

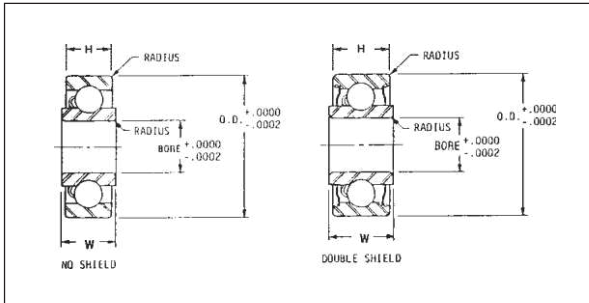
EXTENDED INNER RACE BEARINGS

Material: 440 Stainless Steel

TOLERANCES: ABEC 3 & 7

Lubrication: Open - Oil per MIL-L-6085

Double Shielded: Grease per MIL-G-23827



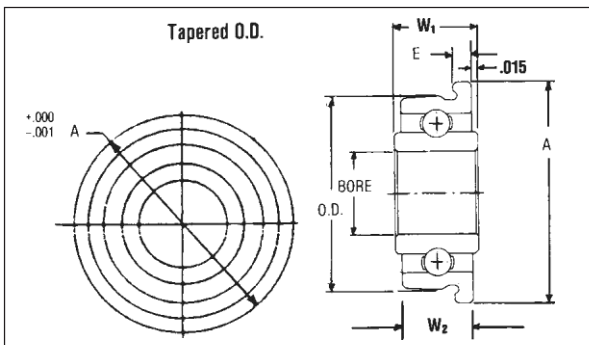
BORE	O.D.	H	W	Shield DATA	ABEC 3 Part No.	ABEC 7 Part No.
.1250	.2500	.0937	.125	Open	E1-OE-3	E1-OE-7
		.1094	.1406	Double Shield	E1-SE-3	E1-SE-7
.1875	.3125	.1094	.1406	Open	E2-OE-3	E2-OE-7
		.125	.1562	Double Shield	E2-SE-3	E2-SE-7
.2500	.3750	.125	.1562	Open	E3-OE-3	E3-OE-7
				Double Shield	E3-SE-3	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-23827
Supplied With Double Shield



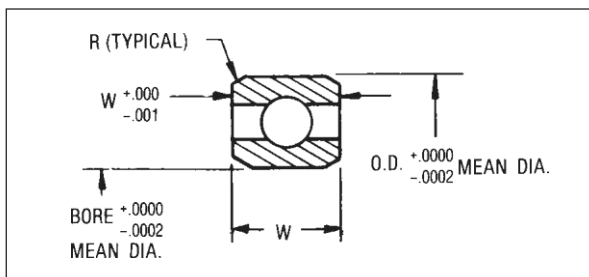
Bore	O.D.	W ₁	W ₂	A	E	Part No.
.1250	.3757	.189	.163	.4380	.037	E8-1
.1875	.5632	.251	.226	.6250	.042	E8-2
.2498	.6257	.251	.226	.6850	.042	E8-3
.3125	.6887	.251	.226	.7500	.042	E8-4

EXTRA THIN BALL BEARINGS

TOLERANCES: ABEC-5 OPEN

Material: 440 Stainless Steel

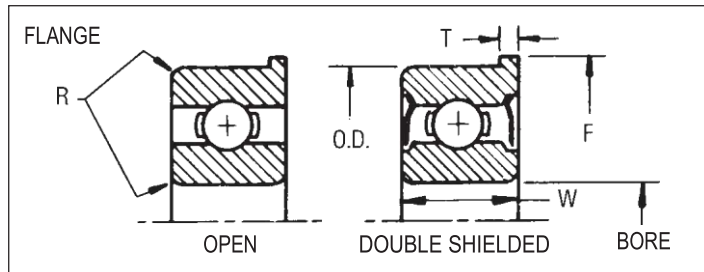
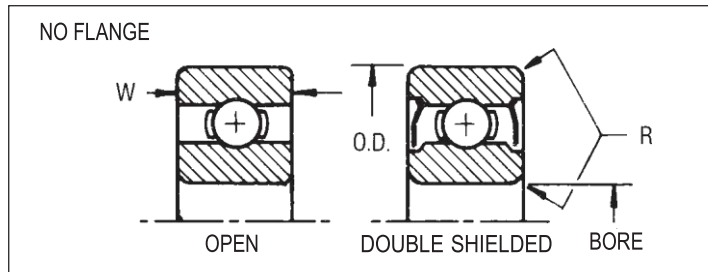
Oil Per MIL-L-6085



