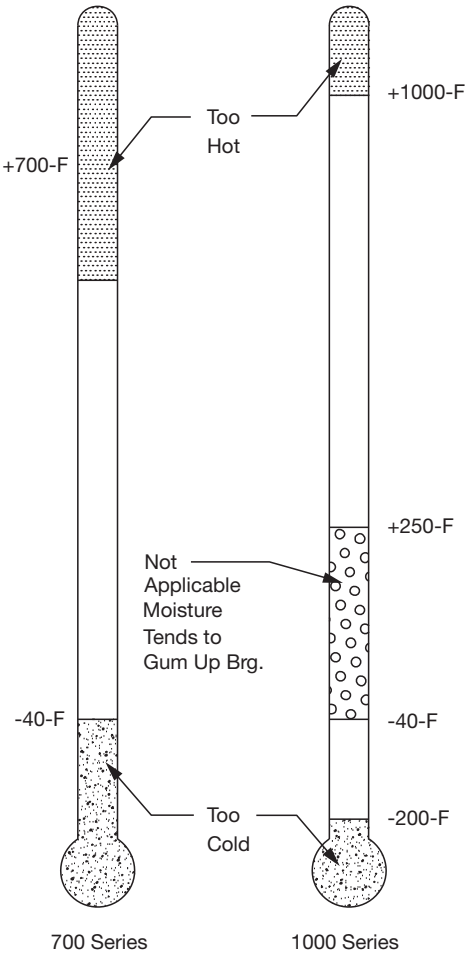
SELECTION

Sleeve Bearings - SOLIDLUBE - Inch



SOLIDLUBE Bearing Operating Temperature

Bearing Size

Select a bearing from tables for normal loads or loads in limited shaft movement applications having a radial load equal to or greater than the actual load. This simple method is all that is required for the majority of general machine applications using commercial steel shafting and operating in a dry atmosphere. (For more favorable conditions, ratings may be increased somewhat; consult factory). Shaft collars may be used for slight amounts of thrust. Generally the rule of 10% of the radial load applies. Dirty environments will reduce bearing life and should be avoided. Losses due to friction can be as high as 30% depending on speed, lead, temperature and shaft material.

Shafting

Commercial steel shafting is good in applications where temperatures do not exceed 700°F. However, for extended bearing life, at any temperature, the shaft should be hardened to 35 Rockwell "C" or better. Shaft finish should be 10 to 20 micro-inches. A finish rougher than 20µ will lessen bearing life. A finish smoother than 10 will not allow the optimum lubricant film to develop. Shaft tolerance should be +.000/-.002 for commercial steel shafting. If using other shaft materials, consult DODGE for the shaft tolerance and thermal expansion.

When commercial shafting is exposed to a corrosive media, it will oxidize. A rusty shaft will grow in the bearing, thus eliminating clearances. In this case stainless steel shafting may be used and/or provide for regularly scheduled movement of shaft. In elevated temperatures stainless grades such as 17-4, 15-5, or 13-8 are hardenable. Shafts can be spray coated with ceramic or hard chrome. This is good up to about 800°F. Check with your supplier, since these coatings can flake off when the coefficient of thermal expansion of the base material differs greatly from that of the coating.

High grade specialty shafting may be used in excess of 1000°F. It may be less expensive to use sleeves of this material on more economical shafting.

Noise or High Pitched Squeal

Carbon-graphite bushings can develop a high frequency vibration in resonance with the operating system to cause noise. Dampening or change of resonant frequency of the shaft is required to eliminate noise.

Specials

SOLIDLUBE bearings or bearings made from alternate bushing materials such as polymers, fibers, bronze, etc. for unusual operating and load conditions are available on a specially engineered basis by supplying the following:

- Shaft size, material and rpm.
- Normal load, shock load and frequency.
- Direction of load.
- Ambient temperature and atmospheric conditions (water, dirt, corrosive, etc.)
- Type of bearing: pillow block, flange bearing, etc.
- Housing material desired.
- Quantity.

End Closures

Ball Bearing End Closures are available (B4-102).

