LEG® SlimLine

LOW PROFILE EQUALIZING LEG® BEARINGS

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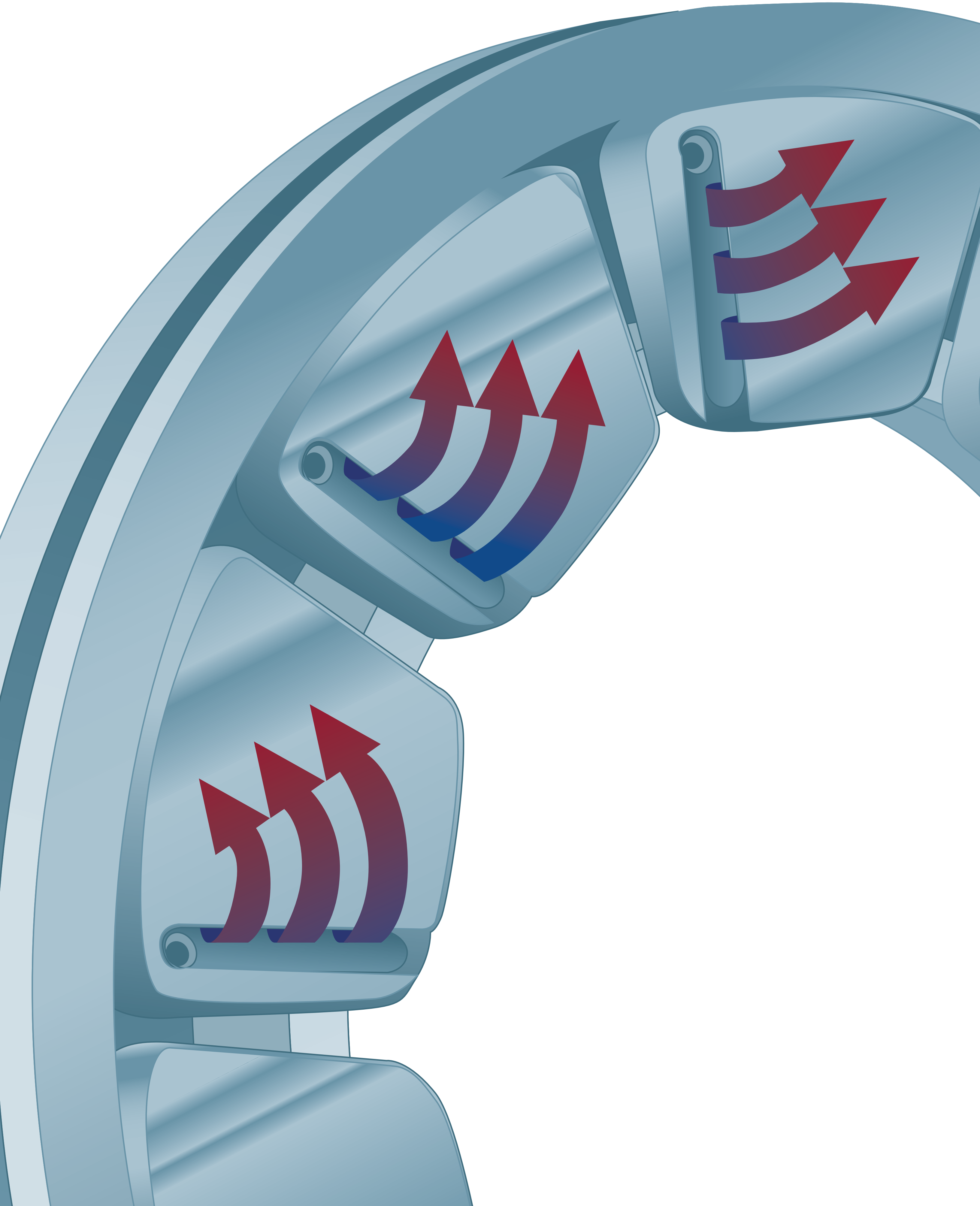
Kingsbury has adapted its Leading Edge Groove lubrication technology to a new low-profile design. The new LEG® SlimLine is a fully equalizing thrust bearing with all the attributes of our standard LEG product, but in a thinner profile.

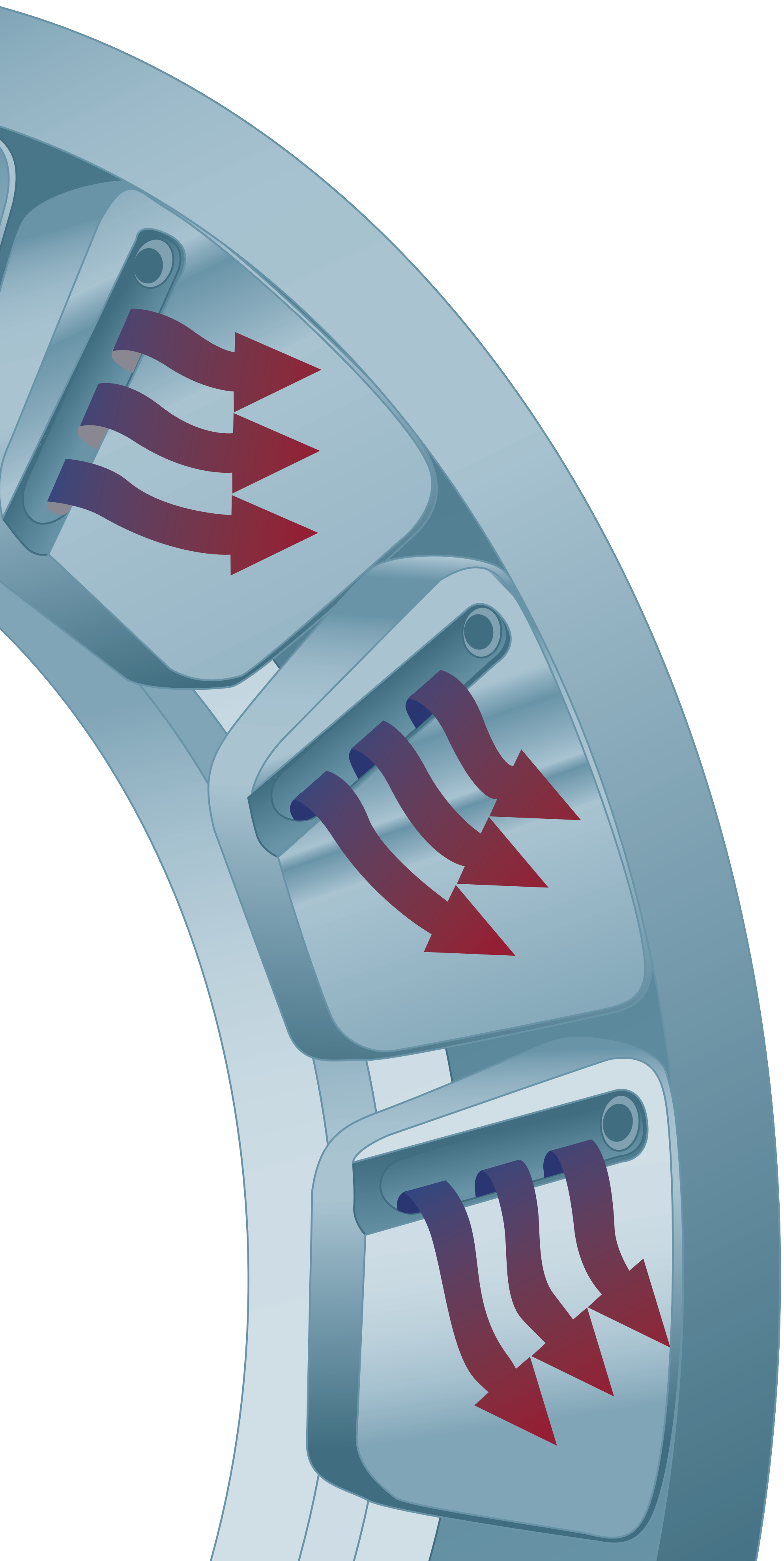
In this new model, each pad is designed to carry an equal amount of thrust load. Leveling plates on the back of the bearing reduce the chance of one pad being more highly loaded than another. The leveling plates, combined with a spherical pad support, also ensure that the thrust bearing face becomes perfectly aligned with the rotating thrust collar.

Important design features, such as Kingsbury's 360º pad pivot arrangement as well as conservative load ratings, allow you to confidently specify the LEG SlimLine in even the toughest applications.

Perfect for retrofit, the LEG SlimLine may be specified for one-to-one replacement for tapered land or low-profile non-equalizing tilt-pad bearings in existing applications, reducing downtime and improving overall performance. ISO standards are used for all dimensional tolerances.

For engineering assistance on OEM or aftermarket applications, contact our offices in Philadelphia, PA. Please see the back cover of this catalog for contact details.





THE ADVANTAGES OF LEG TECHNOLOGY

Leading Edge Groove (LEG) technology, introduced by Kingsbury in 1984, has revolutionized the world of thrust bearings. The creation of these new thrust bearings has made it possible for the world's leading equipment manufacturers to simultaneously increase bearing capacity, reduce friction losses and hold babbitt temperatures within acceptable limits. When compared to a standard thrust bearing, the advanced design LEG SlimLine bearing can:

- Reduce operating temperatures at the 75/75 location by 8° to 27° C, depending on shaft speed.
- Provide a load carrying capacity increase of 15-20%, based on that temperature reduction.
- Operate at oil flow rates as much as 60% lower, with an accompanying reduction in friction losses of 40%.

GENERAL DESCRIPTION

While the general arrangement of the LEG SlimLine appears to be very familiar, certain key features make it superior to the more common tilt-pad bearings in use today.

Pads

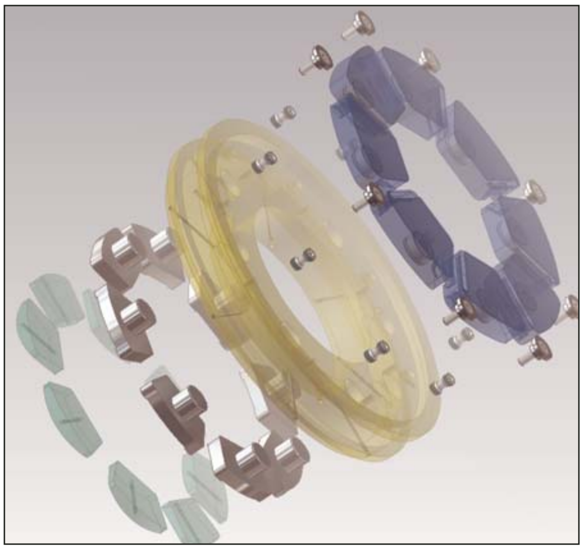
All LEG SlimLine bearing pads are provided with Leading Edge Groove (LEG) lubrication grooves to improve oil flow, reduce power loss, reduce friction and reduce pad temperature. Bearings are designed to the proper rotation direction rather than the "all-in-one" style which accommodates either CW or CCW rotation. This feature means that performance is assured according to design tolerances rather than on averages.

Standard materials of construction of pad body are low carbon steel with high tin content babbitt face, although material selection can be engineered to meet unusual applications.

The low-profile equalizing LEG SlimLine utilizes a distinctive raised "button" on the back of the pad to allow full 360º pivot, rather than the more familiar strip which allows pad tilt in only one direction. Pad buttons are made of carbon tool steel, heat treated to 52 to 57 Rockwell C to ensure no flattening of the sphere. Kingsbury tests indicate that this feature lowers the spread of temperatures from pad to pad.