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



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

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

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	Radial 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.
.0400	.1250	.0469			.003	Open	19	6		E1-16-3	E1-16			
.0469	.1562	.0625 .0937	.203	.013 .031	.005	Open Dbl. Shield	27	9		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	46	14		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	59	19		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	34	10	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	101	33		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	51	18		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	100	32		E3-7-3 E3-8-3	E3-7 E3-8		E4-7-3 E4-8-3	E4-7 E4-8
.1250	.3750	.1094 .1406	.422	.023 .031	.005	Open Dbl. Shield	102	33				E2-16-1 E2-17-1	E2-16-3 E2-17-3	E2-16 E2-17
.1250	.3750	.1562	.440	.030	.012	Open Dbl. Shield Dbl. Seal	115	41	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	70	26	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	70	26	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	129	50	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	.565	.042	.012	Open Open Dbl. Shield Dbl. Seal	236	88	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	76	37	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	150	67	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	265	107	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	434	164	E16-01 E16-S1	E16-03 E16-S3	E16-07 E16-S7			
.3125	.5000	.1562	.547	.031	.016	Open Dbl. Shield	98	42	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	.969	.062	.016	Open Open Dbl. Shield Dbl. Seal	599	252	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	696	402	E7-01 E7-S1	E7-03 E7-S3	E7-07 E7-S7	E7-S1F	E7-S3F	E7-S7F

Continued on page 6-5

PRECISION BALL BEARINGS

ABEC 1, 3, and 7 Tolerances

Continued from page 6-4

Bore	O.D.	W	F	T	R Radius	Shield Data	Radial 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.
									E9-O1 E9-S1	E9-O3 E9-S3				
.6250	1.375	.2812 .3438			.031	Open Dbl. Shield	1072	582	E9-O1 E9-S1	E9-O3 E9-S3				
.7500	1.625	.3125 .4375			.031	Open Dbl. Shield	1688	1048	E10-O1 E10-S1	E10-O3 E10-S3				
.8750	1.875	.3750 .5000			.031	Open Dbl. Shield	1816	1048	E11-O1 E11-S1	E11-O3 E11-S3				
1.000	2.000	.3750 .5000			.031	Open Dbl. Shield	1816	1048	E12-O1 E12-S1	E12-S3				
*1.1250	2.1250	.5000			.031	Open Dbl. Shield	2384	1488	E17-O1 E17-S1	E17-O3 E17-S3				
*1.2500	2.250	.3750 .5000			.031	Open Dbl. Shield	2384	1488	E18-O1 E18-S1	E18-O3 E18-S3				
*1.5000	2.625	.4375 .5625			.031	Open Dbl. Shield	3016	2072	E19-O1 E19-S1	E19-O3 E19-S3				

