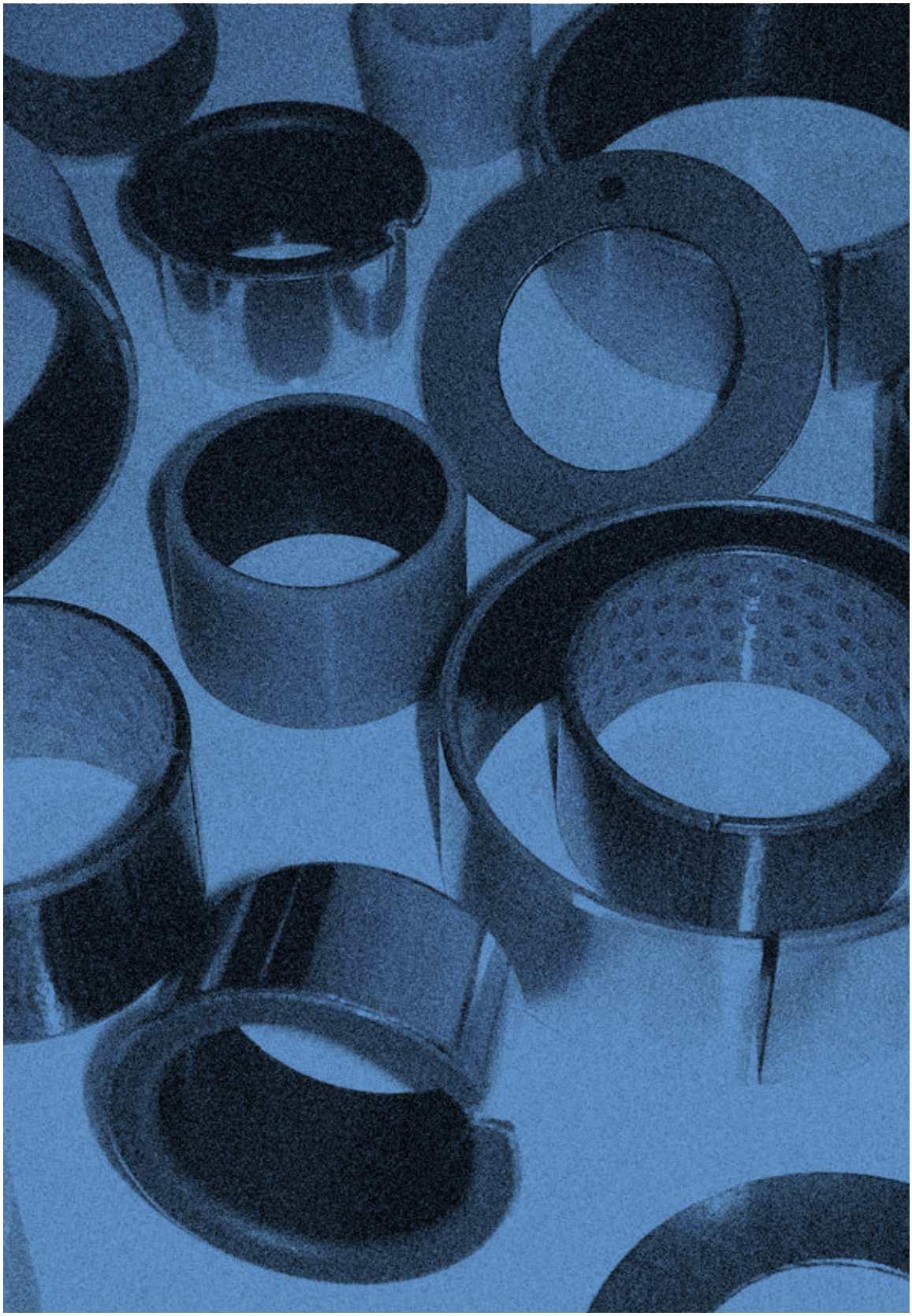
DMR™



www.daemar.com

Daemar® Inc.

BUSHINGS

For over 38 years Daemar®Inc. has remained focused on partnering with our customers to deliver precision component solutions that meet their business challenges. Whether the application is a new design or a maintenance requirement, Daemar's global partnerships offer you one of the most complete sources of supply for Bushings. To ensure that Daemar® consistently meets or exceeds customer requirements, Daemar® is ISO-9001:2008 registered and most suppliers have either TS16949-2000, QS-9000 or ISO-9001:2000 quality registrations.

Daemar® has developed all of the capabilities required to support your lean manufacturing initiatives - providing JIT delivery, vendor managed inventories and computer systems integration. Supported by the Daemar® regional warehousing network you experience fast, courteous service throughout the world. All of Daemar's locations are fully stocked and staffed with experienced and knowledgeable sales & service professionals.

We trust that you will find this catalogue a valuable resource for selecting the appropriate Bushings for your applications. For further selection assistance, pricing and product availability please contact the Daemar® location nearest you.

DMR™
ISO 9001:2008
Registered QMS

CONTENTS

ISO-9001:2008 REGISTERED

To consistently meet and exceed our customers' expectations, Daemar®Inc. is ISO-9001: 2008 registered and most of our suppliers are QS-9000 and/or ISO-9000 quality registered.

CERTIFICATE
OF REGISTRATION

This is to certify that

Daemar Inc.
861 Cranberry Court, Oakville, Ontario L6L 6J7 Canada

operates a

Quality Management System

which complies with the requirements of

ISO 9001:2008

for the following scope of registration

The Registration covers the Quality Management System for the distribution of fluid sealing and precision components - Industrial distribution.

Certificate No:	CERT-0049820	Original Certification Date:	September 20, 2004
File No:	800377	Current Certification Date:	October 1, 2010
Issue Date:	July 27, 2010	Certificate Expiry Date:	September 30, 2013

Chris Joppi
President
QMI-SAI Canada Limited

Alex Ezrielchtch
General Manager
SAI Global Certification Services Pty Ltd

ISO 9001

SAI GLOBAL

DMR™
ISO 9001:2008
Registered QMS

DAEMAR'S COMPLETE BUSHING PRODUCT LINE

Catalogue C0G-003

Dryslide™

Self-Lubricated

- Inch Sizes: TH, FTH, TS-TH & TW-TH
- Metric Sizes: MB - TH, MB - FTH, TS - M, TW - M

Pre-Lubricated

- Inch Sizes: THX, TS-THX, TW - THX
- Metric Sizes: MB-THX, TS-THX-M, TW - THX-M

Fiber-Lube™

- FL - Series (Inch Sizes)
- FLM - Series (Metric Sizes)

Products covered in this catalogue

Catalogue C0G-020

Solid Metal Bushings

- Flange Bushings
- Sleeve Bushings
- Thrust Washers

Catalogue C0G-020

Powdered Metal Bushings

- Flange Bushings
- Sleeve Bushings
- Thrust Washers

Available in SAE841 and SAE 863 materials

Contact a Daemar sales representative for further information on sizes available for these parts and to request a catalogue

Catalogue C0G-030

Linear Motion

- LM76 Ceramic Series
- LM76 SL Series

Interchange				
Daemar®	**Garlock®**	**Ina - Permaglide®**	**Federal Mogul - Glycodur®**	**SKF®**
TH	DU	PAPZ-P10	PGZ	PC-Z
MB-TH	MB-DU	PAP-P10	PG	PCM
FTH	FDU	PAF-P10	PBG	PCMF
TW-TH	G-DU		PXG	PCZW
TW-M	WC-DU	PAW-P10	PXG	PCMW
THX	DXR			PCM
THXD	DX	P20		
PF	GAR-MAX (GM)			PWM
PF TAPED	GAR-FIL (GF)			

TH

INTRODUCTION
SELF-LUBRICATING BEARINGS

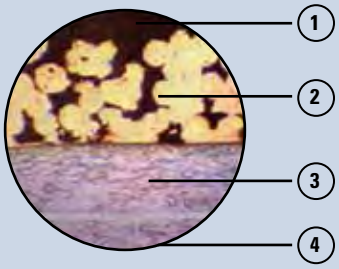
The Dryslide trademark identifies a whole range of self-lubricated dry sliding bearings. A composite structure, TH consists of a carbon steel backing, an intermediate layer of sintered bronze, PTFE based sliding lining. The main items in the TH range are the wrapped cylindrical bushings (DIN 1494) and the flanged cylindrical bushings. Moreover, the range also includes thrust washers, strips and special parts made to customer specifications. From a technical point of view, the product is already widely known and new applications are constantly being identified to take advantage of the high load capacity, the self-lubricated feature and the excellent ratio between cost and performance of the whole range.

Technical Data		
Max. Load	Static	250 N/mm^2 (36,000 psi)
	Very Slow Speeds	140 N/mm^2 (20,000 psi)
	Rotating / Oscillating	60 N/mm^2 (8,400 psi)
Max. PV Dry Running	Short term Operation	3.6 N/mm^2*m/s (102,000 psi-fpm)
	Continuous Operation	1.8 N/mm^2*m/s (51,000 psi-fpm)
Temperature Range (°C)		-195°C to +280°C (-319°F to +536°F)
Max. Speed	Dry Running	2 m/s (400 fpm)
	Hydrodynamic Operation	> 2 m/s (> 400 fpm)
Thermal Conductivity		42 W(m*K)$^{-1}$ 302 BTU/(hr)(ft^2)(°F/in)
Coefficient of Thermal Expansion		11*10^{-6}*K^{-1}
Coefficient of Friction		0.03 - 0.20

PRODUCT STRUCTURE

Steel bronze powder with PTFE/Fibres mixture (Lead Free)

1. PTFE based mixture 0.01-0.03mm: provides an excellent initial transfer film, which effectively coats the mating surface of the bearing assembly, forming an oxide type solid lubricant film.



2. Sintered bronze powder 0.20-0.35mm: provides maximum thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE based mixture.

3. Low-Carbon Steel: provides exceptionally high load carrying capacity.

4. Copper/Tin plating 0.002mm: provides good corrosion resistance.

A dry running bearing with a low coefficient of friction, good wear properties and sliding characteristics. It can be used in both rotary and oscillating applications.

TYPICAL APPLICATIONS

Can meet the demanding criteria for long life and trouble-free performance with or without lubrication.

Automotive: tractors, combines, crop sprayers, earthmovers, and road graders. Specific uses in power steering cylinders, steering gear thrust washers, disc brakes, callipers, pistons, shock absorbers, governor linkage, windshield wiper motor, and tilt gear assemblies...

Office Equipment: photocopy machines, mail sorters, postage meter systems, computer printers, peripheral equipment, automatic printing devices, and mail processing machinery...

Hydraulics and valves: pumps including gear, rotary, water, axial piston, and other types, ball, butterfly, poppet steam, and other valves and valve trunnions...

Home Appliances: refrigerators, air conditioners, vacuum cleaners, polishers, sewing machines, ovens, dishwashers, and washing machines...

Materials handling: pallet trucks, scissor lifts, packaging machinery and textile equipment...

THX

INTRODUCTION
PRE-LUBRICATING BEARINGS

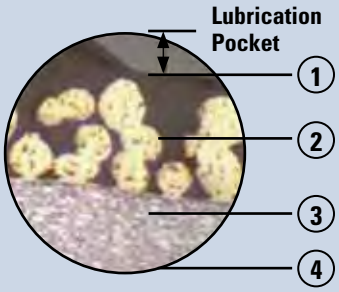
The THX trademark denotes a range of sliding bearings produced from a material with a composite structure. The backing consists of carbon steel onto which a porous layer of bronze is sintered and then impregnated with a co-acetal plastic. The polymeric surface has indentations in which the lubricating grease lies and protects the mating surface. The main products in the THX range are the cylindrical bushings (DIN 1494), but thrust washers and strips are also available as well as special parts made to customer specifications.

Technical Data		
Max. Load	Static	250 N/mm^2 (36,000 PSI)
	Load Capacity	140 N/mm^2 (20,000 PSI)
Max. PV		3.0 N/mm^2*m/s (85,000 PSI-FPM)
Temperature Range		-40°C to +130°C (-40°F to +260°F)
Max. Speed	Greased	0.5 m/s (100 FPM)
	Oiled	2.5 m/s (500 FPM)
Coefficient of Friction		0.05 - 0.20

PRODUCT STRUCTURE

Steel bronze powder with Acetal Marginal bearings

1. POM (Acetal) 0.30-0.50mm: has high wear resistance and low friction. The bearing surface has a pattern of circular indents, which should be filled with grease on assembly.



2. Sintered bronze powder 0.20-0.35mm: provides maximum thermal conductivity away from the bearing surface, also serves as a reservoir for the resin mixture.

3. Low-Carbon Steel: provides exceptionally high load carrying capacity.

4. Copper/Tin plating 0.002mm: provides good corrosion resistance.

The THX bushing can be used in rotary and oscillating applications. Less maintenance requirements due to the long re-lubrication intervals. Less wear, less susceptibility to edge loading, and no absorption of water. The THX has good damping qualities and is resistant to shock loads.

TYPICAL APPLICATIONS

Recommended for applications involving intermittent operation or boundary lubrication.

Automotive: suspension joints, kingpin assemblies, automobile driving joint hinges, steering and other linkages, articulation joints, and rear chassis hinges.

Machine Tools: spindles in drill, grinding, and milling machines, and ram guide plates in multi ram presses.

Agricultural Equipment: gearboxes, clutch assemblies, bale trips and wheel caster swivels for bale accumulators, front axle pivot bearings, steering idler box bearings and kingpin bearings for harvesters...

The THX bushing is especially well suited for applications where lubricant cannot be supplied continuously or repeatedly.

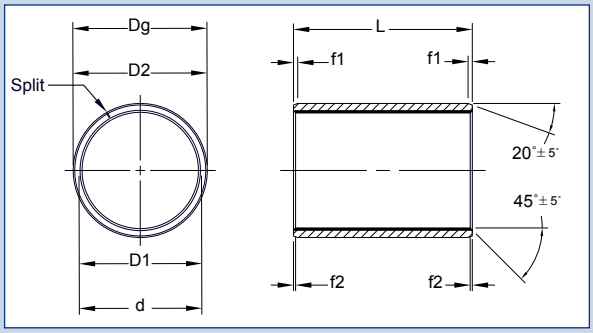
TH

INCH SIZES
SELF-LUBRICATING BEARINGS

Part Numbering

02 TH 02
- 02 — Nominal ID (D1)
- TH — Style
- 02 — Length (L)

Part numbers are represented in 1/16" increments



Part Number	D1	D2	Length (+/- 0.010")	Shaft Diameter (d)	Housing Bore (Dg)	Installed ID (D1E)
02TH02	0.1250	0.1875	0.1250	0.1243 0.1236	0.1878 0.1873	0.1268 0.1243
02TH03			0.1875			
025TH025	0.1563	0.2188	0.1563	0.1554 0.1547	0.2191 0.2186	0.1581 0.1556
025TH04			0.2500			
03TH03	0.1875	0.2500	0.1875	0.1865 0.1858	0.2503 0.2497	0.1893 0.1867
03TH04			0.2500			
03TH06			0.3750			
04TH04	0.2500	0.3125	0.2500	0.2490 0.2481	0.3128 0.3122	0.2518 0.2492
04TH06			0.3750			
05TH06	0.3125	0.3750	0.3750	0.3115 0.3106	0.3753 0.3747	0.3143 0.3117
05TH08			0.5000			
06TH03	0.3750	0.4688	0.1875	0.3740 0.3731	0.4691 0.4684	0.3769 0.3742
06TH04			0.2500			
06TH06			0.3750			
06TH08			0.5000			
06TH I 0			0.6250			
06TH12			0.7500			
07TH08	0.4375	0.5313	0.5000	0.4365 0.4355	0.5316 0.5309	0.4394 0.4367
07TH12			0.7500			
08TH04	0.5000	0.5938	0.2500	0.4990 0.4980	0.5941 0.5934	0.5019 0.4992
08TH06			0.3750			
08TH08			0.5000			
08TH10			0.6250			
08TH12			0.7500			
08TH14			0.8750			
09TH06	0.5625	0.6563	0.3750	0.5615 0.5605	0.6566 0.0656	0.5644 0.5617
09TH08			0.5000			
09TH10			0.6250			
09TH12			0.7500			
10TH04	0.6250	0.7188	0.2500	0.6240 0.6230	0.7192 0.7184	0.6270 0.6242
10TH08			0.5000			
10TH10			0.6250			
10TH12			0.7500			
10TH14			0.8750			
10TH16			1.0000			
11TH14	0.6875	0.7813	0.8750	0.6865 0.6855	0.7817 0.7809	0.6895 0.6867
12TH04	0.7500	0.8750	0.2500	0.7491 0.7479	0.8755 0.8747	0.7525 0.7493
12TH06			0.3750			
12TH08			0.5000			
12TH10			0.6250			
12TH12			0.7500			
12TH16			1.0000			
13TH12	0.8125	0.9375	0.7500	0.8116 0.8104	0.9380 0.9372	0.8150 0.8118
13TH18			1.1250			
14TH04	0.8750	1.0000	0.2500	0.8741 0.8729	1.0005 0.9997	0.8775 0.8743
14TH06			0.3750			
14TH12			0.7500			
14TH14			0.8750			
14TH16			1.0000			
14TH20			1.2500			
16TH06	1.0000	1.1250	0.3750	0.9991 0.9979	1.1256 1.1246	1.0026 0.9992
16TH08			0.5000			
16TH12			0.7500			
16TH16			1.0000			
16TH20			1.2500			
16TH24			1.5000			
18TH06	1.1250	1.2813	0.3750	1.1238 1.1226	1.2818 1.2808	1.1278 1.1240
18TH10			0.6250			
18TH12			0.7500			
18TH16			1.0000			
20TH06	1.2500	1.4063	0.3750	1.2488 1.2472	1.4068 1.4058	1.2528 1.2490
20TH12			0.7500			
20TH14			0.8750			