Note: SOLIDLUBE bearings are not designed for rotating housing applications

DODGE®

Sleeve Bearings - SOLIDLUBE - Inch

SOLIDLUBE 700, 1000 and 800 Series

SOLIDLUBE Bearing 700 and 1000 Series Radial Load Ratings in Pounds (Normal Loads)

Shaft Size	Radial Load Ratings in Pounds at various Revolutions per Minute											
	Up to 10	25	50	75	100	150	200	250	300	350	400	450
3/4	560	560	560	560	560	380	285	230	190	165	145	125
7/8, 15/16, 1	750	750	750	750	610	405	315	245	205	175	155	130
1-1/8, 1-3/16	1050	1050	1050	908	680	450	340	270	225	190	170	150
1-1/4, 1-3/8, 1-7/16, 1-1/2	1610	1610	1610	1140	855	570	430	340	280	245	215	190
1-11/16, 1-3/4	1980	1980	1790	1190	895	595	440	390	295	255	220	200
1-15/16, 2	2360	2360	1860	1240	930	620	465	370	310	265	235	205
2-3/16	2870	2870	2010	1340	1000	670	500	400	335	285	250	225
2-7/16, 2-1/2	3760	3760	2360	1580	1180	795	590	475	390	340	295	265
2-15/16, 3	5970	5970	3120	2070	1560	1040	780	625	515	445	390	345
3-7/16, 3-1/2	9100	8010	4000	2670	2000	1340	1000	800	670	570	500	445
3-15/16, 4	11800	9160	4590	3060	2290	1530	1150	930	765	665	575	510
4-7/16, 4-1/2	15200	10300	5150	3440	2580	1720	1290	1030	860	740	645	...
4-15/16, 5	18400	11400	5710	3810	2860	1910	1430	1140	955	815	...	...

Shaft Size	500	550	600	700	800	900	1000	1100	1300	1600	1900	2200	2500
3/4	110	105	96	82	72	64	57	52	44	35	30	26	22
7/8, 15/16, 1	120	110	105	90	80	70	60	54	47	38	32		
1-1/8, 1-3/16	135	125	115	97	85	75	68	62	42	42			
1-1/4, 1-3/8, 1-7/16, 1-1/2	170	155	145	120	105	95	86	78	66				
1-11/16, 1-3/4	180	165	150	130	110	99	89	81					
1-15/16, 2	185	170	155	135	115	105							
2-3/16	200	180	165	145	125								
2-7/16, 2-1/2	235	215	195	170									
2-15/16, 3	345	315	290										
3-7/16, 3-1/2	400	365											

NOTE: The above ratings apply to all base loaded pillow blocks, all cylindrical units and flange type bearings (up to 700°F). For flange bearings operating at temperatures above 700°F, cap and side loading of pillow blocks consult Application Engineering. For operations speeds below heave line, use LT1000 and/or hardened shaft.

SOLIDLUBE Bearing Corrosion (Chemical) Resistance

Type of Chemical	Chemical	Bearing Series	
		LM800 700	1000
Acids and Acidic Solutions	Mineral (Non-Oxidizing)	★	★
	Mineral (Oxidizing)	■	★
	Inorganic Salts (Acid Forming)	★	★
	Organic (Strong)	★	★
	Organic (Weak) pH 3-7	★	★
	Organic Salts (Acid Forming)	★	★
Alkalis (Bases & Alkaline Solutions)	Mineral (Non-Oxidizing)	★	★
	Mineral (Oxidizing)	▲	★
	Inorganic Salts (Base Forming)	★	★
	Organic (Strong)	★	★
	Weak Organic Bases pH 7-11	★	★
Gases	Acid	★	★
	Alkaline (base)	★	★
	Anhydrous (dew Point below -30˚F)	▲	▲
	Cyrogenic (Liquefied)	■	▲
	Inert	★	★
	Oxidizing	■	▲
	Reducing	★	★
Salts	Acid Salts	▲	▲
	Alkaline Sales	▲	▲
	Metals	★	★
	Neutral Salts	■	▲
	Neutral Salt Solutions	★	★
Solvents	Aliphatic	★	★
	Aromatic	★	★
	Chlorinated, Fluorinated	★	★
	Oxygenated, Sulfides	★	★

★ Good. Not known interaction; compatible
▲ Questionable (depends on conditions)
■ Not recommended

Note: For compatibility or specific chemical, contact Application Engineering

700 and 1000 Series SOLIDLUBE Bearing Radial Load Rating in Pounds (Limited Shaft Movement Applications) ▲

