81	15/16	1.0	.04	819	1.27	20 800	4 680	11 400	2 560	10 000	13 000	7 500
207-SFFC	35	1.3780	72	2.8346	26.99	1 1/16	1.0	.04	1 140	1.76	26 500	5 960	15 300	3 440	9 000	11 000	6 300
208-SFFC	40	1.5748	80	3.1496	30.16	1 3/16	1.0	.04	1 450	2.25	32 500	7 310	20 000	4 550	8 500	10 000	5 600
209-SFFC	45	1.7717	85	3.3465	30.16	1 3/16	1.0	.04	1 640	2.54	36 400	8 180	22 800	5 130	7 500	9 000	5 000
210-SFFC	50	1.9685	90	3.5433	30.16	1 3/16	1.0	.04	1 610	2.50	35 100	7 890	23 200	5 220	7 000	8 500	4 800
211-SFFC	55	2.1654	100	3.9370	33.34	1 5/16	1.5	.06	2 040	3.16	39 700	8 920	29 000	6 520	6 300	7 500	4 300
213-SFFC	65	2.5591	120	4.7244	38.10	1 1/2	1.5	.06	3 050	4.73	62 400	14 000	44 000	9 890	5 300	6 300	3 600
214-SFFC	70	2.7559	125	4.9213	39.69	1 5/8	1.5	.06	3 050	4.73	62 400	14 000	44 000	9 890	5 000	6 000	3 400
216-SFFC	80	3.1496	140	5.5118	44.45	1 3/4	2.0	.08	3 630	5.63	78 000	17 500	53 000	11 900	4 500	5 300	3 000
304-SFFC	20	.7874	52	2.0472	22.23	7/8	1.0	.04	632	.98	15 900	3 570	7 800	1 750	13 000	16 000	9 500
305-SFFC	25	.9843	62	2.4409	25.40	1	1.0	.04	864	1.34	21 000	4 770	11 000	2 470	11 000	14 000	7 500
306-SFFC	30	1.1811	72	2.8346	30.16	1 1/16	1.0	.04	1 290	2.00	29 600	6 650	16 600	3 730	9 000	11 000	6 300
307-SFFC	35	1.3780	80	3.1496	34.93	1 3/8	1.5	.06	1 590	2.47	36 400	8 180	20 000	4 500	8 500	10 000	6 000
308-SFFC	40	1.5748	90	3.5433	36.51	1 7/16	1.5	.06	2 020	3.13	44 200	9 940	26 000	5 850	7 500	9 000	5 000
309-SFFC	45	1.7717	100	3.9370	39.69	1 9/16	1.5	.06	2 330	3.62	52 000	11 700	30 000	6 740	6 700	8 000	4 500
310-SFFC	50	1.9685	110	4.3307	44.45	1 3/4	2.0	.08	2 900	4.50	61 800	13 900	38 000	8 540	6 300	7 500	4 300
311-SFFC	55	2.1654	120	4.7244	49.21	1 5/16	2.0	.08	3 410	5.28	71 500	16 100	45 000	10 100	5 600	6 700	3 800
312-SFFC	60	2.3622	130	5.1181	53.98	2 1/8	2.0	.08	3 950	6.13	81 900	18 400	52 000	11 700	5 000	6 000	3 400
313-SFFC	65	2.5591	140	5.5118	58.74	2 5/16	2.0	.08	4 530	7.03	92 300	20 700	60 000	13 500	4 800	5 600	3 200
314-SFFC	70	2.7559	150	5.9055	63.50	2 1/2	2.0	.08	5 160	8.00	104 000	23 400	68 000	15 300	4 500	5 300	3 000
315-SFFC	75	2.9528	160	6.2992	68.26	2 11/16	2.0	.08	6 530	10.1	124 000	27 900	85 000	19 100	4 300	5 000	2 800
316-SFFC	80	3.1496	170	6.6929	68.26	2 11/16	2.0	.08	7 280	11.3	133 000	29 900	95 000	21 400	3 800	4 500	2 600
317-SFFC	85	3.3465	180	7.0866	73.03	2 7/8	2.5	.10	7 280	11.3	133 000	29 900	96 500	21 700	3 600	4 300	2 400
318-SFFC	90	3.5433	190	7.4803	73.03	2 7/8	2.5	.10	8 060	12.5	143 000	32 100	108 000	24 300	3 400	4 000	2 400
320-SFFC	100	3.9370	215	8.4646	82.55	3 1/4	2.5	.10	11 600	18.0	182 000	40 900	150 000	33 700	3 000	3 600	2 100