TH

INCH SIZES
SELF-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.010")	Shaft Diameter (d)	Housing Bore (Dg)	Installed ID (D1E)
20TH I 6	1.2500	1.4063	1.0000	1.2488 1.2472	1.4068 1.4058	1.2528 1.2490
20TH20			1.2500			
20TH28			1.7500			
22TH12	1.3750	1.5313	0.7500	1.3738 1.3722	1.5318 1.5308	1.3778 1.3740
22TH16			1.0000			
22TH22			1.3750			
22TH24			1.5000			
22TH28			1.7500			
24TH08	1.5000	1.6563	0.5000	1.4988 1.4972	1.6568 1.6558	1.5028 1.4990
24TH16			1.0000			
24TH18			1.1250			
24TH20			1.2500			
24TH24			1.5000			
24TH32			2.0000			
26TH16	1.6250	1.7813	1.0000	1.6238 1.6222	1.7818 1.7808	1.6278 1.6240
26TH24			1.5000			
28TH16	1.7500	1.9375	1.0000	1.7487 1.7471	1.9381 1.9371	1.7535 1.7489
28TH24			1.5000			
28TH28			1.7500			
28TH32			32.0000			
30TH12	1.8750	2.0625	0.7500	1.8737 1.8721	2.0633 2.0621	1.8787 1.8739
30TH16			1.0000			
30TH30			1.8750			
30TH36			2.2500			
32TH08	2.0000	2.1875	0.5000	1.9987 1.9969	2.1883 2.1871	2.0037 1.9989
32TH16			1.0000			
32TH24			1.5000			
32TH28			1.7500			
32TH32			2.0000			
32TH40			2.5000			
34TH48	2.1250	2.3125	3.0000	2.1257 2.1239	2.3127 2.3115	2.1323 2.1259
36TH28	2.2500	2.4375	1.7500	2.2507 2.2489	2.4377 2.4365	2.2573 2.2509
36TH32			2.0000			
36TH36			2.2500			
36TH40			2.5000			
36TH48			3.0000			
36TH56			3.5000			
36TH60			3.7500			
36TH64			4.0000			
36TH72			4.5000			
40TH16	2.5000	2.6875	1.0000	2.5011 2.4993	2.6881 2.6869	2.5077 2.5013
40TH26			1.6250			
40TH32			2.0000			
40TH40			2.5000			
40TH48			3.0000			
40TH56			3.5000			
40TH60			3.7500			
40TH64			4.0000			
40TH72			4.5000			
40TH76			4.7500			
44TH32	2.7500	2.9375	2.0000	2.7500 2.7482	2.9370 2.9358	2.7566 2.7502
44TH36			2.2500			
44TH40			2.5000			
44TH48			3.0000			
44TH56			3.5000			
44TH60			3.7500			
44TH64			4.0000			
44TH72			4.5000			
44TH76			4.7500			
44TH80			5.0000			
46TH32	2.8750	3.0625	2.0000	2.8752 2.8734	3.0623 3.0610	2.8819 2.8754
46TH36			2.2500			
46TH40			2.5000			
46TH48			3.0000			
46TH56			3.5000			
46TH60			3.7500			
46TH64			4.0000			
46TH72			4.5000			
46TH76			4.7500			
46TH80			5.0000			
48TH32	3.0000	3.1875	2.0000	3.0000 2.9982	3.1872 3.1858	3.0068 3.0002
48TH36			2.2500			
48TH40			2.5000			
48TH48			3.0000			
48TH56			3.5000			
48TH60			3.7500			
48TH64			4.0000			
48TH72			4.5000			
48TH76			4.7500			
48TH80			5.0000			
52TH32	3.2500	3.4375	2.0000	3.2500 3.2480	3.4372 3.4358	3.2568 3.2502
52TH38			2.3750			
52TH40			2.5000			
52TH48			3.0000			
52TH56			3.5000			
52TH60			3.7500			
52TH64			4.0000			
52TH72			4.5000			
52TH76			4.7500			

Part Number	D1	D2	Length (+/- 0.010")	Shaft Diameter (d)	Housing Bore (Dg)	Installed ID (D1E)
52TH80	3.2500	3.4375	5.0000	3.2500 3.2480	3.4372 3.4358	3.2568 3.2502
56TH32	3.5000	3.6875	2.0000	3.5000 3.4978	3.6872 3.6858	3.5068 3.5002
56TH38			2.3750			
56TH40			2.5000			
56TH48			3.0000			
56TH56			3.5000			
56TH60			3.7500			
56TH64			4.0000			
56TH72			4.5000			
56TH76			4.7500			
56TH80			5.0000			
58TH32	3.6250	3.8125	2.0000	3.6250 3.6228	3.8122 3.8108	3.6318 3.6258
58TH36			2.2500			
58TH40			2.5000			
58TH48	3.6250	3.8125	3.0000	3.6250 3.6228	3.8122 3.8108	3.6318 3.6258
58TH56			3.5000			
58TH60			3.7500			
58TH64			4.0000			
58TH72			4.5000			
58TH76			4.7500			
58TH80			5.0000			
60TH32	3.7500	3.9375	2.0000	3.7500 3.7478	3.9372 3.9358	3.7568 3.7502
60TH36			2.2500			
60TH40			2.5000			
60TH48			3.0000			
60TH56			3.5000			
60TH60			3.7500			
60TH64			4.0000			
60TH72			4.5000			
60TH76			4.7500			
60TH80			5.0000			
64TH32	4.0000	4.1875	2.0000	4.0000 3.9978	4.1872 4.1858	4.0068 4.0002
64TH36			2.2500			
64TH40			2.5000			
64TH48			3.0000			
64TH56			3.5000			
64TH60			3.7500			
64TH64			4.0000			
64TH72			4.5000			
64TH76			4.7500			
64TH80			5.0000			
68TH32	4.2500	4.4375	2.0000	4.2500 4.2478	4.4372 4.4358	4.2568 4.2502
68TH36			2.2500			
68TH40			2.5000			
68TH48	4.2500	4.4375	3.0000	4.2500 4.2478	4.4372 4.4358	4.2568 4.2502
68TH56			3.5000			
68TH60			3.7500			
68TH64			4.0000			
68TH72			4.5000			
68TH76			4.7500			
68TH80			5.0000			
70TH32	4.3750	4.5625	2.0000	4.3750 4.3728	4.5622 4.5608	4.3818 4.3752
70TH36			2.2500			
70TH40			2.5000			
70TH48			3.0000			
70TH56			3.5000			
70TH60			3.7500			
70TH64			4.0000			
70TH72			4.5000			
70TH76			4.7500			
70TH80			5.0000			
72TH32	4.5000	4.6875	2.0000	4.5000 4.4978	4.6872 4.6858	4.5068 4.5002
72TH36			2.2500			
72TH40			2.5000			
72TH48			3.0000			
72TH56			3.5000			
72TH60			3.7500			
72TH64			4.0000			
72TH72			4.5000			
72TH76			4.7500			
72TH80			5.0000			
76TH32	4.7500	4.9375	2.0000	4.7500 4.7475	4.9374 4.9358	4.7570 4.7502
76TH36			2.2500			
76TH40			2.5000			
76TH48			3.0000			
76TH56			3.5000			
76TH60			3.7500			
76TH64			4.0000			
76TH72			4.5000			
76TH76			4.7500			
76TH80			5.0000			
80TH32	5.0000	5.1875	2.0000	4.9986 4.9961	5.1860 5.1844	5.0056 4.9988
80TH36			2.2500			
80TH40			2.5000			
80TH48			3.0000			
80TH56			3.5000			
80TH60			3.7500			
80TH64			4.0000			
80TH72			4.5000			

TH

INCH SIZES
SELF-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.010")	Shaft Diameter (d)	Housing Bore (Dg)	Installed ID (D1E)
80TH76	5.0000	5.1875	4.7500	4.9986	5.1860	5.0056
80TH80			5.0000	4.9961	5.1844	4.9988
84TH32	5.2500	5.4375	2.0000	5.2500 5.2475	5.4374 5.4358	5.2570 5.2502
84TH36			2.2500			
84TH40			2.5000			
84TH48			3.0000			
84TH56			3.5000			
84TH60			3.7500			
84TH64			4.0000			
84TH72			4.5000			
84TH76			4.7500			
84TH80			5.0000			
88TH32	5.5000	5.6875	2.0000	5.5000 5.2475	5.6874 5.6858	5.5070 5.5002
88TH36			2.2500			
88TH40	5.5000	5.6875	2.5000	5.5000 5.2475	5.6874 5.6858	5.5070 5.5002
88TH48			3.0000			
88TH56			3.5000			
88TH60			3.7500			
88TH64			4.0000			
88TH72			4.5000			
88TH76			4.7500			
88TH80			5.0000			
92TH32	5.7500	5.9375	2.0000	5.7500 5.7475	5.9374 5.9358	5.7570 5.7502
92TH36			2.2500			
92TH40			2.5000			
92TH48			3.0000			
92TH56			3.5000			
92TH60			3.7500			
92TH64			4.0000			
92TH72			4.5000			
92TH76			4.7500			
92TH80			5.0000			
96TH32	6.0000	6.1875	2.0000	6.0000 5.9975	6.1874 6.1858	6.0070 6.0002
96TH36			2.2500			
96TH40			2.5000			
96TH48			3.0000			
96TH56			3.5000			
96TH60			3.7500			
96TH64			4.0000			
96TH72			4.5000			
96TH76			4.7500			
96TH80			5.0000			
100TH32	6.2500	6.4375	2.0000	6.2500 6.2475	6.4374 6.4358	6.2570 6.2502
100TH36			2.2500			
100TH40			2.5000			

Part Number	D1	D2	Length (+/- 0.010")	Shaft Diameter (d)	Housing Bore (Dg)	Installed ID (D1E)
100TH48	6.2500	6.4375	3.0000	6.2500 6.2475	6.4374 6.4358	6.2570 6.2502
100TH56			3.5000			
100TH60			3.7500			
100TH64			4.0000			
100TH72			4.5000			
100TH76			4.7500			
100TH80			5.0000			
104TH32	6.5000	6.6875	2.0000	6.5000 6.4975	6.6874 6.6858	6.5070 6.5002
104TH36			2.2500			
104TH40			2.5000			
104TH48			3.0000			
104TH56			3.5000			
104TH60			3.7500			
104TH64			4.0000			
104TH72			4.5000			
104TH76			4.7500			
104TH80			5.0000			
108TH32	6.7500	6.9375	2.0000	6.7500 6.7475	6.9374 6.9358	6.7570 6.7502
108TH36			2.2500			
108TH40			2.5000			
108TH48			3.0000			
108TH56			3.5000			
108TH60			3.7500			
108TH64			4.0000			
108TH72			4.5000			
108TH76			4.7500			
108TH80			5.0000			
112TH32	7.0000	7.1875	2.0000	6.9954 6.9929	7.1830 7.1812	7.0026 6.9965
112TH36			2.2500			
112TH40			2.5000			
112TH48			3.0000			
112TH56			3.5000			
112TH60			3.7500			
112TH64			4.0000			
112TH72			4.5000			
112TH76			4.7500			
112TH80			5.0000			

Chamfer Dimensions

D1	f1	f2
0.125 to 0.3125	.0078 to .0314	.0039 to .0157
0.375 to 0.6875	.0078 to .0939	.0039 to .0196
0.750 to 1.000	.0078 to .0939	.0039 to .0275
1.125 to 1.625	.0314 to .0629	.0039 to .0275
1.750 to 7.000	.0472 to .0944	.0078 to .0393

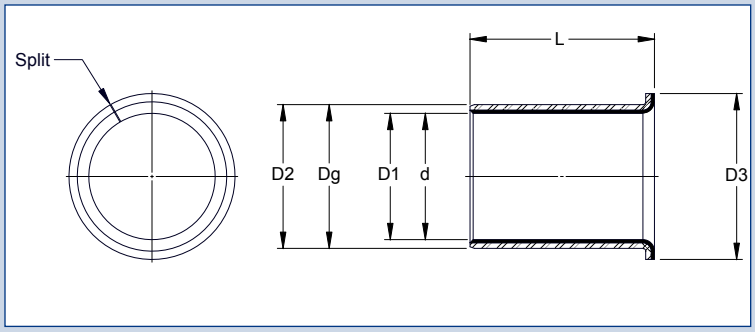
FTH

INCH SIZES
SELF-LUBRICATING BEARINGS

Part Numbering

06 FTH 04
- 04 — Length (L)
- FTH — Style
- 06 — Nominal ID (D1)

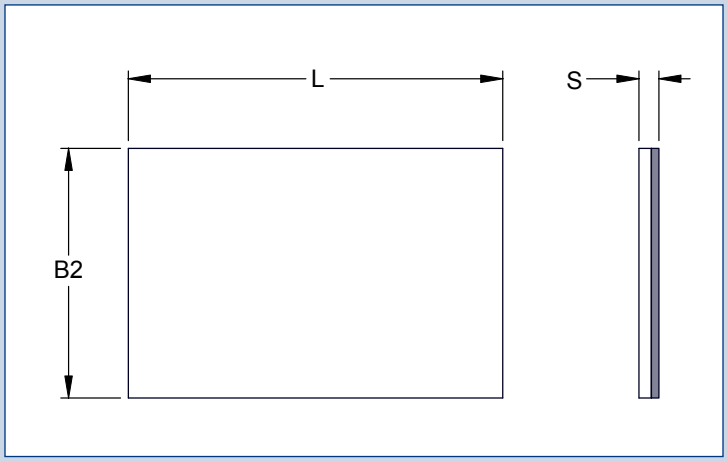
Part numbers are represented in 1/16" increments



Part Number	D1	D2	D3 (+/- 0.020)	Length (+/- 0.010)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
06FTH04	0.3750	0.4688	0.6875	0.2500	0.3740 0.3731	0.4691 0.4684	0.3769 0.3742
06FTH06				0.3750			
06FTH08				0.5000			
06FTH112				0.7500			
08FTH04	0.5000	0.5938	0.8125	0.2500	0.4990 0.4980	0.5941 0.5934	0.5019 0.4992
08FTH06				0.3750			
08FTH08				0.5000			
08FTH12				0.7500			
10FTH06	0.6250	0.7188	0.9375	0.3750	0.6240 0.6230	0.7192 0.7184	0.6270 0.6242
10FTH08				0.5000			
10FTH10				0.6250			
10FTH12				0.7500			
12FTH06	0.7500	0.8750	1.1250	0.375	0.7491 0.7479	0.8755 0.8747	0.7525 0.7493
12FTH08				0.5000			
12FTH12				0.7500			
12FTH16				1.0000			
14FTH08	0.8750	1.0000	1.2500	0.5000	0.8741 0.8729	1.0005 0.9997	0.8775 0.8743
14FTH12				0.7500			
14FTH16				1.0000			
14FTH20				1.2500			
16FTH08	1.0000	1.1250	1.3750	0.5000	0.9991 0.9979	1.1256 1.1246	1.0026 0.9992
16FTH12				0.7500			
16FTH16				1.0000			
16FTH20				1.2500			
20FTH16	1.2500	1.4063	1.7500	1.0000	1.2488 1.2472	1.4068 1.4058	1.2528 1.2490
20FTH20				1.2500			
20FTH24				1.5000			
24FTH16	1.5000	1.6563	2.0000	1.0000	1.4988 1.4988	1.6568 1.6568	1.5028 1.5028
24FTH24				1.5000			
24FTH32				2.0000			
28FTH16	1.7500	1.9375	2.3750	1.0000	1.7487 1.7471	1.9381 1.9371	1.7535 1.7489
28FTH24				1.5000			
28FTH32				2.0000			

TH FLAT STRIPS

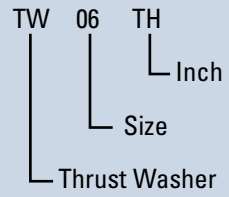
Part Number	S	B2	L
TS-0-TH	0.0277 0.0293	2.75	18
TS-1-TH	0.0431 0.0447	4	18
TS-2-TH	0.0586 0.0602	4	18
TS-3-TH	0.0740 0.0756	4	18
TS-4-TH	0.0897 0.0913	4	18
TS-5-TH	0.1190 0.1210	4	18

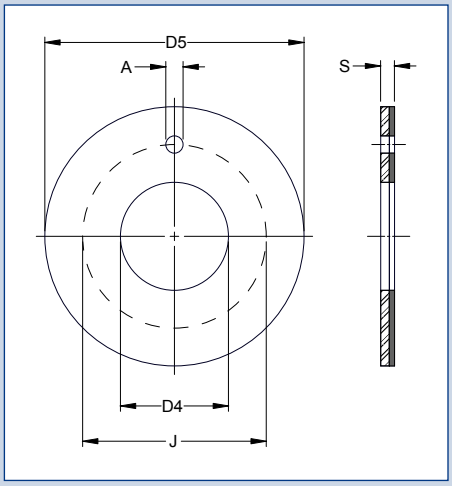


TH THRUST WASHERS

Part Number	D4 (+ 0.010)	D5 (- 0.010)	S (+ 0.0020)	Dowel Hole J (- 0.010)	A (+ 0.010)
TW-06-TH	0.500	0.875	0.0585	0.692	0.067
TW-07-TH	0.562	1.000		0.786	
TW-08-TH	0.625	1.125		0.880	0.099
TW-09-TH	0.687	1.187		0.942	
TW-10-TH	0.750	1.125		1.005	
TW-11-TH	0.812	1.375		1.099	
TW-12-TH	0.875	1.500		1.192	0.130
TW-14-TH	1.000	1.750		1.380	
TW-16-TH	1.125	2.000		1.567	0.161
TW-18-TH	1.250	2.125		1.692	
TW-20-TH	1.375	2.250		1.817	
TW-22-TH	1.500	2.500		2.005	0.192
TW-24-TH	1.625	2.625		2.130	
TW-26-TH	1.750	2.750		2.255	
TW-28-TH	2.000	3.000	0.0895	2.505	
TW-30-TH	2.125	3.125		2.630	
TW-32-TH	2.250	3.250		2.755	

Part Numbering





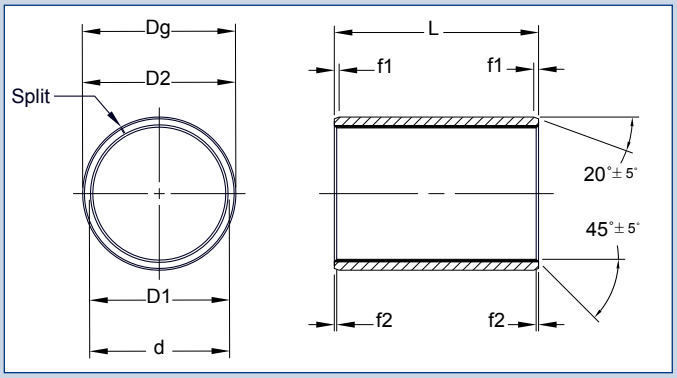
TH

METRIC SIZES
SELF-LUBRICATING BEARINGS

Part Numbering

MB 03 045 3 TH

- TH — Style
- 3 — Length (L)
- 045 — Nominal OD (D2)
- 03 — Nominal ID (D1)



Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB030453-TH	3	4.5	3	2.994 3.000	4.500 4.508	3.000 3.048
MB030454-TH			4			
MB030455-TH			5			
MB030456-TH			6			
MB040553-TH	4	5.5	3	3.992 4.000	5.000 5.508	4.000 4.048
MB040554-TH			4			
MB040556-TH			6			
MB0405510-TH			10			
MB05075-TH	5	7	5	4.978 4.990	7.000 7.015	4.990 5.055
MB05078-TH			8			
MB050710-TH			10			
MB06084-TH	6	8	4	5.978 5.990	8.000 8.015	5.990 6.055
MB06086-TH			6			
MB06088-TH			8			
MB060810-TH			10			
MB070910-TH	7	9	10	6.972 6.987	9.000 9.015	6.990 7.055
MB08106-TH	8	10	6	7.972 7.987	10.000 10.015	7.990 8.055
MB08108-TH			8			
MB081010-TH			10			
MB081012-TH			12			
MB10128-TH	10	12	8	9.972 9.987	12.000 12.018	9.990 10.058
MB101210-TH			10			
MB101212-TH			12			
MB101215-TH			15			
MB101220-TH			20			
MB12148-TH	12	14	8	11.966 11.984	14.000 14.018	11.990 12.058
MB121410-TH			10			
MB121412-TH			12			
MB121415-TH			15			
MB121420-TH			20			
MB121425-TH			25			