Leveling Plates

Leveling plates are built in to the carrier ring assembly, to allow even distribution of load on each pad surface. The unique design of Kingsbury's low-profile leveling plates permits installation of the bearing in an extremely shallow envelope, allowing for retrofits in spaces where only a non-equalizing bearing could fit previously.



Carrier Rings

Carrier rings are constructed to exacting ISO tolerances and are normally provided in halves to allow simple installation in tough-to-reach applications. Standard material of construction is low carbon steel.

Pad Retention

Pads are held in place by a retaining fastener which can be removed easily to facilitate service or replacement.

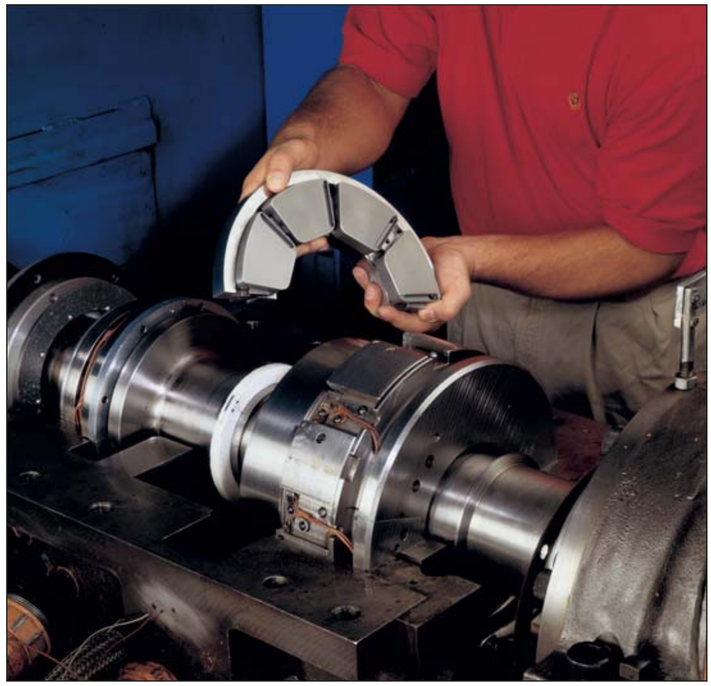
Lubrication

Lubrication ports from the carrier ring provide oil directly to the bearing pads, through individual oil feed tubes, to ensure even pressure and distribution. The oil feed tubes are designed so that the pad is free to pivot. This ensures that all oil is fed directly to the leading edge of the pad face.

BEARING HOUSING REQUIREMENTS

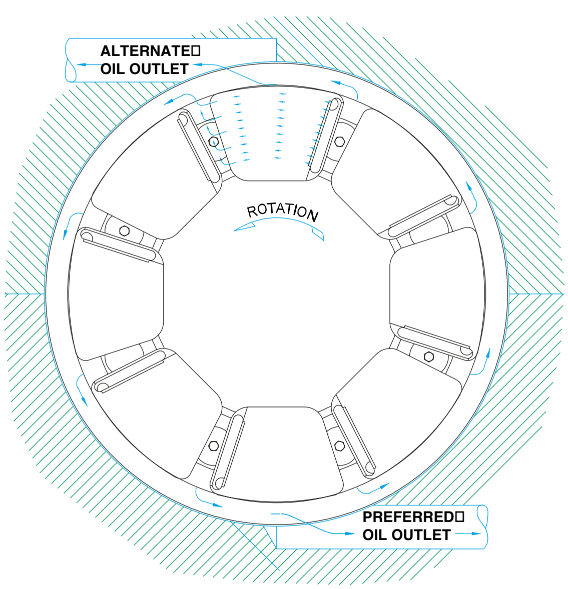
The bearing housing requirements for the LEG SlimLine bearing are similar to those of standard thrust bearings. The use of oil seals is not required since the inlet oil is confined to passages within the carrier ring assembly. Fresh oil enters the bearing through an annulus located at the outside diameter of the carrier ring. The discharge space should be large enough to minimize contact between the discharged oil and the rotating collar. The discharge oil outlet should be amply sized so that oil can flow freely from the bearing cavity.

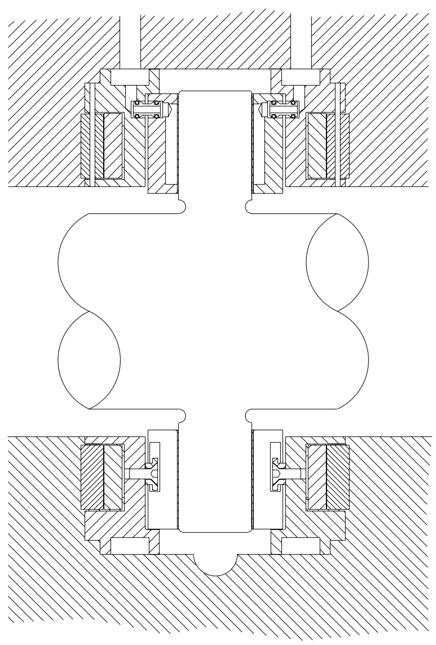
We recommend a tangential discharge opening, equal in diameter to 80% of the recommended collar thickness. If possible, the discharge outlet should be located in the bottom of the bearing housing. Alternately, it should be located tangential to collar rotation.



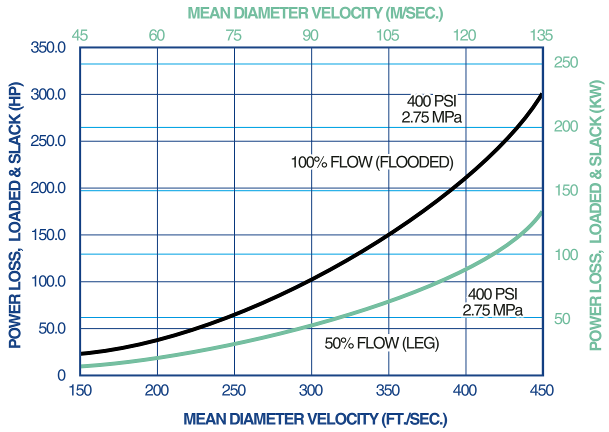
SlimLine's split-ring design simplifies installation.

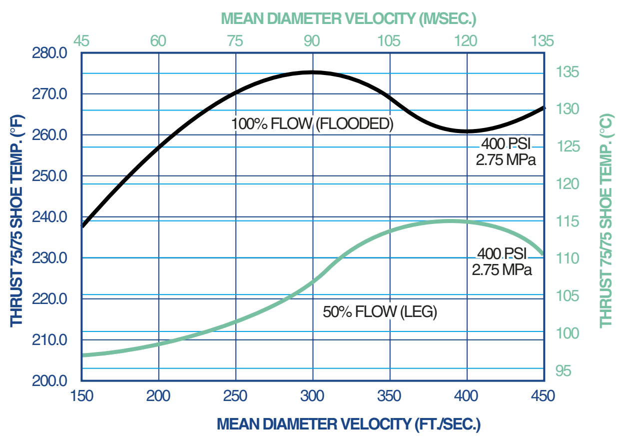
OIL DISCHARGE CONFIGURATION

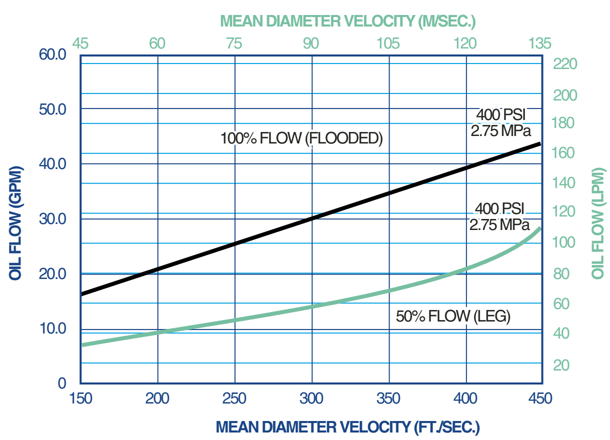




*Note:
Size inlet orifices for required oil flow at 0.5 atmosphere pressure.







DESIGNED TO OUTPERFORM FLOODED AND SPRAY FEED BEARING TECHNOLOGY

The LEG SlimLine's bearing design has proven itself through exhaustive testing and field research to represent the ultimate in directed lubrication technology. Yet the design concept is remarkably — and elegantly — simple.

The bearing pads and carrier ring are constructed so that cool undiluted inlet oil flows from the leading edge groove in the bearing pad directly into the oil film. The cool oil in the oil film wedge insulates the babbitt face from the hot oil carryover that adheres to the rotating collar.

In contrast to the LEG SlimLine bearing, the oil for spray-fed bearings is injected not directly onto the bearing surfaces but between them. This can result in uneven bearing lubrication and the need to supply impractically high pressure to get true effective scouring of the hot oil carryover adhering to the thrust collar. There is also a tendency of the small jet holes to clog with foreign material, further hampering distribution. Greater friction, higher operating temperatures and more power loss are the ultimate results.

With the LEG, friction power loss is lower than both flooded and spray feed bearings due to the reduced oil flow. The flow of cool oil over the leading edge lowers pad surface temperatures, increasing the SlimLine's capacity.

The resulting performance improvements are shown in these graphs.

BEARING SELECTION

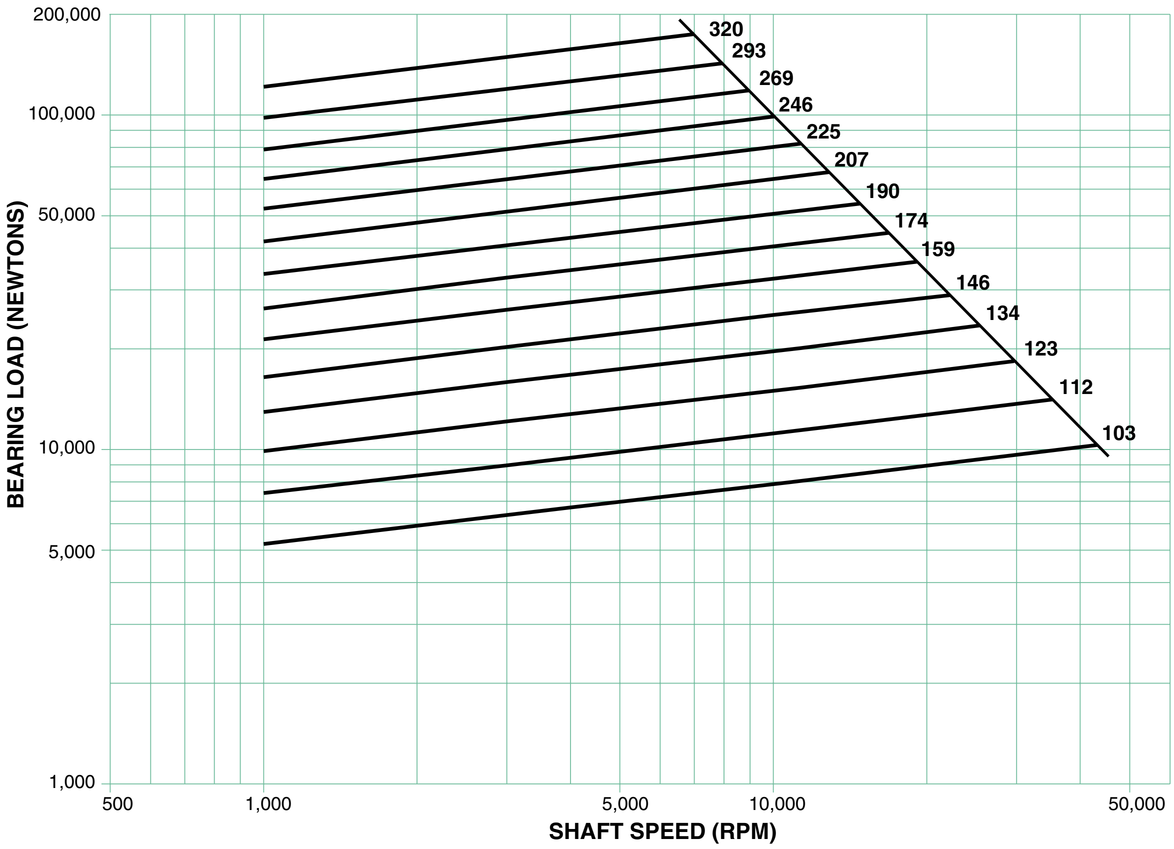
Thrust load, shaft RPM, oil viscosity and shaft diameter through the bearing determine the bearing size to be selected.

