PIC® DESIGN

PRECISION INDUSTRIAL COMPONENTS

BEARINGS

RADIAL BEARINGS & ACCESSORIES

PIC Design has recently added several new bearing products to its already extensive offerings. What's more, PIC has expanded the coverage available from its existing products. The new lines, including Spherical Bearings, Rod Ends, and Tapered Outside Diameter Ball Bearings complement the expanded ABEC and equivalent ISO Ball Bearings. PIC Design ball bearings are available in inch and metric sizes.

PIC Design Bearings — a brief overview.

BALL BEARINGS:

PIC offers a comprehensive and varied line of ball bearings. Engineers and designers can precisely select bearings for specific applications. The ABEC rating of a bearing is determined by radial runout and tolerancing:

ABEC-7 Precision Bearings used in instrument applications, disk drives and applications with low noise requirements.

ABEC-3 Semi-Precision Bearings are used in applications such as office equipment and computer print heads.

ABEC-1 Commercial Bearings are used in applications such as gear trains, chain drive systems, and other applications requiring long service life and good load carrying capabilities, but not necessarily high degrees of precision.

Tapered Outside Diameter Precision Bearings eliminate mounting problems in sheet metal or soft metal housings.

Metric Precision Bearings available in standard and extra-small series for use with metric shafts and housings.

Extra Thin section bearings save space and are appropriate for aerospace applications and anywhere a need for reduced weight, or critical mounting surface mass exists.

EXTENDED INNER RING BEARINGS:

Used to provide a mounting clearance between the inner and outer race.

THRUST BEARINGS:

Designed for low speed and high thrust application. Available in carbon steel and stainless steel materials.

NON-METALLIC BEARINGS:

PIC offers a line of non-corrosive ball bearings which are particularly desirable for use in chemical or magnetic environments.

SPHERICAL BEARINGS:

Designed for use in applications where high loads are present and compensation for angular misalignment is required.

ROD ENDS:

Used as connecting links in many applications, with allowance for angular misalignment.

SINTERED BRONZE BEARINGS:

PIC offers a line of self-lubricating, oil impregnated bronze bearings which are particularly desirable for maintenance free applications.

Precision Bearings: Direct replacement for ball bearings.

Sleeve and Flanged: For inexpensive low speed systems. Available in inch and metric sizes.

ENGINEERED PLASTIC BEARINGS:

Similar to sleeve and flanged bronze bearings, but made of custom blended material for ease of maintenance and lube-free performance.

BEARING MOUNTING ACCESSORIES:

- Cam followers
- Bearing housings
- Shims and spacers
- Pre-load springs

To help customers select the most appropriate bearings for use in particular applications, PIC Design has included an Application Guide and an ABEC and ISO Tolerancing Chart.

The Application Guide assists in determining the bearing quality necessary for your system. If you do not find your specific applications listed, use ones which are most similar.

Table 1. Application Guide

	ABEC Grade			
Application	**1**	**3**	**5**	**7**
Electric Motors		✔		
Tape Guides				✔
Gyro Gimbals				✔
Commercial Gear Trains	✔	✔		
Precision Gear Trains			✔	✔
AGMA Q14 Gear Trains				✔
Very High Speed Applications				✔
Timing Pulley Supports	✔	✔		
"No-Slip" Pulley Systems		✔	✔	
Chain Drive Systems	✔			
Bread Board Experiments				✔
Computer Disk Drive				✔
Laser Aligning Equipment			✔	✔
Hand Adjusted Settings	✔			
Robotics			✔	✔
Encoder Applications			✔	✔
Office Equipment		✔	✔	
Print Heads		✔	✔	

Table 2. ABEC & ISO Tolerancing Chart

	Radial Runout		Mean Diameter Tolerance			
ABEC Grade	**Inner Ring**	**Outer Ring**	**Bore**	**O.D.**	**O.D. Size**	**ISO Class**
1	.0003	.0005	+.0000 -.0003	+.0000 -.0003	0-18 mm	0 (Normal)
3	.0003	.0004	+.0000 -.0002	+.0000 -.0003	0-30 mm	6
5	.00015	.0002	+.0000 -.0002	+.0000 -.0002	0-30 mm	5
7	.0001	.00015	+.0000 -.0002	+.0000 -.0002	0-30 mm	4

This information is intended for reference only. All dimensions are in inches.

BEARING SELECTION:

Bearing Size

A variety of criteria may have an influence on bearing size selection for different installations:

Mating parts. One or more of the bearing dimensions may be governed by the size of a mating part (e.g. shaft, housing).

Capacity. Bearing loading, dynamic and static, will establish minimum capacity requirements and influence size selection because capacity generally increases with size.

Speedability. Smaller bearings can usually operate at higher speeds than large bearings, hence the speed requirement of an application may affect size selection.

Stiffness. Large bearings yield less than small bearings and are the better choice where bearing stiffness is crucial.

Weight. In some cases, bearing weight may have to be considered and factored into the selection process.

Torque. Reducing the ball size and using wider raceway curvatures are tactics which may be used to reduce torque.

AISI 440 stainless steel is the standard material for miniature and instrument bearings and torque tube bearings. It is optional for spindle and turbine bearings. This is a hardenable, corrosion-resistant steel with adequate fatigue resistance, good load-carrying capacity, excellent stability and wear resistance. Operating temperature range is -400°F to 300°F for miniature and instrument bearings.

SAE 52100 chrome steel is the standard material for spindle and turbine bearings. It is also available in many miniature and instrument sizes, and may be preferable when fatigue life and static capacity are critical. This material has excellent capacity, fatigue resistance and stability. Operating temperature limit is 400°F when used in spindle and turbine bearings.

Preloading Techniques

Preloading is the removal of internal clearance in a bearing by applying a permanent thrust load to it. Preloading is used to:

- Eliminate radial and axial play
- Increase system rigidity
- Reduce nonrepetitive runout
- Lessen the difference in contact angles between the balls and both inner and outer rings at very high speeds
- Prevent ball skidding under very high accelerations
- Suppress noise

Bearings should be preloaded as lightly as is necessary to achieve the desired results. This avoids excessive heat generation, which reduces speed capability and bearing life.

There are three basic methods of preloading — springs, axial adjustment and duplex bearings.

Limiting Speeds

Limiting speed is defined as the speed at which the internally generated temperature in a mounted bearing reaches the lowest maximum temperature permissible for any of its components, including the lubricant.

There are many factors which combine to determine the limiting speeds of ball and roller bearings. Therefore it is not possible to calculate these speeds with accuracy. Frequently it is necessary to estimate the speed limit of a bearing on the basis of experience with bearings operating under conditions similar to those in question. For small and medium size bearings of the same type and dimension series, operating under similar conditions, the speed limit is approximately inversely proportional to the bearing bore. For large bearings this no longer applies as their speed limits are relatively lower. A bearing of light section has a higher speed limit than a bearing of heavy section. As a result a more general comparison can be made between speeds of different radial bearings by using the bearing mean diameter d_m as a reference instead of the bore d. From the above, the following formulas are derived:

For Radial and Angular Contact Bearings. $N = \frac{A}{d_m}$

Where: N = The speed Limit, RPM

dm = The Bearing, mean diameter = $\frac{d + D}{2}$

d = The bearing bore in mm

D = The bearing O.D., mm

A = A value Single Row Ball: 400,000

Single Row Angular Contact:

Low Contact Angle: 800,000

High Contact Angle: 500,000

The above values for A are useful as a quick orientation regarding speed limits for different bearing types and sizes operating under a moderate load and otherwise favorable conditions.

The speed limits calculated using these formulas and values of A should be considered a maximum. These values apply only to bearings lubricated with oil. When bearings are lubricated with grease, use 70% of the above for A.