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

²⁾ Listed values are for pressed steel or polyamide cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 274.

³⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.

Dynamic and static equivalent radial load and life rating

Dynamic equivalent radial load

$P = XF_R + YF_A$ P = Dynamic equivalent radial load
 F_R = Radial load
 F_A = Thrust load
 Z = Number of balls
 D = Ball diameter
 X = Radial load factor
 Y = Thrust load factor
 e = Limiting factor for F_A/F_R

Life rating

$$L_{10} = \left(\frac{C}{P}\right)^3 \text{ (Millions of revolutions)}$$

or

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

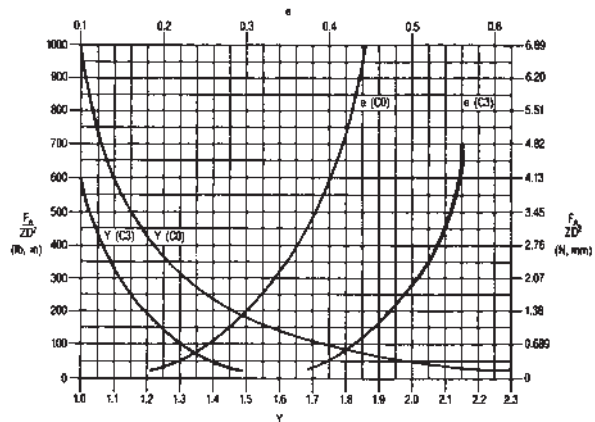
C = Basic dynamic load rating
 P = Dynamic equivalent radial load
 n = Speed in RPM

Static equivalent radial load

$P_0 = 0.6 F_R + 0.5 F_A$
 P_0 is always $\geq F_R$
 P_0 = Static equivalent radial load
 F_R = Radial load
 F_A = Thrust load

Internal Radial Clearance	$\frac{F_A}{ZD^2}$		$\frac{F_A}{F_R} > e$		e
	Units N, mm	Units lb, in	X	Y	
Standard (ABMA C0)	0.172	25		2.30	0.19
	0.345	50		1.99	0.22
	0.689	100		1.71	0.26
	1.03	150		1.56	0.28
	1.38	200	0.56	1.45	0.30
	2.07	300		1.31	0.34
	3.45	500		1.15	0.38
	6.89	1000		1.04	0.42
Loose (ABMA C3)	0.172	25		1.47	0.38
	0.345	50		1.40	0.40
	0.689	100		1.30	0.43
	1.03	150		1.23	0.46
	1.38	200	0.44	1.19	0.47
	2.07	300		1.12	0.50
	3.45	500		1.02	0.55
	6.89	1000		1.00	0.56

When $F_A/F_R \leq e$, use $X = 1.0$, $Y = 0$.
 Values of Y and e for loads not shown are obtained from chart to the right.