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB131510-TH	13	15	10	12.966 12.984	15.000 15.018	12.990 13.058
MB131520-TH			20			
MB14165-TH	14	16	5	13.966 13.984	16.000 16.018	13.990 14.058
MB141610-TH			10			
MB141612-TH			12			
MB141615-TH			15			
MB141620-TH			20			
MB141625-TH			25			
MB151710-TH	15	17	10	14.966 14.984	17.000 17.018	14.990 15.058
MB151712-TH			12			
MB151715-TH			15			
MB151720-TH			20			
MB151725-TH			25			
MB161810-TH	16	18	10	15.966 15.984	18.000 18.018	15.990 16.058
MB161812-TH			12			
MB161815-TH			15			
MB161820-TH			20			
MB161825-TH			25			
MB171915-TH	17	19	15	16.966 16.984	19.000 19.021	16.990 17.061
MB171920-TH			20			
MB182010-TH	18	20	10	17.966 17.984	20.000 20.021	17.990 18.061
MB182015-TH			15			
MB182020-TH			20			
MB182025-TH			25			
MB202210-TH	20	22	10	19.959 19.980	22.000 22.021	19.990 20.061
MB202215-TH			15			
MB202220-TH			20			
MB202310-TH	20	23	10	19.959 19.980	23.000 23.021	19.990 20.071
MB202315-TH			15			
MB202320-TH			20			
MB202325-TH			25			
MB202330-TH			30			

TH

METRIC SIZES
SELF-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB222515-TH	22	25	15	21.959 21.980	25.000 25.021	21.990 22.071
MB222520-TH			20			
MB222525-TH			25			
MB222530-TH			30			
MB222715-TH	22	27	15	23.959 23.980	27.000 27.021	23.990 24.071
MB222720-TH			20			
MB222725-TH			25			
MB222730-TH			30			
MB242815-TH	24	28	15	23.959 23.980	28.000 28.021	23.990 24.071
MB242820-TH			20			
MB242825-TH			25			
MB242830-TH			30			
MB252812-TH	25	28	12	24.959 24.980	28.000 28.021	24.990 25.071
MB252815-TH			15			
MB252820-TH			20			
MB252825-TH			25			
MB252830-TH			30			
MB252850-TH			50			
MB283215-TH	28	32	15	27.959 27.980	32.000 32.025	27.990 28.085
MB283220-TH			20			
MB283225-TH			25			
MB283230-TH			30			
MB303410-TH	30	34	10	29.959 29.980	34.000 34.025	29.990 30.085
MB303415-TH			15			
MB303420-TH			20			
MB303425-TH			25			
MB303430-TH			30			
MB303440-TH			40			
MB323620-TH	32	36	20	31.950 31.975	36.000 36.025	31.990 32.085
MB323630-TH			30			
MB323640-TH			40			
MB353920-TH	35	39	20	34.950 34.975	39.000 39.025	34.990 35.085
MB353930-TH			30			
MB353935-TH			35			
MB353940-TH			40			
MB353950-TH			50			
MB374120-TH	37	41	20	36.950 36.975	41.000 41.025	36.990 37.085
MB404420-TH	40	44	20	39.950 39.975	44.000 44.025	39.990 40.085
MB404430-TH			30			
MB404440-TH			40			
MB404445-TH			45			
MB404450-TH			50			
MB455020-TH	45	50	20	44.950 44.975	50.000 50.025	44.990 45.105
MB455030-TH			30			
MB455040-TH	45	50	40	44.950 44.975	50.000 50.025	44.990 45.105
MB455045-TH			45			
MB455050-TH			50			
MB505520-TH	50	55	20	49.950 49.975	55.000 55.030	49.990 50.110
MB505525-TH			25			
MB505530-TH			30			
MB505540-TH			40			
MB505550-TH			50			
MB505560-TH			60			
MB556020-TH	55	60	20	54.940 54.970	60.000 60.030	54.990 55.110
MB556025-TH			25			
MB556030-TH			30			
MB556040-TH			40			
MB556050-TH			50			
MB556055-TH			55			
MB556060-TH			60			
MB606520-TH	60	65	20	59.940 59.970	65.000 65.030	59.990 60.110
MB606530-TH			30			
MB606540-TH			40			
MB606550-TH			50			
MB606560-TH			60			
MB606570-TH			70			
MB657030-TH	65	70	30	64.940 64.970	70.000 70.030	64.990 65.110
MB657040-TH			40			
MB657050-TH			50			
MB657070-TH			70			
MB707540-TH	70	75	40	69.940 69.970	75.000 75.030	69.990 70.110
MB707550-TH			50			
MB707560-TH			60			
MB707570-TH			70			
MB758040-TH	75	80	40	74.940 74.970	80.000 80.030	74.990 75.110
MB758050-TH			50			
MB758060-TH			60			
MB758070-TH			70			
MB758080-TH			80			
MB808560-TH	80	85	60	79.954 80.000	85.000 85.035	80.020 80.155
MB808580-TH			80			
MB8085100-TH			100			
MB859030-TH	85	90	30	94.946 85.000	90.000 90.035	85.020 85.155
MB859060-TH			60			
MB8590100-TH			100			
MB909560-TH	90	95	60	89.946 90.000	95.000 95.035	90.020 90.155
MB9095100-TH			100			
MB9510060-TH	95	100	60	94.946 95.000	100.000 100.035	95.020 95.155
MB95100100-TH			100			

TH

METRIC SIZES
SELF-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB10010550-TH	100	105	50	99.946 100.000	105.000 105.035	100.020 100.155
MB10010560-TH			60			
MB10010570-TH			70			
MB10010580-TH			80			
MB100105100-TH			100			
MB100105115-TH			115			
MB10511060-TH	105	110	60	104.946 105.000	110.000 110.035	105.020 105.155
MB105110100-TH			100			
MB105110115-TH			115			
MB11011560-TH	110	115	60	109.946 110.000	115.000 115.035	110.020 110.155
MB110115100-TH			100			
MB110115115-TH			115			
MB11512050-TH	115	120	50	114.946 115.000	120.000 120.035	115.020 115.155
MB11512060-TH			60			
MB11512070-TH			70			
MB115120115-TH			115			
MB12012550-TH	120	125	50	119.946 120.000	125.000 125.040	120.070 120.210
MB12012560-TH			60			
MB120125100-TH			100			
MB12513060-TH	125	130	60	124.937 125.000	130.000 130.040	125.070 125.210
MB125130100-TH			100			
MB13013560-TH	130	135	60	129.937 130.000	135.000 135.040	130.070 130.210
MB130135100-TH			100			
MB13514060-TH	135	140	60	134.937 135.000	140.000 140.040	135.070 135.210
MB13514080-TH			80			
MB135140100-TH			100			
MB14014560-TH	140	145	60	139.937 140.000	145.000 145.040	140.070 140.210
MB140145100-TH			100			
MB14515060-TH	145	150	60	144.937 145.000	150.000 150.040	145.070 145.210
MB145150100-TH			100			
MB15015560-TH	150	155	60	149.937 150.000	155.000 155.040	150.070 150.210
MB15015580-TH			80			
MB150155100-TH			100			
MB15516060-TH	155	160	60	154.937 155.000	160.000 160.040	155.070 155.210
MB155160100-TH			100			
MB16016560-TH	160	165	60	159.937 160.000	165.000 165.040	160.070 160.210
MB16016580-TH			80			
MB160165100-TH			100			
MB16517060-TH	165	170	60	164.937 165.000	170.000 170.040	165.070 165.210
MB165170100-TH			100			
MB17017560-TH	170	175	60	169.937 170.000	175.000 175.040	175.070 170.210
MB170175100-TH			100			
MB17518060-TH	175	180	60	174.937 175.000	180.000 180.040	175.070 175.210
MB175180100-TH			100			

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB18018560-TH	180	185	60	179.937 180.000	185.000 185.046	180.070 180.216
MB18018580-TH			80			
MB180185100-TH			100			
MB19019560-TH	190	195	60	189.928 190.000	195.000 195.046	190.070 190.216
MB190195100-TH			100			
MB20020560-TH	200	205	60	199.928 200.000	205.000 205.046	200.070 200.216
MB200205100-TH			100			
MB20521060-TH	205	210	60	204.928 205.000	210.000 210.046	205.070 205.216
MB205210100-TH			100			
MB21021560-TH	210	215	60	209.928 210.000	215.000 215.046	210.070 210.216
MB210215100-TH			100			
MB21522060-TH	215	220	60	214.928 215.000	220.000 220.046	215.070 215.216
MB215220100-TH			100			
MB22022560-TH	220	225	60	219.928 220.000	225.000 225.046	220.070 220.216
MB220225100-TH			100			
MB23023560-TH	230	235	60	229.928 230.000	235.000 235.046	230.070 230.216
MB230235100-TH			100			
MB24024560-TH	240	245	60	239.928 240.000	245.000 245.046	240.070 240.216
MB240245100-TH			100			
MB25025560-TH	250	255	60	249.928 250.000	255.000 255.052	250.070 250.222
MB250255100-TH			100			
MB28028560-TH	280	285	60	279.928 280.000	285.000 285.052	280.070 280.222
MB280285100-TH			100			
MB30030560-TH	300	305	60	299.919 300.000	305.000 305.052	300.070 300.222
MB300305100-TH			100			

Chamfer Dimensions

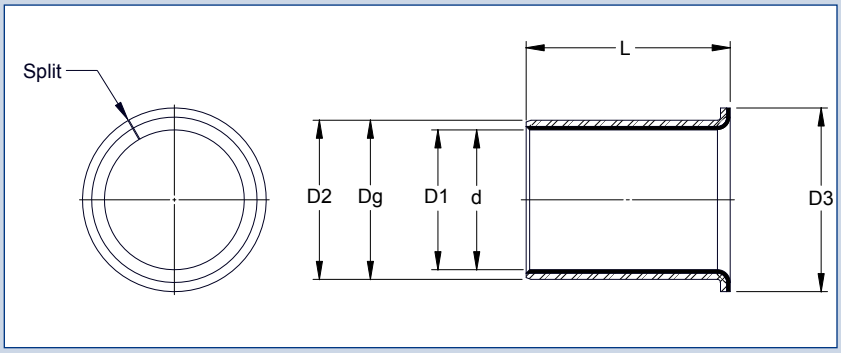
D1	f1	f2
3 to 18	.20 to 1.00	.10 to .50
20 to 28	.20 to 1.00	.10 to .70
28 to 40	.80 to 1.60	.10 to .70
45 to 300	1.20 to 2.40	.20 to 1.00

TH FLANGED BEARINGS

Part Numbering

MB 03 045 3 - FTH

- Style
- Length (L)
- Nominal OD (D2)
- Nominal ID (D1)



Part Number	D1	D3 (+/- 0.50)	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB06084-FTH	6	12	4	5.990 5.978	8.000 8.015	5.990 6.055
MB06087-FTH			7			
MB06088-FTH			8			
MB081055-FTH	8	15	5.5	7.972 7.987	10.000 10.015	7.990 8.055
MB081075-FTH			7.5			
MB081095-FTH			9.5			
MB10127-FTH	10	18	7	9.972 9.987	12.000 12.018	9.990 10.058
MB10129-FTH			9			
MB101212-FTH			12			
MB101217-FTH			17			
MB12147-FTH	12	20	7	11.966 11.984	14.000 14.018	11.990 12.058
MB12149-FTH			9			
MB121412-FTH			12			
MB121417-FTH			17			
MB141612-FTH	14	22	12	13.966 13.984	16.000 16.018	13.990 14.058
MB141617-FTH			17			
MB15179-FTH	15	23	9	14.966 14.984	17.000 17.018	14.990 15.058
MB151712-FTH			12			
MB151717-FTH			17			
MB161812-FTH	16	24	12	15.966 15.984	18.000 18.018	15.990 16.058
MB161817-FTH			17			
MB182012-FTH	18	26	12	17.966 17.984	20.000 20.021	17.990 18.061
MB182017-FTH			17			
MB182022-FTH			22			
MB2023115-FTH	20	30	11.5	19.959 19.980	23.000 23.021	19.990 20.071
MB2023165-FTH			16.5			
MB2023215-FTH			21.5			
MB2528115-FTH	25	35	11.5	24.959 24.980	28.000 28.021	24.990 25.071
MB2528165-FTH			16.5			
MB2528215-FTH			21.5			

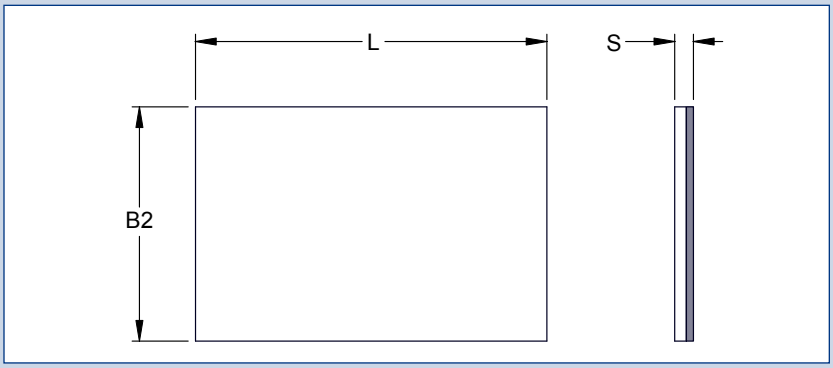
Part Number	D1	D3 (+/- 0.50)	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB303416-FTH	30	42	16	29.959 29.980	34.000 34.025	29.990 30.085
MB303426-FTH			26			
MB353916-FTH	35	47	16	34.950 34.975	39.000 39.025	34.990 35.085
MB353926-FTH			26			
MB404416-FTH	40	53	16	39.950 39.975	44.000 44.025	39.990 40.085
MB404426-FTH			26			
MB455016-FTH	45	58	16	44.950 44.975	50.000 50.025	44.990 45.105
MB455026-FTH			26			

TH FLAT STRIPS

Part Number	S	B2	L
TS-07150-M	0.744 0.704	150	500
TS-10200-M	0.99 0.95	215	500
TS-15240-M	1.51 1.47	245	500
TS-20240-M	2 1.96	245	500
TS-25240-M	2.5 2.46	245	500
TS-30240-M	3.06 3.02	245	500

Part Numbering

TS 07 150 M
- M — Metric
- 150 — Nominal Width (B2)
- 07 — Nominal Thickness (S)
- TS — Strip

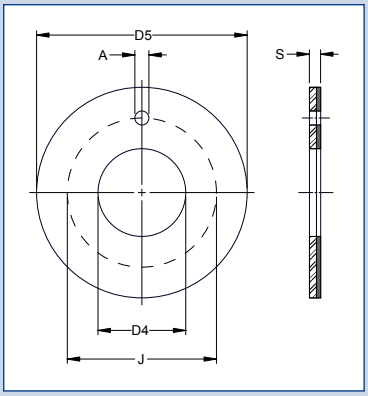


TH THRUST WASHERS

Part Number	D4 (+/- 0.25)	D5 (+/- 0.25)	S	Dowel Hole J (+/- 0.12)	A
TW-1020-M	10	20	1.500 1.450		
TW-1224-M	12	24		18	1.87 1.62
TW-1426-M	14	26		20	2.37 2.12
TW-1630-M	16	30		22	
TW-1832-M	18	32		25	
TW-2036-M	20	36		28	3.37 3.12
TW-2238-M	22	38		30	
TW-2442-M	24	42		33	
TW-2644-M	26	44		35	
TW-2848-M	28	48		38	4.37 4.12
TW-3254-M	32	54		43	
TW-3862-M	38	62		50	
TW-4266-M	42	66		54	
TW-4874-M	48	74	2.000 1.950	61	
TW-5278-M	52	78		65	
TW-6290-M	62	90		76	

Part Numbering

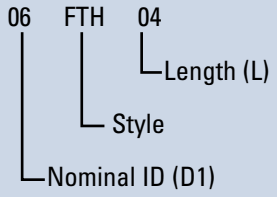
TW 10 20 M
- M — Metric
- 20 — Nominal OD (D5)
- 10 — Nominal ID (D4)
- TW — Thrust Washer



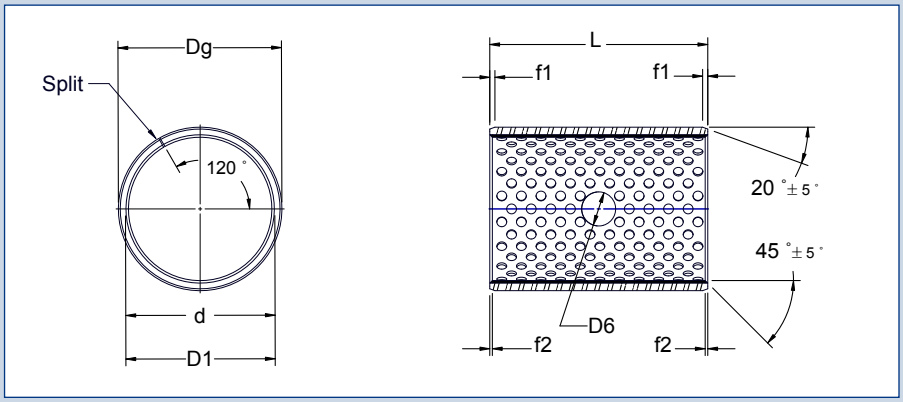
THX

INCH SIZES
PRE-LUBRICATING BEARINGS

Part Numbering



Part numbers are represented in 1/16" increments



Part Number	D1	D6	Length (L)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
06THX06	1/2	5/32	3/8	0.5000 0.4990	0.6352 0.6345	0.5038 0.5007
06THX08			1/2			
10THX10	5/8	5/32	1/2	0.6250 0.6240	0.7604 0.7596	0.6290 0.6258
10THX12			3/4			
12THX12	3/4	5/32	3/4	.7500 .7488	.8854 .8846	.7540 .7508
12THX16			1			
14THX12	7/8	5/32	3/4	.8750 .8738	1.0105 1.0097	.8791 .8759
14THX16			1			
16THX12	1	5/16	3/4	1.0000 0.9988	1.1356 1.1348	1.0042 1.0010
16THX16			1			
18THX12	1 1/8	5/16	3/4	1.1250 1.1238	1.2606 1.2598	1.1292 1.1260
18THX16			1			
20THX12	1 1/4	5/16	3/4	1.2500 1.2484	1.4170 1.4160	1.2550 1.2512
20THX16			1			
22THX16	1 3/8	5/16	1	1.3750 1.3743	1.5420 1.5410	1.3800 1.3762
22THX24			1 1/2			
24THX16	1 1/2	5/16	1	1.5000 1.4984	1.6670 1.6660	1.5050 1.5012
24THX24			1 1/2			
24THX32			2			
26THX16	1 5/8	5/16	1	1.6250 1.6234	1.7920 1.7910	1.6300 1.6262
26THX24			1 1/2			
26THX32			2			
28THX16	1 3/4	5/16	1	1.7500 1.7484	1.9381 1.9371	1.7577 1.7515
28THX24			1 1/2			
28THX32			2			
30THX16	1 7/8	5/16	1	1.8750 1.8734	2.0633 2.0621	1.8829 1.8765
30THX24			1 1/2			
30THX32			2			
30THX36			2 1/4			