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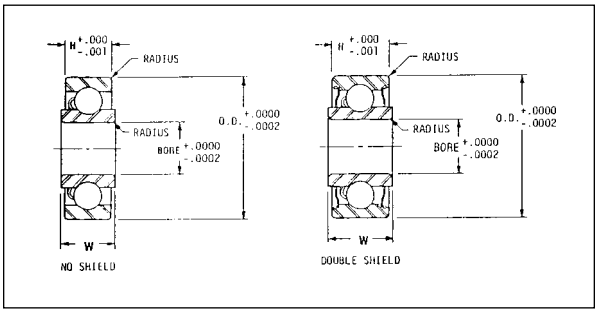
EXTENDED INNER RACE BEARINGS

TOLERANCES: ABEC 3 & 7

Material: 440 Stainless Steel

Lubrication: Open - Oil per MIL-L-6085A
Double Shielded: Grease per MIL-G-23827A



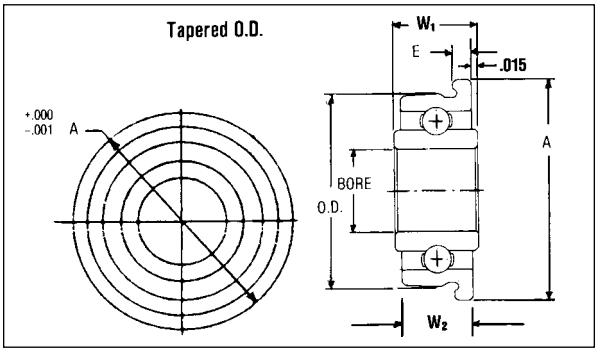
BORE	O.D.	H	W	Shield DATA	ABEC 3 Part No.	ABEC 7 Part No.
.1250	.2500	.0937	.125	Open	**E1-OE-3**	**E1-OE-7**
		.1094	.1406	Double Shield	**E1-SE-3**	**E1-SE-7**
.1875	.3125	.1094	.1406	Open	**E2-OE-3**	**E2-OE-7**
		.125	.1562	Double Shield	**E2-SE-3**	**E2-SE-7**
.2500	.3750	.125	.1562	Open	**E3-OE-3**	**E3-OE-7**
				Double Shield	**E3-SE-3**	**E3-SE-7**
.3125	.5000	.1562	.1875	Open	**E4-OE-3**	**E4-OE-7**
				Double Shield	**E4-SE-3**	**E4-SE-7**

TAPERED O.D. BEARINGS

TOLERANCES: ABEC 7

Material: 440 Stainless Steel

Lubricated: Grease Per MIL-G-23827A
Supplied With Double Shield

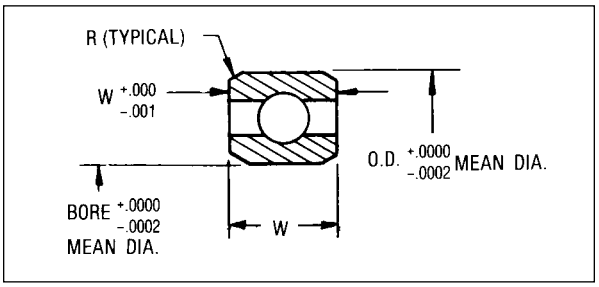


Bore	O.D.	W_1	W_2	A	E	Part No.
.1250	.3757	.189	.163	.4380	.037	**E8-1**
.1875	.5632	.251	.226	.6250	.042	**E8-2**
.2498	.6257	.251	.226	.6850	.042	**E8-3**
.3125	.6887	.251	.226	.7500	.042	**E8-4**

EXTRA THIN BALL BEARINGS

TOLERANCES: ABEC-5 OPEN

Material: 440 Stainless Steel
Oil Per MIL-L-6085A

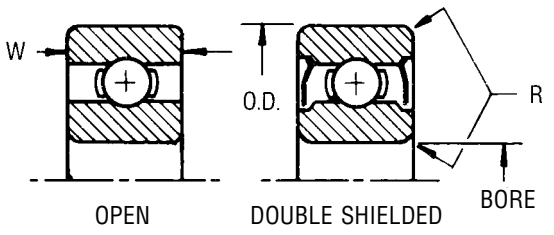


Bore	O.D.	W	R	Load Rating		Part No.
				Dyn.	Static	
.3750	.6250	.1562	.010	96	53	**E5-1**
.5000	.7500	.1562	.010	112	67	**E5-2**
.6250	.8750	.1562	.010	116	81	**E5-3**
.7500	1.0000	.1562	.010	129	98	**E5-4**

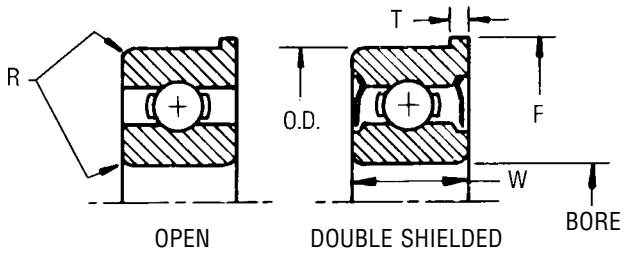
PRECISION BALL BEARINGS

ABEC 1,3, And 7 Tolerances

NO FLANGE



FLANGE



Material: ABEC 3 & 7 440 Stainless Steel
ABEC 1 - 52100 Steel

Lubrication: Open - Oil per MIL-L-6085A
Double Shielded & Sealed: Grease per MIL-G-23827A

Standard Radial Play: .0002-.0005 (Inch)
0.005-0.013 (Millimeter)

Sealed: Buna N Rubber or Teflon at PIC Option

Bore	O.D.	W	F	T	R Radius	Shield Data	Load Rating (lbs.)		No Flange			Flanged		
							Dynamic	Static	ABEC 1 Part No.	ABEC 3 Part No.	ABEC 7 Part No.	ABEC 1 Part No.	ABEC 3 Part No.	ABEC 7 Part No.
.0469	.1562	.0625 .0937	.203	.013 .031	.005	Open Dbl. Shield	17	6		E3-11-3 E3-12-3	E3-11 E3-12		E4-11-3 E4-12-3	E4-11 E4-12
.0550	.1875	.0781 .1094	.234	.023 .031	.005	Open Dbl. Shield	26	9		E3-13-3 E3-14-3	E3-13 E3-14		E4-13-3 E4-14-3	E4-13 E4-14
.0781	.2500	.0937 .1406	.296	.023 .031	.006	Open Dbl. Shield	36	14		E3-1-3 E3-2-3	E3-1 E3-2		E4-1-3 E4-2-3	E4-1 E4-2
.0937	.1875	.0625 .0937	.234	.018 .031	.006	Open Dbl. Shield	14	6	E13-01 E13-S1	E13-03 E13-S3	E13-07 E13-S7	E13-01F E13-S1F	E13-03F E13-S3F	E13-07F E13-S7F
.0937	.3125	.1094 .1406	.359	.023 .031	.006	Open Dbl. Shield	59	24		E3-3-3 E3-4-3	E3-3 E3-4		E4-3-3 E4-4-3	E4-3 E4-4
.1250	.2500	.0937 .1094	.296	.023 .031	.005	Open Dbl. Shield	33	13		E3-5-3 E3-6-3	E3-5 E3-6		E4-5-3 E4-6-3	E4-5 E4-6
.1250	.3125	.1094 .1406	.359	.023 .031	.006	Open Dbl. Shield	60	24		E3-7-3 E3-8-3	E3-7 E3-8		E4-7-3 E4-8-3	E4-7 E4-8
.1250	.3750	.1562	.440	.030	.012	Open Dbl. Shield Dbl. Seal	60	24	E1-1-1 E6-2 E6-3	E1-1-3 E1-3-3	E1-1 E1-3	E2-1-1 E2-3-1	E2-1-3 E2-3-3	E2-1 E2-3
.1562	.3125	.1094 .1250	.359	.023 .036	.006	Open Dbl. Shield	33	14	E14-01 E14-S1	E14-03 E14-S3	E14-07 E14-S7	E14-01F E14-S1F	E14-03F E14-S3F	E14-07F E14-S7F
.1875	.3125	.1094 .1250	.359	.023 .036	.006	Open Dbl. Shield	33	14	E15-01 E15-S1	E15-03 E15-S3	E15-07 E15-S7	E15-01F E15-S1F	E15-03F E15-S3F	E15-07F E15-S7F
.1875	.3750	.1250	.422	.023 .031	.005	Open Dbl. Shield	76	33	E1-2-1 E1-5-1	E1-2-3 E1-5-3	E1-2 E1-5	E2-2-1 E2-5-1	E2-2-3 E2-5-3	E2-2 E2-5
.1875	.5000	.1562 .1960 .1960 .1960	.565	.042	.012	Open Open Dbl. Shield Dbl. Seal	148	64	E1-4-1 E6-5 E6-6	E1-4-3 E1-6-3	E1-4 E1-6	 E2-4-1 E2-6-1	 E2-4-3 E2-6-3	 E2-4 E2-6
.2500	.3750	.1250	.422	.023 .036	.005	Open Dbl. Shield	37	17	E1-8-1 E1-11-1	E1-8-3 E1-11-3	E1-8 E1-11	E2-8-1 E2-11-1	E2-8-3 E2-11-3	E2-8 E2-11
.2500	.5000	.1250 .1875	.547	.023 .045	.005	Open Dbl. Shield	114	57	E1-12-1 E1-13-1	E1-12-3 E1-13-3	E1-12 E1-13	E2-12-1 E2-13-1	E2-12-3 E2-13-3	E2-12 E2-13
.2500	.6250	.1960	.690	.042	.012	Open Dbl. Shield Dbl. Seal	168	77	E1-7-1 E6-8 E6-9	E1-7-3 E1-9-3	E1-7 E1-9	E2-7-1 E2-9-1	E2-7-3 E2-9-3	E2-7 E2-9
.2500	.7500	.2188 .2812			.012	Open Dbl. Shield	405	198	E16-01 E16-S1	E16-03 E16-S3	E16-07 E16-S7			
.3125	.5000	.1562	.547	.031	.016	Open Dbl. Shield	56	31	E6-01 E6-S1	E6-03 E6-S3	E6-07 E6-S7	E6-01F E6-S1F	E6-03F E6-S3F	E6-07F E6-S7F
.3750	.8750	.2188 .2812 .2812 .2812	.969	.062	.016	Open Open Dbl. Shield Dbl. Seal	575	305	E1-14-1 E6-11 E6-12	E1-14-3 E1-15-3	E1-14 E1-15	 E2-14-1 E2-15-1	 E2-14-3 E2-15-3	 E2-14 E2-15
.5000	1.125	.2500 .3125	1.225	.062	.016	Open Dbl. Shield	885	505	E7-01 E7-S1	E7-03 E7-S3	E7-07 E7-S7	E7-S1F	E7-S3F	E7-S7F
.6250	1.375	.2812 .3438			.031	Open Dbl. Shield	1040	650	E9-01 E9-S1	E9-03 E9-S3				
.7500	1.625	.3125 .4375			.031	Open Dbl. Shield	1620	1030	E10-01 E10-S1	E10-03 E10-S3				