Size the bearing for normal load and speed when transient load and speed are within 20% of normal conditions. If transients exceed 120% of normal, please consult our Engineering Department for specific recommendations.

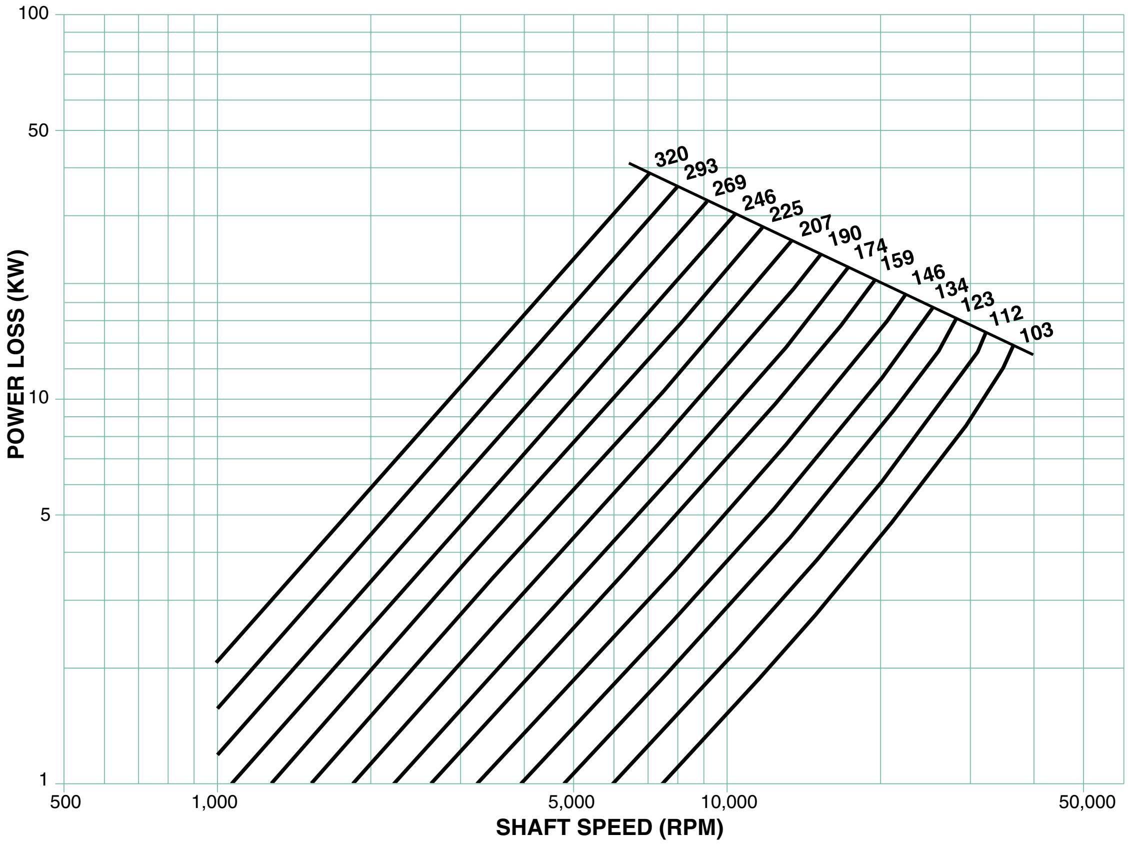
Friction losses are based on recommended flow rates and an evacuated drain cavity. To calculate friction losses for double element bearings, add 10% to the values in these graphs to accommodate the slack-side bearing.

To calculate lubricant supply for double element bearings, add 20% to the values in these graphs.

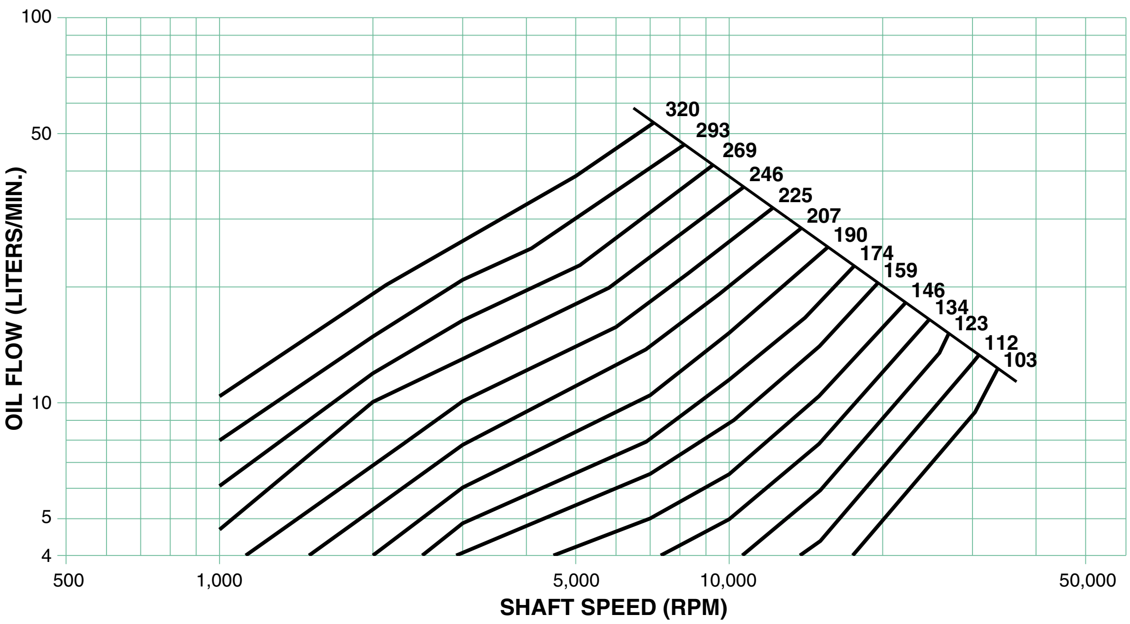
RATED LOAD FOR 6-PAD LEG BEARINGS



FRICTIONAL LOSS FOR SINGLE ELEMENT 6-PAD LEG BEARINGS



RECOMMENDED LUBRICANT SUPPLY FOR SINGLE ELEMENT 6-PAD LEG BEARINGS



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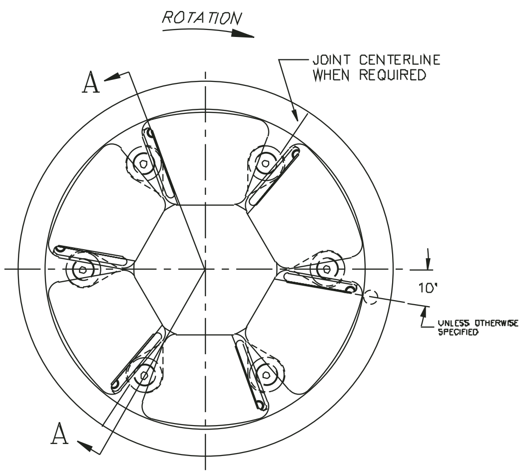

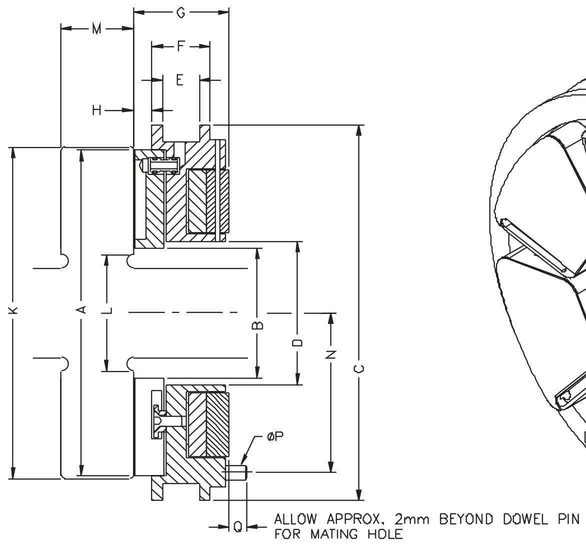

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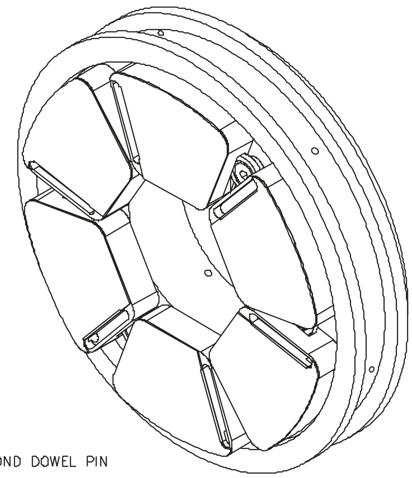
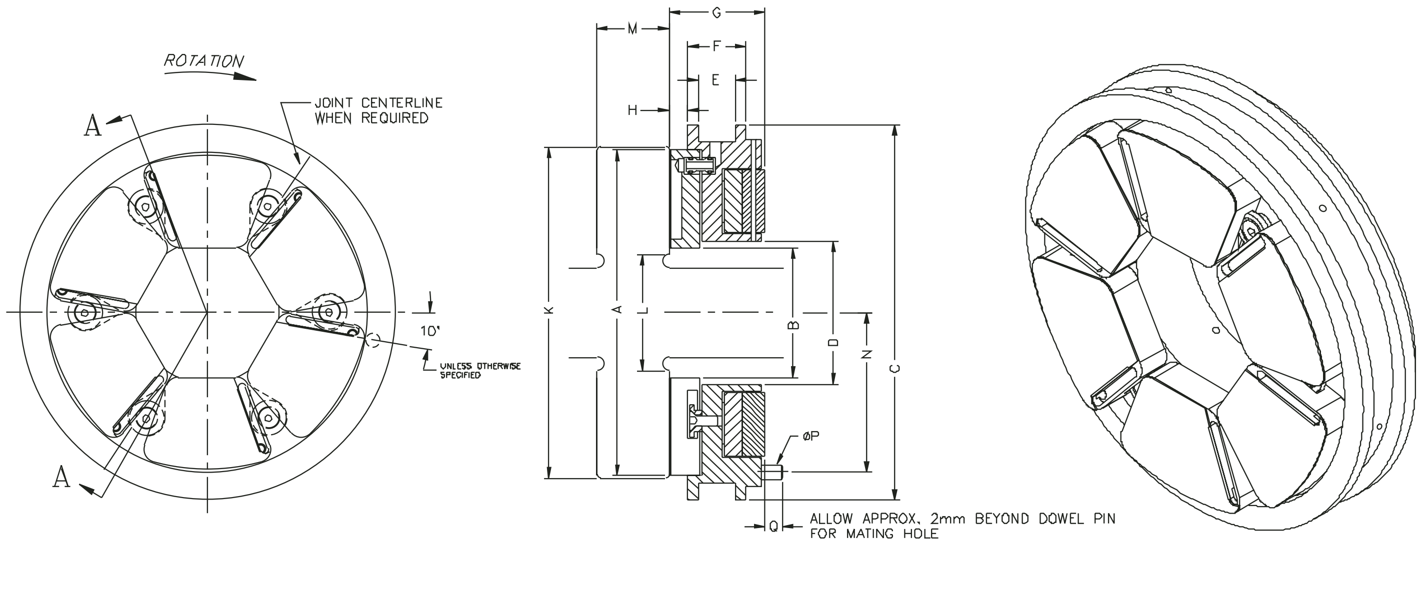


