

ROLLWAY

ANGULAR CONTACT BALL BEARINGS



ANGULAR CONTACT BALL BEARINGS

From Rollway — Setting The Quality Standard For Less Vibration/Friction/Heat/Wear, For Longer Bearing Life In The Most Demanding Applications

The name 'Rollway' on a roller bearing has been synonymous with precision and quality craftsmanship for nearly a century. Since 1908 when the first bearings were shipped from the company's plant in Syracuse, New York, to the present day, Rollway has been dedicated to advancing bearing technology. Today, Rollway maintains a leadership position, meeting the high performance demands of the industrial, military and aerospace markets. Drawing upon our heritage of product excellence and experience with tough applications, Rollway now presents this line of distinguished Angular Contact Ball Bearings.

Design Specifications And Features

The entire focus of Rollway concept, design and manufacturing technique is upon a single end value: producing bearings that provide dynamic control necessary for high performance equipment. Given the proper dynamic capacity, the life of a bearing depends upon how it runs, i.e. dynamic control: balance, accuracy and smooth performance.

Rollway's standard ball bearings are made to ABEC-1 tolerances with ABEC-3 tolerances for the inner ring bore and radial runout. The cage is made from selected high density bronze and machined for close running control on the inner ring land.

Rollway angular contact ball bearings are available in the 7200, 7300 and 7400 Series, with 40 contact angles. All bearings are universally flush ground for DB, DF or DT mounting. Flush grinding removes end play at a theoretical zero preload. The outer ring has one counter-bored shoulder to allow assembly, and a low shoulder snap to retain the cage and ball assembly.

Material

The ring and balls are made from vacuum degassed through hardened 52100 bearing quality steel. Carefully controlled heat treatment assures stabilized parts that will maintain dimensional integrity at operating temperatures. The cage is made from centrifugally cast, physically controlled bearing bronze.

Load Ratings

Static and dynamic capacities are calculated in accordance with AFBMA Standard #9.

Limiting Speed

The limiting speed of a ball bearing is based on what is considered an acceptable temperature rise in the bearing. This temperature rise is dependent on frictional characteristics (particularly of rubbing components vis-a-vis ball and cage), running accuracy, the type of lubricant and lubrication system, and the heat surrounding the application.

With angular contact ball bearings, the limiting speed is also dependent on the amount of preload and the contact angle, i.e. a smaller angle and/or a lighter preload allows high speeds.

A machined, land riding cage has better speed characteristics than a ball riding cage. Where temperatures and/or environmental conditions preclude the use of plastics, the machined bronze cage is the optimal choice in every respect for high speeds. (For details concerning limiting speed, contact the Rollway Engineering Department.)

Bearing Installations

Rollway's flush ground, 40° angular contact ball bearings, are designed to take the thrust loads in one direction only. Therefore, they are usually mounted in opposing pairs or in multiple sets where at least one bearing opposes the tandem mounting. Universal flush grinding allows these bearings to be mounted in the following configurations: back to back (DB), face to face (DF) and tandem (DT). When correctly mounted, the inner and outer ring faces will be flush and the end play will be zero at theoretical zero preload.

The type of mounting selected depends on the type of loads and the operating conditions. The "DB" mounting is very rigid due to the diverging contact angles and the spread of the pressure centers (see dimension a in the tables). This spread of the pressure points provides maximum resistance to the overturning moments and shaft deflections.

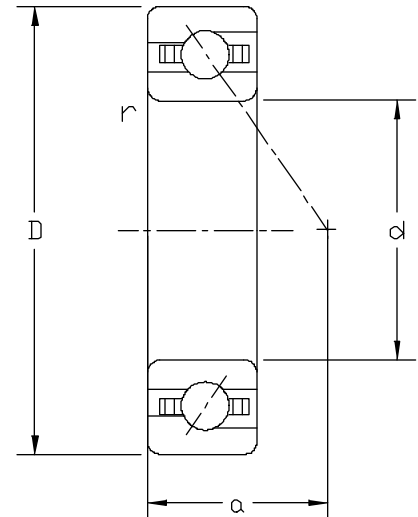
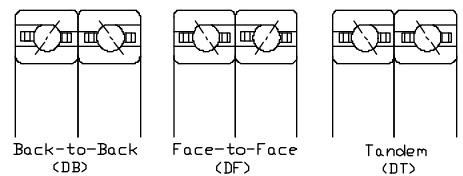
The "DF" mounting has converging contact angles which results in a less rigid, more forgiving arrangement. This mounting will accept more misalignment and deflection than the "DB" mounting. However, the trade-off is a less rigid support for an overhung load.