Continued on page 6-5

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PRECISION BALL BEARINGS

Continued from page 6-4

ABEC 1, 3, and 7 Tolerances

Bore	O.D.	W	F	T	R Radius	Shield Data	Load Rating (lbs.)		No Flange			Flanged		
							Dynamic	Static	ABEC 1 Part No.	ABEC 3 Part No.	ABEC 7 Part No.	ABEC 1 Part No.	ABEC 3 Part No.	ABEC 7 Part No.
.8750	1.875	.3750 .5000			.031	Open Dbl. Shield	1740	1160	**E11-01 E11-S1**	**E11-03 E11-S3**				
1.000	2.000	.3750 .5000			.031	Open Dbl. Shield	1740	1160	**E12-01 E12-S1**	**E12-S3**				
*1.1250	2.1250	.5000			.031	Open Dbl. Shield	2290	1630	**E17-01 E17-S1**	**E17-03 E17-S3**				
*1.2500	2.250	.3750 .5000			.031	Open Dbl. Shield	2290	1650	**E18-01 E18-S1**	**E18-03 E18-S3**				
*1.5000	2.625	.4375 .5625			.031	Open Dbl. Shield	2900	2200	**E19-01 E19-S1**	**E19-03 E19-S3**				

*Material ABEC 1 and 3 — 52100 chrome steel

METRIC PRECISION BALL BEARINGS

TOLERANCES: ISO Class 4 or Normal

Material: 440 Stainless Steel

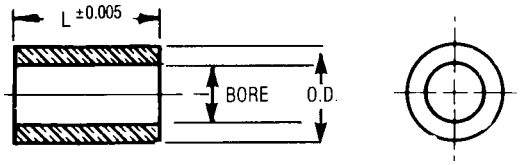
Bore	O.D.	W	F	T	R	Sheild Data	Load Rating (N)		No Flange Part No.	Flanged Part No.
							Dynamic	Static		
3	7	2.0 3.0	8.1	0.5 0.8	0.2 0.15	Open Shielded	155	60	**MBG1-1 MBG2-1**	**MBG3-1 MBG4-1**
3	10	4.0	11.5	1.0	0.3	Open Shielded	490	220	**MBG5-1 MBG6-1**	**MBG7-1 MBG8-1**
4	9	2.5 4.0	10.3	0.6 1.0	0.25 0.5	Open Shielded	365	170	**MBG1-2 MBG2-2**	**MBG3-2 MBG4-2**
4	13	5.0	15.0	1.0	0.4	Open Shielded	1000	480	**MBG5-2 MBG6-2**	**MBG7-2 MBG8-2**
4	16	5.0	18.0	1.0	0.5	Open Shielded	1355	670	**MBG5-3 MBG6-3**	**MBG7-3 MBG8-3**
5	11	3.0 5.0	12.5	0.8 1.0	0.3 0.2	Open Shielded	550	260	**MBG1-3 MBG2-3**	**MBG3-3 MBG4-3**
5	16	5.0	18.0	1.0	0.5	Open Shielded	1330	885	**MBG5-4 MBG6-4**	**MBG7-4 MBG8-4**
6	13	3.5 5.0	15.0	1.0 1.1	0.3 0.2	Open Shielded	835	400	**MBG1-4 MBG2-4**	**MBG3-4 MBG4-4**
6	19	6.0	22.0	1.5	0.5	Open Shielded	1800	900	**MBG5-5 MBG6-5**	**MBG7-5 MBG8-5**
7	22	7.0			0.3	Open Shielded	2535	1355	**MBG7-O MBG7-S**	
8	16	4.0 5.0	18.0	1.0	0.4 0.3	Open Shielded	960	520	**MBG1-5 MBG2-5**	**MBG3-5**
8	22	7.0	25.0	1.5	0.5	Open Shielded	2535	1355	**MBG5-6 MBG6-6**	**MBG7-6 MBG8-6**
10	19	5.0 7.0			0.5	Open Shielded	1460	770	**MBG1-6 MBG2-6**	
10	26	8.0			0.5	Open	3515	1920	**MBG5-7**	
12 *	28	8.0			0.5	Open Shielded	3935	2225	**MBG10-O MBG10-S**	
15 *	32	9.0			0.5	Open Shielded	4315	2490	**MBG15-O MBG15-S**	
20 *	42	12.0			1.0	Open Shielded	7205	4450	**MBG20-O MBG20-S**	
25 *	47	12.0			1.0	Open Shielded	7740	4940	**MBG25-O MBG25-S**	
30 *	55	13.0			1.5	Open Shielded	10190	7250	**MBG30-O MBG30-S**	
40 *	68	15.0			1.5	Open Shielded	12900	9875	**MBG40-O MBG40-S**	

* ISO Class Normal 52100 Chrome Steel

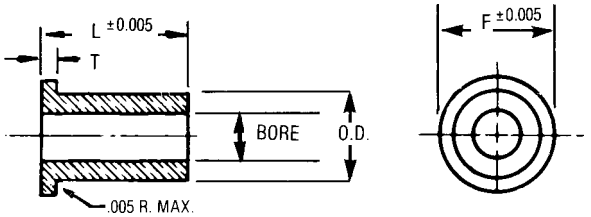
SINTERED BRONZE BEARINGS

Sleeve & Flanged **Oil-Impregnated**

SLEEVE



FLANGED



Material: Bronze, MIL-B-5687D
Type 1, Grade 1

Specifications:

Density:	6.4 - 6.8 gm/cm^3	PV (100ft./min.):	50,000
Porosity (% by Vol.):	19 min.	Static, P:	8,000 PSI
Tensile Strength:	14,000 PSI	Dynamic P:	2,000 PSI
Compressive Yield Strength:	11,000 PSI	Speed V:	1,200 fpm

Bearing Design Calculations For Loads & Speed: The load carrying capability of sleeve bearings is expressed by a PV factor in the following formula:

$$PV = \frac{.262\ WN}{L}$$

$$P = \frac{W}{LD}$$

$$V = .262\ DN$$

Where:
P = Load, PSI
V = Shaft Speed (fpm)
W = Load (lbs.)
L = Bearing Length (In.)
D = Bearing I.D. (In.)
N = Shaft Speed (Rpm)

Recommended Press Fits

Outside Diameter In.	Press Fit, In.	
	Minimum	Maximum
Up to 0.760	0.001	0.003
0.761 to 1.150	0.0015	0.004
1.511 to 2.510	0.002	0.005
2.511 to 3.010	0.002	0.006
Over 3.010	0.002	0.007

Running Clearances

Shaft Size In.	Clearance, min. in.
	Sintered Bronze
Up to 0.760	0.0005
0.761 to 1.150	0.001
1.511 to 2.510	0.00015
Over 2.510	0.002