BEARING SERIES "6" PAD			ALL DIMENSIONS ARE IN MM					
Pad Series	Thrust Pad		Thrust Surface Sq. MM	Base Ring				
	Dia "A"	Dia "B"		Dia "C" Bearing	Dia "C" Housing	Dia "D"	Dia "E"	Dim "F"
103	92	38.4	3858	107.91/107.88	107.99/107.95	44	9.0	15.0
112	100	41.7	4615	115.85/115.82	115.93/115.89	49	10.0	17.0
123	110	46.2	5449	126.96/126.92	127.04/127.00	54	10.5	17.5
134	119	49.3	6634	139.66/139.62	139.74/139.70	59	12.5	20.5
146	130	53.8	7834	147.60/147.56	147.68/147.64	63	13.5	21.5
159	143	59.9	9641	165.06/165.02	165.14/165.10	70	16.0	25.0
174	155	64.3	11390	179.35/179.31	179.43/179.39	76	17.0	27.0
190	168	69.6	14124	193.63/193.58	193.73/193.68	83	19.0	29.0
207	184	76.5	16897	209.50/209.45	209.60/209.55	89	20.0	32.0
225	200	81.0	19730	228.55/228.50	228.65/228.60	98	22.0	34.0
246	219	90.4	23751	247.60/247.55	247.70/247.65	108	23.0	37.0
269	240	99.8	27879	266.64/266.59	266.75/266.70	117	26.0	40.0
293	261	108.2	33461	292.04/291.99	292.15/292.10	129	26.0	42.0
320	286	119.1	39622	317.44/317.38	317.56/317.50	140	28.0	46.0



SECTION A–A

BEARING SERIES "6" PAD **ALL DIMENSIONS ARE IN MM**

Pad Series	Thickness		Collar			Anti Rotation Dowel			Total End Play	Approx. Weight kg
	Dim "G"	Dim "H"	Dia "K" O.D.	Dia "L" Undercut	Dim "M" Width	Rad "N" Dowel P.C.	Dia "P" Dowel	Dim "Q" Dowel Out		
103	25.5	5.50	95	35	17	44.0	6	10.0	0.30	0.97
112	28.0	6.00	105	38	19	50.0	6	10.0	0.30	1.05
123	30.0	6.25	113	43	21	55.0	6	10.0	0.30	1.40
134	34.0	7.25	122	46	22	58.5	8	10.0	0.35	2.02
146	36.0	7.25	134	51	25	63.5	8	10.0	0.35	2.51
159	41.0	8.75	146	56	27	71.5	8	10.0	0.35	3.39
174	43.0	9.00	159	61	30	77.5	10	10.0	0.40	4.16
190	46.0	9.00	171	66	32	82.5	10	12.0	0.40	5.60
207	52.0	11.00	189	72	35	90.0	10	12.0	0.40	6.67
225	56.0	11.00	203	78	38	98.0	12	14.0	0.50	9.39
246	61.0	12.75	224	87	43	107.5	12	14.0	0.50	12.18
269	65.0	12.75	243	96	48	115.5	16	14.0	0.50	14.54
293	68.0	13.00	265	104	53	125.5	16	15.0	0.50	19.58
320	76.0	14.50	289	116	56	139.0	16	15.0	0.60	25.26

BEARING SELECTION

Thrust load, shaft RPM, oil viscosity and shaft diameter through the bearing determine the bearing size to be selected.

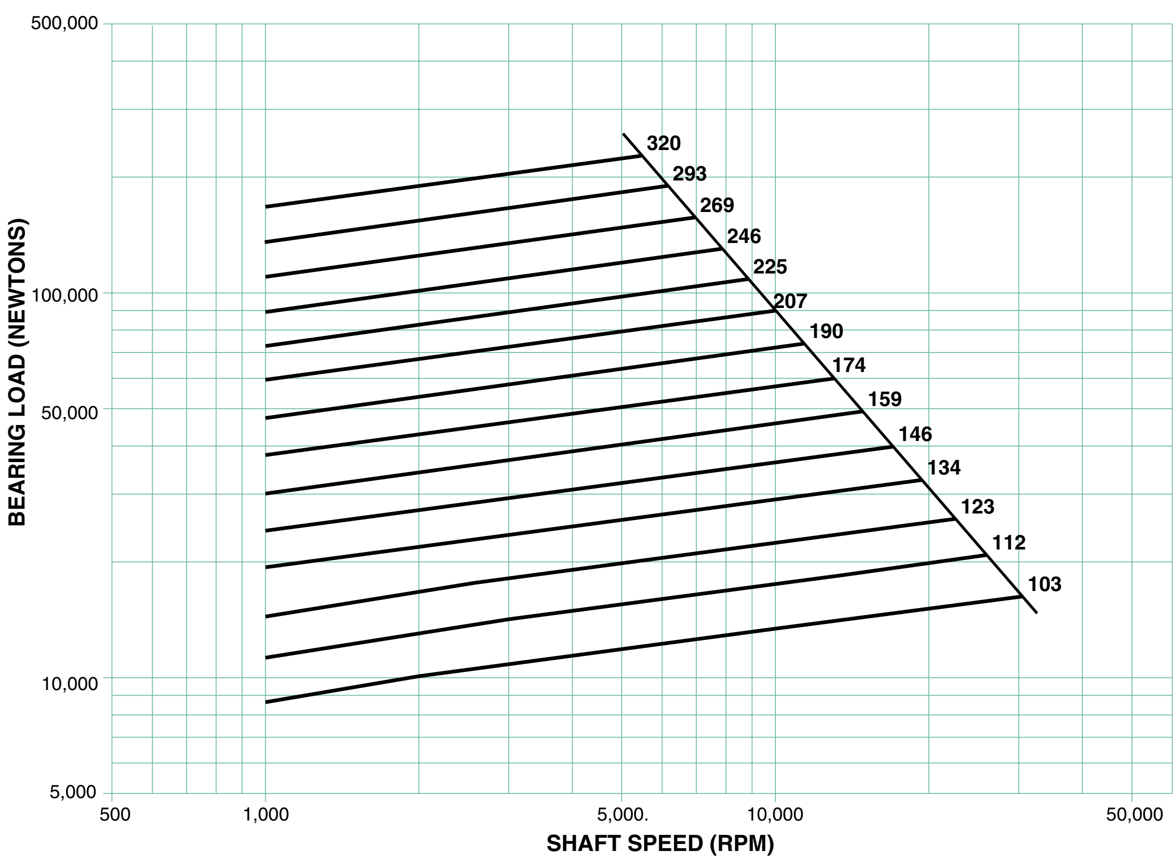
Size the bearing for normal load and speed when transient load and speed are within 20% of normal conditions. If transients exceed 120% of normal, please consult our Engineering Department for specific recommendations.

Friction losses are based on recommended flow rates and an evacuated drain cavity. To calculate friction losses for double element bearings, add 10% to the values in these graphs to accommodate the slack-side bearing.

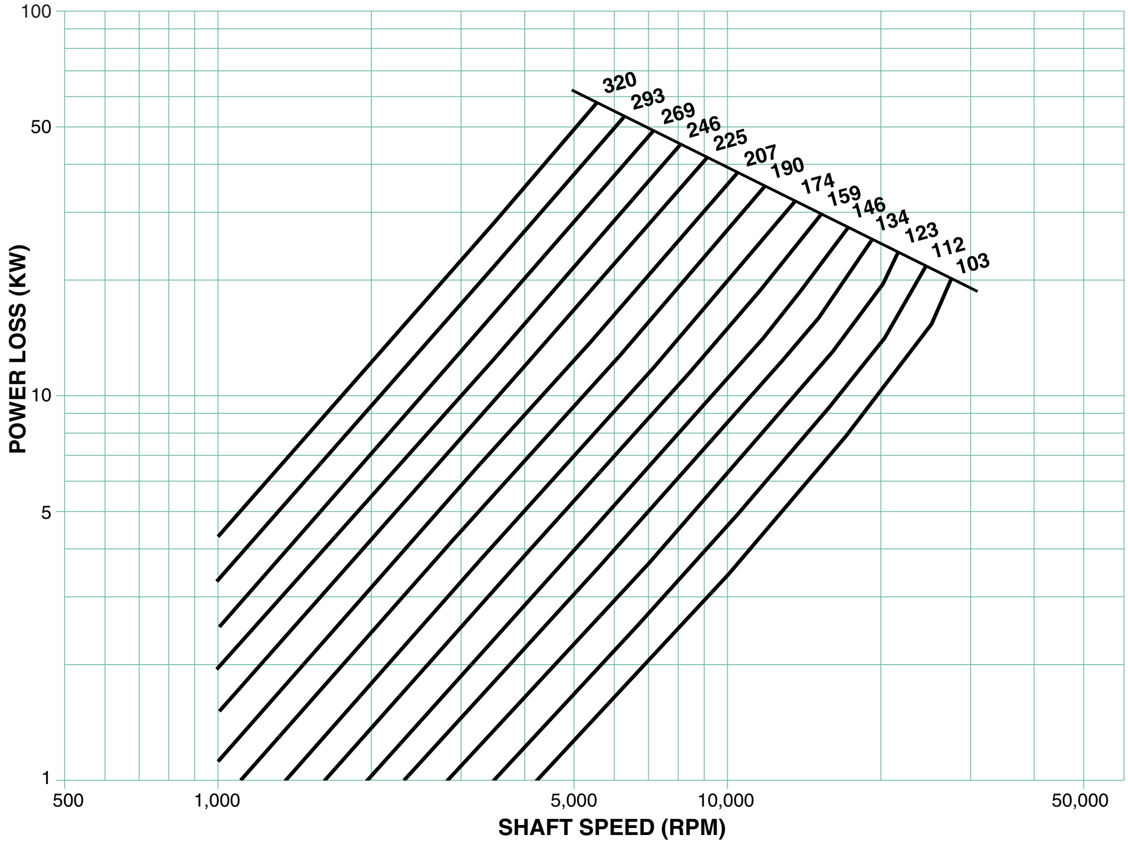
To calculate lubricant supply for double element bearings, add 20% to the values in these graphs.

All curves are based on an oil viscosity of ISO VG32, with an inlet oil temperature of 50° C. We recommend ISO VG32 oil viscosity for moderate through high speed applications. For other oil viscosities, consult our Engineering Department for assistance in bearing selection, frictional losses and oil flow requirements.