The "DT" mounting is used where the thrust load in one direction exceeds the capacity of one bearing. A "DT" mounting requires at least one opposing bearing.

Applications

Rollway's ball bearings are designed for high performance applications where better dynamic control will provide smoother operation and longer life. Typical applications are heavy duty pumps for processing plants, deep well pumps, compressors and gear boxes.

Rollway's Engineering Department is ready to assist you with your bearing applications.



40 deg.
Contact
angle

Rollway's standard bearing is made to ABEC-1 tolerances with inner ring bore and radial runout made to ABEC-3 tolerances

7200 Series

Bearing Number	d		D		B		r		a		C		Co		Weight	
	Bore Diameter		Outside Diameter		Width		Fillet Radius		Pressure Center		Dynamic Load Rating		Static Load Rating			
	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	N	Lbs. F	N	Lbs. F	Kg	Lbs.
7209	45	1.7717	85	3.3465	19	0.7480	1	0.039	37	1.457	29600	6650	23600	5310	0.48	1.06
7210	50	1.9685	90	3.5433	20	0.7874	1	0.039	39	1.535	30800	6920	25900	5820	0.55	1.21
7211	55	2.1654	100	3.9370	21	0.8268	1.5	0.059	43	1.693	37700	8480	32300	7260	0.72	1.59
7212	60	2.3622	110	4.3307	22	0.8661	1.5	0.059	47	1.850	45200	10160	39400	8860	0.92	2.03
7213	65	2.5591	120	4.7224	23	0.9055	1.5	0.059	50	1.969	49000	11020	43700	9820	1.15	2.53
7214	70	2.7559	125	4.9213	24	0.9449	1.5	0.059	53	2.087	53000	11920	47800	10750	1.26	2.78
7215	75	2.9528	130	5.1181	25	0.9843	1.5	0.059	56	2.205	55200	12410	51800	11650	1.38	3.04
7216	80	3.1496	140	5.5118	26	1.0236	2	0.079	59	2.323	64200	14430	61000	13710	1.68	3.70
7217	85	3.3465	150	5.9055	28	1.1024	2	0.079	63	2.480	73900	16610	71000	15960	2.09	4.61
7218	90	3.5433	160	6.2992	30	1.1811	2	0.079	67	2.638	84100	18900	81700	18370	2.57	5.67
7219	95	3.7402	170	6.6929	32	1.2598	2	0.079	72	2.835	94900	21340	93200	20950	3.11	6.86
7220	100	3.9370	180	7.0866	34	1.3386	2	0.079	76	2.992	100300	22550	99800	22440	3.73	8.22
7221	105	4.1339	190	7.4803	36	1.4173	2	0.079	80	3.150	109200	24550	109200	24550	4.42	9.74
7222	110	4.3307	200	7.8740	38	1.4961	2	0.079	84	3.307	118500	26640	118500	26640	5.19	11.44
7224	120	4.7244	215	8.4646	40	1.5748	2	0.079	90	3.543	127300	28620	141000	31700	6.23	13.73
7226	130	5.1181	230	9.0551	40	1.5748	2.5	0.098	96	3.780	142600	32060	167400	37630	7.05	15.54
7228	140	5.5118	250	9.8425	42	1.6535	2.5	0.098	103	4.055	151800	34130	485700	41750	8.82	19.44
7230	150	5.9055	270	10.6299	45	1.7717	2.5	0.098	111	4.370	168000	37770	218000	49010	11.11	24.49
7232	160	6.2992	290	11.4173	48	1.8898	2.5	0.098	118	4.646	182900	41120	243000	54630	13.75	30.31