Shaft Size	Bore +.000 -.001	O.D. +.000 -.001	L ±.005	F ±.005	T ±.0025	Part No. Sleeve	Part No. Flange
1/8	.127	.252	.125 .250 .375	.360	.047	B10-1 B10-2 B10-3	B11-1 B11-2 B11-3
3/16	.189	.314	.250 .375 .500 .625	.370	.047	B10-5 B10-6 B10-7 B10-8	B11-5 B11-6 B11-7 B11-8
1/4	.252	.377	.250 .375 .500 .625	.560	.047	B10-9 B10-10 B10-11 B10-12	B11-9 B11-10 B11-11 B11-12
1/4	.252	.439	.375 .500 .625 .750			B10-31 B10-32 B10-33 B10-34	
1/4	.252	.503	.500 .625 .750	.625	.062	B10-49 — B10-51	— B11-50 B11-51
5/16	.315	.440	.250 .375 .500 .625	.563	.062	B10-13 B10-14 B10-15 B10-16	B11-13 B11-14 B11-15 B11-16
3/8	.377	.502	.250 .375 .500 .625 .750	.625	.062		B11-17 B11-18 B11-19 B11-20 B11-21
3/8	.378	.503	.250 .375 .500 .625 .750			B10-17 B10-18 B10-19 B10-20 B10-21	
1/2	.502	.628	.375 .500 .625 .750 1.000			B10-22 B10-23 B10-24 B10-25 B10-26	
1/2	.502	.627	.375 .500 .625 .750 1.000	.875	.062		B11-22 B11-23 B11-24 B11-25 B11-26
5/8	.628	.753	.500 .750 1.000			B10-52 B10-53 B10-54	
5/8	.627	.753	.500 .750 1.000	1.000	.094		B11-52 B11-53 B11-54
3/4	.753	1.003	.500 .750 1.000 1.250	1.125	.125	B10-55 B10-56 B10-57 B10-58	B11-55 B11-56 B11-57 B11-58
7/8	.878	1.003	.500 .750 1.000			B10-59 B10-60 B10-61	
		1.128	.625 .750 1.000	1.500	.125	— B10-63 B10-64	B11-62 B11-63 B11-64
1	1.004	1.254	.500 .750 1.000			B10-65 B10-66 B10-67	
	1.003	1.253	.750 1.000 1.250	1.625	.125		B11-68 B11-69 B11-70

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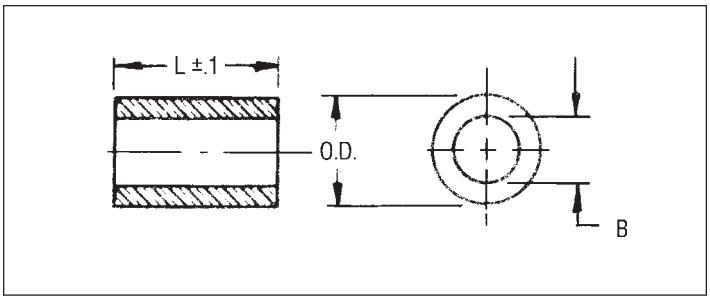
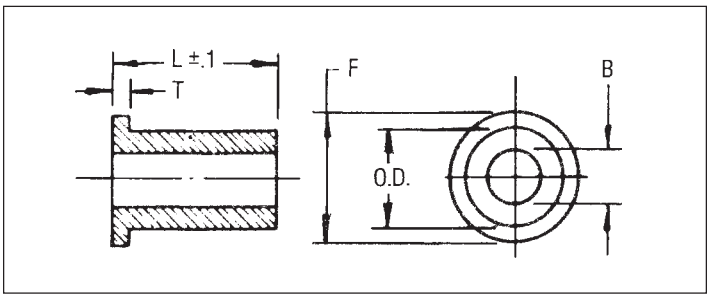
METRIC SINTERED BRONZE BEARINGS

Oil-Impregnated **ISO Standard**





All Dimensions in Millimeters

Material: Bronze, Per MIL-B-5687
Type 1, Grade 1 (BP 25)

Bearing Tolerances
(Before Fitting):

Bore (B)	
Unflanged Bearing	F7
Flanged Bearing	F8
O.D.	
Unflanged Bearing	s7
Flanged Bearing	s8
Flange	
Diameter (F)	js13
Thickness (T)	js14
T.I.R. O.D. and Bore	.060μ
Bore After Assembly	
Unflanged	H7
Flanged	H8
Recommended Housing	H7

Features:

Eliminates Lubrication Points
Reduces Maintenance
Max Speed 30,000 rpm
Dynamic Load 1500 daN/cm^2
Temperature -20^o to +100^{o}c
No Siezing
Permanent Presence of a Veritable Cushion of Oil.
Silent Running

Shaft Size F7	Bore	O.D.	L	F	T	Part No. Unflanged	Part No. Flanged
3	3	6	4 6 10	9	1.5	**MBG9-1** **MBG9-2** **MBG9-3**	**MBG10-1** **MBG10-2** **MBG10-3**
4	4	8	4 8 12	12	2	**MBG9-4** **MBG9-5** **MBG9-7**	**MBG10-4** **MBG10-5** **MBG10-7**
5	5	8	5 8 12 16	12	2	**MBG9-8** **MBG9-9** **MBG9-10** **MBG9-11**	
6	6	10	6 10 12 16	14	2	**MBG9-12** **MBG9-13** **MBG9-14** **MBG9-15**	**MBG10-12** **MBG10-13** **MBG10-14** **MBG10-15**
8	8	12	8 12 16	16	2	**MBG9-16** **MBG9-17** **MBG9-18**	**MBG10-16** **MBG10-17** **MBG10-18**
10	10	13	10 16 20	16	1.5	**MBG9-19** **MBG9-20** **MBG9-21**	**MBG10-19** **MBG10-20** **MBG10-21**
12	12	17	12 16 20	22	2.5	**MBG9-22** **MBG9-23** **MBG9-24**	**MBG10-22** **MBG10-23** **MBG10-24**
16	16	22	16 20 25	28	3	**MBG9-25** **MBG9-26** **MBG9-27**	**MBG10-25** **MBG10-26** **MBG10-27**
20	20	26	16 20 25 32	32	3	**MBG9-28** **MBG9-29** **MBG9-30** **MBG9-31**	**MBG10-28** **MBG10-29** **MBG10-30** **MBG10-31**
25	25	30	20 25 32 40	35	2.5	**MBG9-32** **MBG9-33** **MBG9-34** **MBG9-35**	**MBG10-32** **MBG10-33** **MBG10-34**

Tolerances per ISO 286-2

Bore	O.D.	F7	F8	s7	s8
3	6	+16	+21	+31	+37
		+7	+7	+19	+19
4	8	+22	+28	+38	+45
		+10	+10	+23	+23
5	8	+22		+38	
		+10		+23	
6	10	+22	+28	+38	+45
		+10	+10	+23	+23
8	12	+28	+35	+46	+55
		+13	+13	+28	+28
10	13	+28	+35	+46	+55
		+13	+13	+28	+28
12	17	+34	+43	+46	+55
		+16	+16	+28	+28
16	22	+34	+43	+56	+68
		+16	+16	+35	+35
20	26	+41	+53	+56	+68
		+20	+20	+35	+35
25	30	+41	+53	+56	+68
		+20	+20	+35	+35

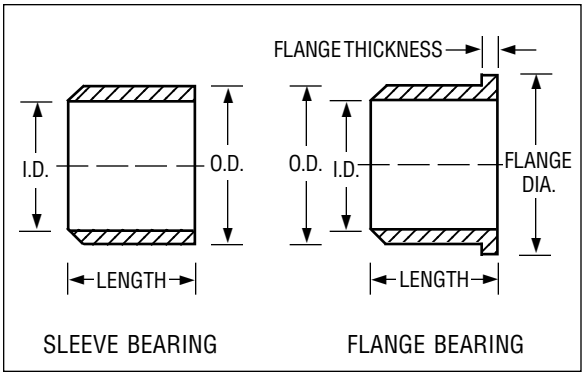
NON-METALLIC BEARINGS

Sleeve & Flanged

Material: This self-lubricating, maintenance-free bearing is manufactured from a custom blended material that exhibits excellent abrasion resistance and long life. It's an all-purpose bearing for rotational, linear and oscillating movements with low & medium loads.

Specifications:

Operating Temperature Range	-40° to 240°F (+390° short term)
Max PV	10,000 PSI x FPM
Max P	1,000 PSI
Max V	240 FPM
Coefficient of friction	approximate .2
Chemical resistance	Parts are resistant to alkalies and most weak organic and inorganic acids. Insoluble in normal organic solution.