**Dynamic equivalent radial load
and life calculation examples**

Bearing size: 309S
 Speed = 2000 RPM
 Basic dynamic load rating (C) = 11900 lbf
 ZD² = 3.62

ABMA CO Internal Clearance**Case 1**

$$\begin{aligned} \text{Radial load } (F_R) &= 1890 \\ \text{Equivalent load } (P) &= X F_R + Y F_A \\ P &= F_R = 1890 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{1890}\right)^3 = 249.6 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{1890}\right)^3 \\ &= 2080 \text{ Hrs} \end{aligned}$$

Case 2

$$\begin{aligned} \text{Radial load } (F_R) &= 1890 \\ \text{Thrust load } (F_A) &= 1250 \\ \text{Equivalent load } (P) &= X F_R + Y F_A \\ F_A/ZD^2 &= 1250/3.62 = 345 \\ X &= 0.56 \\ Y &= 1.27 \\ P &= 0.56 \times 1890 + 1.27 \times 1250 = 2646 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{2646}\right)^3 = 91.0 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{2646}\right)^3 \\ &= 758 \text{ Hrs} \end{aligned}$$

Case 3

$$\begin{aligned} \text{Thrust load } (F_A) &= 1250 \\ \text{Equivalent load } (P) &= X F_R + Y F_A \\ F_A/ZD^2 &= 1250/3.62 = 345 \\ Y &= 1.27 \\ P &= 1.27 \times 1250 = 1588 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{1588}\right)^3 = 420.8 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{1588}\right)^3 \\ &= 3507 \text{ Hrs} \end{aligned}$$

ABMA C3 Internal Clearance**Case 1**

$$\begin{aligned} \text{Radial load } (F_R) &= 1890 \\ \text{Equivalent load } (P) &= X F_R + Y_A \\ P &= F_R = 1890 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{1890}\right)^3 = 249.6 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{1890}\right)^3 \\ &= 2080 \text{ Hrs} \end{aligned}$$

Case 2

$$\begin{aligned} \text{Radial load } (F_R) &= 1890 \\ \text{Thrust load } (F_A) &= 1250 \\ \text{Equivalent load } (P) &= X F_R + Y F_A \\ F_A/ZD^2 &= 1250/3.62 = 345 \\ X &= 0.44 \\ Y &= 1.08 \\ P &= 0.44 \times 1890 + 1.08 \times 1250 = 2182 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{2182}\right)^3 = 162.2 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{2182}\right)^3 \\ &= 1352 \text{ Hrs} \end{aligned}$$

Case 3

$$\begin{aligned} \text{Thrust load } (F_A) &= 1250 \\ \text{Equivalent load } (P) &= X F_R + Y F_A \\ F_A/ZD^2 &= 1250/3.62 = 345 \\ Y &= 1.08 \\ P &= 1.08 \times 1250 = 1350 \\ \text{Life } (L_{10}) &= \left(\frac{C}{P}\right)^3 = \left(\frac{11900}{1350}\right)^3 = 684.9 \times 10^6 \text{ Rev.} \end{aligned}$$

$$\begin{aligned} \text{or} \\ \text{Life } (L_{10h}) &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11900}{1350}\right)^3 \\ &= 5708 \text{ Hrs} \end{aligned}$$

Part Numbering System

Basic Conrad Series

- 100KS
- 200S
- 300S

Sealing Options

- ZZ- Two contact seals
- FF- Two shields
- FFP- Two low friction seals

Other suffixes

- HYB- Ceramic balls
- #1- ABEC 1

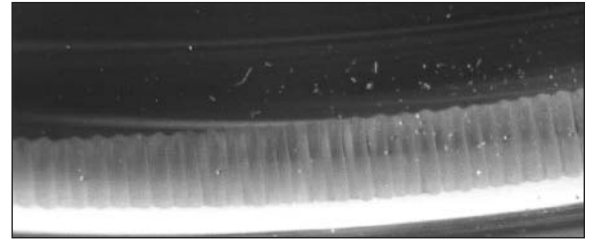


MRC hybrid ball bearings are stocked in an open version in the sizes listed. In most cases, hybrid bearings can also be supplied with seals, shields, or low friction seals through the MRC Made-to-Order (MTO) program. In addition to those listed, other sizes of the 200S and 300S series as well as the 100KS series can be supplied through the MTO program. Most series of angular contact ball bearings can also be supplied through MTO.