7300 Series

7308	40	1.5748	90	3.5433	23	0.9055	1.5	0.059	39	1.535	36500	8200	26000	5845	0.74	1.62
7309	45	1.7717	100	3.9370	25	0.9843	1.5	0.059	43	1.693	45800	10300	34500	7760	0.97	2.13
7310	50	1.9685	110	4.3307	27	1.0630	2.0	0.079	47	1.850	53200	12000	40900	9200	1.25	2.76
7311	55	2.1654	120	4.7244	29	1.1417	2.0	0.079	51	2.008	61100	13740	47900	10770	1.60	3.52
7312	60	2.3622	130	5.1181	31	1.2205	2.0	0.079	55	2.165	69500	15630	55500	12480	2.00	4.39
7313	65	2.5591	140	5.5118	33	1.2992	2.0	0.079	60	2.362	78400	17630	63600	14300	2.45	5.40
7314	70	2.7559	150	5.9055	35	1.3780	2.0	0.079	64	2.520	90300	20300	76000	17090	2.97	6.53
7315	75	2.9528	160	6.2992	37	1.4567	2.0	0.079	68	2.677	97900	22000	85400	19200	3.56	7.84
7316	80	3.1496	170	6.6929	39	1.5354	2.0	0.079	72	2.835	105600	23740	95400	21450	4.24	9.32
7317	85	3.3465	180	7.0866	41	1.6142	2.5	0.098	76	2.992	113500	2550	106000	23830	4.99	10.98
7318	90	3.5433	190	7.4803	43	1.6929	2.5	0.098	80	3.150	121500	27320	117000	26300	5.83	12.82
7319	95	3.7402	200	7.8740	45	1.7717	2.5	0.098	84	3.307	129700	29160	128700	28930	6.75	14.85
7320	100	3.9370	215	8.4646	47	1.8504	2.5	0.098	90	3.543	146200	32900	154400	34710	8.25	18.15
7321	105	4.1339	225	8.8583	49	1.9291	2.5	0.098	94	3.701	155200	34900	168300	37800	9.50	20.94
7322	110	4.3307	240	9.4488	50	1.9685	2.5	0.098	98	3.858	164200	36910	183600	41280	10.98	24.15
7324	120	4.7244	260	10.2362	55	2.1654	2.5	0.098	107	4.213	192700	43300	228200	51300	14.33	31.59
7326	130	5.1181	280	11.0236	58	2.2835	3.0	0.118	115	4.528	212100	47680	262500	59020	17.26	37.97

7400 Series

7408	40	1.5748	110	4.3307	27	1.0630	2.0	0.079	45	1.772	49900	11220	36400	8180	1.42	3.13
7409	45	1.7717	120	4.7244	29	1.1417	2.0	0.079	49	1.929	57300	12880	42760	9610	1.80	3.97
7410	50	1.9685	130	5.1181	31	1.2205	2.0	0.079	53	2.087	65200	14660	49600	11150	2.24	4.93
7411	55	2.1654	140	5.5118	33	1.2992	2.0	0.079	56	2.205	73500	16500	56900	12790	2.75	6.06
7412	60	2.3622	150	5.9055	35	1.3780	2.0	0.079	62	2.441	77900	17510	61470	13820	3.32	7.32
7413	65	2.5591	160	6.2992	37	1.4567	2.0	0.079	66	2.598	91800	20640	76600	17220	3.97	8.75
7414	70	2.7559	180	7.0866	42	1.6535	2.5	0.098	73	2.874	106400	23920	94600	21270	5.80	12.79
7415	75	2.9528	190	7.4803	45	1.7717	2.5	0.098	78	3.071	113900	25610	104600	23520	6.88	15.17
7416	80	3.1496	200	7.8740	48	1.8898	2.5	0.098	83	3.268	129300	29070	124000	27880	8.10	17.86
7417	85	3.3465	210	8.2677	52	2.0472	3.0	0.118	88	3.465	137200	30800	135400	30440	9.63	21.23
7418	90	3.5433	225	8.8583	54	2.1260	3.0	0.118	93	3.661	145400	32700	148100	33300	11.53	25.42

NOTES:

Maximum shaft or housing fillet radius which bearing corners will clear

Rollway standard series is 40° (suffix B) contact angle, brass cage — inner land riding (suffix M), flush ground (suffix G)

Rollway also manufactures angular contact ball bearings with 15° (suffix C) and 25° (suffix AC) contact angles

Rollway also manufactures angular contact ball bearings in tolerance classes ABEC-3 and ABEC-5

Tolerances:

Rollway's standard bearing has ABEC-1 tolerances with ABEC-3 inner ring tolerances for bore and radial runout.