*Material ABEC 1 and 3 — 52100 chrome steel

METRIC PRECISION BALL BEARINGS

TOLERANCES: ISO Class 4 or Normal

Material: 440 Stainless Steel

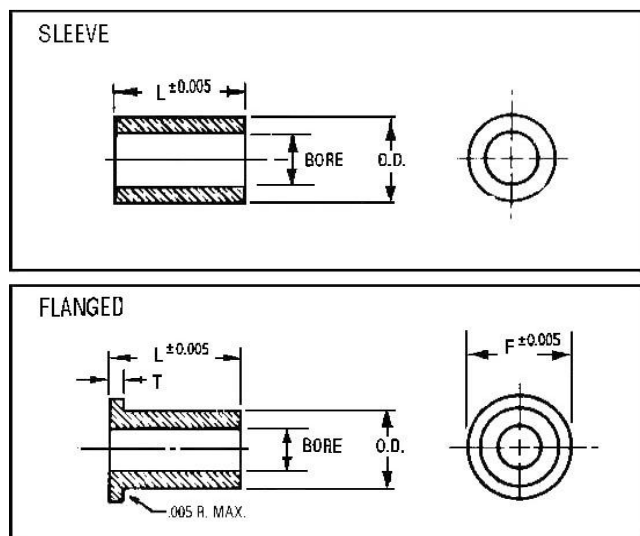
Bore	O.D.	W	F	T	R	Shield Data	Radial Load Rating (N)		No Flange Part No.	Flanged Part No.
							Dynamic	Static		
3	7	2.0 3.0	8.1	0.5 0.8	0.2 0.15	Open Shielded	248	88	MBG1-1 MBG2-1	MBG3-1 MBG4-1
3	10	4.0	11.5	1.0	0.3	Open Shielded	504	172	MBG5-1 MBG6-1	MBG7-1 MBG8-1
4	9	2.5 4.0	10.3	0.6 1.0	0.25 0.5	Open Shielded	512	180	MBG1-2 MBG2-2	MBG3-2 MBG4-2
4	13	5.0	15.0	1.0	0.4	Open Shielded	1040	388	MBG5-2 MBG6-2	MBG7-2 MBG8-2
4	16	5.0	18.0	1.0	0.5	Open Shielded	1072	416	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	572	226	MBG1-3 MBG2-3	MBG3-3 MBG4-3
5	16	5.0	18.0	1.0	0.5	Open Shielded	1382	540	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	864	352	MBG1-4 MBG2-4	MBG3-4 MBG4-4
6	19	6.0	22.0	1.5	0.5	Open Shielded	1868	716	MBG5-5 MBG6-5	MBG7-5 MBG8-5
7	22	7.0			0.3	Open Shielded	2632	1104	MBG7-0 MBG7-S	
8	16	4.0 5.0	18.0	1.0	0.4 0.3	Open Shielded	1000	474	MBG1-5 MBG2-5	MBG3-5 MBG4-5
8	22	7.0	25.0	1.5	0.5	Open Shielded	2632	1104	MBG5-6 MBG6-6	MBG7-6 MBG8-6
10	19	5.0 7.0			0.5	Open Shielded	1372	670	MBG1-6 MBG2-6	
10	26	8.0			0.5	Open	3470	1950	MBG5-7	
12 *	28	8.0			0.5	Open Shielded	4340	1910	MBG10-O MBG10-S	
15 *	32	9.0			0.5	Open Shielded	4750	2270	MBG15-O MBG15-S	
20 *	42	12.0			1.0	Open Shielded	7960	4050	MBG20-O MBG20-S	
25 *	47	12.0			1.0	Open Shielded	8550	4690	MBG25-O MBG25-S	
30 *	55	13.0			1.5	Open Shielded	11240	6610	MBG30-O MBG30-S	
40 *	68	15.0			1.5	Open Shielded	14250	9220	MBG40-O MBG40-S	

* ISO Class Normal 52100 Chrome Steel

SINTERED BRONZE BEARINGS

Oil-Impregnated

Sleeve & Flanged



Material: Bronze, MIL-B-438/438
Type 2, Grade 1

Specifications:

Density: 6.4 -6.8 gm/cm³ 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
Speed V: 1,200 fpm

Compressive Yield Strength: 11,000 PSI

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

Where:

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

P = Load, PSI

V = Shaft Speed (fpm)

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

$$V = .262 DN$$

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 1.510 *	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 1.510 *	0.0010
1.511 to 2.510	0.0015
Over 2.510	0.0020