Nominal Sizes					I.D. When In Housing		Housing Bore		Recommend Shaft Size			
I.O.	O.D.	LG.	FLG. Dia.	FLG. TH. (-0.0055")	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	Sleeve Part No.	Flanged Part No.
1/8	1/4	1/4 3/8	.360	.047	.1280	.1262	.2515	.2510	.1250	.1241	**BS-0204-04** **BS-0204-06**	**BF-0204-04** **BF-0204-06**
3/16	5/16	1/4 3/8 1/2	.370	.047	.1905	.1887	.3140	.3135	.1875	.1866	**BS-0305-04** **BS-0305-06** **BS-0305-08**	**BF-0305-04** **BF-0305-06** **BF-0305-08**
1/4	3/8	1/4 5/16 3/8 1/2	.560	.047	.2539	.2516	.3765	.3760	.2500	.2491	**BS-0406-04** **BS-0406-05** **BS-0406-06** **BS-0406-08**	**BF-0406-04** **BF-0406-05** **BF-0406-06** **BF-0406-08**
5/16	7/16	3/8 1/2 5/8	.560	.062	.3164	.3141	.4390	.4385	.3125	.3116	**BS-0507-06** **BS-0507-08** **BS-0507-10**	**BF-0507-06** **BF-0507-08** **BF-0507-10**
3/8	1/2	3/8 1/2 5/8 3/4	.625	.062	.3789	.3766	.5015	.5010	.3750	.3741	**BS-0608-06** **BS-0608-08** **BS-0608-10** **BS-0608-12**	**BF-0608-06** **BF-0608-08** **BF-0608-10** **BF-0608-12**
1/2	5/8	3/8 1/2 5/8 3/4 1	.875	.062	.5047	.5020	.6260	.6250	.5000	.4990	**BS-0810-06** **BS-0810-08** **BS-0810-10** **BS-0810-12** **BS-0810-16**	**BF-0810-06** **BF-0810-08** **BF-0810-10** **BF-0810-12** **BF-0810-16**
5/8	13/16	1/2 5/8 3/4 1	1.063	.156	.6297	.6270	.8135	.8125	.6250	.6240	**BS-1013-08** **BS-1013-10** **BS-1013-12** **BS-1013-16**	**BF-1013-08** **BF-1013-10** **BF-1013-12** **BF-1013-16**
3/4	1	5/8 3/4 1	1.250	.156	.7559	.7525	1.0010	1.0000	.7500	.7490	**BS-1216-10** **BS-1216-12** **BS-1216-16**	**BF-1216-10** **BF-1216-12** **BF-1216-16**
1	1-1/4	1/2 3/4 1	1.500	.188	1.0059	1.0025	1.2510	1.2500	1.0000	.9990	**BS-1620-08** **BS-1620-12** **BS-1620-16**	**BF-1620-08** **BF-1620-12** **BF-1620-16**

Tolerances for Sleeve and Flange Bearings

(Dimensions shown in inches)

Range	Length	Flange Diameter
1/8 to 3/8	0/-0.0087	-0.0016 / -0.0102
above 3/8 to 11/16	0/-0.0106	-0.0020 / -0.0126
above 11/16 to 1-1/8	0/-0.0130	-0.0026 / -0.0156
above 1-1/8 to 1-15/16	0/-0.0150	-0.0031 / -0.0185
above 1-15/16 to 3-1/8	0/-0.0180	-0.0040 / -0.0220

Bearings of FDA cleared materials available on special orders — consult factory.

- Material in compliance with 21CFR177. For use in food packaging, handling and processing applications
- Oil free, self lubricating
- Non toxic
- Corrosion resistant

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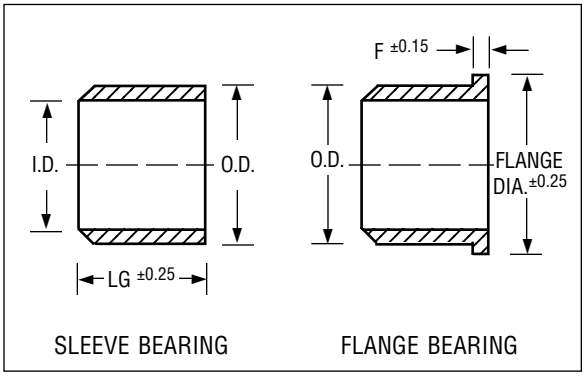
Material: A custom blended formulation for a self-lubricating, maintenance-free bearing with high performance in almost any environment.

Specifications:

Operating Temperature Range	-40° to 120°C
Max PV (continuous)	0.35 N/mm^2 x m/sec
Max P	18 N/mm^2
Max V	1.2 m/sec
Coefficient of Friction	approximate .2
Chemical Resistance	Parts are resistant to alkalies and most weak organic and inorganic acids. Insoluble in normal



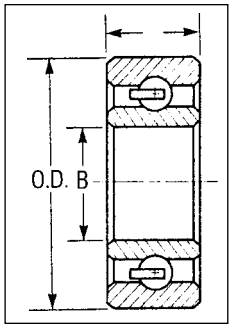
Nominal Sizes					I.D. In Housing		Housing Bore		Recommend Shaft Size			
I.D.	O.D.	LG.	FLG. Dia.	FLG. TH.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	Sleeve Part No.	Flanged Part No.
3	6	4	9	1.5	3.078	3.030	6.012	6.000	3.000	2.975	**MBS-0306-4**	**MBF-0306-4**
4	8	4 6	12	2	4.078	4.030	8.015	8.000	4.000	3.970	— **MBS-0408-6**	**MBF-0408-4** **MBF-0408-6**
5	9	5 6 8	13	2	5.078	5.030	9.015	9.000	5.000	4.970	**MBS-0509-5** — **MBS-0509-8**	**MBF-0509-5** **MBF-0509-6** **MBF-0509-8**
6	10	6 10	14	2	6.078	6.030	10.015	10.000	6.000	5.970	**MBS-0610-6** **MBS-0610-10**	**MBF-0610-6** **MBF-0610-10**
8	12	6 8 12	16	2	8.098	8.040	12.018	12.000	8.000	7.964	**MBS-0812-6** **MBS-0812-8** **MBS-0812-12**	**MBF-0812-6** **MBF-0812-8** **MBF-0812-12**
10	16	6 8 10 16	20 22 22 22	3	10.130	10.040	16.018	16.000	10.000	9.964	**MBS-1016-6** — **MBS-1016-10** **MBS-1016-16**	**MBF-1016-6** **MBF-1016-8** **MBF-1016-10** **MBF-1016-16**
12	18	8 10 15 20	24 22 22 22	3	12.160	12.050	18.018	18.000	12.000	11.957	**MBS-1218-8** **MBS-1218-10** **MBS-1218-15** **MBS-1218-20**	**MBF-1218-8** **MBF-1218-10** **MBF-1218-15** **MBF-1218-20**
16	22	12 15 20 25	28	3	16.160	16.050	22.021	22.000	16.000	15.957	**MBS-1622-12** **MBS-1622-15** **MBS-1622-20** **MBS-1622-25**	**MBF-1622-12** **MBF-1622-15** **MBF-1622-20** **MBF-1622-25**
20	26	15 20 30	32	3	20.195	20.065	26.021	26.000	20.000	19.948	**MBS-2026-15** **MBS-2026-20** **MBS-2026-30**	**MBF-2026-15** **MBF-2026-20** **MBF-2026-30**
25	32	20 30 40	38	4	25.195	25.065	32.025	32.000	25.000	24.948	**MBS-2532-20** **MBS-2532-30** **MBS-2532-40**	**MBF-2532-20** **MBF-2532-30** **MBF-2532-40**

Bearings of FDA cleared materials available on special orders — consult factory.

- FDA cleared material in compliance with 21CFR177 for use in food packaging, handling and processing applications.

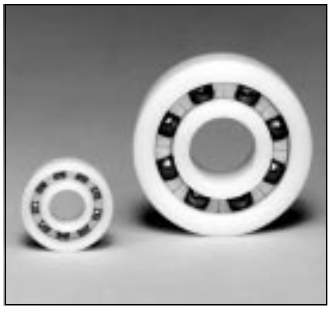
NON-CORROSIVE BALL BEARINGS

Inch & Metric **Plastic Races**



Material: Acetal Races & Cage
Stainless Steel or Glass Balls

Acetal polymer bearings have excellent corrosion resistance & dielectric properties. Ball bearings are available with stainless steel or hard glass balls. The glass balls offer additional corrosion resistance, have good electrical insulation and magnetic properties. These bearings are ideal for use in gas or liquid media and food processing applications. They can be washed and remain corrosion free. Their main features are: resistance to chemicals and corrosion; lubrication free/no maintenance; light weight, low friction, non magnetic properties; operating temperature range from -22° to +220° F (intermittent temperature range from -67° to 284° F).