Designation	d	D	B	r1,2 min	DYNAMIC	STATIC	SPEED	Mass	
	mm	mm	mm	mm	C	Co	RPM	kg	lbs
306S-HYB#1	30	72	19	1	6,700	3,200	14,300	0.328	0.72
207S-HYB#1	35	72	17	1.1	6,100	3,300	14,300	0.265	0.58
307S-HYB#1	35	80	21	1.5	7,900	3,800	13,200	0.422	0.93
208S-HYB#1	40	80	18	1.1	7,300	3,800	12,100	0.334	0.74
308S-HYB#1	40	90	23	1.5	9,500	4,800	12,100	0.580	1.28
209S-HYB#1	45	85	19	1.1	7,900	4,300	12,100	0.384	0.85
309S-HYB#1	45	100	25	1.5	12,400	6,300	10,450	0.769	1.70
210S-HYB#1	50	90	20	1.1	8,300	4,600	11,000	0.427	0.94
310S-HYB#1	50	110	27	2	14,600	7,600	9,350	0.997	2.20
211S-HYB#1	55	100	21	1.5	10,400	5,800	9,900	0.564	1.24
311S-HYB#1	55	120	29	2	16,700	9,000	8,800	1.282	2.83
212S-HYB#1	60	110	22	1.5	12,400	7,200	8,800	0.737	1.62
312S-HYB#1	60	130	31	2	19,400	10,400	7,700	1.606	3.54
213S-HYB#1	65	120	23	1.5	13,100	8,100	8,250	0.946	2.09
313S-HYB#1	65	140	33	2	21,900	12,000	7,370	1.957	4.31
214S-HYB#1	70	125	24	1.5	14,300	9,000	7,700	1.017	2.24
314S-HYB#1	70	150	35	2	24,900	13,600	6,930	2.181	4.81
215S-HYB#1	75	130	25	1.5	15,500	9,800	7,370	1.106	2.44
315S-HYB#1	75	160	37	2	26,700	15,200	6,160	2.884	6.36
216S-HYB#1	80	140	26	2	16,400	11,000	6,600	1.358	2.99
316S-HYB#1	80	170	39	2.1	29,200	17,200	6,160	3.415	7.53
217S-HYB#1	85	150	28	2	19,600	12,800	6,160	1.712	3.77
317S-HYB#1	85	180	41	2.1	31,500	19,200	5,500	4.012	8.85
218S-HYB#1	90	160	30	2	22,700	14,700	5,830	2.082	4.59
318S-HYB#1	90	190	43	2.1	33,900	21,500	5,280	4.657	10.27
220S-HYB#1	100	180	34	2	28,500	18,500	5,280	3.006	6.63
222S-HYB#1	110	200	38	2	33,900	23,500	4,730	4.169	9.19
224S-HYB#1	120	215	40	2	32,800	23,500	4,400	4.935	10.88
226S-HYB#1	130	230	40	3	37,100	26,300	3,960	5.471	12.06
228S-HYB#1	140	250	42	3	37,100	29,900	3,740	7.260	16.01
230S-HYB#1	150	270	45	3	39,100	33,100	3,520	10.855	23.94
232S-HYB#1	160	290	48	3	41,800	37,100	3,300	13.583	29.95
236S-HYB#1	180	320	52	4	51,500	47,800	3,960	17.319	38.19

Prevents Electrical Arcing

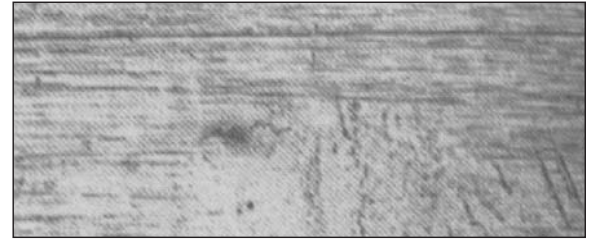
When electrical current passes across bearings, a washboard or fluting pattern appears on the raceways, in addition to a darkened grey appearance. This damage usually results in excessive noise which requires that the bearing be removed. Besides the surface damage, premature aging of the lubricant also occurs. The natural insulating properties of ceramic material eliminates this type of damage.