Part Number	D1	D6	Length (L)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
32THX16	2	5/16	1	2.0000 1.9982	2.1883 2.1871	2.0079 2.0015
32THX24			1 1/2			
32THX32			2			
40THX24	2 1/2	5/16	1 1/2	2.5000 2.4982	2.6883 2.6871	2.5079 2.5015
40THX32			2			
40THX40			2 1/2			
48THX24	3	5/16	1 1/2	3.0000 2.9982	3.1889 3.1875	3.0085 3.0019
48THX32			2			
48THX40			2 1/2			
48THX48			3			

General Tolerances:

Length (L) = ±0.010
Lubrication Hole (D6) = ±0.011

Chamfer Dimensions

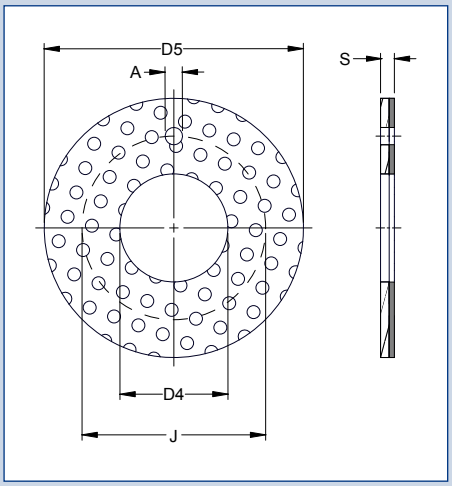
D1	f1	f2
1/2 to 1 1/8	.0078 to .0393	.0039 to .0275
1 1/4 to 1 5/8	.0314 to .0629	.0039 to .0275
1 3/4 to 1.000	.0472 to .0944	.0078 to .0393

THX THRUST WASHERS

Part Number	D4 (+ 0.010)	D5 (- 0.010)	S	Dowel Hole J	A
TW-08-THX	0.625	1.125	0.0625 0.0660	0.880 0.870	0.099 0.109
TW-10-THX	0.750	1.125		1.005 0.995	
TW-12-THX	0.875	1.500		1.192 1.182	0.130 0.140
TW-14-THX	1.000	1.750		1.380 1.370	
TW-16-THX	1.125	2.000		1.567 1.557	0.161 0.171
TW-18-THX	1.250	2.125		1.692 1.682	
TW-20-THX	1.375	2.250		1.817 1.807	
TW-22-THX	1.500	2.500		2.005 1.995	0.192 0.202
TW-24-THX	1.625	2.625		2.130 2.120	
TW-26-THX	1.750	2.750		2.255 2.245	
TW-28-THX	2.000	3.000	0.0895 0.0930	2.505 2.495	
TW-30-THX	2.125	3.125		2.630 2.620	
TW-32-THX	2.250	3.250		2.755 2.745	

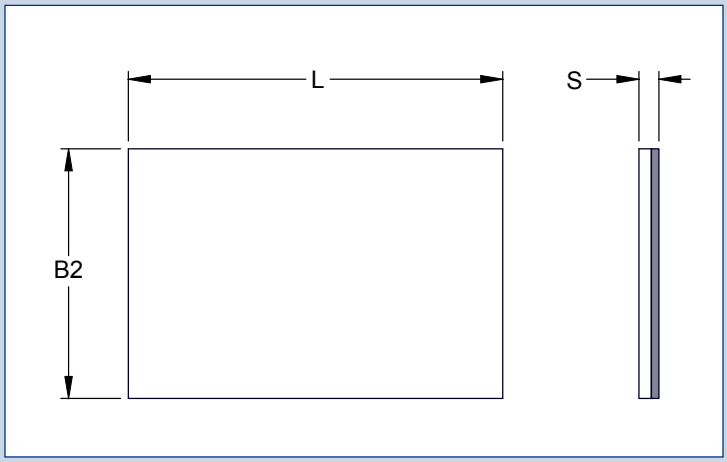
Part Numbering

TW 08 THX
- THX: Inch Style
- 08: Size
- TW: Thrust Washer



THX FLAT STRIPS

Part Number	S	B2	L
TS-0-THX	0.0480 0.0492	2.75	18
TS-1-THX	0.0630 0.0642	4	18
TS-2-THX	0.0783 0.0795	4	18
TS-3-THX	0.0937 0.0949	4	18



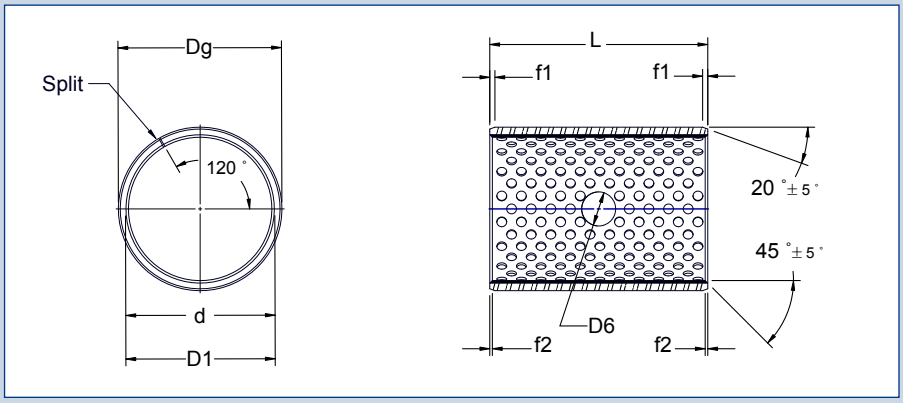
THX

METRIC SIZES
PRE-LUBRICATING BEARINGS

Part Numbering

MB 08 10 08 THX

- THX — Style
- 08 — Length (L)
- 10 — Nominal OD (D2)
- 08 — Nominal ID (D1)



Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB08108-THX	8	10	8	7.978 8.000	10.000 10.015	8.040 8.105
MB081010-THX			10			
MB081012-THX			12			
MB101210-THX	10	12	10	9.978 10.000	12.000 12.018	10.040 10.108
MB101212-THX			12			
MB101215-THX			15			
MB101220-THX			20			
MB121410-THX	12	14	10	11.973 12.000	14.000 14.018	12.040 12.108
MB121412-THX			12			
MB121415-THX			15			
MB121420-THX			20			
MB121425-THX			25			
MB141615-THX	14	16	15	13.973 14.000	16.000 16.018	14.040 14.108
MB141620-THX			20			
MB141625-THX			25			
MB151710-THX	15	17	10	14.973 15.000	17.000 17.018	15.040 15.108
MB151712-THX			12			
MB151715-THX			15			
MB151720-THX			20			
MB161815-THX	16	18	15	15.973 16.000	18.000 18.018	16.040 16.108
MB161820-THX			20			
MB161825-THX			25			
MB182015-THX	18	20	15	17.973 18.000	20.000 20.021	18.040 18.111
MB182020-THX			20			
MB182025-THX			25			
MB202310-THX	20	23	10	19.967 20.000	23.000 23.021	20.050 20.131
MB202315-THX			15			
MB202320-THX			20			
MB202325-THX			25			
MB202330-THX			30			

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB222515-THX	22	25	15	21.967 22.000	25.000 25.021	22.050 22.131
MB222520-THX			20			
MB222525-THX			25			
MB222530-THX			30			
MB242715-THX	24	27	15	23.967 24.000	27.000 27.021	24.050 24.131
MB242720-THX			20			
MB242725-THX			25			
MB242730-THX			30			
MB252815-THX	25	28	15	24.967 25.000	28.000 28.021	25.050 25.131
MB252820-THX			20			
MB252825-THX			25			
MB252830-THX			30			
MB283130-THX	28	31	30	27.967 28.000	31.000 31.025	28.050 28.135
MB283220-THX	28	32	20	27.967 28.000	32.000 32.025	28.060 28.155
MB283225-THX			25			
MB283230-THX			30			
MB303420-THX	30	34	20	29.967 30.000	34.000 34.025	30.060 30.155
MB303430-THX			30			
MB303440-THX			40			
MB323620-THX	32	36	20	31.961 32.000	36.000 36.025	32.060 32.155
MB323630-THX			30			
MB323635-THX			35			
MB323640-THX			40			
MB353920-THX	35	39	20	34.961 35.000	39.000 39.025	35.060 35.155
MB353930-THX			30			
MB353935-THX			35			
MB353940-THX			40			
MB364035-THX	36	40	35	35.961 36.000	40.000 40.025	36.060 36.155
MB374120-THX	37	41	20	36.961 37.000	41.000 41.025	37.060 37.155

THX

METRIC SIZES
PRE-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB404420-THX	40	44	20	39.961 40.000	44.000 44.025	40.060 40.155
MB404430-THX			30			
MB404440-THX			40			
MB404450-THX			50			
MB455020-THX	45	50	20	44.961 45.000	50.000 50.025	45.080 45.195
MB455030-THX			30			
MB455040-THX			40			
MB455045-THX			45			
MB455050-THX			50			
MB505540-THX	50	55	50	49.961 50.000	55.000 55.030	50.080 50.200
MB505550-THX			55			
MB505560-THX			60			
MB556020-THX	55	60	20	54.954 55.000	60.000 60.030	55.080 55.200
MB556025-THX			25			
MB556030-THX			30			
MB556040-THX			40			
MB556050-THX			50			
MB556060-THX			60			
MB606530-THX	60	65	30	59.954 60.000	65.000 65.030	60.080 60.200
MB606540-THX			40			
MB606560-THX			60			
MB606570-THX			70			
MB657040-THX	65	70	40	64.954 65.000	70.000 70.030	65.080 65.200
MB657050-THX			50			
MB657060-THX			60			
MB657070-THX			70			
MB707540-THX	70	75	40	69.954 70.000	75.000 75.030	70.080 70.200
MB707550-THX			50			
MB707565-THX			65			
MB707570-THX			70			
MB707580-THX			80			
MB758040-THX	75	80	40	74.954 75.000	80.000 80.030	75.080 75.200
MB758060-THX			60			
MB758080-THX			80			
MB808540-THX	80	85	40	79.954 80.000	85.000 85.035	80.080 80.205
MB808550-THX			50			
MB808560-THX			60			
MB808580-THX			80			
MB8085100-THX			100			
MB859030-THX	85	90	30	84.946 85.000	90.000 90.035	85.080 85.205
MB859040-THX			40			
MB859060-THX			60			
MB859080-THX			80			
MB8590100-THX			100			

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB909540-THX	90	95	40	89.946 90.000	95.000 95.035	90.080 90.205
MB909560-THX			60			
MB909580-THX			80			
MB909590-THX			90			
MB9095100-THX			100			
MB9510060-THX	95	100	60	94.946 95.000	100.000 100.035	95.080 95.205
MB95100100-THX			100			
MB10010550-THX	100	105	50	99.946 100.000	105.000 105.035	100.080 100.205
MB10010560-THX			60			
MB10010580-THX			80			
MB10010595-THX			95			
MB100105115-THX			115			
MB10511060-THX	105	110	60	104.946 105.000	110.000 110.035	105.080 105.205
MB105110100-THX			100			
MB105110115-THX			115			
MB11011560-THX	110	115	60	109.946 110.000	115.000 115.035	110.080 110.205
MB110115100-THX			100			
MB110115115-THX			115			
MB11512050-THX	115	120	50	114.946 115.000	120.000 120.035	115.080 115.205
MB11512070-THX			70			
MB12012560-THX	120	125	60	119.946 120.000	125.000 125.040	120.080 120.210
MB120125100-THX			100			
MB120125110-THX			110			
MB12513060-THX	125	130	60	124.937 125.000	130.000 130.040	125.080 125.210
MB125130100-THX			100			
MB1251301100-THX			110			
MB13013550-THX	130	135	50	129.937 130.000	135.000 135.040	130.080 130.210
MB13013560-THX			60			
MB13013580-THX			80			
MB130135100-THX			100			
MB13514060-THX	135	140	60	134.937 135.000	140.000 140.040	135.080 135.210
MB13514080-THX			80			
MB14014550-THX	140	145	50	139.937 140.000	145.000 145.040	140.080 140.210
MB14014560-THX			60			
MB14014580-THX			80			
MB140145100-THX			100			
MB15015550-THX	150	155	50	149.937 150.000	155.000 155.040	150.080 150.210
MB15015560-THX			60			
MB15015580-THX			80			
MB150155100-THX			100			
MB16016550-THX	160	165	50	159.937 160.000	165.000 165.040	160.080 160.210
MB16016560-THX			60			
MB16016580-THX			80			
MB160165100-THX			100			

THX

METRIC SIZES
PRE-LUBRICATING BEARINGS

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB17017550-THX	170	175	50	169.937 170.000	175.000 175.040	170.080 170.210
MB17017560-THX			60			
MB17017580-THX			80			
MB170175100-THX			100			
MB18018550-THX	180	185	50	179.937 180.000	185.000 185.046	180.080 180.216
MB18018560-THX			60			
MB18018580-THX			80			
MB180185100-THX			100			
MB19019550-THX	190	195	50	189.928 190.000	195.000 195.046	190.080 190.216
MB19019560-THX			60			
MB19019580-THX			80			
MB190195100-THX			100			
MB190195120-THX			120			
MB20020550-THX	200	205	50	199.928 200.000	205.000 205.046	200.080 200.216
MB20020560-THX			60			
MB20020580-THX			80			
MB200205100-THX			100			
MB200205120-THX			120			
MB22022550-THX	220	225	50	219.928 220.000	225.000 225.046	220.080 220.216
MB22022560-THX			60			
MB22022580-THX			80			
MB220225100-THX			100			
MB220225120-THX			120			
MB24024550-THX	240	245	50	239.928 240.000	245.000 245.046	240.080 240.216
MB24024560-THX			60			
MB24024580-THX			80			
MB240245100-THX			100			
MB240245120-THX			120			
MB25025550-THX	250	255	50	249.928 250.000	255.000 255.052	250.080 250.222
MB25025560-THX			60			
MB25025580-THX			80			
MB250255100-THX			100			
MB250255120-THX			120			
MB26026550-THX	260	265	50	259.919 260.000	265.000 265.052	260.080 260.222
MB26026560-THX			60			
MB26026580-THX			80			
MB260265100-THX			100			
MB260265120-THX			120			
MB28028550-THX	280	285	50	279.919 280.000	285.000 285.052	280.080 280.222
MB28028560-THX			60			
MB28028580-THX			80			
MB280285100-THX			100			
MB280285120-THX			120			

Part Number	D1	D2	Length (+/- 0.25)	Shaft Dia. (d)	Housing Bore (Dg)	Installed ID (D1E)
MB30030550-THX	300	305	50	299.919 300.000	305.000 305.052	300.080 300.222
MB30030560-THX			60			
MB30030580-THX			80			
MB300305100-THX			100			
MB300305120-THX			120			

Chamfer Dimensions

D1	f1	f2
8 to 18	.20 to 1.00	.10 to .50
20 to 28	.20 to 1.00	.10 to .70
28 to 40	.80 to 1.60	.10 to .70
45 to 300	1.20 to 2.40	.20 to 1.00

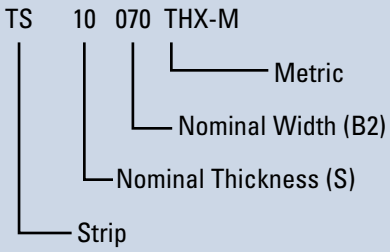
Oil Hole Diameter (D6)

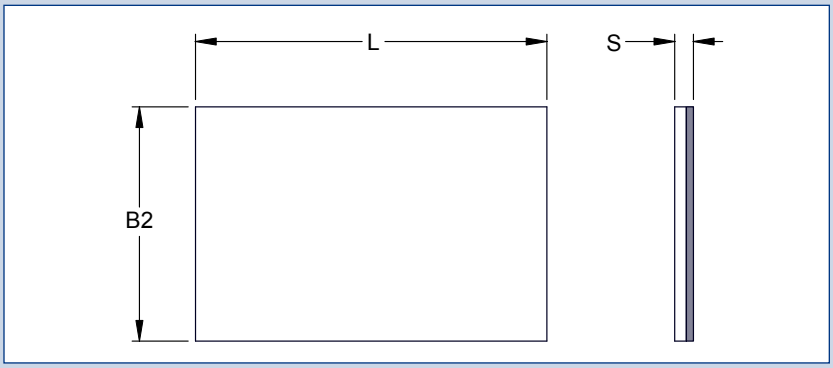
D1	D6 (mm)	tolerance
8	no hole	
10 to 22	3	±0.30
24 to 40	4	±0.30
45 to 50	5	±0.30
55 to 100	6	±0.30
105 to 300	8	±0.30

THX FLAT STRIPS

Part Number	S	B2	L
TS-10070-THX-M	1.030 1.060	70	460
TS-15100-THX-M	1.520 1.550	100	460
TS-20100-THX-M	2.020 2.050	100	460
TS-25100-THX-M	2.530 2.560	100	460

Part Numbering

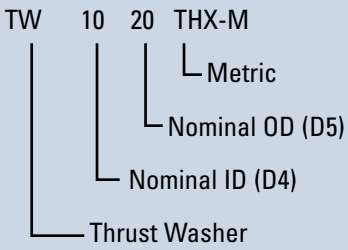


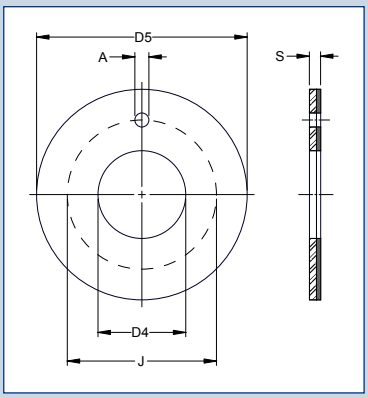


THX THRUST WASHERS

Part Number	D4 (+/- 0.25)	D5 (+/- 0.25)	S	Dowel Hole J (+/- 0.12)	A
TW-1224-THX-M	12	24	1.577 1.487	18	1.870 1.620
TW-1426-THX-M	14	26		20	2.370 2.120
TW-1630-THX-M	16	30		22	
TW-1832-THX-M	18	32		25	
TW-2036-THX-M	20	36		28	3.375 3.125
TW-2238-THX-M	22	38		30	
TW-2442-THX-M	24	42		33	
TW-2644-THX-M	26	44		35	
TW-2848-THX-M	28	48		38	4.375 4.125
TW-3254-THX-M	32	54		43	
TW-3862-THX-M	38	62		50	
TW-4266-THX-M	42	66		54	
TW-4874-THX-M	48	74	2.600 2.510	61	
TW-5278-THX-M	52	78		65	

Part Numbering





CHEMICAL PROPERTIES

The PTFE sliding layer is resistant to most chemical products, while the corrosion resistance of TH bushing depends on the steel backing which does not oxidize when:

- Immersed in water, alcohols or glycols
- In the presence of mineral and synthetic oils
- In acid substances with a pH level of > 5
- In alkali substances with a pH level of < 9

Corrosion is triggered off in the case of repeated wet/dry cycles, the presence of oxygen and when the temperature exceeds 90ºC.