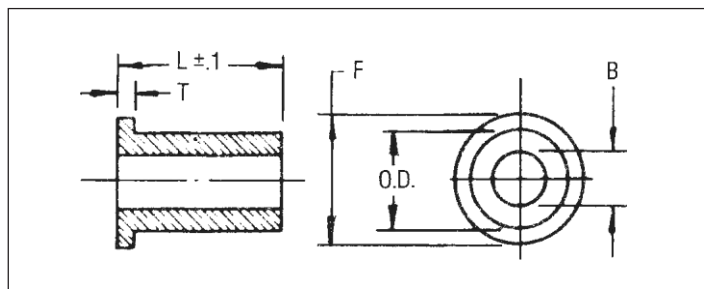
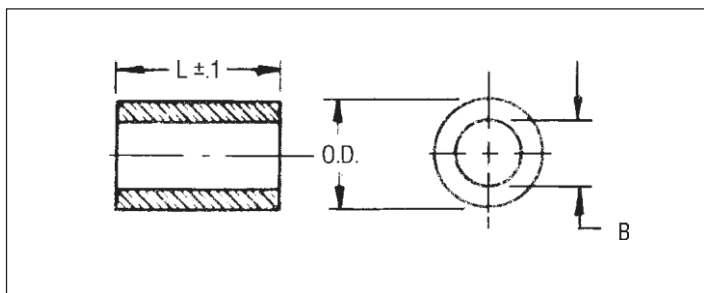
*Revised
1/8/08

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	
7/8	.878	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	1.003	1.253	.750 1.000 1.250	1.625	.125		B11-68 B11-69 B11-70

METRIC SINTERED BRONZE BEARINGS

ISO Standard

Oil-Impregnated



All Dimensions in Millimeters

Material: Bronze, Per MIL-B-438/438
Type 2, 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/cm²

Temperature -20° to +100°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	9	1.5	MBG9-1	MBG10-1
			6			MBG9-2	MBG10-2
			10			MBG9-3	MBG10-3
4	4	8	4	12	2	MBG9-4	MBG10-4
			8			MBG9-5	MBG10-5
			12			MBG9-7	MBG10-7
5	5	8	5	12	2	MBG9-8	
			8			MBG9-9	
			12			MBG9-10	
			16			MBG9-11	
6	6	10	6	14	2	MBG9-12	MBG10-12
			10			MBG9-13	MBG10-13
			12			MBG9-14	* MBG10-14
			16			MBG9-15	MBG10-15
8	8	12	8	16	2	MBG9-16	MBG10-16
			12			MBG9-17	MBG10-17
			16			MBG9-18	MBG10-18
10	10	13	10	16	1.5	MBG9-19	MBG10-19
			16			MBG9-20	MBG10-20
			20			MBG9-21	MBG10-21
12	12	17	12	22	2.5	MBG9-22	MBG10-22
			16			MBG9-23	MBG10-23
			20			MBG9-24	MBG10-24
16	16	22	16	28	3	MBG9-25	MBG10-25
			20			MBG9-26	MBG10-26
			25			MBG9-27	MBG10-27
20	20	26	16	32	3	MBG9-28	MBG10-28
			20			MBG9-29	MBG10-29
			25			MBG9-30	MBG10-30
			32			MBG9-31	MBG10-31
25	25	30	20	35	2.5	MBG9-32	MBG10-32
			25			MBG9-33	MBG10-33
			32			MBG9-34	MBG10-34
			40			MBG9-35	

* Flange thickness on MBG10-14 = 1.2mm

Tolerances per ISO 286-2 μm

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

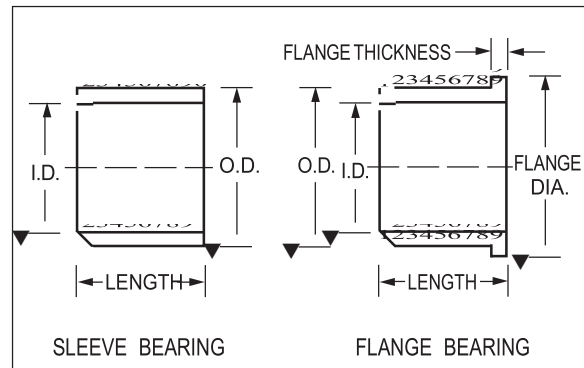
Temperature Range -40° to 176°F (+338° short term)