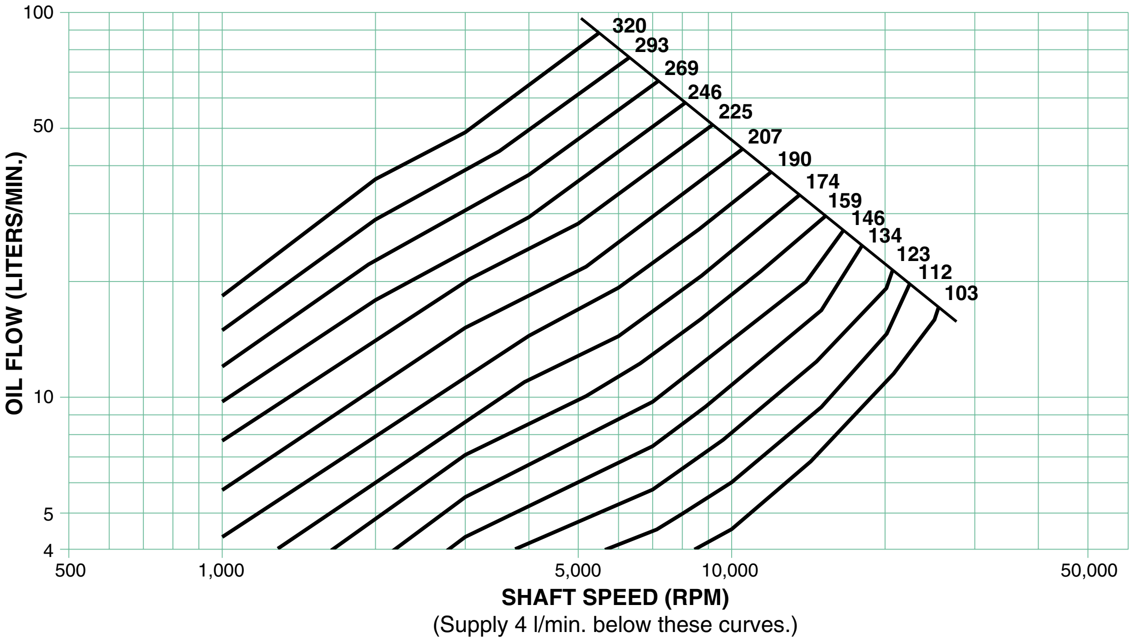
RATED LOAD FOR 8-PAD LEG BEARINGS



FRICTIONAL LOSS FOR SINGLE ELEMENT 8-PAD LEG BEARINGS



RECOMMENDED LUBRICANT SUPPLY FOR SINGLE ELEMENT 8-PAD LEG BEARINGS



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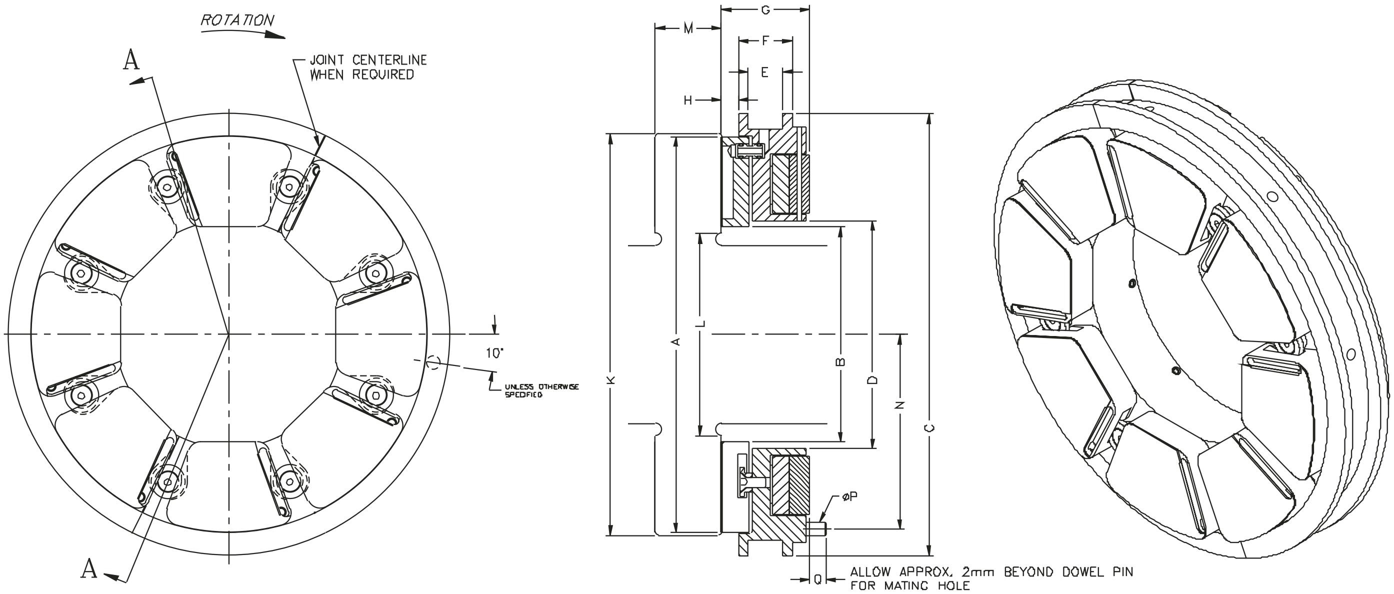
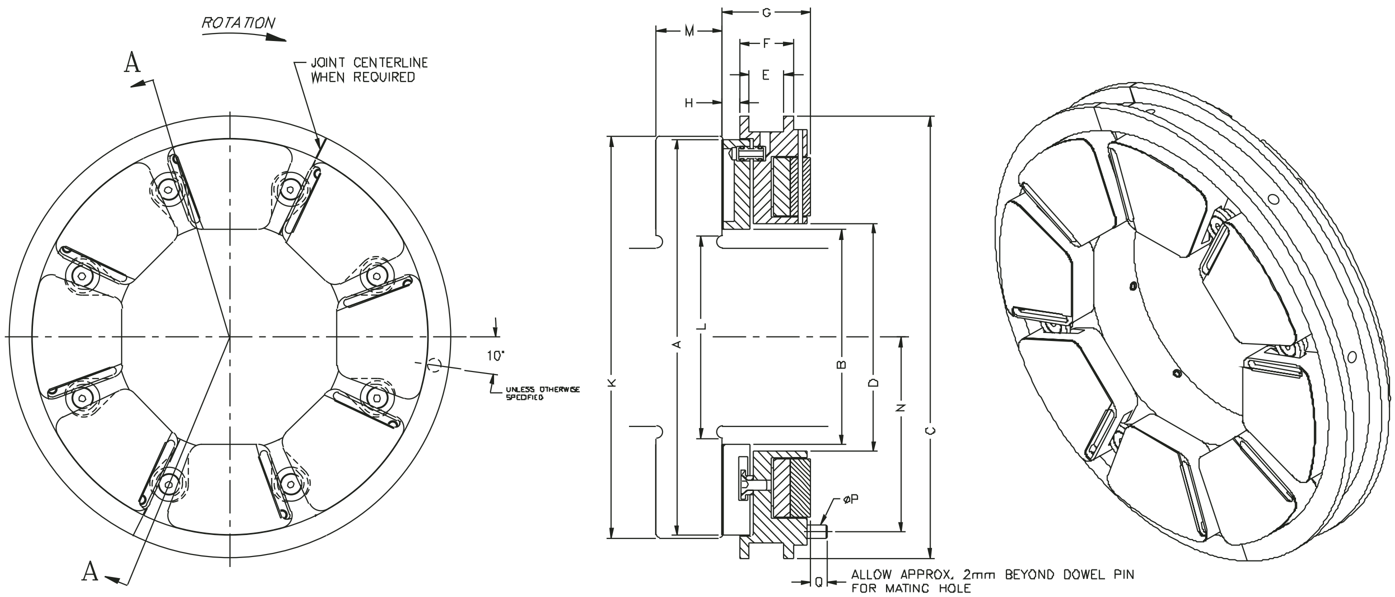


SECTION A-A

BEARING SERIES "8" PAD — **ALL DIMENSIONS ARE IN MM**

Pad Series	Thrust Pad		Thrust Surface Sq. MM	Base Ring				
	Dia "A"	Dia "B"		Dia "C" Bearing	Dia "C" Housing	Dia "D"	Dia "E"	Dim "F"
103	114	61.7	5144	130.17/130.13	130.25/130.21	63	9.0	15.0
112	124	66.5	6153	139.69/139.65	139.77/139.73	69	10.0	17.0
123	137	74.4	7266	152.39/152.35	152.47/152.43	78	10.5	17.5
134	149	81.0	8845	168.27/168.23	168.35/168.31	85	12.5	20.5
146	162	87.6	10445	180.95/180.90	181.04/181.00	92	13.5	21.5
159	176	95.3	12855	196.84/196.79	196.93/196.89	100	16.0	25.0
174	192	103.6	15187	215.89/215.84	215.98/215.94	109	17.0	27.0
190	210	112.8	18831	234.94/234.89	235.03/234.99	119	19.0	29.0
207	229	123.2	22529	253.98/253.93	254.10/254.04	130	20.0	32.0
225	251	136.7	26306	279.38/279.33	279.50/279.44	144	22.0	34.0
246	273	147.6	31668	301.61/301.56	301.73/301.67	157	23.0	37.0
269	297	160.0	37172	323.83/323.78	323.95/323.89	169	26.0	40.0
293	324	174.8	44614	355.58/355.53	355.70/355.64	182	26.0	42.0
320	354	191.0	52829	384.16/384.11	384.28/384.22	202	28.0	46.0



SECTION A-A

BEARING SERIES "8" PAD — ALL DIMENSIONS ARE IN MM

Pad Series	Thickness		Collar			Anti Rotation Dowel			Total End Play	Approx. Weight kg
	Dim "G"	Dim "H"	Dia "K" O.D.	Dia "L" Undercut	Dim "M" Width	Rad "N" Dowel P.C.	Dia "P" Dowel	Dim "Q" Dowel Out		
103	25.5	5.50	117	59	17	57.0	6	10.0	0.30	1.26
112	28.0	6.00	127	64	19	61.0	6	10.0	0.30	1.52
123	30.0	6.25	140	70	21	67.5	6	10.0	0.30	1.78
134	34.0	7.25	152	76	22	73.0	8	10.0	0.35	2.63
146	36.0	7.25	165	84	25	79.5	8	10.0	0.35	3.32
159	41.0	8.75	179	92	27	86.0	8	10.0	0.35	4.30
174	43.0	9.00	195	100	30	94.0	10	10.0	0.40	5.36
190	46.0	9.00	213	110	32	104.0	10	12.0	0.40	7.29
207	52.0	11.00	232	119	35	112.5	10	12.0	0.40	8.56
225	56.0	11.00	254	132	38	122.5	12	14.0	0.50	12.41
246	61.0	12.75	276	141	43	134.0	12	14.0	0.50	15.98
269	65.0	12.75	300	156	48	145.0	16	14.0	0.50	19.16
293	68.0	13.00	327	170	51	157.5	16	15.0	0.50	25.63
320	76.0	14.50	357	187	56	171.5	20	15.0	0.60	32.26

BEARING SELECTION

Thrust load, shaft RPM, oil viscosity and shaft diameter through the bearing determine the bearing size to be selected.