Shaft Size	Max. Radial Load		Max. Thrust
	Base Loaded	Cap or Side Loading	
3/4	1100	775	56
7/8, 15/16, 1	1500	795	75
1-1/8, 1-3/16	2100	820	105
1-1/4, 1-3/8, 1-7/16, 1-1/2	3200	1710	161
1-11/16, 1-3/4	4000	1905	198
1-15/16, 2	4700	1920	236
2-3/16	5700	1900	287
2-7/16, 2-1/2	7500	2360	376
2-15/16, 3	12,000	4151	597

▲ Use only when shaft movement is limited to approx. ±90º. Movement is infrequent as opposed to continuous and maximum bearing temperature is 700ºF.

LM800 Radial Load Ratings

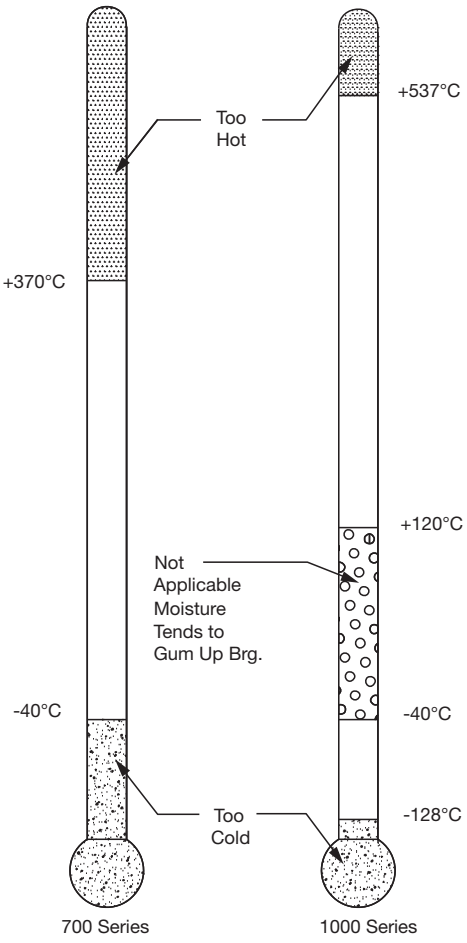
Bearing Size	Max. Radial Base Load	Max. Radial Cap Load
3/4	560	560
1	750	600
1-1/4	1610	600
1-1/2	1610	600

Note: These load ratings are to be used only when shaft rotation is less than 10 RPM and temperature does not exceed 800º F. Maximum allowable thrust load is 50 lbs.

FEATURES/BENEFITS PAGE B17-2	SPECIFICATION/HOW TO ORDER PAGE B17-4	NOMENCLATURE PAGE B17-5	SELECTION/DIMENSIONS PAGE B17-10

SELECTION

Sleeve Bearings - SOLIDLUBE - Metric



SOLIDLUBE Bearing Operating Temperature

Bearing Size

Select a bearing from tables for normal loads or loads in limited shaft movement applications having a radial load equal to or greater than the actual load. This simple method is all that is required for the majority of general machine applications using commercial steel shafting and operating in a dry atmosphere. (For more favorable conditions, ratings may be increased somewhat; consult factory). Shaft collars may be used for slight amounts of thrust. Generally the rule of 10% of the radial load applies. Dirty environments will reduce bearing life and should be avoided. Losses due to friction can be as high as 30% depending on speed, load, temperature and shaft material.

Shafting

Commercial steel shafting is good in applications where temperatures do not exceed 370°C. However, for extended bearing life, at any temperature, the shaft should be hardened to 35 Rockwell "C" or better. Shaft finish should be .25 to .50 micro-meters. A finish rougher than .50 will lessen bearing life. A finish smoother than R_a. 25 micro-meters will not allow the optimum lubricant film to develop. Shaft tolerance should be +.000/-.051 millimeters for commercial steel shafting. If using other shaft materials, consult DODGE for the shaft tolerance and thermal expansion.

When commercial shafting is exposed to a corrosive media, it will oxidize. A rusty shaft will grow in the bearing, thus eliminating clearances. In this case stainless steel shafting may be used and/or provide for regularly scheduled movement of shaft. In elevated temperatures stainless grades such as 17-4, 15-5, or 13-8 are hardenable. Shafts can be spray coated with ceramic or hard chrome. This is good up to about 425°C. Check with your supplier, since these coatings can flake off when the coefficient of thermal expansion of the base material differs greatly from that of the coating.