Max PV 3,400 PSI x FPM

Max V (continuous) FPM Rotating Oscillating Linear
118 157 492

Coefficient of friction approximate .2

Chemical resistance Parts are resistant to alkalis and most weak organic and inorganic acids. Insoluble in normal organic solution.



Nominal Sizes					I.D. When In Housing		Housing Bore		Recommend Shaft Size		Sleeve Part No.	Flanged Part No.
I.D.	O.D.	LENGTH	FLG. Dia.	FLG. TH. (-0.0055")	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.		
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

METRIC NON-METALLIC BEARINGS

Sleeve & Flanged

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 82°C

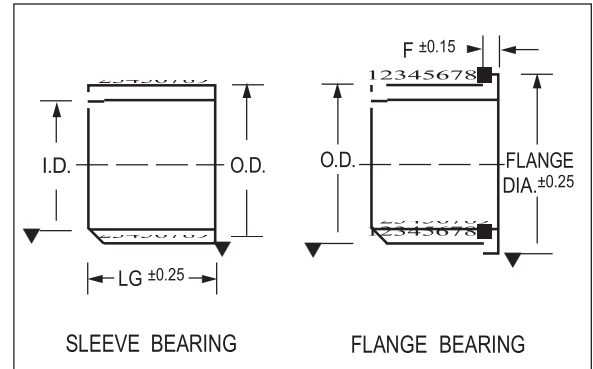
Max PV (continuous) 0.35 N/mm² x m/sec

Max P 18 N/mm²

Max V (continuous) cm/sec Rotating 60 Oscillating 80 Linear 250

Coefficient of Friction approximate .2

Chemical Resistance Parts are resistant to alkalis and most weak organic and inorganic acids. Insoluble in normal organic solution.

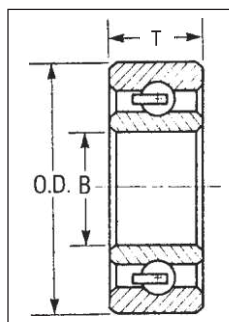


Nominal Sizes					I.D. In Housing		Housing Bore		Recommend Shaft Size		Sleeve Part No.	Flanged Part No.
I.D.	O.D.	LG.	FLG. Dia.	FLG. TH.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.		
3	6	4	9	1.5	3.078	3.030	6.012	6.000	3.000	2.975	MBS-0306-4	MBF-0306-4
4	8	4 6	12	2	4.078	4.030	8.015	8.000	4.000	3.970	— MBS-0408-6	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

NON-CORROSIVE BALL BEARINGS

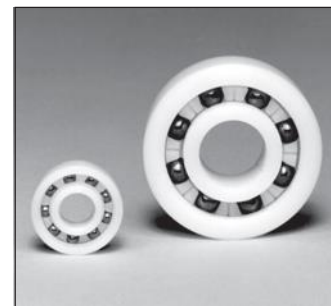
Inch & Metric

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 In Air (RPM)	Part No. Ball Type Glass	Part No. Ball Type Stainless Steel
			Dyn.	Static			
.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