Inch Sizes

B +.003 -.000	O.D. +.000 -.003	T ±.005	Load Capacity Radial (LB)		Max Speed	Part No. Ball Type Glass	Part No. Ball Type Stainless Steel
			Dyn.	Static	In Air (RPM)		
.250	.625	.1960	27	18	2300		ES-250
.375	.875	.2187	58	42	1600	EG-375	ES-375
.375	1.375	.4375	86	64	1600	EG-375B	ES-375B
.500	1.125	.2500	84	59	1150	EG-500	ES-500
.500	1.375	.4375	86	60	1150	EG-500B	ES-500B
.625	1.125	.2500	86	64	1070	EG-625	ES-625
.625	1.375	.4375	96	64	1070	EG-625B	ES-625B
1.000*	2.000**	.5000	160	92	750		ES-1000

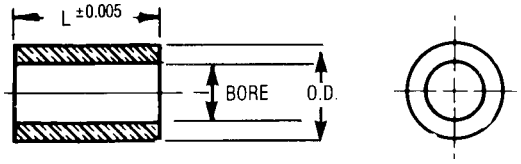
* Bore Tolerance +.004, -.000
** OD Tolerance +.000, -.004

Metric Sizes

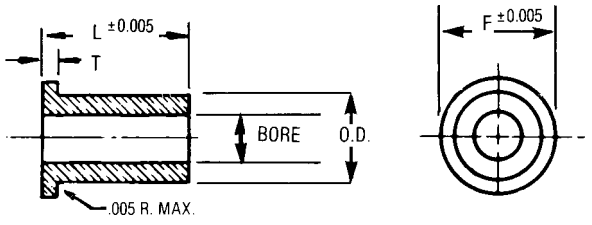
B +.07 -.00	O.D. +.00 -.09	T +.00 -.09	Load Capacity Radial (N)		Max Speed In Air (RPM)	Part No. Ball Type Glass	Part No. Ball Type Stainless Steel
			Dyn.	Static			
6	19	6	65	35	3500	MEG-6	MES-6
8	22	7	80	53	2600	MEG-8	MES-8
10	26	8	160	110	2200	MEG-10	MES-10
12	28	8	240	150	2050	MEG-12	MES-12
15	32	9	280	170	1800	MEG-15	MES-15
17	35	10	325	215	1640	MEG-17	MES-17
20	42	12	415	275	1365	MEG-20	MES-20

TEFLON FILLED POLYMER BEARINGS

PLAIN



FLANGED



Shaft Size	Bore +.002 -.000	O.D. +.000 -.002	L	F	T ±.003	Part No. PLAIN	Part No. FLANGED
1/8"	.126	.253	.250 .375	.360	.047	- -	B15-1A B15-2A
1/8"	.129	.253	.250 .375	.344	.062	B14-1 B14-2	B15-1 B15-2
3/16"	.191	.315	.250 .500	.437	.062	B14-3 B14-4	B15-3 B15-4
1/4"	.254	.378	.375 .500	.500	.062	B14-5 B14-6	B15-5 B15-6
5/16"	.316	.437	.375 .500	.562	.062	- -	B15-7A B15-8A
5/16"	.316	.503	.375 .500	.625	.094	B14-7 B14-8	B15-7 B15-8
3/8"	.379	.565	.500 .750	.875	.125	B14-9 B14-10	B15-9 B15-10
3/8"	.379	.628	.500 .750	.875	.125	- -	B15-13 B15-14
1/2"	.504	.753	.500 1.000	1.000	.125	B14-11 B14-12	B15-11 B15-12

Material: Heavy Duty TFE Filled Polymer
(Practically inert to all acids, bases, and solvents)

Specifications:

Temperature Limits	-400° F to +550° F
Coeffient of Friction	Approximate 0.20
Recommended Max. PV	10,000 PSI x FPM
Recommended Max V	400 FPM
Recommended Max. P	1000 PSI
Chemical Resistance	Excellent
Water Absorption	Zero
Outgassing	Negligible at 10^{-7} TORR

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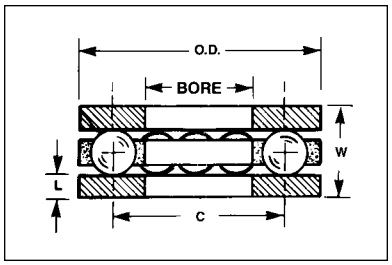
THRUST BEARINGS



Material: **STAINLESS STEEL MODEL**
Races — 410 SS. RC 42-45
Balls — 440C SS Hardened
Retainer — Nylon 8200

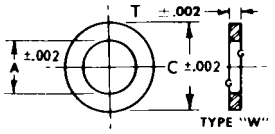
CARBON STEEL MODEL
Races — C1075 Steel. RC 59-61
Balls — Hardened Carbon Steel
Retainer — Nylon 8200

Bore +.008 −.000	O.D. +.000 −.008	C	W	L ±.002	NO. OF BALLS	410 Stainless Steel LOAD RATING AT 15 RPM	410 Stainless Steel Part No.	C1075 Carbon Steel LOAD RATING AT 15 RPM	C1075 Carbon Steel Part No.
.128	.434	9/32	.195	.050	6	63 LBS.	ET-02-S	89 LBS.	ET-02-C
.190	.497	11/32	.195	.050	7	73 LBS.	ET-03-S	104 LBS.	ET-03-C
.253	.559	13/32	.195	.050	8	83 LBS.	ET-04-S	119 LBS.	ET-04-C
.315	.622	15/32	.195	.050	9	94 LBS.	ET-05-S	134 LBS.	ET-05-C
.378	.809	19/32	.249	.062	6	104 LBS.	ET-06-S	149 LBS.	ET-06-C
.503	.934	23/32	.249	.062	8	139 LBS.	ET-08-S	198 LBS.	ET-08-C
.628	1.122	7/8	.342	.093	6	170 LBS.	ET-10-S	243 LBS.	ET-10-C
.753	1.247	1″	.342	.093	8	255 LBS.	ET-12-S	322 LBS.	ET-12-C
1.003	1.622	1-5/16	.437	.125	10	347 LBS.	ET-16-S	496 LBS.	ET-16-C
1.253	1.872	1-9/16	.437	.125	14	486 LBS.	ET-20-S	694 LBS.	ET-20-C

THRUST WASHERS

Oil Impregnated Bronze & Steel

STEEL-HARDENED AND GROUND



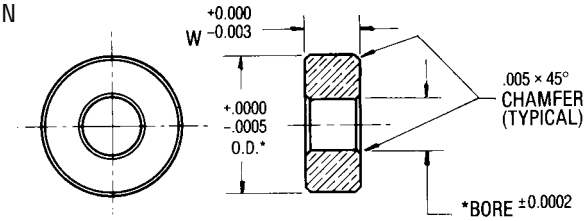
A	Bronze C	Steel C	T	Bronze Part No.	Steel Part No.
.130	.370	.250	.062	AH-1-W	AJ-1-W
.192	.495	.375	.062	AH-2-W	AJ-2-W
.255	.620	.500	.062	AH-3-W	AJ-3-W
.318	.745	.625	.093	AH-4-W	AJ-4-W
.380	.870	.750	.125	AH-5-W	AJ-5-W
.505	1.125	1.000	.187	AH-6-W	AJ-6-W

Material: Tool Steel
Hardened and Ground RC55-60
Bronze MIL-B-5687
Type 1, Comp. A

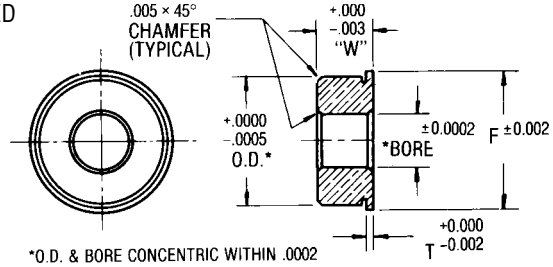
PRECISION BRONZE BEARINGS

Oil Impregnated

PLAIN



FLANGED



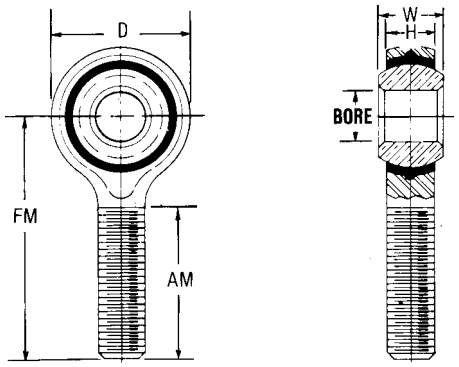
Material: Bronze MIL-B-5687A
Type 1, Comp. A

Bore	O.D.	W	F	T	Plain Part No.	Plain Interchangeable with Ball Bearing Part No.	Flanged Part No.	Flanged Interchangeable with Ball Bearing Part No.
.1250	.2500	.0937	.296	.023	AM-10	E3-5 to E3-6	AM-14	E4-5 to E4-6
.1250	.3125	.1094	.359	.023	AM-11	E3-7 to E3-8	AM-15	E4-7 to E4-8
.1250	.3750	.1562	.440	.030	AM-1	E1-1 to E1-3	AM-5	E2-1 to E2-3
.1875	.5000	.1562			AM-2	E1-4		
.1875	.5000	.1960	.565	.042	AM-3	E1-5 to E1-6	AM-6	E2-4 to E2-6
.2500	.6250	.1960	.690	.042	AM-4	E1-7 to E1-9	AM-7	E2-7 to E2-9