The chemical resistance of TH bushing is improved by tin-plating, but the problems of corrosion must be overcome by further protection such as special tin-plating, by sealing the bearings or by using the bronze-backed bearings (TH-B) or stainless steel-backed bearings (TH30).

THERMAL CONDUCTIVITY

During operation heat is generated by the friction between the bearing and the shaft. The heat is partly dissipated by the fluids present (gas or liquids) and partly absorbed by the mating parts.

Under normal operating conditions, the bearing must be able to dissipate the heat generated and not give rise to thermal dilations that may compromise the working of the two parts. Under both aspects, TH bushing performs very well as it features:

Perpendicular thermal conductivity which is linked to the steel backing and the close contact of the bronze and the polymer layer. Both factors lead to a high level of thermal conductivity between the layers that enables the heat to be eliminated without causing a sharp rise in the temperature (on average + 20º to 25ºC compared to the temperature of the environment).

Volumetric expansion: the increase in temperature gives rise to an expansion in the volume of the materials. Given the composition of the product, TH bushing expands in a way very similar to that of metals normally used for the housing and the counterpart. This similar behaviour prevents seizure during heating and movement of the bearing in the housing during cooling which sometimes arises when plastic bearings are used.

ELECTRICAL CONDUCTIVITY

TH bushing not only offers a high level of thermal conductivity, but also a high level of electrical conductivity that is perpendicular to the layers. However, this electrical conductivity only appears after the first running-in period, when the bronze starts to be exposed and comes into contact with the mating surface. The perpendicular electrical conductivity increases with the specific load applied on the bearing and with the degree of wear. Typical values of specific electrical resistance for units-surface are the following:

Perpendicular electrical resistance: R = 1 - 10W x cm^2

FRICTION

The TH bushing sliding layer has a PTFE base that gives an excellent slide quality due to the low coefficient of friction. The amount of friction cannot be defined exactly as it is influenced by the following parameters:

- Load factor p x v on the surface
- Operating temperature
- Presence of liquids and lubricants
- Material and finish of the mating surface

The load factor p x v is the result of the specific load p (N/mm^2) and the speed v (m/s) and represents the reference parameter for checking the performance of this type of bearing. p x v being equal, the coefficient of friction decreases as the specific load increases, while the coefficient of friction increases as the speed increases.

Sliding Speed v (m/s)	Specific Load p (N/mm^2)	Coefficient of Friction μ
up to 0.001	140	0.03
0.001 to 0.005	140 to 62	0.04 to 0.07
0.005 to 0.05	62 to 11	0.07 to 0.1
0.05 to 0.5	11 to 1	0.1 to 0.15
0.5 to 2	1	0.15 to 0.20

TEMPERATURE

The temperature has a very slight effect on the coefficient of friction if it remains within a range of 0º to 100ºC. Once these limits are exceeded, the coefficient of friction increases rapidly by 50% or more. It should be noted that very high temperatures reduce the useful life of TH bearings. Under equal load factors, the useful life is reduced by 80% at a temperature of over 200ºC compared to that noted at 25ºC.

LIQUIDS AND LUBRICANTS

TH bearings have been designed for dry operations, but despite this, the presence of clean fluids in the working area can facilitate the dissipation of heat and prolong the useful life of the bearing.

The presence of liquids, whether lubricants or other, may lead to hydrodynamic operating conditions which enable a considerable increase in the sliding speed at the same specific load. Hydrodynamic operating conditions are influenced by the following parameters:

- Sliding speed
- Specific load
- Tolerance of the mating surfaces
- Viscosity of the liquid
- Operating temperature

OPERATION IN THE PRESENCE OF LIQUIDS AND LUBRICANTS

In practise, even the self-lubricated bearings (TH Series) can be used in the presence of liquids and/or lubricating fluids.

In these situations, the behaviour of the bearings are modified and the following considerations apply:

- The presence of a clean fluid on the bearing (whether lubricating or not) usually has a positive effect as it improves the dissipation of the heat caused by the friction and also improves the contact between the sliding surfaces.
- It is necessary to the check the compatibility of the bearing with the fluid. Most problems arise with THX bearings as the acetal co-polymer is not recommended for use in water, glycols or synthetic oils with phosphoric esters. The other TH Series does not have any particular contraindications in the presence of widely used liquids and lubricants.

If in doubt and in case of special applications, it is advisable to carry out a simple test by immersing half of a sample bearing in the liquid in question. If, after two weeks, the bearing shows non signs of alteration in any part it can be considered to be compatible with the fluid.

- For the TH Series of bearings, the positive effects of the presence of fluids are confirmed only if alternating dry and wet cycles are avoided. In the presence of repeated cycles, the result is a premature decline in the product compared to dry operating conditions.
- For the bearings subject to lubrication, just the initial greasing may be sufficient as long as the application is subject to limited specific load and speed values.

LUBRICATION SYSTEMS

In the presence of fluids and under certain speed and specific load conditions, hydrodynamic lubrication occurs. This involves a thin film of fluid being generated permanently between the mating surfaces. During a hydrodynamic regime, the coefficient of friction and the wear of the parts falls to such a level that the life of the bearing depends more on the number of stop-start operations rather than the actual running time.

If a hydrodynamic operating regime is provided for during the design phase, steps must be taken to increase the clearance of the mating parts to facilitate the formation and maintenance of the separating film.

MATERIAL AND FINISH OF THE MATING SURFACE

The material of the mating surface, whether it is a shaft or a shoulder, has a considerable effect on the results of the application. The metals which may corrode in the presence of humidity or pollutants, accelerate the deterioration of the mating surface.

For applications with no protection, it is advisable to use stainless steel, chromium-plated steel or anodized aluminum mating surfaces.

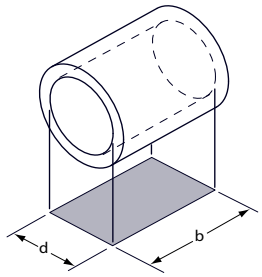
Bronze, non-anodized aluminum, phosphated or nickel-plated steel mating surfaces are not suitable. The roughness of the mating surface must be quite low to permit a good operating life. The recommended value for the best performance is 0.4mm Ra.

PV CALCULATIONS

The load factor PV has a considerable influence on determining the bearings useful operating life. PV is determined by multiplying the specific bearing load or pressure (P) by the sliding speed (V). Bearing materials are rated by a PV limit, with the PV limit representing the highest combination of load and speed under which the bearing material will operate. The PV unit of measure is N/mm^2 x m/s.

To determine P in an application: The specific bearing load (P) is determined by dividing the bearing load by the pressure supporting area of the bearing. The units for P are N/mm^2. The pressure supporting area depends on the specific geometry of the bearing, the following are formula for the most common types of bearing geometry.

Sleeve Bushing



Specific Bearing Load (N/mm2)

$$p = \frac{Wr}{d \times b}$$

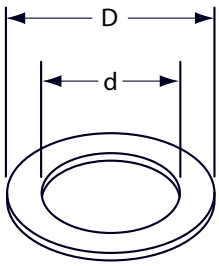
Sliding Speed (m/s) Rotation

$$v = \frac{\P \times d \times N}{60 \times 10^3}$$

Sliding Speed (m/s) Oscillation

$$v = \frac{\P \times d \times \partial \times N_{os}}{60 \times 10^3 \times 360}$$

Thrust Washer



Specific Bearing Load (N/mm^2)

$$p = \frac{4Wt}{\P (D^2 - d^2)}$$

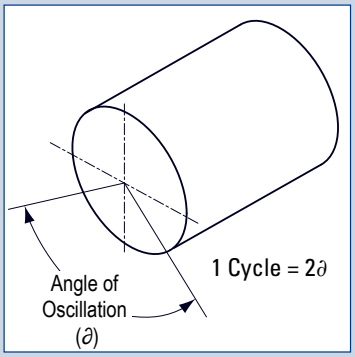
Sliding Speed (m/s) Rotation

$$v = \frac{\P \times D \times N}{60 \times 10^3}$$

Sliding Speed (m/s) Oscillation

$$v = \frac{\P \times D}{60 \times 10^3} \times \frac{2\partial \times N_{os}}{360}$$

p	specific bearing load	N/mm^2	psi
W_r	load on bushing	N	pounds
d	inside diameter	mm	inches
D	outside diameter	mm	inches
W_t	load on thrust washer	N	pounds
N	speed of rotation	rpm	rpm
∂	angle of oscillation	degrees	degrees
N_{os}	frequency of oscillation	cycles /min	cycles/min
v	sliding speed	m/s	fpm

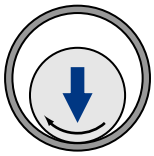
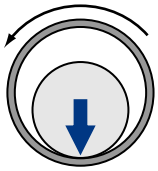
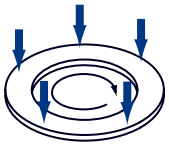


CALCULATION OF THE USEFUL LIFE

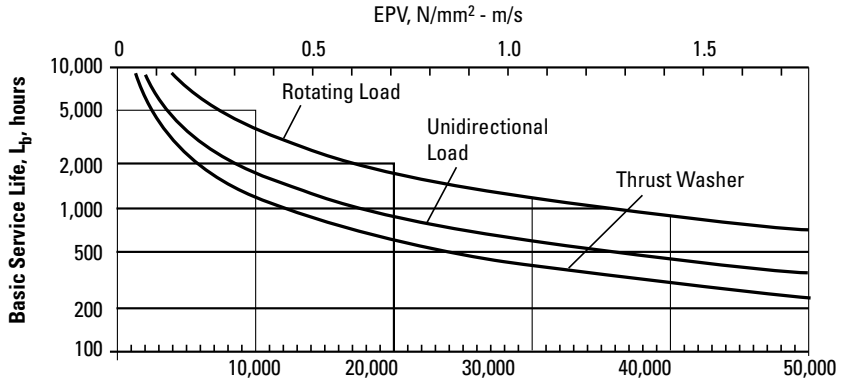
The operating life of a dry application TH sliding bushing is inversely proportional to the load factor (p x v) but, in order to achieve a close approximation of the figure, the following corrective factors must be introduced:

$$L_h = L_b \times f_h \times f_b \times f_m - f_a$$

L_h = bushing life (hours)
L_b = basic service life (hours)
f_h = heat dissipation factor
f_b = bushing size factor
f_m= mating surface factor
f_a = life adjustment factor (hours)

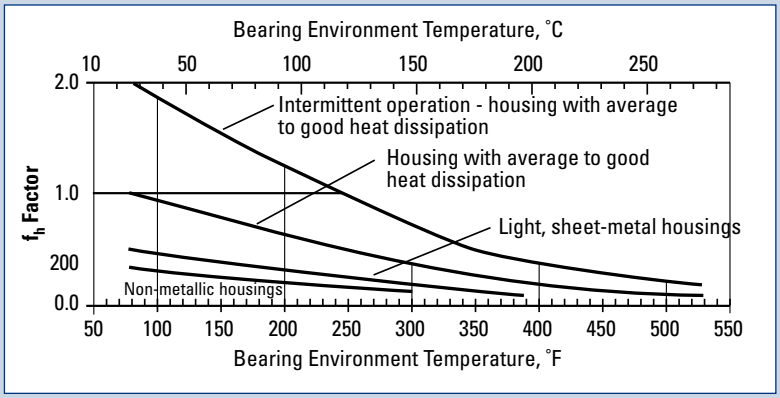
UNIDIRECTIONAL LOAD	ROTATING LOAD	THRUST LOAD
		
400	800	250

Dryslide Basic Surface life, L_b (hours)

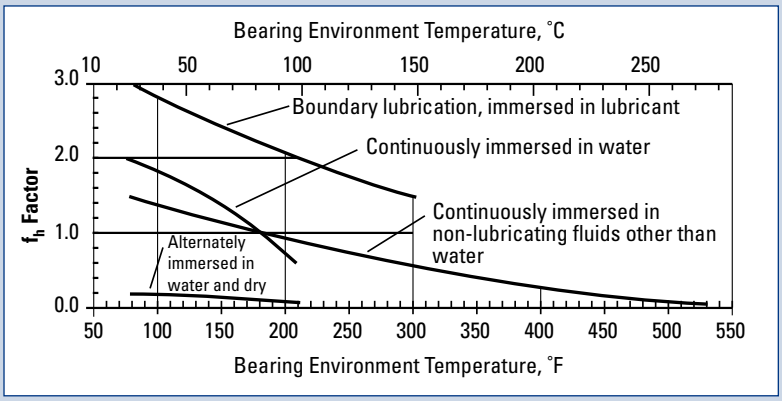


Basic Service Life, L_b vs. EPV

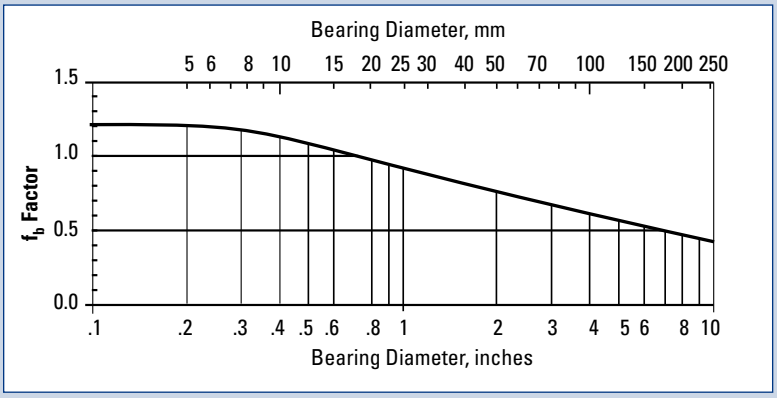
Dryslide Heat Dissipation Factor, f_h - for dry applications



Dryslide Heat Dissipation Factor, f_h - for fluid applications



Bushing Size Factor, f_b



Mating Surface (f_m) and Life Adjustment (f_a) Factors		
Material	**Mating Surface Factor f_m**	**Life Adjustment Factor f_a (hours)**
Steel and Cast Iron		
Case-hardened steel	**1.0**	**200**
Cast iron-12 microinches (0.3 micrometers)	**1.0**	**200**
Mild steel	**1.0**	**200**
Nitrided steel	**1.0**	**200**
Sprayed stainless steel	**1.0**	**200**
Stainless steel	**2.0**	**200**
Plated Steel with 0.0005 inch, (0.013 mm) minimum plating thickness		
Hard chrome	**2.0**	**600**
Nickel	**0.2**	**600**
Phosphated	**0.2**	**300**
Tin nickel	**1.2**	**600**
Tungsten carbide flame	**3.0**	**600**
Zinc	**0.2**	**600**
Non-Ferrous Metals		
Anodized aluminum (decorative)	**0.4**	**200**
Bronze and copper base alloys	**0.1-0.4**	**200**
Hard anodized aluminum, 0.001 inch (0.025 mm) thick	**3.0**	**600**

RUNNING-IN PERIOD

In order to complete the information and the calculations concerning the operating life of the bearings, consideration must be given to the operating method and the degree of wear on the bearings. The bearings have an initial running-in period during which the outer layer of the sliding surface is transferred onto the mating surface, compensating for the non-flatness of the contact and making the coefficient of friction stable.

After the running-in phase, the porous bronze layer is gradually exposed. The surface of the exposed bronze increases with the number of operating hours until it reaches 90% of the contact surface. At this point, the bearing is considered to have reached the end of its useful life.

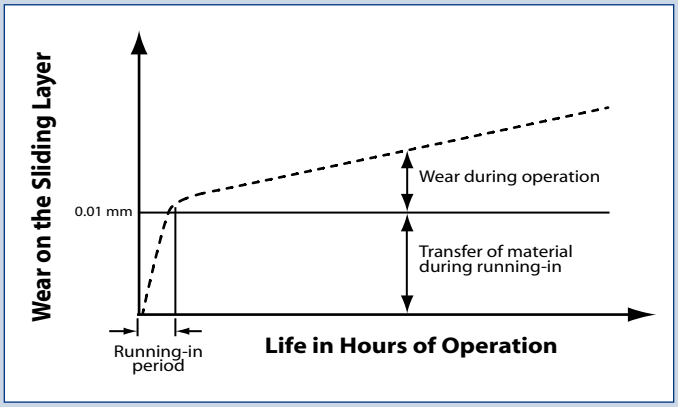
If, after the running-in period, the bronze is exposed regularly over all the contact area, it confirms that the application was correct.

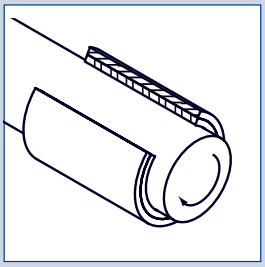
APPLICATION

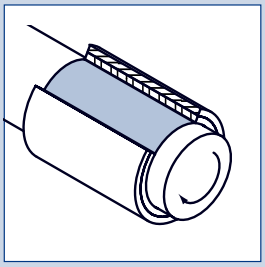
Having calculated the life of the bushing (L_h), the engineer has to decide whether to accept or reject the data obtained. If the estimated life is not acceptable, the sizes of the bushing are modified and a new check is made following the sequence previously adopted.

For a more detailed estimation of the operating life of DMR bushings and other products in the series, please complete the Application Data Sheet at the back of the catalogue and fax it to your local Daemar Technical Sales Representative.

For applications that come close to the design limits, it is always advisable to carry out prototype testing.







FITTING METHODS

The most commonly used method for fitting the bushings is to press them into the housing. Having created the correct housing (H7), the following steps should be taken:

- Chamfer the lead-in to the housing by 20° ± 5° to a depth of 1-2mm
- Deburr and clean the mating surfaces
- Lubricate the outside surface of the bushing before fitting it (do not apply excessive lubricant as it may cause the bushing to move about when fitted in the housing)
- Check the alignment of the axes between the bushing and the housing
- Where several bushings are necessary, align the butt joints
- It is always advisable to use a guiding mandrel to insert the bushings in their housing

Press fitting is usually carried out using hydraulic, pneumatic or mechanical equipment (fig 1).