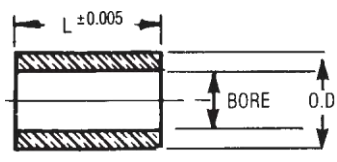
** OD Tolerance +.000, -.004

Metric Sizes

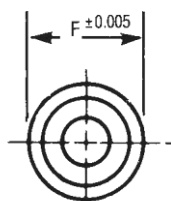
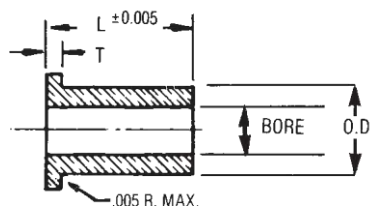
B +.07 -.00	O.D. +.00 -.09	T +.00 -.09	Load Capacity Radial (N)		Max Speed In Air (RPM)	Part No. Ball Type Glass	Part No. Ball Type Stainless Steel
			Dyn.	Static			
6	19	6	65	35	3500	MEG-6	MES-6
8	22	7	80	53	2600	MEG-8	MES-8
10	26	8	160	110	2200	MEG-10	MES-10
12	28	8	240	150	2050	MEG-12	MES-12
15	32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



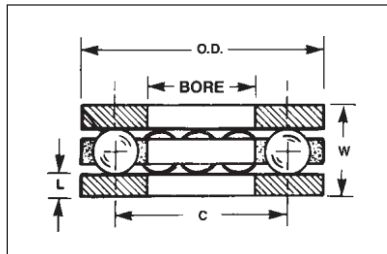
Material: Heavy Duty TFE Filled Polymer
(Practically inert to all acids, bases, and solvents)

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

Specifications:

Temperature Limits	-400° F to +550° F
Coefficient 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

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

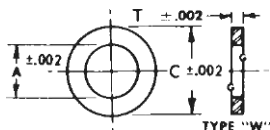
Retainer — Nylon 8200

Bore +.008 -.000	O.D. +.000 -.008	C	W	L ±.002	NO. OF BALLS	410 Stainless Steel		C1075 Carbon Steel	
						LOAD RATING AT 15 RPM	Part No.	LOAD RATING AT 15 RPM	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	.689	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

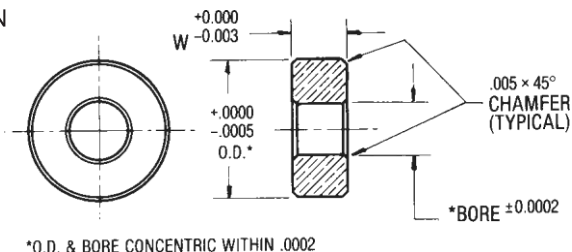
Hardened and Ground RC55-60

Bronze (Oil Impregnated)

PRECISION BRONZE BEARINGS

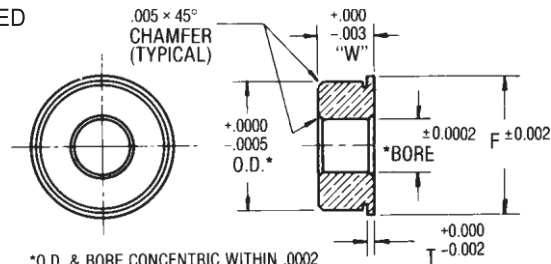
Oil Impregnated

PLAIN



*O.D. & BORE CONCENTRIC WITHIN .0002

FLANGED



*O.D. & BORE CONCENTRIC WITHIN .0002

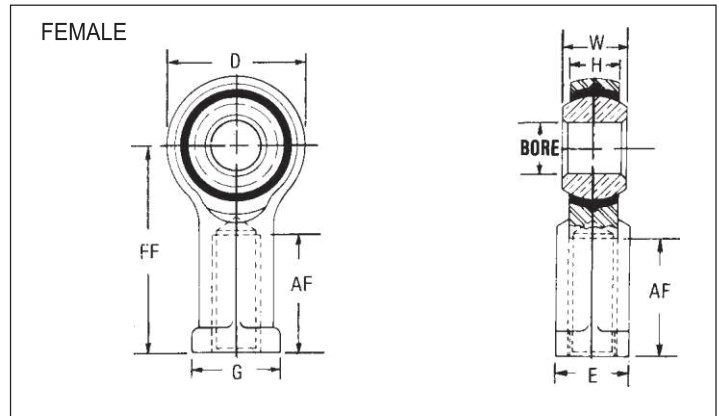
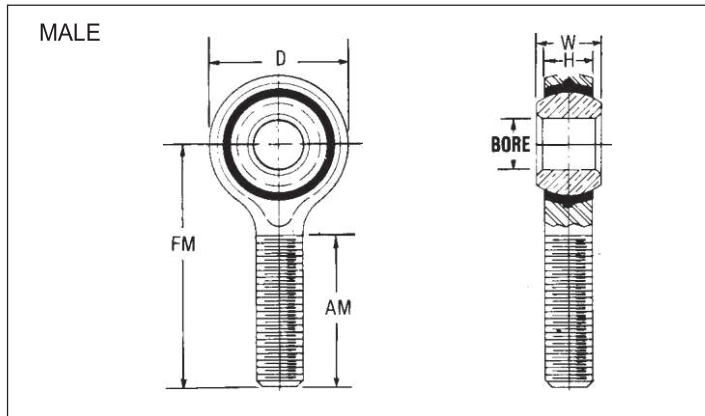
Material: Bronze ASTM B438