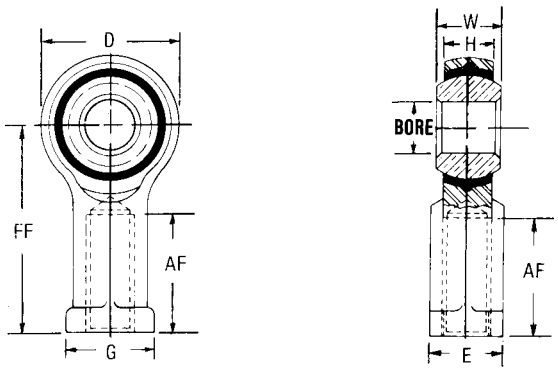
ROD ENDS

Nylon & Phosphor Bronze Races

MALE



FEMALE



Integral Nylon Race

Materials: Housing — Mild Steel, Plated.
Race — Nylon Integrally Molded Around The Ball.
Ball — Case Hardened, Plated
— Sintered Oil Impregnated Ball Available On Special Quotes And Orders Only

Bore	W	H	AM	FM	AF	FF	D	G	E	Thread	Angle of misalignment Degrees	Operational Load rating (lbs.)		PART NUMBER			
												Male	Female	MALE		FEMALE	
+.0025 −.0005	±.005	(Ref.)	±.062	±.030	±.030	±.030	±.010	(Ref.)	(Ref.)	Class UNF-2				RH	LH	RH	LH
.1900	.312	.250	.750	1.250	.559	1.062	.750	.406	.312	10-32	24	1150	1200	PE3-1	PE4-1	PE5-1	PE6-1
.2500	.375	.281	1.000	1.562	.735	1.312	.750	.468	.375	1/4-28	28	1600	1650	PE3-2	PE4-2	PE5-2	PE6-2
.3125	.437	.344	1.250	1.875	.735	1.375	.875	.500	.437	5/16-24	24	2700	2800	PE3-3	PE4-3	PE5-3	PE6-3
.3750	.500	.406	1.250	1.938	.907	1.625	1.000	.687	.562	3/8-24	22	3200	3250	PE3-4	PE4-4	PE5-4	PE6-4
.5000	.625	.500	1.500	2.438	1.239	2.125	1.312	.875	.750	1/2-20	20	5800	6400	PE3-5	PE4-5	PE5-5	PE6-5

*Ultimate static load in lbs.

Phosphor Bronze Race

Materials: Housing — Mild Steel, Cadmium Plated.
Race — Sintered Phosphor Bronze Oil Impregnated
Ball — Case Hardened Carbon Steel, Tin-Nickel Plated

Bore	W	H	AM	FM	AF	FF	D	G	E	Thread	Angle of misalignment Degrees	Operational Load rating (lbs.)		PART NUMBER			
												Male	Female	MALE		FEMALE	
+.0025 −.0005	±.005	(Ref.)	±.060	±.030	±.030	±.030	±.010	(Ref.)	(Ref.)	Class UNF-2				RH	LH	RH	LH
.1900	.312	.250	.750	1.250	.559	1.062	.750	.406	.312	10-32	22	1600	1800	PE13-1	PE14-1	PE15-1	PE16-1
.2500	.375	.281	1.000	1.562	.735	1.312	.750	.468	.375	1/4-28	26	2250	2300	PE13-2	PE14-2	PE15-2	PE16-2
.3125	.437	.344	1.250	1.875	.735	1.375	.875	.500	.437	5/16-24	22	2850	2900	PE13-3	PE14-3	PE15-3	PE16-3
.3750	.500	.406	1.250	1.938	.907	1.625	1.000	.687	.562	3/8-24	20	3900	4300	PE13-4	PE14-4	PE15-4	PE16-4
.5000	.625	.500	1.500	2.438	1.239	2.125	1.312	.875	.750	1/2-20	20	7400	8400	PE13-5	PE14-5	PE15-5	PE16-5

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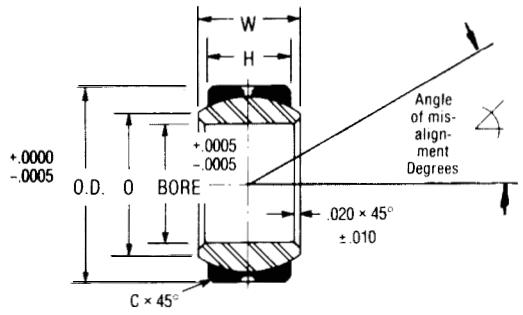
SPHERICAL BEARINGS

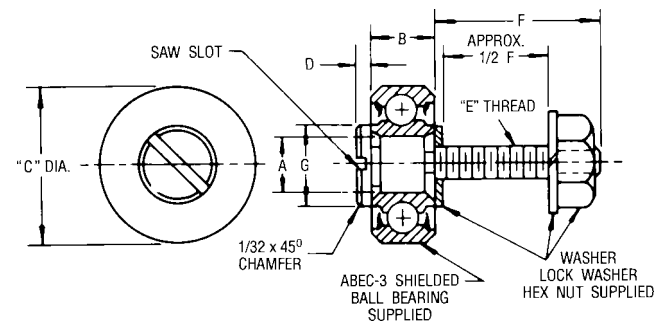
SPHERICAL BEARINGS



Bore	O.D.	H	W	C	Ball Dia.	O	Degrees	Ultimate (Radial) Static Load Rating (lbs.)	Part No.
.1900	.5625	.218	.281	.010	.500	.416	17º	4800	**PE12-1**
.2500	.6562	.250	.343	.010	.594	.485	21º	7720	**PE12-2**
.3125	.7500	.281	.375	.020	.670	.556	18.5º	10550	**PE12-3**
.3750	.8125	.312	.406	.020	.718	.592	17.5º	13700	**PE12-4**
.5000	1.0000	.390	.500	.020	.880	.725	16.5º	22500	**PE12-5**

Materials: Race-Hardened Steel
Ball-Impregnated Nickel Iron

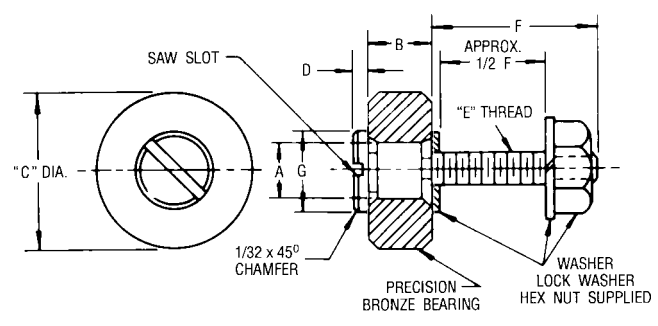
CAM FOLLOWER WITH BALL BEARINGS



A	B	C	D	E	F	G	Part No.
.0781	.1406	.2500	3/32	#1-64	1/4	5/32	**P1-21**
.0937	.1406	.3125	3/32	#2-56	1/4	3/16	**P1-22**
.1250	.1094	.2500	1/8	#4-40	9/32	3/16	**P1-23**
.1250	.1406	.3125	1/8	#4-40	5/16	7/32	**P1-24**
.1250	.1562	.375	1/8	#4-40	5/16	1/4	**P1-25**
.1875	.1960	.500	5/32	#8-32	3/8	5/16	**P1-26**
.2500	.1960	.625	5/32	#10-32	1/2	3/8	**P1-27**

Material: Bearings — 440 Stainless Steel
Screw — 303 Stainless Steel
Nut & Washer — 300 Series Stainless Steel

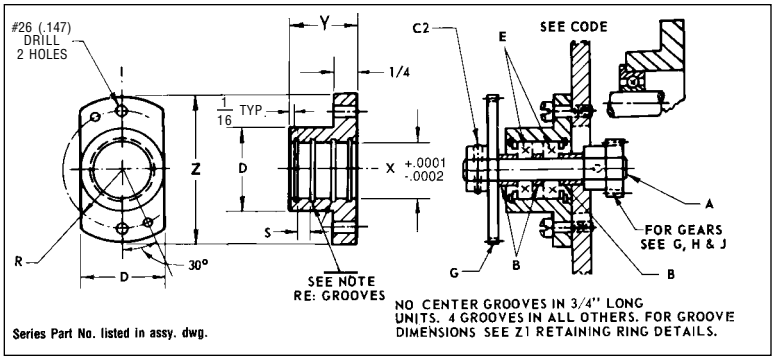
CAM FOLLOWER WITH BRONZE BEARINGS



A	B	C	D	E	F	G	Part No.
.1250	.1094	.2500	1/8	#4-40	9/32	3/16	**P1-23B**
.1250	.1406	.3125	1/8	#4-40	5/16	7/32	**P1-24B**
.1250	.1562	.375	1/8	#4-40	5/16	1/4	**P1-25B**
.1875	.1960	.500	5/32	#8-32	3/8	5/16	**P1-26B**
.2500	.1960	.625	5/32	#10-32	1/2	3/8	**P1-27B**