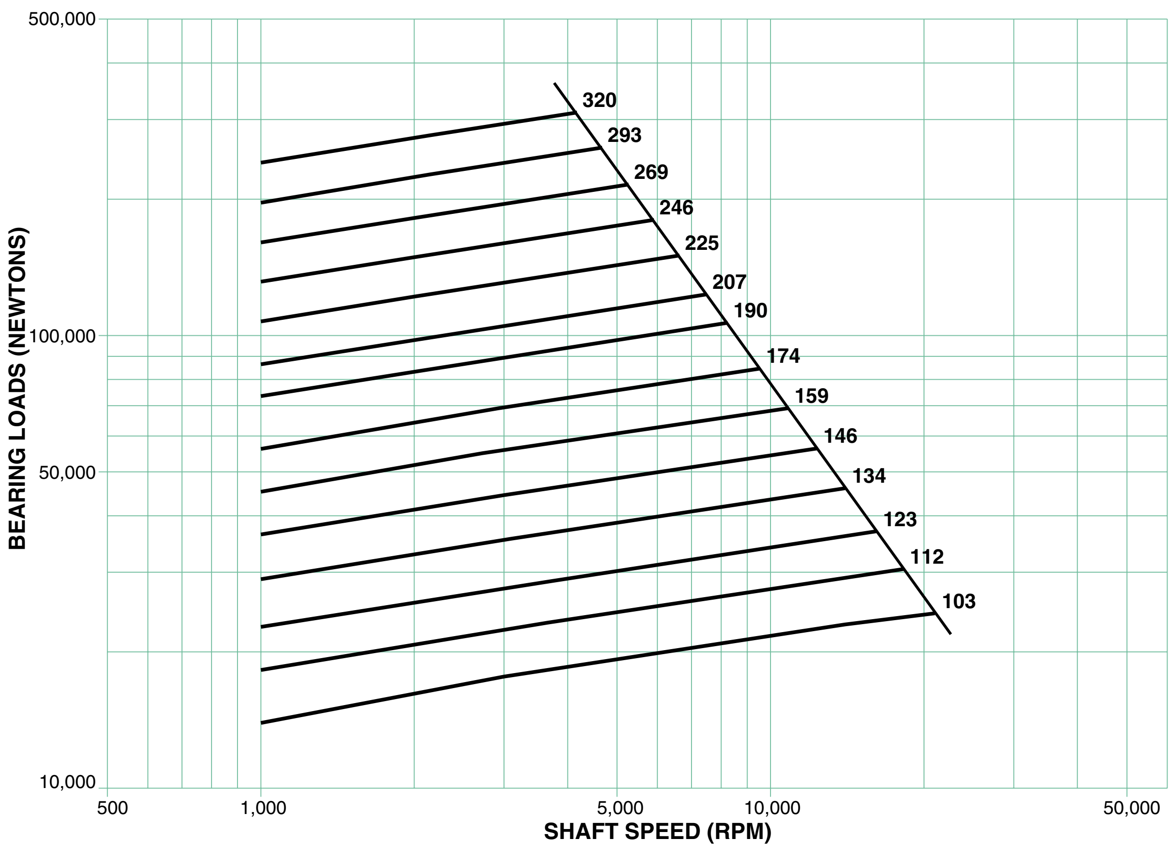
Size the bearing for normal load and speed when transient load and speed are within 20% of normal conditions. If transients exceed 120% of normal, please consult our Engineering Department for specific recommendations.

Friction losses are based on recommended flow rates and an evacuated drain cavity. To calculate friction losses for double element bearings, add 10% to the values in these graphs to accommodate the slack-side bearing.

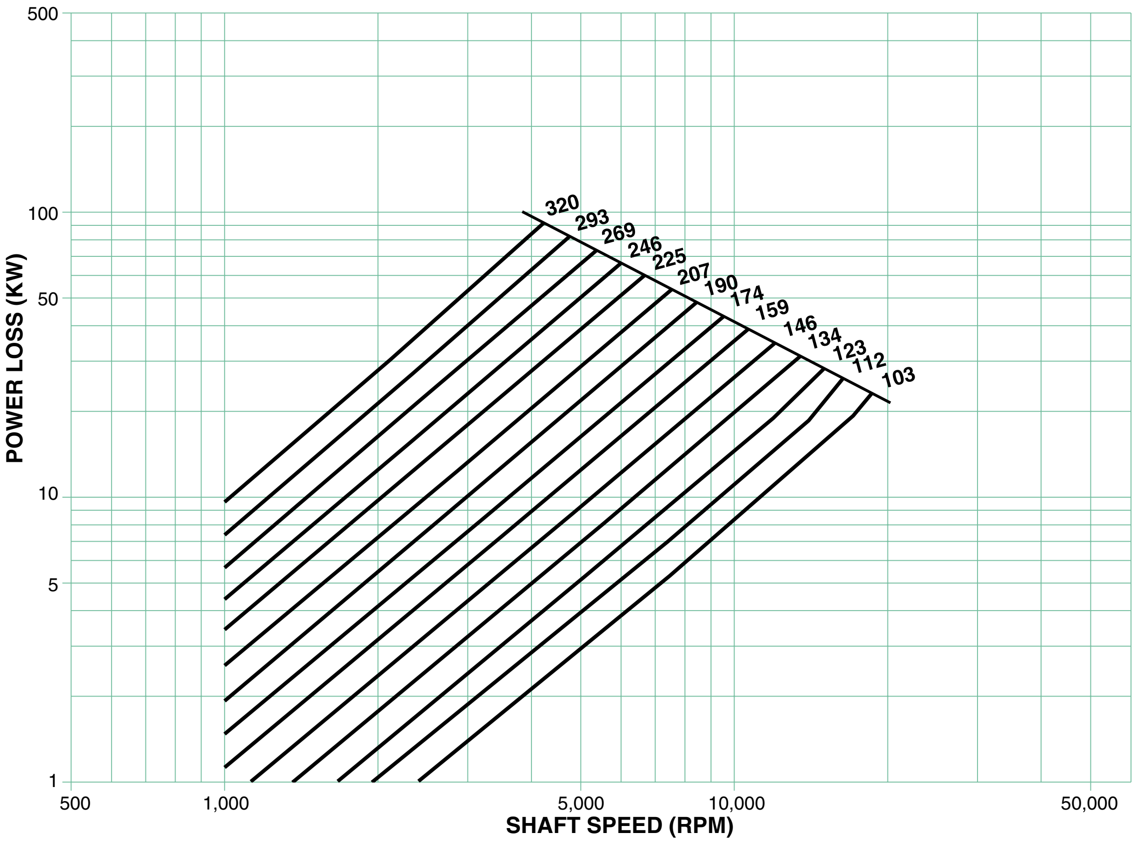
To calculate lubricant supply for double element bearings, add 20% to the values in these graphs.

All curves are based on an oil viscosity of ISO VG32, with an inlet oil temperature of 50° C. We recommend ISO VG32 oil viscosity for moderate through high speed applications. For other oil viscosities, consult our Engineering Department for assistance in bearing selection, frictional losses and oil flow requirements.