Type 2, Grade 1

Bore	O.D.	W	F	T	Plain		Flanged	
					Part No.	Interchangeable with Ball Bearing Part No.	Part No.	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



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	Ultimate Radial Static Load Rating (lbs.)		PART NUMBER			
												Male	Female	MALE		FEMALE	
														RH	LH	RH	LH
+ .0025 - .0005	± .005	(Ref.)	± .062	± .030	± .030	± .030	± .010	(Ref.)	(Ref.)	Class UNF-2							
.1900	.312	.250	.750	1.250	.562	1.062	.625	.406	.312	10-32	24	1150	1200	PE3-1	PE4-1	PE5-1	PE6-1
.2500	.375	.281	1.000	1.562	.750	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	.750	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	.937	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	1.187	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

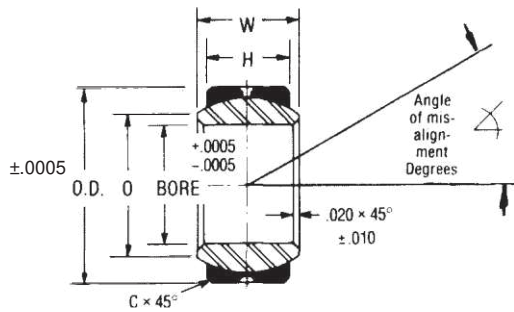
Bore	W	H	AM	FM	AF	FF	D	G	E	Thread	Angle of misalignment Degrees	Ultimate Radial Static Load Rating (lbs.)		PART NUMBER			
												Male	Female	MALE		FEMALE	
														RH	LH	RH	LH
+ .0025 - .0005	± .005	(Ref.)	± .060	± .030	± .030	± .030	± .010	(Ref.)	(Ref.)	Class UNF-2							
.1900	.312	.250	.750	1.250	.562	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	.750	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	.750	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	.937	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	1.187	2.125	1.312	.875	.750	1/2-20	20	7400	8400	PE13-5	PE14-5	PE15-5	PE16-5

Metric Sizes Available

Inquire for Price and Availability

SPHERICAL BEARINGS

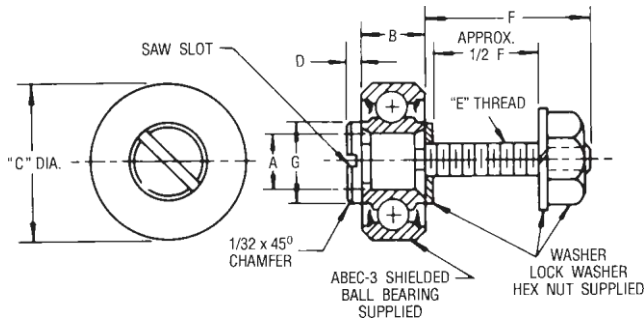
SPHERICAL BEARINGS



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	17°	4800	PE12-1
.2500	.6562	.250	.343	.010	.594	.485	21°	7720	PE12-2
.3125	.7500	.281	.375	.020	.670	.556	18.5°	10550	PE12-3
.3750	.8125	.312	.406	.020	.718	.592	17.5°	13700	PE12-4
.5000	1.0000	.390	.500	.020	.880	.725	16.5°	22500	PE12-5