High grade specialty shafting may be used in excess of 537°C. It may be less expensive to use sleeves of this material on more economical shafting.

Noise or High Pitched Squeal

Carbon-graphite bushings can develop a high frequency vibration in resonance with the operating system to cause noise. Dampening or change of resonant frequency of the shaft is required to eliminate noise.

Specials

SOLIDLUBE bearings or bearings made from alternate bushing materials such as polymers, fibers, bronze, etc. for unusual operating and load conditions are available on a specially engineered basis by supplying the following:

- Shaft size, material and rpm.
- Normal load, shock load and frequency.
- Direction of load.
- Ambient temperature and atmospheric conditions (water, dirt, corrosive, etc.)
- Type of bearing: pillow block, flange bearing, etc.
- Housing material desired.
- Quantity.

End Closures

Ball Bearing End Closures are available (Page B4-102).

Note: SOLIDLUBE bearings are not designed for rotating housing applications

Sleeve Bearings - SOLIDLUBE - Metric

SOLIDLUBE BEARING 700 and 1000 SERIES

SOLIDLUBE Bearing 700 and 1000 Series Radial Load Ratings in Newtons (N) Normal Loads

Series	Shaft Size	Radial Load Ratings in Newtons at Various Revolutions per Minute											
		10	25	50	75	100	150	200	250	300	350	400	450
204	20mm	2490	2490	2490	2490	2490	1690	1270	1020	840	730	640	560
205	25mm	3340	3340	3340	3340	2710	1800	1400	1090	910	780	690	580
206	30mm	4670	4670	4670	4040	3020	2000	1510	1200	1000	840	760	670
207	35mm	7160	7160	7160	5070	3800	2540	1910	1510	1240	1090	960	840
209	40mm, 45mm	8800	8800	7960	5290	3980	2650	1960	1740	1310	1130	980	890
210	50mm	10500	10500	8270	5520	4140	2760	2070	1650	1380	1180	1040	910
212	60mm	16700	16700	10500	7030	5250	3540	2620	2110	1730	1510	1310	1180
215	70mm, 75mm	26500	26500	13900	9200	6940	4630	3470	2780	2290	1980	1740	1540

Series	Shaft Size	Radial Load Ratings in Newtons at Various Revolutions per Minute												
		500	550	600	700	800	900	1000	1100	1300	1600	1900	2200	2500
204	20mm	490	470	430	360	320	200	250	230	200	160	130	120	100
205	25mm	530	490	470	400	360	310	270	240	210	170	140		. ..
206	30mm	600	560	510	430	380	330	300	280	190	190		. .	.
207	35mm	760	690	640	530	470	420	380	350	300	. .	.	. .	.
209	40mm, 45mm	800	730	670	580	490	440	400	360	. . .	. .	.	. .	.
210	50mm	820	760	690	600	510	470	. . .	. . .	. . .	. .	.	. .	.
212	60mm	1040	960	870	760	. . .	. . .	. . .	. . .	. . .	. .	.	. .	.
215	70mm, 75mm	1530	1400	1290	. . .	. . .	. . .	. . .	. . .	. . .	. .	.	. .	.

NOTE: The above ratings apply to all base loaded pillow blocks, all cylindrical units an flange type bearings (up to 370°C). For flange bearings operating at temperatures above 370°C, cap and side loading of pillow blocks consult Applications Engineering. For operation speeds below heavy line, use LT1000 and/or hardened shaft.

SOLIDLUBE Bearings
700 Series and 1000 Series
Radial Load Ratings in Newtons (N)
(Limited Shaft Movement Applications) ▲

Series	Shaft Size	Max. Radial Load		Max. Thrust Load
		Base Loaded	Cap or Side Loading	
204	20mm	4890	3450	250
205	25mm	6670	3540	330
206	30mm	9340	3650	470
207	35mm	14200	7600	720
209	40mm, 45mm	17800	8470	880
210	50mm	20900	8540	1050
212	60mm	33400	10500	1670
215	70mm, 75mm	53400	18500	2660

▲ Use only when shaft movement is Limited to approx. ± 90º
Movement is infrequent as opposed to continuous and maximum bearing temperature is 370ºC.