Fluting created by electrical arcing

Lower Maintenance Costs

Maintenance costs can quickly add up if a bearing must be changed frequently. Anything that extends the service life of a bearing without increasing maintenance costs will reduce the operating cost of the equipment. Though the initial cost of a hybrid bearing is higher than a standard steel bearing, the difference is quickly recovered in maintenance savings. Less friction also results in lower energy costs.



Wear caused by static vibration

Extended Service Life

Most bearings are designed into applications based on loading conditions and do not take into account factors such as lubrication, contamination and maintenance. Without proper attention to these external factors, a steel bearing rarely reaches its design L10 life and therefore has a shortened service life. Because of the properties of ceramics, the service life of a hybrid bearing is up to 10 times that of a standard steel bearing. And longer service life reduces the need for maintenance on your machine as well as the costly interruptions in production.

conditions or, if applicable, a higher rotational speed while maintaining the same temperature.

Reduced Wear from Contamination

In contaminated environments, solid particles create dents in the rolling surfaces and raised edges around those dents. This condition causes noise and premature wear as the steel balls roll over those surfaces. The harder ceramic ball material smooths the surface roughness with no material removal. Also, there is little evidence of adhesive wear as seen in steel bearings. This reduces the noise and wear, which extends the bearing service life.

Extended Grease Life

In environments that place high demands on the bearing lubricant, standard bearings experience surface wear because of insufficient lubricant film. Bearings can fail if the initial grease charge is not replenished within an acceptable period of time. Hybrid bearings run cooler and can operate with thinner lubricant films, so there is less aging of the grease and the required relubrication interval will be longer. The result is increased service life compared to standard bearings in the same operating conditions.

Reduced Wear from Vibration

In equipment exposed to static vibration, there is an inherent risk of false brinelling, (the wearing away of the surfaces within the ball and raceway contacts) which can eventually lead to spalling and premature failure. Because of the lighter weight ceramic balls and dissimilar materials, the risk of false brinelling damage is much less.

Lower Operating Temperatures

The heat generated in bearings is attributable to viscous friction from lubrication and load dependent friction between the balls and raceways. The source of the loading is external as well as internal. There is little that can be done to reduce the external loads. However, since ceramic balls have only 40% of the density of steel balls, the centrifugal load generated by the balls is less and the internal friction is lower. This provides cooler running for the same operating

Material Properties	Bearing Steel	Bearing Silicon Nitride	Benefit
Mechanical properties			
Density [g/cm ³]	7.9	3.2	Lower density reduces the centrifugal force and thereby reduces bearing friction
Hardness, HV10 [kg/mm ²]	700	1600	Higher hardness promotes wear resistance against hard particles and lower plastic deformation
Modulus of elasticity, E [GPa]	210	310	Higher modulus of elasticity increases the bearing stiffness. Hybrid bearings deflect less under load, providing more predictable performance
Coefficient of thermal expansion [1/C]	12 x 10 ⁻⁶	63 x 10 ⁻⁶	Lower coefficient of expansion reduces the effects of ring temperature difference resulting in more stable clearance or preload
Electrical properties			
Electrical resistivity [Wm]	0.4 x 10 ⁻⁶ (conductor)	10 ¹² (insulator)	The ceramic balls break the electrical current (DC) path and act as an insulator
Relative dielectric constant	N/A	4.2 to 6.1	The ceramic balls break the electrical current (AC) path and act as a large impedance
Magnetic field influence	Yes	No	Ceramic balls do not respond to magnetic forces
Chemical resistance	Reactive	Inert	Ceramic to steel contacts show no micro-welding and do not seize during poor lubrication