Materials: Race-Hardened Steel
Ball-Impregnated Nickel Iron

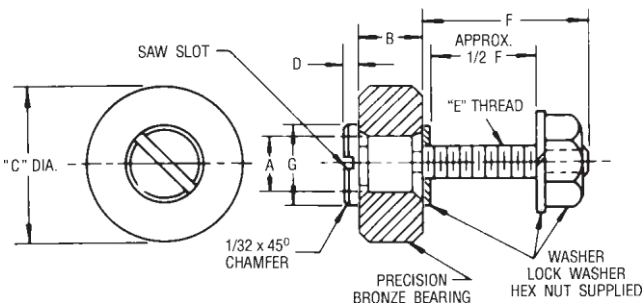
CAM FOLLOWER WITH BALL BEARINGS



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

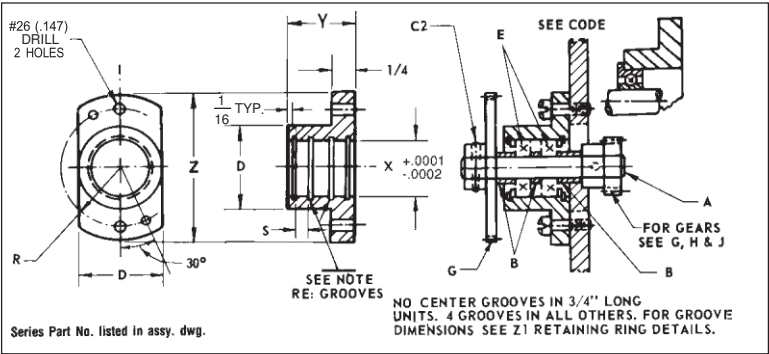
CAM FOLLOWER WITH BRONZE BEARINGS



A	B	C	D	E	F	G	Part No.
.1250	.0937	.2500	1/8	#4-40	9/32	3/16	P1-23B
.1250	.1094	.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, Oil Impregnated
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

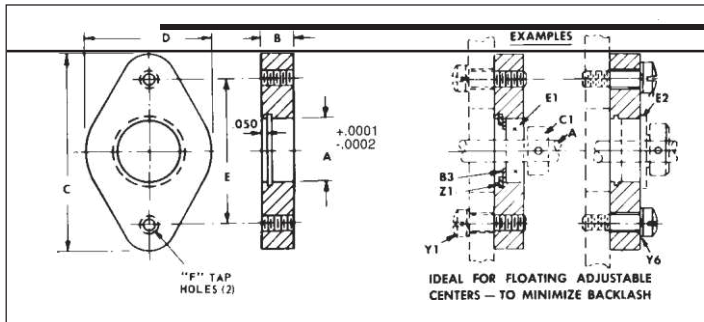
Material: Aluminum

Finish: Anodized

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

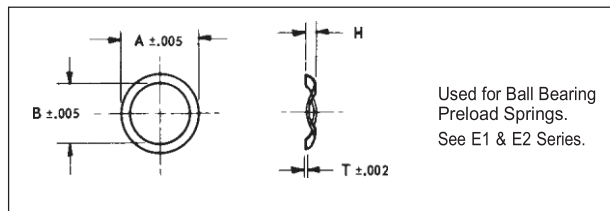


Shaft Size	A	B	C	D	E	F Holes	Part No.
						Tap	
1/4	.6250	.312	1-3/4	1	1.375	#6-32	AP-3

See Section 3 for alternate Bearing Housings

Material: Aluminum
Finish: Anodized

WAVE SPRING WASHERS



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

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

A	B	T	H	H ₁	Load in Lbs.	Part No.
					H Deflected to H ₁ (Aprox.)	
.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