To fit bushings with a diameter or more than 55mm, it is advisable to use a retaining ring with a diameter that is 0.3/0.4mm larger (fig. 2)

For flange bushings (fig. 3), the chamfer on the lead-in must have an angle of 45º and a depth of at least 2mm (2.55 for a bushing with a wall thickness of 2.5mm).

Approximate Values of the Pressing Force "F" in Newtons	
Bushing Thickness 1 mm	**F = 300 x L**
Bushing Thickness 1.5 mm	**F = 500 x L**
Bushing Thickness 2 mm	**F = 700 x L**
Bushing Thickness 2.5 mm	**F = 900 x L**

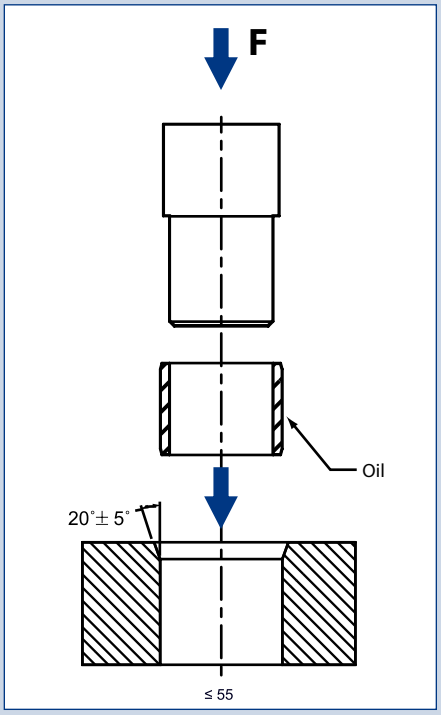


Fig. 1

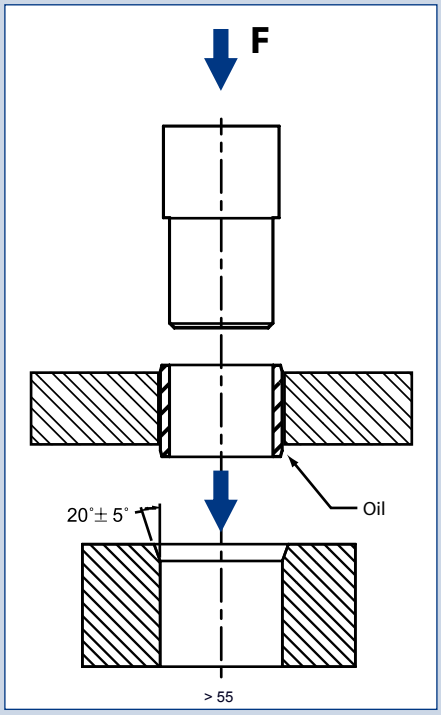


Fig. 2

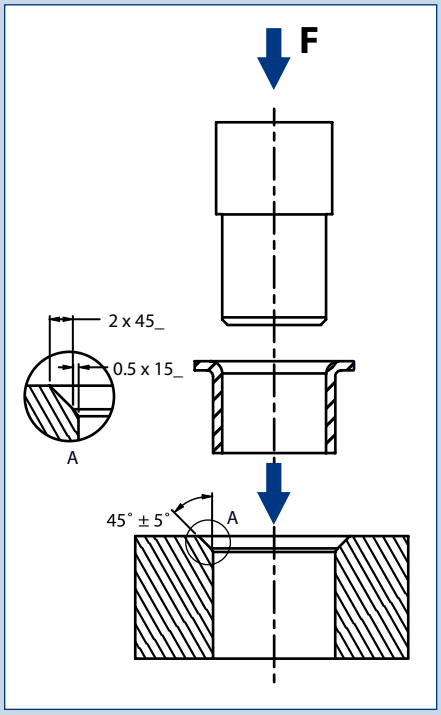


Fig. 3

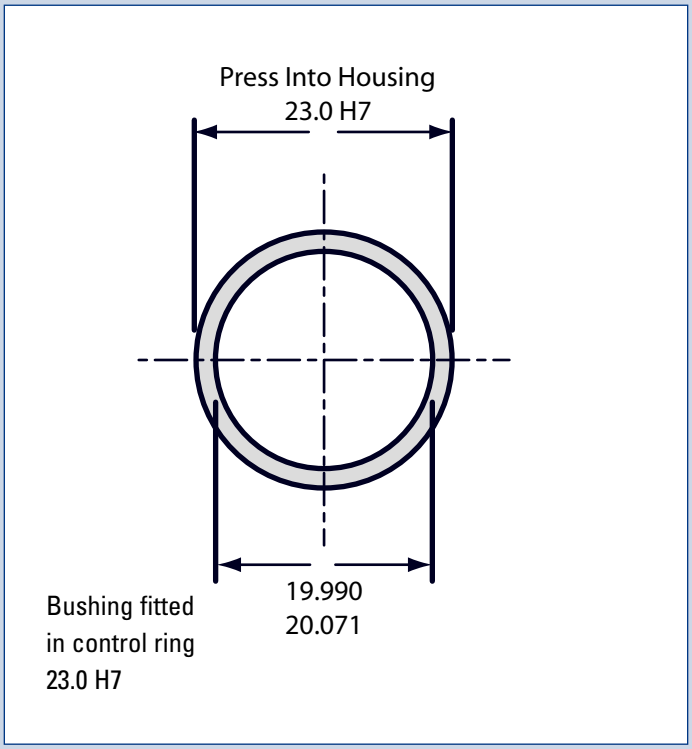
CHECKING METHODS

The main method for checking the wrapped bushings supplied by Daemar is to check the measurements of the internal and external diameters. Neither of the diameters can be checked before the bushing is fitted as an imperfect contact of the two edges leads to incorrect measurements.

The standard (DIN 1494) specifies the valid methods for measuring the internal and external diameters. The two methods are summarized below:

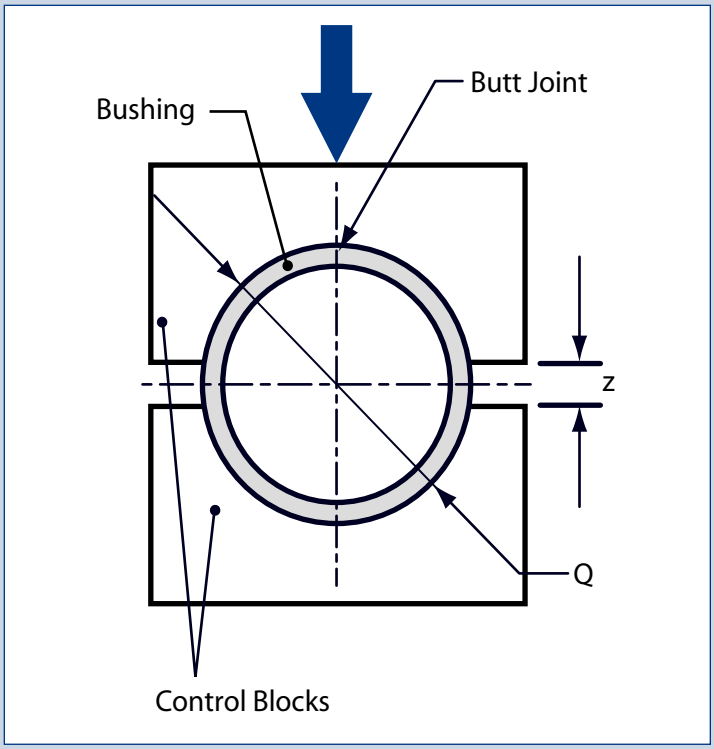
Internal Diameter - Test C

The bushing to be checked is fitted in the housing corresponding to the nominal external diameter with the H7 tolerance. Once the bushing has been fitted, the internal diameter is measured and must fall within the tolerance field shown on the relevant table of this catalogue.



External Diameter - Test A

To carry out this test, it is necessary to have the testing equipment as provided for by the standard (DIN 1494). The device consists of two half-shell shaped blocks in which the bushing is inserted and then pressed. The test consists of loading the outside of the bushing and measuring how much the bushing yields. If the amount of yield falls within a certain range, the external diameter of the bushing can be said to be correct.



Test A DIN 1494 Part 2 (Ref. TFP 20 20)	
Test Housing and Mandrel	Q = 23.062 mm
Load	Fb = 4500N
Limits of Δ	$-0.065 \leq \Delta \leq 0$
Bushing Thickness 2.5 mm	F = 900 x L

FIBER-LUBE™ - CJ SERIES

CJ composites are ideal for non-lubricated, high-load applications in a variety of climates and operating environments, exhibit a high load capacity similar to bronze, powdered metal and steel, and provide longer wear and extended operating life without the costs associated with lubrication. CJ composites are available with thick walls for drop in replacement of steel and bronze bearings. CJ composites also don't rust like metal components, so you can use them in environments where traditional metals corrode and fail. You'll find CJ bearing materials in heavy-duty agricultural, automotive, construction, industrial, marine, railway, and material handling equipment.

CJ composites possess a modulus of elasticity that falls between rigid metals and soft plastics. CJ components are rigid enough to support heavy loads, yet compliant enough to tolerate moderate amounts of shaft misalignment without highly stressing the ends. The composite wall acts like a spring and the thicker the wall section of the bearing the greater the deflection for a given load. Thick wall bearings tolerate greater shaft misalignment and provide better shock absorbency.

FEATURES	BENEFITS
High-load capacity/ high-shock load capability	Accommodates tremendous compression loads that literally crush competing composite materials.
Self-lubricating design	Provides maintenance-free operation and eliminates the need for costly and messy greasing systems.
Low coefficient of friction	Reduces wear and extends operating life. Coefficients as low as 0.05 in dry applications and <0.009 in lubricated environments.
Temperature resistant	Operates flawlessly in temperatures ranging from cryogenic levels to a high of 300°F (149°C). Call for higher temperature availability.
Dimensionally stable in fluids (water, corrosive liquids, and chemical solutions)	Absorption rates are negligible, providing near zero swell.
Chemical resistant	Compatible with a wide range of lubricants and media.
Flexible material design	Suitable for press fit, freeze fit, epoxy bonding, as well as conventional mechanical retention.
Low weight/high strength	Accommodates high-load with a compact strength to weight ratio.
Thick-wall availability	Drop in replacement for metal or bronze bearings

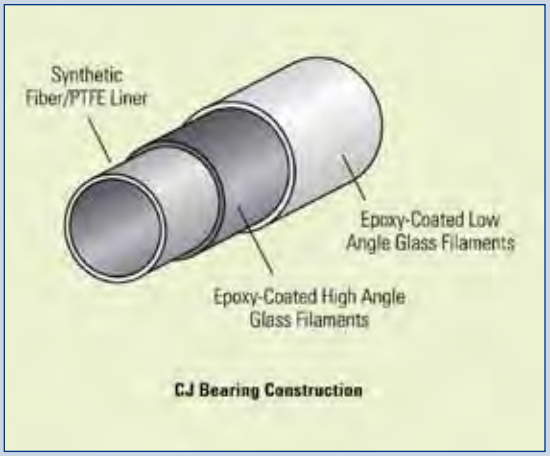
CJ Applications

- Back hoes
- Front end loaders
- Marine Davits/Sheaves
- Valve stem bushings
- Hitches
- Hydraulic cylinder pivots
- Graders
- Mining equipment
- Vending machines

FCJ Applications

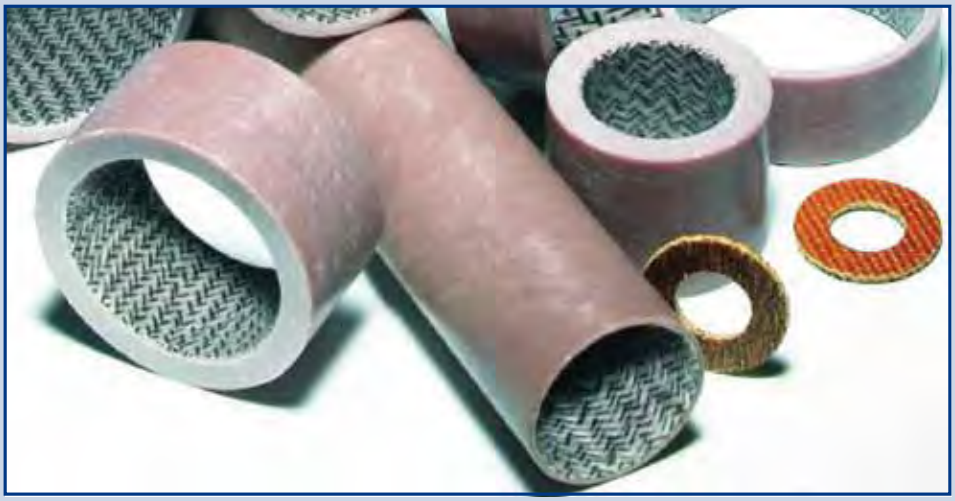
- Material handling equipment
- Packaging machinery
- Farm implements
- Spreaders
- Marine pivots
- Robotics
- Business machines
- Linear bearings
- Amusement park rides

TYPICAL SPECIFICATIONS			
Recommended Operating Limits and Engineering Information			
Properties		**CJ**	**FCJ**
Maximum Pressure (P)	psi	35,000 (1)	20,000
(static)	MPa	241	138
Maximum Velocity (V)	ft/min	150	500
(no load)	m/sec	.76	2.54
Lubrication		No	No
Temperature	°F	-320/+350	-320/+350
—Typical Range	°C	-195/+176	-195/+176
Shaft Hardness		Rc 50	Rb 25
—Minimum, Rockwell Scale			
Shaft Finish		8-16	8-16
Recommended Ra (Microinches)			
Shaft Material Steel Steel			
Coefficient of Friction		.02 - .25	.01 - .20
(Static/Dynamic Range)			
Water Absorption		<.5%	<.5%
ASTM D570			
Corrosion Resistance		Excellent	Excellent
Linear Coefficient of Thermal Expansion	in/in/°F	7 x 10-6	7 x 10-6
	cm/cm/°C	13 x 10-6	13 x 10-6
(ASTM D696) 78°F to 300°F			
26°C to 149°C			
(1) 15,000 psi maximum dynamic			



CJ Bearing Construction

FIBER-LUBE™ - CJ SERIES



Light-weight, high-strength, fatigue-resistant CJ composites are the ideal bearing choice for nonlubricated high-load/low-speed applications. CJ bearings provide excellent resistance to impact and shock loads and are capable of with standing a high degree of shaft misalignment.

FCJ bearings are the ideal choice for combination motion-oscillatory, linear, and/or rotary applications.Their ability to run successfully against mild steel shafting makes for a cost-competitive system. Their versatility makes them excellent general purpose self-lubricating bearings.

The self-lubricating wear surface of CJ and FCJ composites are capable of reducing both equipment costs and the need for maintenance. Use CJ bearings in applications where:

- Conventional lubricants will not function.
- Shock loads are present.
- Stick-slip operation is undesirable.
- Low cost is an issue, particularly when taking into consideration the bearing, lubrication system, or maintenance.

Use CJ when your application requires:

- High-load capacity.
- Resistance to chemical, galvanic, or fretting corrosion.
- Minimal galling and scoring.
- Reduced weight.
- Electrical insulation.

Use FCJ in applications where you would normally use low-speed porous and cast bronze. It is corrosion resistant, practically chemically inert and electrically insulative. FCJ bearings are more tolerant of small contaminants than standard CJ bearings. They are also easily machined using standard techniques. Standard FCJ sizes interc hange with standard bronze bearings. That means FCJ is not only an ideal alternative to metal, it's also a perfect fit.

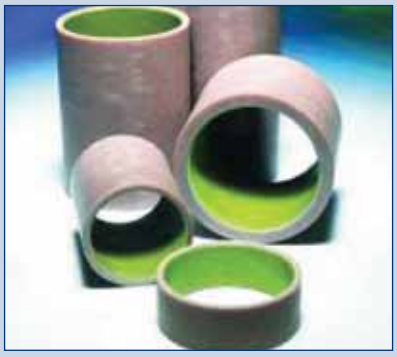


Figure A
Typical Wear Behavior For Composite Bearings

Figure B
Wear vs. Surface Finish

Figure C
Deflection
Chart shows the deflection and the permanent set of a typical CJ Composite Bearing at load

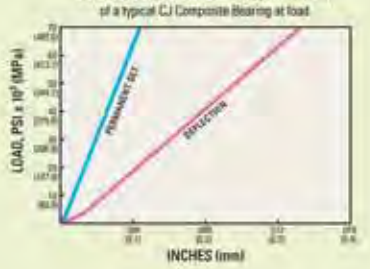


Figure D
Coefficient of Friction vs. Load

GENERAL DESCRIPTION

The CJ composite bearing is a multi-layer structure. The inner-most layer consists of a synthetic fiber/PTFE layer. The second layer consists of epoxy-coated high-angle glass filaments. The outer-most layer consists of epoxy-coated low-angle glass filiments.

The synthetic and PTFE fibers used in the liner have a long history of successful use as a bearing wear surface for rod end and aircraft spherical bearings. The high-load capacity and reliability of these bearings has made them the preferred design for many applications.

Fiberglass/epoxy filament wound composites were originally developed for use as pressure vessels and rocket motor cases. Their light weight, high strength, and fatigue resistance make them ideal materials for structural applications. When used to make a bearing, this material allows the selection of fiber angles to provide optimum strength and rigidity. The resulting structure has a modulus of elasticity of approximately 2 x 106 psi (13.79 GPa) placing it in an intermediate area between rigid metals and soft plastic. It is rigid enough to support heavy loads, and at the same time compliant enough to tolerate moderate amounts of shaft misalignment without highly stressing the bearing corners.

The composite wall acts like a spring and the thicker the wall section of the bearing the greater the deflection for a given load (See Figure C). This allows thick wall bearings to tolerate greater shaft misalignment. The wear surface will support the shaft primarily as a function of the load rather than the shaft clearance. As load is applied, the wear surface will conform to the shaft assuring a large contact area. In contrast, the contact area of metal bearings decreases sharply as shaft clearances increase, and increase only slightly with load.

BEARING WEAR

Figure A depicts the typical wear behavior of a CJ or FCJ bearing. There is an initial break-in period during which a transfer film is established on the mating surface. In some situations, up to .001" (.03mm) of wear may occur at break-in and in other situations the wear may be negligible. After the break-in period, the wear rate stabilizes and remains relatively constant for the life of the bearing.

There is a transfer film of PTFE, epoxy, and some synthetic fiber that clings tenaciously to the metal surface, and acts as a lubricant between the shaft and the bearing.

The equilibrium wear rate depends on a number of factors including loads, speeds, shaft hardness, and shaft surface finish. Under laboratory conditions, radial wear is approximately proportional to both sliding distance and load. The wear rate is often

reported as a factor K. This relationship can be expressed as follows:

W = KPVT
W = Radial wear in inches
K = Wear factor
P = Load in psi
V = Sliding velocity (ft/min)
T = Time in hours

The following tables show the actual measured wear factor for a number of conditions of oscillation and rotation. These values were obtained using Rc 50 shafts with a surface finish of 16 Ra (.4 µm). The wear factor would increase if the shaft material was softer or the surface finish rougher. The performance using the softer shafts was significantly lower, especially at the higher load condition. While performance is lower, it is adequate for many less demanding applications.