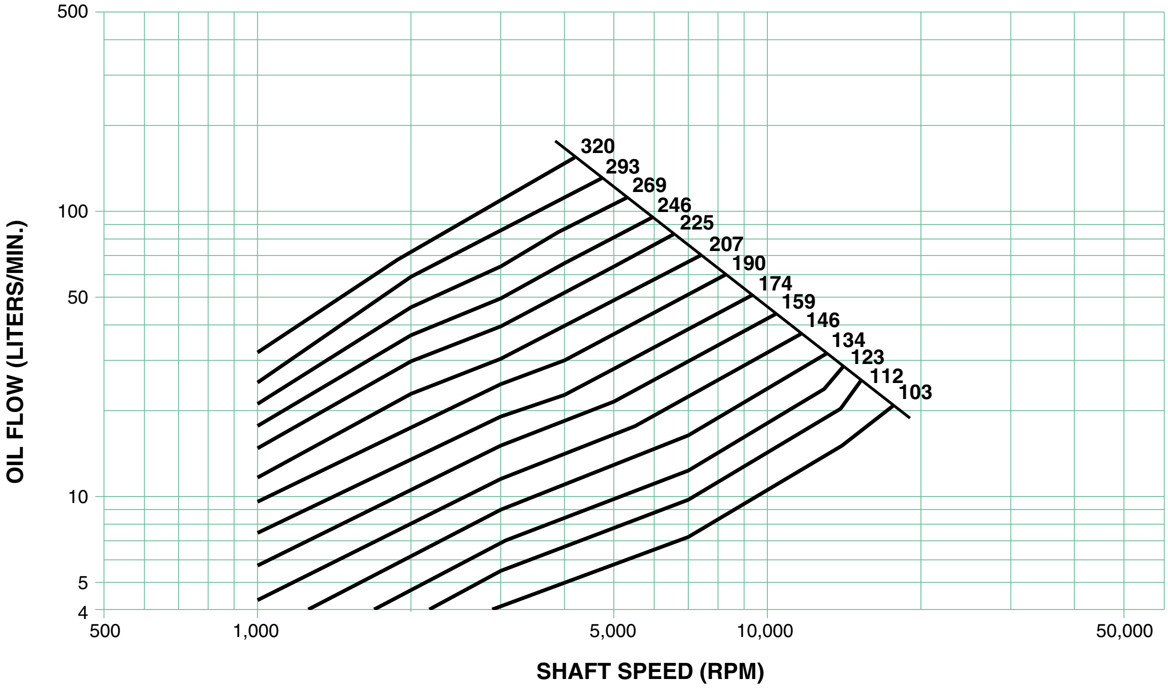
RATED LOAD FOR 11-PAD LEG BEARINGS



FRICTIONAL LOSS FOR SINGLE ELEMENT 11-PAD LEG BEARINGS



RECOMMENDED LUBRICANT SUPPLY FOR SINGLE ELEMENT 11-PAD LEG BEARINGS



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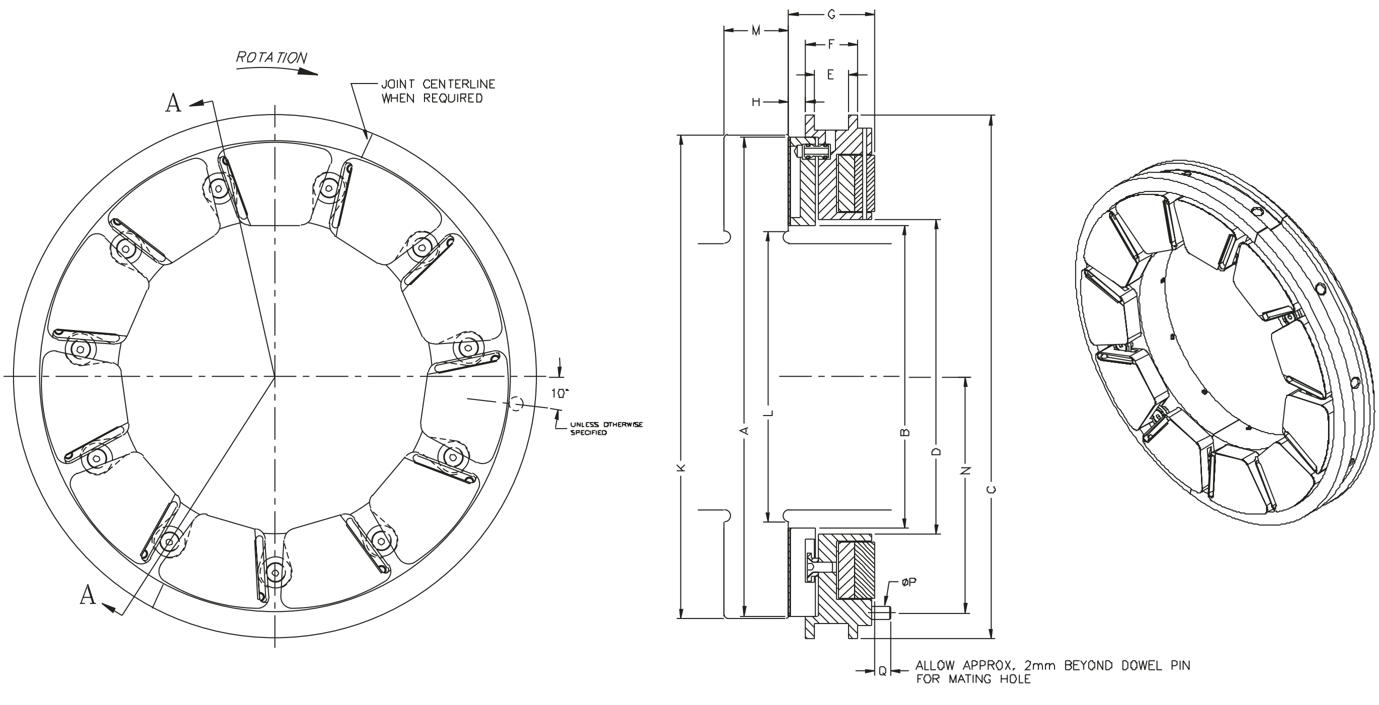
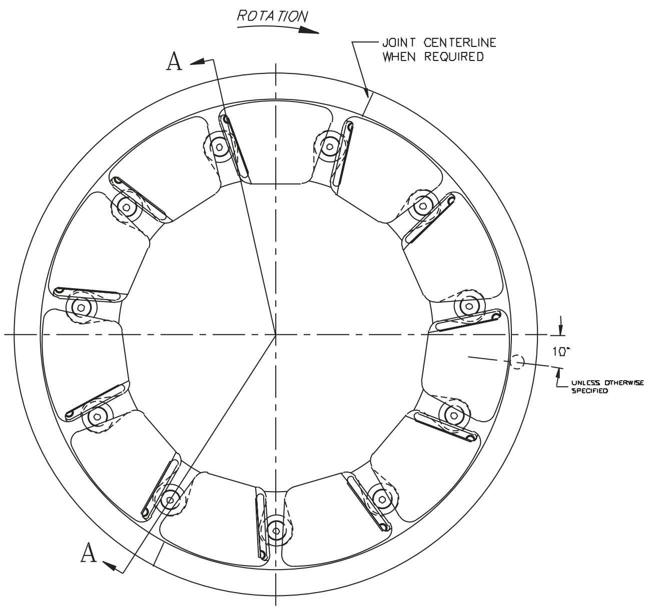
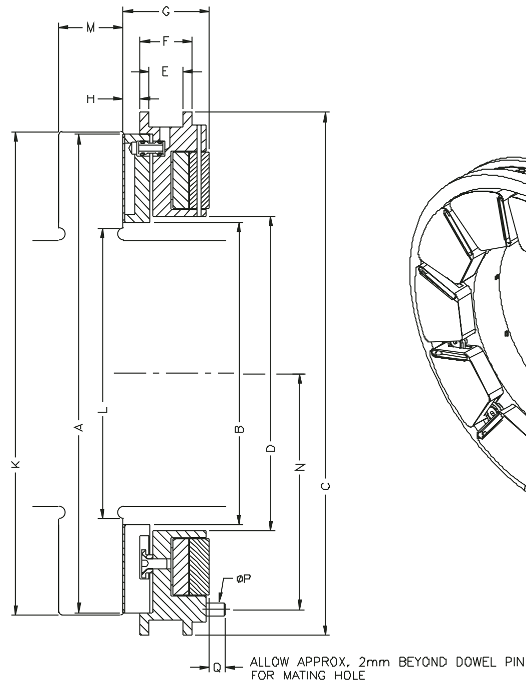


SECTION A-A

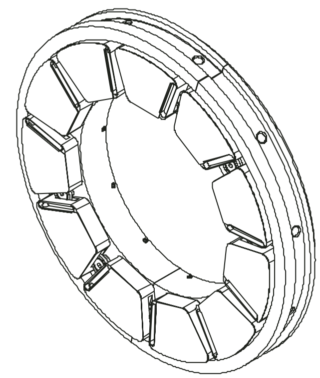
BEARING SERIES "11" PAD **ALL DIMENSIONS ARE IN MM**

Pad Series	Thrust Pad		Thrust Surface Sq. MM	Base Ring				
	Dia "A"	Dia "B"		Dia "C" Bearing	Dia "C" Housing	Dia "D"	Dia "E"	Dim "F"
103	148	95.2	7073	168.27/168.23	168.35/168.31	98	9.0	15.0
112	162	105.1	8460	180.97/180.92	181.06/181.02	109	10.0	17.0
123	175	112.8	9990	196.84/196.79	196.93/196.89	117	10.5	17.5
134	191	122.4	12162	212.72/212.67	212.81/212.77	128	12.5	20.5
146	210	135.4	14362	234.94/234.89	235.03/234.99	141	13.5	21.5
159	229	147.8	17676	253.98/253.93	254.10/254.04	155	16.0	25.0
174	249	160.8	20882	279.38/279.33	279.50/279.44	168	17.0	27.0
190	271	175.0	25893	301.61/301.56	301.73/301.67	180	19.0	29.0
207	295	190.2	30977	323.83/323.78	323.95/323.89	198	20.0	32.0
225	324	209.5	36171	355.58/355.53	355.70/355.64	220	22.0	34.0
246	352	227.6	43543	384.16/384.11	384.28/384.22	240	23.0	37.0
269	384	247.6	51111	415.91/415.85	416.04/415.98	260	26.0	40.0
293	419	270.2	61344	454.01/453.95	454.14/454.08	282	26.0	42.0
320	457	294.6	72640	495.28/495.22	495.41/495.35	308	28.0	46.0





SECTION A-A



BEARING SERIES "11" PAD **ALL DIMENSIONS ARE IN MM**

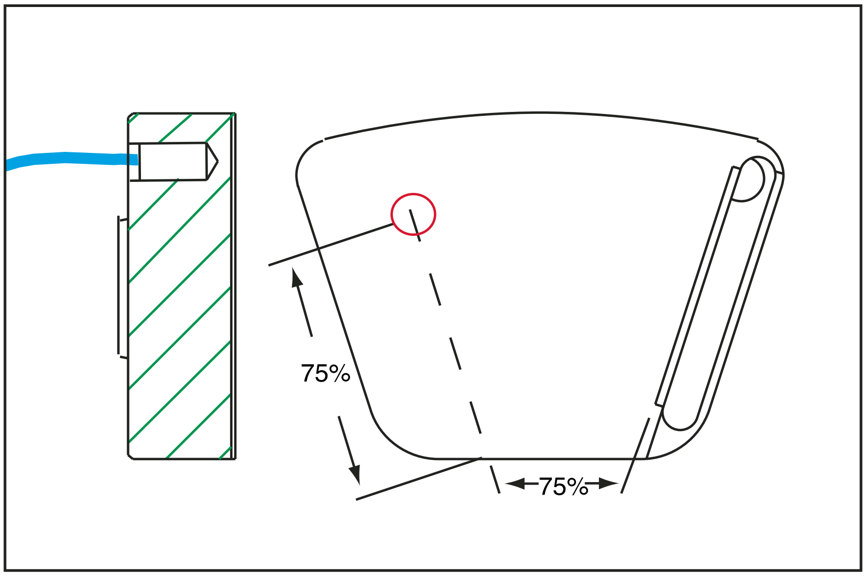
Pad Series	Thickness		Collar			Anti Rotation Dowel			Total End Play	Approx. Weight kg
	Dim "G"	Dim "H"	Dia "K" O.D.	Dia "L" Undercut	Dim "M" Width	Rad "N" Dowel P.C.	Dia "P" Dowel	Dim "Q" Dowel Out		
103	25.5	5.50	151	92	17	75.0	6	10.0	0.30	1.84
112	28.0	6.00	165	102	19	81.0	6	10.0	0.30	2.22
123	30.0	6.25	178	110	21	88.0	8	10.0	0.30	2.70
134	34.0	7.25	194	119	22	95.0	8	10.0	0.35	3.67
146	36.0	7.25	213	132	25	105.5	10	10.0	0.35	4.97
159	41.0	8.75	232	144	27	114.0	10	10.0	0.35	6.21
174	43.0	9.00	252	157	30	125.0	10	10.0	0.40	7.94
190	46.0	9.00	275	171	32	136.0	10	12.0	0.40	10.54
207	52.0	11.00	298	187	35	147.0	12	12.0	0.40	12.18
225	56.0	11.00	327	206	38	161.0	16	14.0	0.50	17.80
246	61.0	12.75	356	224	43	176.0	16	14.0	0.50	22.58
269	65.0	12.75	391	241	48	190.0	16	14.0	0.50	27.15
293	68.0	13.00	425	264	51	207.0	20	15.0	0.50	36.64
320	76.0	14.50	464	289	56	225.0	20	15.0	0.60	46.47

INSTRUMENTATION

SlimLine bearings can be instrumented by arranging lead wires through the back of the carrier ring (see illustration).

Temperature measurement

Changes in load, shaft speed, oil flow, oil inlet temperature, or bearing surface finish can affect bearing surface temperatures. At excessively high temperatures, the pad babbitt is subject to wiping which causes bearing failure. For critical applications, we recommend using pads with built-in temperature sensors so you can see actual metal temperatures under all operating conditions. Either thermocouples or resistance temperature detectors (RTDs) can be installed in contact with the babbitt or in the pad body near the pad body/babbitt interface. See drawing for recommended sensor location.