Standard ABECTolerances — Inner Ring (Tolerances in .0001 inch., .001 mm)

Bearing Bore (mm)		Bore Numbers Reference	Outside Diameter +.0000" +.000 mm To				Width Variation			Radial Runout				Side Runout With Bore			Raceway Runout With Slide		
over	incl.		1	3	5	7	3	5	7	1	3	5	7	3	5	7	3	5	7
			in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm	in. mm
30	50	07-10	-5 -13	-3 -8	-2 -5	-2 -5	4 15	2 5	1 3	6 15	4 10	2 5	1.5 4	4 10	3 8	1.5 4	6 15	3 8	1.5 4
50	80	11-16	-6 -15	-4 -10	-3 -8	-2 -5	5 13	2 5	1.5 4	8 20	4 10	2 5	1.5 4	5 13	3 8	2 5	7 18	3 8	1.5 4
80	120	17-24	-8 -20	-5 -13	-3 -8	-2.5 -5	5 13	3 8	1.5 4	10 25	5 13	2.5 6	2 5	5 13	3 8	2 5	7 18	4 10	2 5
120	150	26-30	-10 -25	-6 -15	-4 -10	-3 -8	6 15	3 8	2 5	12 30	6 15	3 8	3 8	6 15	4 10	3 8	9 23	4 10	3 8
150	180	32-36	-10 -25	-6 -15	-4 -10	-3 -8	6 15	3 8	2 5	12 30	6 15	3 8	3 8	6 15	4 10	3 8	9 23	4 10	3 8

Standard ABECTolerances — Outer Ring (Tolerances in .0001 inch., .001 mm)

Bearing O.D. (mm)		Ball Bearing Sizes	Outside Diameter +.0000" +.000 mm To				Width Variation			Radial Runout				Raceway Runout Without Side			Outside Diameter Runout With Slide		
over	incl.		1	3	5	7	3	5	7	1	3	5	7	3	5	7	3	5	7
80	120	7209-13 7308-11 7408-09	-6 -15	-4 -10	-3 -8	-3 -8	6 15	3 8	2 5	14 36	7 18	4 10	2 5	9 23	5 13	2 5	5 13	3 8	2 5
120	150	7214-17 7312-14 7410-12	-8 -20	-5 -13	-4 -10	-4 -10	8 20	3 8	2 5	16 41	8 20	4 10	3 8	10 25	5 13	3 8	6 15	4 10	2 5
150	180	7218-20 7315-17 7413-14	-10 -25	-6 -15	-5 -13	-4 -10	8 20	3 8	2 5	18 46	9 23	5 13	3 8	12 30	6 15	3 8	6 15	4 10	2 5
180	250	7220-28 7318-22 7415-18	-12 -30	-7 -18	-5 -13	-4 -10	8 20	4 10	3 8	20 51	10 25	5 13	4 10	14 36	6 15	4 10	6 15	4 10	3 8
250	315	7230-34 7324-28	-14 -36	-8 -20	-5 -13	-5 -13	10 25	5 13	3 8	24 61	12 30	6 15	4 10	16 41	7 18	4 10	7 18	5 13	3 8

Interchange Key

40° Angular Contact Ball Bearings

ROLLWAY:

- B - 40°
- M - Machine Bronze Cage
- G - Flush Ground

FAFNIR:

- WN - 40°
- SU - Flush Ground
- MBR - Machine Bronze Cage
- PW - Extra duty radial thrust type 35°

NTN:

- B - 40°
- G - Flush Ground
- L1 - Brass Cage
- No designation - Steel Cage

SKF:

- B - 40°
- J - Steel Cage
- Y - Pressed Brass Cage
- M - Machine Bronze Cage
- G - Flush Ground

MRC - TRW:

- BKE - Bakelite Cage
- BRZ - Machine Bronze Cage
- P - 40°
- DT - Duplex/ tandem mounting
- DU - Duplex/ universal
- PJDU - 40° Stamped Brass Cage Universal Ground

FAG:

- B - 40°
- TVP - Plastic Cage
- MP - Machine Bronze Cage
- UA - Flush Ground

For specific application information and ordering, write or phone:



Rollway Bearing
Emerson Power Transmission Corp.

P.O. Box 4827, Syracuse, New York 13221
 (315) 457-6211
 Fax: (315) 451-8596 • Toll-Free: 1-800-448-2260