Measured Wear Factor for CJ Composite Bushings

Type of Operations	P lbs/ in2	V ft/min	K in3 x min/ lbs x ft x hr
Oscillation	229	43.6	9.6x10-10
±25°	4,900	2.0	1.9x10-10
	15,000	.73	2.0x10-9
Rotation	64	78.5	39.8x10-10
	64	157.0	24.9x10-10
	256	39.3	14.9x10-10
	512	39.3	12.4x10-10

Measured Wear Factors for FCJ Composite Bearings

Type of Operations	P lbs/ in2	V ft/min	K in3 x min/ lbs x ft x hr
Oscillation	229	43.6	7.4x10-10
±25°	4,900	2.0	1.6x10-10
	14,000	.73	5.52x10-10
Rotation	64	78.5	33.1x10-10
	64	157.00	19.9x10-10
	256	39.3	14.6x10-10
	512	39.3	12.41x10-10

Using wear factors, the radial wear of a CJ bearing can be estimated by calculating W and adding .001" (.025 mm) for break-in wear. The liner can sustain .015-.020" (.38mm-.51mm) wear and still operate normally. Bearings having an inside diameter of over 2-1/2" have a thicker liner capable of sustaining .025" to .030" (.64mm - .76mm) wear. Surface finish affects wear rate as shown in (See Figure B) Field experience has shown that hard chrome plating gives excellent wear performance and protects the shaft from corrosion. Softer coatings such as cadmium and zinc will not stand up in service and quickly wear off.

LOAD CAPACITY

Normal application of load will cause a simple elastic deflection of the CJ bearing along with some permanent set. The set is primarily due to compaction of the synthetic fiber/PTFE liner.

We do not typically recommend subjecting the bearings to over 35,000 psi (241 MPa) load. In common with other materials, fiberglass/epoxy composites can undergo fatigue after repeated application of stress. Fatigue has not been a limiting factor in the use of the CJ bearing.

In fact, laboratory tests have shown that in many cases the bearing is more fatigue-resistant than the shaft. Laboratory tests show that the bearings fail by a gradual crushing action rather than a rapid catastrophic failure. This is consistent with typical composite behavior in which stress is supported by many fibers.

If one fiber breaks, the load is redistributed among the others. Breakage of the entire structure will not occur until a large number of the individual fibers are broken. CJ composite bearings can easily withstand over 35,000 psi (241 MPa) static load or 15,000 psi (103 MPa) dynamic load with a great deal of reliability.

In many cases, higher loading can be tolerated if the design and conditions of service are discussed fully with a technical representative.

Figure E
Deflection
Chart shows the deflection and the permanent set of a typical FCJ Composite Bearing at load.

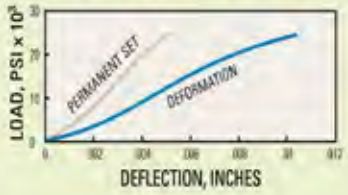
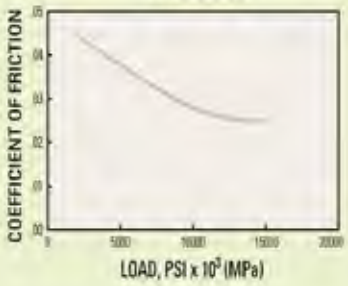


Figure F
Coefficient of Friction vs. Load for FCJ Bearing



Length to diameter ratio is also an important design consideration. Test results from the laboratory and the field have shown that the optimum performance can be attained by specifying a length to inside diameter ratio (L/D) ranging from .5 to 2. When the L/D ratio of less than .5 is used, it is possible to create highly stressed areas at the corner of the bearing and cracking will occur at this location prematurely. If the L/D ratio is over 2, with any amount of shaft misalignment, cross corner jamming will occur and unit stresses can exceed the 15,000 psi (103 MPa) safe dynamic limit or the 35,000 psi (241 MPa) static limit of the bearings.

Bearings built with the proper L/D ratio will accept misalignment and shock load without premature failure.

COEFFICIENT OF FRICTION

The coefficient of friction of a synthetic fiber/PTFE lined composite journal bearing running against a hardened Rc 50 steel shaft with a 16 Ra (.4 µm) surface, or less, varies from .02 to .25 depending on the load, the relative sliding velocity, and the bearing surface temperature. Generally, the coefficient of friction decreases with increasing load (See Figure D).

This information indicates that if the lowest coefficient of friction is desired, the smallest bearing capable of sustaining the load should be used, and that the bearings are capable of performing best under peak operating conditions when temperatures and loads may be higher.

LUBRICATION

The synthetic fiber/PTFE fabric wear surface of the CJ bearing is a self-contained boundary lubrication system; however, the addition of conventional lubricants often improves the overall performance of the CJ bearing.

"Lubricant" is a very general term, and it is often said that any liquid will act as a lubricant.

To some extent, this is true if hydrodynamic conditions are established, and the surfaces have minimal contact. The composite bearing, in earth moving equipment, operates generally in a state of boundary lubrication. Hydrocarbon oils are advantageous and can produce tenfold reductions in wear rates. Liquid lubricants can carry away heat and reduce the coefficient offriction. Greases can be used for lubrication, to prevent corrosion, and keep contamination out of the journal. In

oscillating motion, the synthetic fiber/PTFE liner acts as a true boundary lubricant when the direction of motion changes and the lubrication film collapses. In rotation, with oil lubrication, the wear rate of the CJ

composite has been found equal to sintered or cast bronze bearings. Fluorocarbon oils and greases should be avoided because they have been found to soften the synthetic fibers and greatly increase the rate of wear.

It is possible to add lubrication holes to the CJ bearing, but grooves are impractical. The abrasion resistance of the synthetic fibers makes groove fabrication difficult and costly.

THERMAL PROPERTIES

The operating temperature range for CJ bearings is -320°F to +300°F (-195°C to +149°C).

The bearing has been heat stabilized at a temperature above 300°F (149°C) and very little dimensional change will occur in the bearing during operation. In the free state, the coefficient of expansion of the CJ bearing in the radial direction is approximately 7 x 10-6 in/in/°F.

When press fit into a housing, the CJ bearing assumes the coefficient of expansion of the housing material, as long as the press fit is maintained, and thus the elastic modulus of the bearing is maintained, because the elastic modulus of the bearing is lower than the elastic modulus of most metals.

The CJ composite is a thermal insulator and when heat is generated from running friction, the bearing wear surface may be hotter thanthe adjacent housing due to the thermal lag.

Since the installed bearing cannot expand outward, it grows inward, reducing the shaft clearance. For this reason, the shaft clearance should be increased for dry running applications that have high running velocities.

Naturally, fluid cooling and lubricants will reduce the operating temperatures.

Heat transfer through the bearing wall is proportional to the wall thickness, and the thinnerthe composite wall, the greater the transfer of heat.

MEASURING OPERATING PV

PV is a means of measuring the performance capabilities of bearings. P is expressed as pressure or pounds per square inch on the projected bearing area. V is the velocity in feet per minute of the wear surface.

For sleeve bearings the surface speed V is .262 x RPM x diameter in inches. P is equal to the load on the bearing in pounds divided by the projected area in square inches. For sleeve bearings the projected area is the length times the diameter

of the bearing. PV is then obtained by multiplying the P x V as shown in the following example:

3/4" Shaft @ 341 RPM;
90 lb. total load, bearing length 1"

V = .262 x RPM x Diameter
or .262 x 341 x .750 = 67 ft/min

P = Total load ÷ projected area
area = .750 x 1.0 = .75 in2

P = 90 lbs ÷ .75 = 120 psi
PV = 120 psi x 67 fpm = 8040 PV

MECHANICAL PROPERTIES

The CJ bearing has withstood static loads in excess of 50,000 psi (345 MPa) at room temperature. However, we do not generally recommend static loads in excess of 35,000 psi (241 MPa). At the recommended load limits, minimal crushing will occur. As the temperature increases, the load capacity of the bearing decreases. The composite backing tends to act as a shock absorber and reduces vibration. The maximum speed is 150 surface feet per minute for dry running applications.

CORROSION RESISTANCE

The CJ bearing is not affected by corrosive environments. Some solutions of highly concentrated acids will attack the backing material.

Specific information can be obtained from our Technical Service Department. The shaft should be stainless steel or chrome-plated if an alloy steel is used. The CJ bearing cannot rust, but when using a lubricant, it should contain a rust inhibitor to protect the shaft.

FIBER-LUBE™ INCH SIZES

Identification	ID	Selected Liner	OD	Length	Style
FL	XX	T = Tape F=Fibre	XX	XX	XXX

Example: FL14F16-24-CJ

I.D. = 0.875" Fibre Liner O.D. = 1.000" Length = 1.500"

STANDARD SIZES FOR FIBER-LUBE™ BEARINGS: 1/16" THIN WALL

Bearing Number	Nominal ID X OD	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Running Clearance	Length ±0.010
FL08F10-04	1/2 X 5/8	0.5020 0.5040	0.6255 0.6265	0.6245 0.6250	0.0005 0.0020	0.4985 0.4990	0.0010 0.0055	1/4
FL08F10-08								1/2
FL08F10-16								1
FL10F12-04	5/8 X 3/4	0.6270 0.6290	0.7505 0.7515	0.7495 0.7500	0.0005 0.0020	0.6235 0.6240	0.0010 0.0075	1/4
FL10F12-08								1/2
FL10F12-16								1
FL12F14-08	3/4 X 7/8	0.7525 0.7555	0.8755 0.8765	0.8745 0.8750	0.0005 0.0020	0.7485 0.7490	0.0010 0.0075	1/2
FL12F14-12								3/4
FL12F14-16								1
FL14F16-	7/8 X 1	0.8775 0.8805	1.0005 1.0025	0.9995 1.0000	0.0005 0.0030	0.8740 0.8745	0.0010 0.0075	Up to 12"
FL16F18-16	1 X 1-1/8	1.0025 1.0055	1.1255 1.1275	1.1245 1.1250	0.0005 0.0030	0.9985 0.9990	0.0010 0.0075	1
FL16F18-20								1-1/4
FL16F18-24								1-1/2
FL18F20-	1-1/8 X 1-1/4	1.1305 1.1335	1.2505 1.2525	1.2495 1.2500	0.0005 0.0030	1.1245 1.1250	0.0010 0.0075	Up to 12"
FL20F22-	1-1/4 X 1-3/8	1.2525 1.2555	1.3765 1.3785	1.3745 1.3750	0.0010 0.0040	1.2485 1.2490	0.0010 0.0075	Up to 12"
FL22F24-	1-3/8 X 1-1/2	1.3790 1.3830	1.5005 1.5025	1.4995 1.5000	0.0005 0.0030	1.3735 1.3745	0.0010 0.0085	Up to 18"
FL24F26-	1-1/2 X 1-5/8	1.5040 1.5080	1.6265 1.6285	1.6245 1.6250	0.0015 0.0040	1.4990 1.4995	0.0010 0.0085	Up to 18"
FL26F28-	1-5/8 X 1-3/4	1.6290 1.6330	1.7515 1.7535	1.7495 1.7500	0.0015 0.0040	1.6240 1.6245	0.0010 0.0085	Up to 18"
FL28F30-	1-3/4 X 1-7/8	1.7540 1.7580	1.8765 1.8785	1.8745 1.8750	0.0015 0.0040	1.7490 1.7495	0.0010 0.0085	Up to 18"
FL32F34-	2 X 2-1/8	2.0040 2.0080	2.1265 2.1285	2.1245 2.1255	0.0010 0.0040	1.9985 1.9995	0.0010 0.0085	Up to 18"

Length tolerance is +.005"/-.005" up to 2-1/2" I.D.; +.008/-.007" on I.D. 2-1/2" and over. Sizes not listed above may be quoted upon request. All measurements in inches.

STANDARD SIZES FOR FIBER-LUBE™ BEARINGS: 1/8" STANDARD WALL

Bearing Number	Nominal ID	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Running Clearance	Length ±0.010
FL08F12-08	1/2 X 3/4	0.5020 0.5040	0.7505 0.7515	0.7495 0.7500	0.0005 0.0020	0.5155 0.5160	0.0010 0.0055	1/2
FL08F12-12								3/4
FL08F12-16								1
FL10F14-08	5/8 X 7/8	0.6270 0.6290	0.8755 0.8765	0.8745 0.8750	0.0005 0.0020	0.6235 0.6240	0.0010 0.0055	1/2
FL10F14-12								3/4
FL10F14-16								1
FL12F16-08	3/4 X 1	0.7525 0.7555	1.0005 1.0025	0.9995 1.0000	0.0005 0.0030	0.7485 0.7490	0.0010 0.0075	1/2
FL12F16-12								3/4
FL12F16-16								1
FL14F18-	7/8 X 1-1/8	0.8775 0.8805	1.1255 1.1275	1.1245 1.1250	0.0005 0.0030	0.8740 0.8745	0.0010 0.0075	Up to 12"
FL16F20-08	1 X 1-1/4	1.0025 1.0055	1.2505 1.2525	1.2495 1.2500	0.0005 0.0030	0.9985 0.9990	0.0010 0.0075	1/2
FL16F20-10								5/8
FL16F20-12								3/4
FL16F20-16								1
FL16F20-20								1-1/4
FL18F22-08	1-1/8 X 1-3/8	1.1305 1.1335	1.3765 1.3785	1.3745 1.3750	0.0015 0.0040	1.2445 1.2450	0.0010 0.0080	1/2
FL18F22-16								1
FL18F22-32								2
FL20F24-16	1-1/4 X 1-1/2	1.2525 1.2555	1.5005 1.5025	1.4995 1.5000	0.0005 0.0030	1.2485 1.2490	0.0010 0.0080	1
FL20F24-24								1-1/2
FL20F24-32								2
FL22F26-	1-3/8 X 1-5/8	1.3790 1.3830	1.6265 1.6285	1.6245 1.6250	0.0015 0.0040	1.3735 1.3745	0.0010 0.0075	Up to 18"
FL24F28-24	1-1/2 X 1-3/4	1.5040 1.5080	1.7515 1.7535	1.7495 1.7500	0.0015 0.0040	1.4990 1.4995	0.0010 0.0085	1-1/2
FL24F28-32								2
FL24F28-48								3
FL26F30-	1-5/8 X 1-7/8	1.6290 1.6330	1.8765 1.8785	1.8745 1.8750	0.0015 0.0040	1.6240 1.6245	0.0010 0.0085	Up to 18"
FL28F32-	1-3/4 X 2	1.7540 1.7580	2.0015 2.0035	1.9995 2.0000	0.0015 0.0040	1.7490 1.7495	0.0010 0.0095	Up to 18"
FL32F36-24	2 X 2-1/4	2.0040 2.0080	2.2515 2.2535	2.2495 2.2505	0.0010 0.0040	1.9985 1.9995	0.0020 0.0110	1-1/2
FL32F36-32								2
FL32F36-48								3
FL36F40-	2-1/4 X 2-1/2	2.2540 2.2580	2.5020 2.5040	2.4995 2.5005	0.0015 0.0045	2.2485 2.2490	0.0020 0.0110	Up to 18"

Length tolerance is +.005"/-.005" up to 2-1/2" I.D.; +.008/-.007" on I.D. 2-1/2" and over. Sizes not listed above may be quoted upon request. All measurements in inches.

STANDARD SIZES FOR FIBER-LUBE™ BEARINGS: 1/8" STANDARD WALL

Bearing Number	Nominal ID	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Running Clearance	Length ±0.010
FL38F42-	2-3/8 X 2-5/8	2.3810 2.3850	2.6270 2.6290	2.6245 2.6255	0.0015 0.0045	2.3740 2.3750	0.0020 0.0110	Up to 18"
FL40F44-24	2-1/2 X 2-3/4	2.5060 2.5100	2.7520 2.7540	2.7495 2.7505	0.0015 0.0045	2.4985 2.4995	0.0020 0.0110	1-1/2
FL40F44-32								2
FL40F44-48								3
FL42F46-	2-5/8 X 2-7/8	2.6330 2.6370	2.8770 2.8790	2.8745 2.8755	0.0015 0.0045	2.6235 2.6245	0.0020 0.0110	Up to 18"
FL44F48-	2-3/4 X 3	2.7580 2.7620	3.0020 3.0040	2.9990 3.0005	0.0015 0.0050	2.7485 2.7495	0.0020 0.0110	Up to 18"
FL48F52-	3 X 3-1/4	3.0100 3.0140	3.2520 3.2540	3.2490 3.2505	0.0015 0.0050	2.9985 2.9995	0.0020 0.0110	Up to 18"
FL52F56-	3-1/4 X 3-1/2	3.2600 3.2640	3.5020 3.5040	3.4990 3.5010	0.0010 0.0050	3.2485 3.2495	0.0020 0.01105	Up to 18"
FL56F60-	3-1/2 X 3-3/4	3.5100 3.5140	3.7520 3.7540	3.7490 3.7510	0.0010 0.0050	3.4985 3.4995	0.0020 0.0110	Up to 18"
FL60F64-	3-3/4 X 4	3.7600 3.7640	4.0020 4.0040	3.9990 4.0010	0.0010 0.0050	3.7485 3.7495	0.0020 0.0110	Up to 18"
FL64F68-	4 X 4-1/4	4.0100 4.0140	4.2520 4.2540	4.2490 4.2510	0.0010 0.0050	3.9985 3.9995	0.0030 0.0120	Up to 18"
FL68F72-	4-1/4 X 4-1/2	4.2600 4.2640	4.5020 4.5040	4.4990 4.5010	0.0015 0.0050	4.2485 4.2495	0.0030 0.0120	Up to 18"
FL72F76-	4-1/2 X 4-3/4	4.5100 4.5140	4.7520 4.7540	4.7490 4.7510	0.0010 0.0050	4.4985 4.4995	0.0030 0.0120	Up to 18"
FL76F80-	4-3/4 X 5	4.7600 4.7640	5.0020 5.0040	4.9990 5.0010	0.0010 0.0050	4.7485 4.7495	0.0030 0.0120	Up to 18"
FL80F84-	5 X 5-1/4	5.0100 5.0140	5.2520 5.2540	5.2490 5.2510	0.0010 0.0050	4.9985 4.9995	0.0030 0.0120	Up to 18"

Length tolerance is +.005"/-.005" up to 2-1/2" I.D.; +.008/-.007" on I.D. 2-1/2" and over. Sizes not listed above may be quoted upon request. All measurements in inches.