Material: Bearings — Bronze per MIL-B-5687D, Type 1, Grade 1
Screw — 416 Stainless Steel
Nut & Washer — 300 Series Stainless Steel

BEARING HOUSING — 3/8", 1/2" and 5/8" Bores

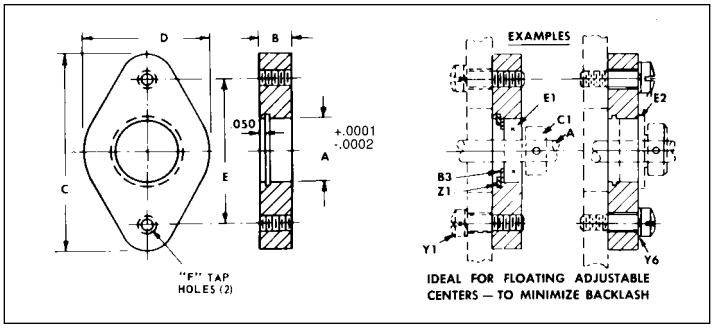


X	Y	D	Z	R	S	Part No. (Tap Holes)	Part No. (Cl. Drill)
.3750	3/4 1 1-1/2	3/4	1-1/2	.562	.187	**AA1-1** **AA1-2** **AA1-3**	**AA2-1** **AA2-2** **AA2-3**
.5000	3/4 1 1-1/2	7/8	1-5/8	.625	.260	**AA3-1** **AA3-2** **AA3-3**	**AA4-1** **AA4-2** **AA4-3**
.6250	3/4 1 1-1/2	15/16	1-3/4	.687	.260	**AA5-1** **AA5-2** **AA5-3**	**AA6-1** **AA6-2** **AA6-3**

Material: Aluminum (Chromic Acid Anodize)
Above assembly drawing depicts a common usage with PIC parts.
Consult Series Index for description of parts shown.

See Section 3 for alternate Bearing Housings

BEARING MOUNTING PLATE

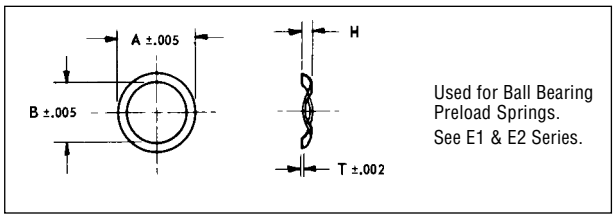


Shaft Size	A	B	C	D	E	F Holes Tap	Part No.
1/4	.6250	.312	1-3/4	1	1.375	#6-32	**AP-3**

See Section 3 for alternate Bearing Housings

Material: Aluminum
Finish: Chromic Acid Anodize

WAVE SPRING WASHERS



A	B	T	H (Aprox.)	H_1 (Aprox.)	Load in Lbs. H Deflected to H_1 (Aprox.)	Part No.
.367	.265	.006	.030	.015	2-4	**D6-1**
.492	.350	.007	.035	.020	3-5	**D6-2**
.618	.440	.008	.040	.025	3-5	**D6-4**
.734	.531	.009	.050	.030	4-7	**D6-5**
.855	.650	.010	.060	.030	4-7	**D6-6**
1.102 *	.856	.012	.075	.037	9-13	**D6-7**
1.351	1.051	.015	.099	.049	16-20	**D6-8**
1.543 *	1.201	.017	.105	.053	19-23	**D6-9**
1.819 *	1.404	.020	.125	.062	26-34	**D6-10**
2.028 *	1.575	.022	.140	.069	31-39	**D6-11**
2.420 *	1.872	.022	.168	.082	40-50	**D6-12**

Material: 300 Series Stainless Steel - spring tempered, except where noted with " * " it is high carbon steel ASTM-A684

Note: A and B dimensions shown in above diagram indicate blank size before forming.

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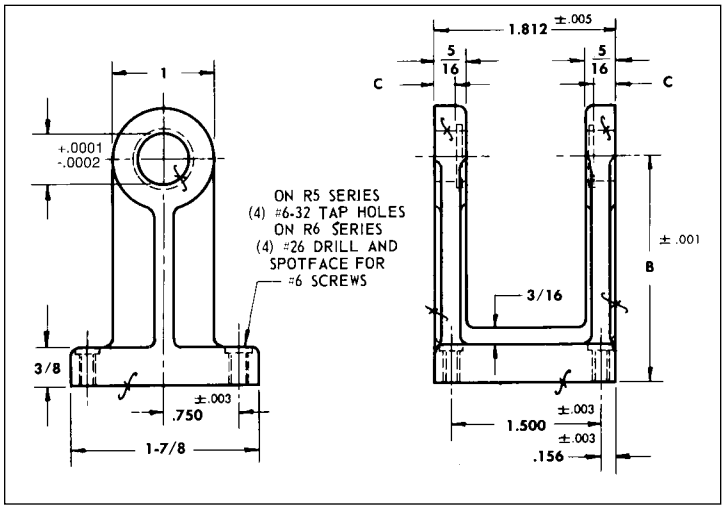
DOUBLE SHAFT HANGER / BEARING HOUSING



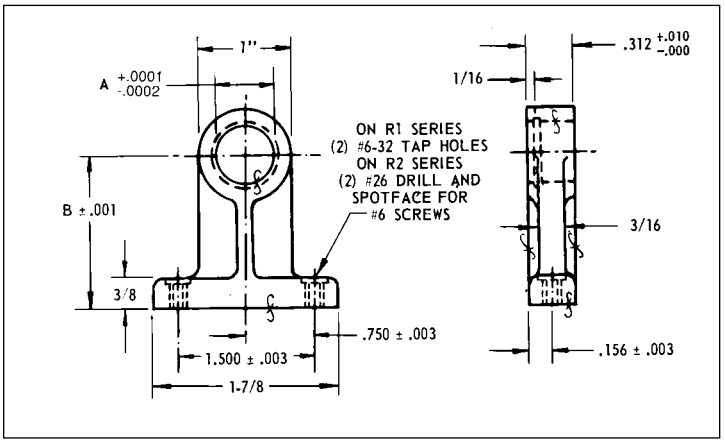
Material: Aluminum
Finish: Chromic Acid Anodize

Shaft Size Bearing I.D.	A	B	C	Part No. (Tap Holes)	Part No. (Clearance Holes)
1/8	.3750	1.000	3/16	R5-1	R6-1
		1.500		R5-2	R6-2
		2.000		R5-3	R6-3
		2.250		R5-4	R6-4
		2.500		R5-5	R6-5
3/16	.5000	1.000	7/32	R5-6	R6-6
		1.500		R5-7	R6-7
		2.000		R5-8	R6-8
		2.250		R5-9	R6-9
		2.500		R5-10	R6-10
1/4	.6250	1.000	7/32	R5-11	R6-11
		1.500		R5-12	R6-12
		2.000		R5-13	R6-13
		2.250		R5-14	R6-14
		2.500		R5-15	R6-15

See E Series for Ball Bearings, AM Series for Oil Impregnated Bearings and Z Series for Retaining Rings.
See R1 Series for Bearing and Spacer Arrangements.

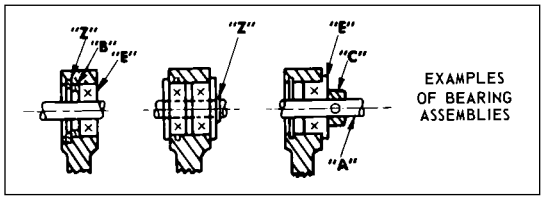
See Section 3 for alternate Bearing Housings

UNIVERSAL SHAFT HANGER / BEARING HOUSING



Material: Aluminum
Finish: Chromic Acid Anodize

Shaft Size Bearing I.D.	A	B	Part No. (Tap Holes)	Part No. (Clearance Holes)
1/8	.3750	1.000	R1-1	R2-1
		1.500	R1-2	R2-2
		2.000	R1-3	R2-3
		2.250	R1-13	R2-13
		2.500	R1-4	R2-4
3/16	.5000	1.000	R1-5	R2-5
		1.500	R1-6	R2-6
		2.000	R1-7	R2-7
		2.250	R1-14	R2-14
		2.500	R1-8	R2-8
1/4	.6250	1.000	R1-9	R2-9
		1.500	R1-10	R2-10
		2.000	R1-11	R2-11
		2.250	R1-15	R2-15
		2.500	R1-12	R2-12



See Section 3 for alternate Bearing Housings