STANDARD SIZES FOR FIBER-LUBE™ BEARINGS: 1/4" HEAVY WALL

Bearing Number	Nominal ID	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Running Clearance	Length
FL08F16-	1/2 X 1	0.5020 0.5040	1.0005 1.0025	0.9995 1.0000	0.0005 0.0030	0.4985 0.4990	0.0010 0.0065	Up to 12"
FL10F18-	5/8 X 1-1/8	0.6270 0.6290	1.1255 1.1275	1.1245 1.1250	0.0005 0.0030	0.6235 0.6240	0.0010 0.0065	Up to 12"
FL12F20-	3/4 X 1-1/4	0.7525 0.7555	1.2505 1.2525	1.2495 1.2500	0.0005 0.0030	0.7485 0.7490	0.0010 0.0075	Up to 12"
FL14F22-	7/8 X 1-3/8	0.8775 0.8805	1.3765 1.3785	1.3745 1.3750	0.0005 0.0040	0.8740 0.8745	0.0010 0.0075	Up to 12"
FL16F24-16	1 X 1-1/2	1.0025 1.0055	1.5005 1.5025	1.4995 1.5000	0.0005 0.0030	0.9985 0.9990	0.0010 0.0075	1
FL16F24-24								1-1/4
FL18F26-	1-1/8 X 1-5/8	1.1305 1.1335	1.6265 1.6285	1.6245 1.6250	0.0015 0.0040	1.2445 1.2450	0.0010 0.0075	Up to 12"
FL20F28-16	1-1/4 X 1-3/4	1.2525 1.2555	1.7515 1.7535	1.7495 1.7500	0.0015 0.0040	1.2485 1.2490	0.0010 0.0075	1
FL20F28-32								2
FL22F30-	1-3/8 X 1-7/8	1.3790 1.3830	1.8765 1.8785	1.8745 1.8750	0.0015 0.0040	1.3740 1.3745	0.0010 0.0085	Up to 18"
FL24F32-24	1-1/2 X 2	1.5040 1.5080	2.0015 2.0035	1.9995 2.0005	0.0010 0.0040	1.4990 1.4995	0.0010 0.0085	1-1/2
FL24F32-32								2
FL26F34-	1-5/8 X 2-1/8	1.6290 1.6330	2.1265 2.1285	2.1245 2.1255	0.0010 0.0040	1.6240 1.6246	0.0010 0.0085	Up to 18"
FL28F36-	1-3/4 X 2-1/4	1.7540 1.7580	2.2515 2.2535	2.2495 2.2505	0.0010 0.0040	1.7490 1.7495	0.0010 0.0085	Up to 18"
FL32F40-24	2 X 2-1/2	2.0040 2.0080	2.5020 2.5040	2.4995 2.5005	0.0015 0.0045	1.9985 1.9995	0.0020 0.0105	1-1/2
FL32F40-32								2
FL36F44-	2-1/4 X 2-3/4	2.2540 2.2580	2.7520 2.7540	2.7495 2.7505	0.0015 0.0045	2.2480 2.2490	0.0020 0.0105	Up to 18"

Length tolerance is +.005"/-.005" up to 2-1/2" I.D.; +.008/-.007" on I.D. 2-1/2" and over. Sizes not listed above may be quoted upon request. All measurements in inches.

STANDARD SIZES FOR FIBER-LUBE™ BEARINGS: 1/4" HEAVY WALL DIMENSIONS

Bearing Number	Nominal ID	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Running Clearance	Length
FL38F46-	2-3/8 X 2-7/8	2.3810 2.3850	2.8770 2.8790	2.8745 2.8755	0.0015 0.0045	2.3740 2.3750	0.0020 0.0105	Up to 18"
FL40F48-	2-1/2 X 3	2.5060 2.5100	3.0020 3.0040	2.9990 3.0005	0.0015 0.0050	2.4990 2.4995	0.0020 0.0105	Up to 18"
FL42F50-	2-5/8 X 3-1/8	2.6330 2.6370	3.1270 3.1290	3.1240 3.1255	0.0015 0.0050	2.6240 2.6245	0.0020 0.0105	Up to 18"
FL44F52-	2-3/4 X 3-1/4	2.7580 2.7620	3.2520 3.2540	3.2490 3.2505	0.0015 0.0050	2.7485 2.7495	0.0020 0.0105	Up to 18"
FL48F56-	3 X 3-1/2	3.0100 3.0140	3.5020 3.5040	3.4990 3.5010	0.0010 0.0050	2.9985 2.9995	0.0020 0.0105	Up to 18"
FL52F60-	3-1/4 X 3-3/4	3.2600 3.2640	3.7520 3.7540	3.7490 3.7510	0.0010 0.0050	3.2485 3.2495	0.0020 0.0105	Up to 18"
FL56F64-	3-1/2 X 4	3.5100 3.5140	4.0020 4.0040	3.9990 4.0010	0.0010 0.0050	3.4985 3.4995	0.0020 0.0105	Up to 18"
FL0F68-	3-3/4 X 4-1/4	3.7600 3.7640	4.2520 4.2540	4.2490 4.2510	0.0010 0.0050	3.7485 3.7495	0.0020 0.0105	Up to 18"
FL64F72-	4 X 4-1/2	4.0100 4.0140	4.5020 4.5040	4.4990 4.5010	0.0010 0.0050	3.9985 3.9995	0.0030 0.0120	Up to 18"
FL68F76-	4-1/4 X 4-3/4	4.2600 4.2640	4.7520 4.7540	4.7490 4.7510	0.0010 0.0050	4.2485 4.2495	0.0030 0.0120	Up to 18"
FL72F80-	4-1/2 X 5	4.5100 4.5140	5.0020 5.0040	4.9990 5.0010	0.0010 0.0050	4.4985 4.4995	0.0030 0.0120	Up to 18"
FL76F84-	4-3/4 X 5-1/4	4.7600 4.7640	5.2520 5.2540	5.2490 5.2510	0.0010 0.0050	4.7485 4.7495	0.0030 0.0120	Up to 18"
FL80F88-	5 X 5-1/2	5.0100 5.0140	5.5020 5.5040	5.4990 5.5010	0.0010 0.0050	4.9985 4.9995	0.0030 0.0120	Up to 18"

Length tolerance is +.005"/-.005" up to 2-1/2" I.D.; +.008/-.007" on I.D. 2-1/2" and over. Sizes not listed above may be quoted upon request. All measurements in inches.

Identification	ID	Selected Liner	OD	Length	Style
FLM	XXX	T = Tape F=Fibre	XXX	XX	XXX

Example: FLM040F048-40-CJ

I.D. = 40mm O.D. = 48mm Length = 40mm

STANDARD SIZES FOR FIBER-LUBE™ METRIC BEARINGS: 2.5MM WALL

Bearing Number	Nominal ID X OD	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Length Tolerance
FLM012F017-	12 X 17	12.093 12.143	17.043 17.068	17.000 17.018	.025 .068	11.982 12.000	+0.00 / -.25
FLM015F020-	15 X 20	15.096 15.146	20.046 20.071	20.000 20.021	.025 .071	14.982 15.000	+0.00 / -.25
FLM018F023-	18 X 23	18.121 18.201	23.046 23.096	23.000 23.021	.025 .096	17.928 18.000	+0.00 / -.25
FLM020F025-	20 X 25	20.121 20.201	25.046 25.096	25.000 25.021	.025 .096	19.979 20.010	+0.00 / -.25
FLM022F027-	22 X 27	22.121 22.201	27.046 27.096	27.000 27.021	.025 .096	21.979 22.000	+0.00 / -.25
FML025F030-	25 X 30	25.125 25.205	30.050 35.100	30.000 30.025	.029 .100	24.979 25.000	+0.00 / -.25
FLM030F035-	30 X 35	30.125 30.205	35.050 35.100	35.000 35.025	.025 .100	29.797 30.000	+0.00 / -.25
FLM035F040-	35 X 40	35.125 35.225	40.050 40.100	40.000 40.025	.025 .100	34.975 35.000	+0.00 / -.25
FLM040F045-	40 X 45	40.125 40.225	45.050 45.100	45.000 45.025	.025 .100	39.975 40.000	+0.00 / -.25
FLM045F050-	45 X 50	45.130 45.230	50.055 50.105	50.000 50.025	.030 .105	44.975 45.000	+0.00 / -.25
FLM050F055-	50 X 55	50.155 50.225	55.055 55.105	55.000 55.030	.025 .105	49.975 50.000	+0.00 / -.25

Housing bore and shaft diameter tolerances: H7/H8 and h7/h8 respectively. Smaller tolerance in length is available on request. Measurements in millimeters.

STANDARD SIZES FOR FIBER-LUBE™ METRIC BEARINGS: 5MM WALL

Bearing Number	Nominal ID X OD	ID	OD	Recommended Housing Bore	Press Fit	Recommended Shaft Size	Length Tolerance
FLM030F040-	30 X 40	30.125 30.205	40.050 40.100	40.000 40.025	.025 .100	29.979 30.000	+0.00 / -.25
FLM035F045-	35 X 45	35.125 35.225	45.050 45.100	45.000 45.025	.025 .100	34.975 35.000	+0.00 / -.25
FLM040F050-	40 X 50	40.125 40.225	50.050 50.100	50.000 50.025	.025 .100	39.975 40.000	+0.00 / -.25
FLM045F055-	45 X 55	45.130 45.230	55.055 55.105	55.000 55.030	.025 .105	44.975 45.000	+0.00 / -.25
FLM050F060-	50 X 60	50.155 50.225	60.055 60.105	60.000 60.030	.025 .105	49.975 50.000	+0.00 / -.25
FML055F065-	55 X 65	55.155 55.255	65.055 65.105	65.000 65.030	.025 .105	54.970 55.000	+0.00 / -.25
FLM060F070-	60 X 70	60.155 60.255	70.055 70.105	70.000 70.030	.025 .105	59.970 60.000	+0.00 / -.40
FLM065F075-	65 X 75	65.155 65.255	75.055 75.105	75.000 75.030	.025 .105	64.970 65.000	+0.00 / -.40
FLM070F080-	70 X 80	70.205 70.305	80.055 80.105	80.000 80.030	.025 .105	69.970 70.000	+0.00 / -.40
FLM075F085-	75 X 85	75.210 75.310	85.060 85.110	85.000 85.035	.025 .110	74.970 75.000	+0.00 / -.40
FLM080F090-	80 X 90	80.210 80.310	90.060 90.110	90.000 90.035	.025 .110	79.970 80.000	+0.00 / -.40
FLM085F095-	85 X 95	85.260 85.360	95.060 95.110	95.000 95.035	.025 .110	84.965 85.000	+0.00 / -.40
FLM090F100-	90 X 100	90.260 90.360	100.060 100.110	100.000 100.035	.025 .110	89.965 90.000	+0.00 / -.40
FLM100F110-	100 X 110	100.260 100.360	110.060 110.110	110.000 110.035	.025 .110	99.965 100.000	+0.00 / -.40
FLM110F120-	110 X 120	110.260 110.360	120.060 120.110	120.000 120.035	.025 .110	109.965 110.000	+0.00 / -.40
FLM120F130-	50 X 55	120.265 120.365	130.065 130.115	130.000 130.040	.025 .115	119.965 120.000	+0.00 / -.40

Housing bore and shaft diameter tolerances: H7/H8 and h7/h8 respectively. Smaller tolerance in length is available on request. Measurements in millimeters.

APPLICATION DATA SHEET

Date: _____

Customer: _____ **Contact:** _____

Address: _____ **Title:** _____

_____ **Phone:** _____

_____ **Fax:** _____

Bearing to be used for _____ ◯ New Design ◯ Existing Design

If not new, what type of bearing has been used? _____

Part Number _____ I.D. _____ O.D. _____ Length _____

Was it satisfactory? _____ If not, why not? _____

SERVICE CONDITIONS

Speeds (Max., Min., Average Rpm Or Cycles Per Minute) _____

Loads (Lbs, Or Psi) Radial _____ Axial _____

Constant _____ Fluctuating _____

Shock _____ Vibratory _____

Motion ◯ Rotating Shaft With Unidirectional Load ◯ Rotating Load With Stationary Shaft

◯ Oscillating Shaft Angle _____ ◯ Reciprocating Stroke _____

Shaft Drawing Number _____ ◯ Horizontal ◯ Vertical

Diameter _____ Misalignment Anticipated _____

Material _____ Hardness _____ Surface Finish _____

Housing Length _____ I.d. _____ O.d. _____ Material _____

Construction: ◯ Light ◯ Heavy

SERVICE LIFE REQUIRED

Total Life (operating hours) _____ Total Allowable Wear (inches) _____

◯ Continuous

◯ Intermittent (describe) _____

ENVIRONMENTAL CONDITIONS

◯ Air ◯ Clean ◯ Contaminated-Type _____

◯ Gas ◯ Clean ◯ Contaminated-Type _____

◯ Liquid-Type _____ Concentration _____

Lubrication properties _____

Is sealing available? _____ Type _____

ENVIRONMENTAL TEMPERATURE

Maximum _____ Minimum _____ Normal _____

Quantity required per year? _____

861 Cranberry Court
Oakville, ON L6L 6J7
(905) 847-6500
Fax:(905) 847-6943
1-800-387-7115
sales@daemarinc.com

548 Meloche
Dorval, QC H9P 2T2
(514) 636-3113
Fax:(514) 633-1206
1-800-361-6826
mtlsales@daemarinc.com

4472-97TH Street
Edmonton, AB T6E 5R9
(780) 435-8899
Fax:(780) 435-9090
1-800-214-9590
edmsales@daemarinc.com

1635 Lakes Parkway, Suite F
Lawrenceville, GA 30043
(770) 953-4710
Fax:(770) 953-4711
1-877-432-3627
atlanta@daemarinc.com


Dryslide™


Oil Seals


Tapered Caps and Plugs


Rotor Clip®


Woodruff Keys


Fiber-Lube™


O-Ring Kits


Caps


Spirolox®


Slotted Shim


Linear Motion


DMR Bearing Isolators

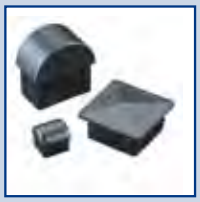

Plugs


Ring Masters®


Slotted Shim Kits


Powdered Metal


V-Rings


Finishing


Rotor Clamp®


Shim Stock Rolls


Solid Metal

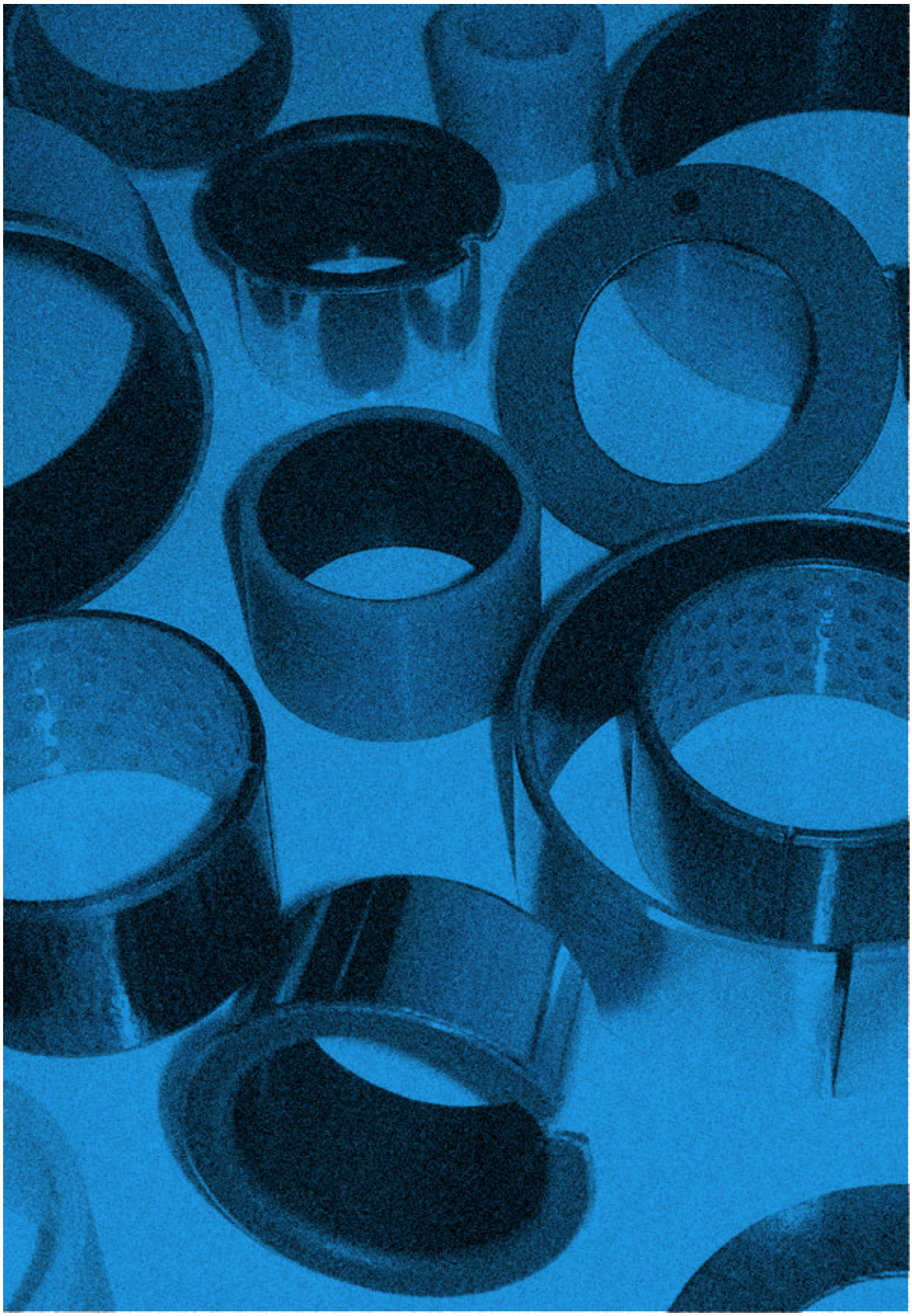

Shaft Repair Sleeves


Electronics


Retaining Ring Kits & Packs


Keystock

www.daemar.com



DMR™

DAEMAR® INC.
861 CRANBERRY COURT
OAKVILLE, ON L6L 6J7
PH/905/847/6500
FX/905/847/6943
TF/800/387/7115
TFX/800/269/4571
sales@daemarinc.com

DAEMAR® INC.
548 MELOCHE
DORVAL, QC H9P 2T2
PH/514/636/3113
FX/514/633/1206
TF/800/361/6826
mtlsales@daemarinc.com

DAEMAR® INC.
4472-97TH STREET
EDMONTON, AB T6E 5R9
PH/780/435/8899
FX/780/435/9090
TF/800/214/9590
edmsales@daemarinc.com

DAEMAR® INC.
1635 Lakes Parkway, Suite F
Lawrencevile, GA 30043
PH/770/953/4710
FX/770/953/4711
TF/877/432/3627
atlanta@daemarinc.com

www.daemar.com

Daemar® Inc.