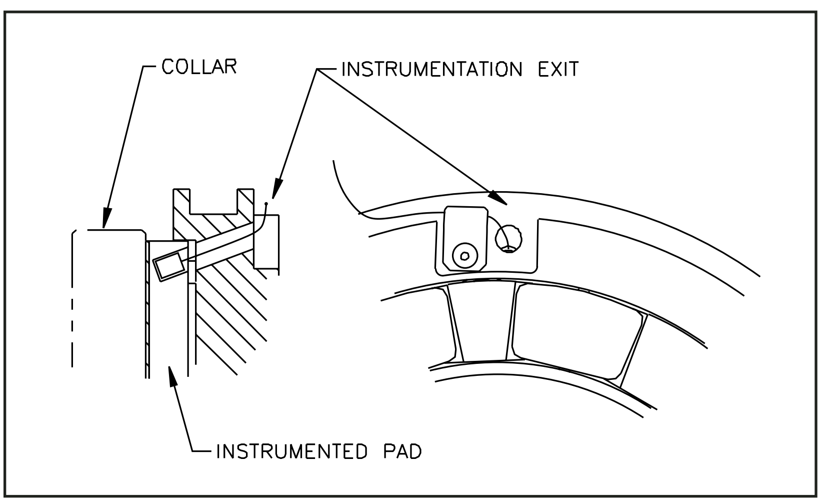
Recommended Sensor Location

BABBITT TEMPERATURE

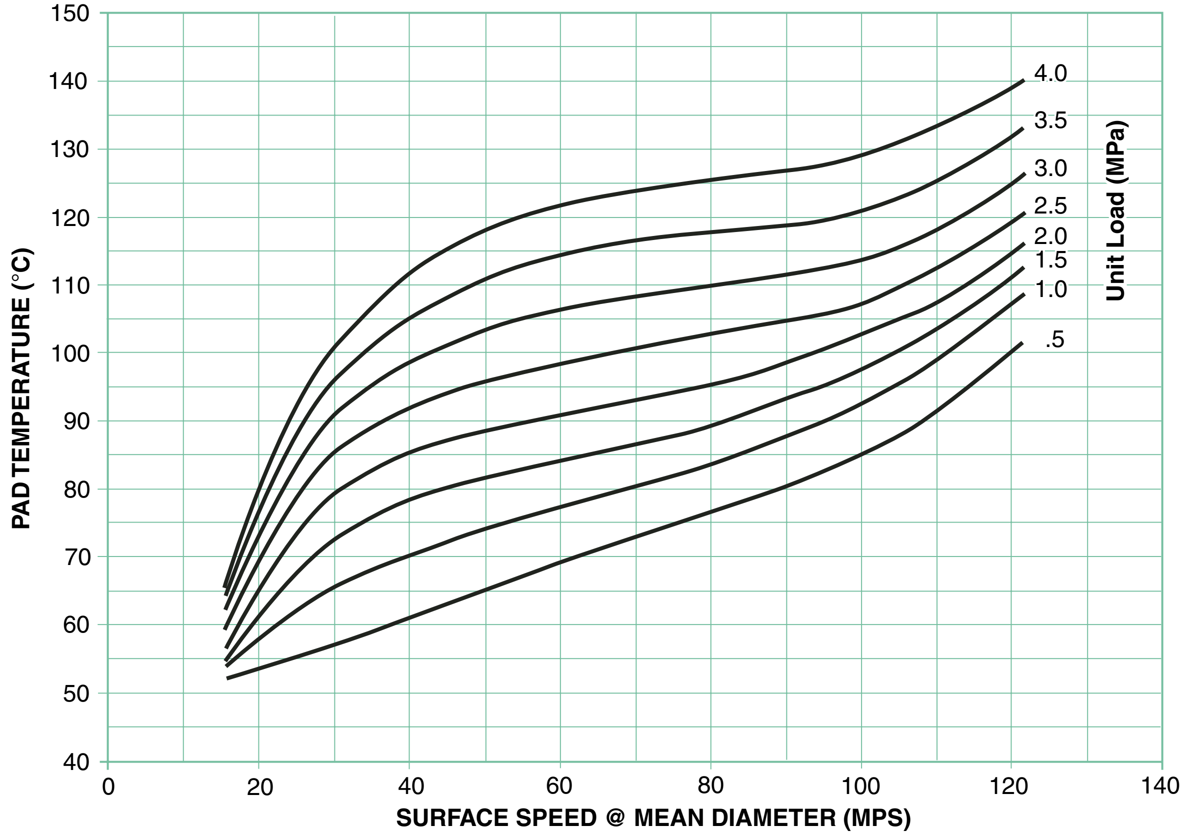
With the correct LEG thrust bearing selected, you may wish to estimate the babbitt temperature at operating conditions, particularly if:

- Bearing load exceeds 2.8 MPa
- Collar surface speed exceeds 76.2 m/s
- Inlet oil temperature exceeds 50° C
- User specifications limit maximum allowable temperature

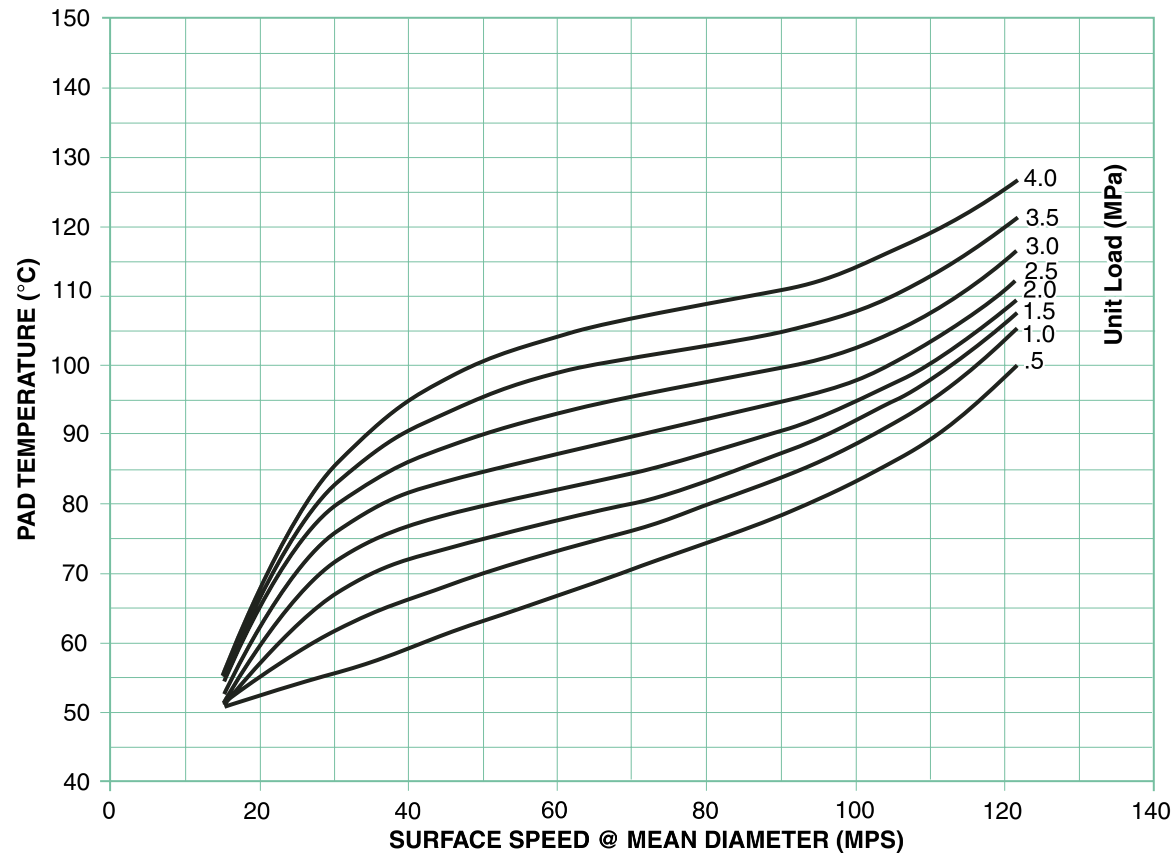
Please refer to the graphs on the next page to estimate the babbitt temperature at the recommended 75/75 position. If babbitt temperature exceeds bearing limitations of 130° C or user specifications (whichever is lower), you may be able to reduce it to a more acceptable level by substituting chrome-copper-backed shoes. Please contact our Engineering Department for additional suggestions.



75/75 PAD TEMPERATURE (STEEL)



75/75 PAD TEMPERATURE (CHROME-COPPER)



Temperatures are based on recommended oil, flow, and supply temperatures.
Unit load is load divided by bearing area.

NOTES ON SELECTING LEG THRUST BEARINGS

API Ratings

The thrust bearing ratings given in the charts comply with API specifications for thrust bearing selection, i.e., all loads listed are equal to or less than one half of the ultimate capacity.

Slack Side Load Capacity & Flow

Load capacity is related to shoe temperature which is influenced by oil flow. The rated loads listed in the charts are based on recommended flow values to the loaded bearing. In machines where load can reverse and apply full force on the normally slack bearing, an equal amount of oil flow is required to the "slack side."

Power loss varies with oil flow. The case of equal rated load capacity and flow to both bearing sides results in the highest power loss. If design loads are less than the bearing ratings, flow requirements can be lowered with a resulting reduction in power loss. To achieve the optimum reduction in power loss, loaded and slack flows can be sized proportionately for normal and reverse design loads.

Time is required for operating shoe temperatures to climb to steady state values. When the reverse load is of very short duration, or when there is little or no reverse load, slack side flows can be reduced to as low as 20% of rated values resulting in the lowest possible power loss and flow requirements.

Endplay

Endplay recommendations presented in this catalog are a generic guideline to cover a wide range of applications. Special cases such as very high speeds, extreme ambient conditions, external axial vibration, etc., may require special consideration and recommendations. Please contact your Kingsbury Sales Engineer for situations not addressed by this catalog.

Shock Loads

Thrust bearings contain several contact areas which allow pad pivot, equalizing and misalignment features. These features are conservatively designed for the rated loads listed in this catalog as well as usual momentary or adverse conditions that may be encountered in most machine operation. Special designs and parts are available for more severe requirements such as shock loads or earthquake design criteria. Contact your Kingsbury Sales Engineer to discuss these applications.

GENERAL INFORMATION ON LEG THRUST BEARINGS

Hydrodynamic Principle

Because of its adhesion, oil is dragged by the rotating member so as to form a wedge-shaped film between the bearing surfaces. Like a flooded bearing, the LEG is a hydrodynamic bearing and has the fluid film properties of a hydrodynamic bearing. The difference is in the lubrication method. In a flooded bearing, oil is provided to the rotating surface by flooding the space between pads. In an LEG bearing, cool oil is provided directly to the rotating surface at the entrance to the oil film.

LEG Catalog Curves

Power loss and pad temperature curves are provided to allow a quick, reasonably accurate estimation of loss and temperature for the various bearings available in this catalog. To accomplish this, curves have been reduced in quantity to average values for a variety of configurations. This results in a possible 5% variation which is a reasonably good estimate for design purposes. If your estimations fall too close to design limits, our engineering department can assist with your particular selection, application, and criteria.

Temperature Detector Location

The most accurate measurement of surface temperature is obtained with the detector installed in the babbitt. However, babbitt is a soft material and can deform over time under hydrodynamic film forces resulting in a dimple in the surface. The detector may read inaccurate values because of the local distortion and can be damaged by the forces. Unsupported babbitt is also subject to fatigue which can lead to more severe damage and eventual failure.

Such problems are prevented by installing the detector in the pad body assuring there is base metal above the detector hole to support the babbitt. There is only a small difference in temperature which we can relate to surface temperature and set alarm and trip appropriately to accommodate the slight change in depth. Considering the problems associated with installation in the babbitt, installation in the pad body provides a more effective level of protection and is recommended by Kingsbury.

Pressure And Flow Orifice

For flow control, Kingsbury recommends an upstream orifice in the line to each bearing (loaded thrust, slack thrust). If these are external to the housing, adjustments to flow can be made without disassembling and machining the bearings or bearing casings. Such adjustments may be required to optimize flow for bearing temperature or power loss, or to increase flow in cases of upgrades.

Orifice sizing is a straightforward procedure. The major pressure drops consist of the pressure drop through the upstream orifice and the drop through the bearing. The recommended flow for the bearing depends on operating conditions. For lower speeds, less flow is required and, since pressure is proportional to flow, less pressure is required at the bearing. The required pressure at the bearings ranges from .25 atmosphere for flows at the low speed end of the charts, to .5 atmosphere at mid range, to 1.0 atmosphere at the high speed end. Each upstream orifice can be sized to drop the system supply pressure to the pressure required at each bearing.

Alarm & Shutdown Limits For Temperature

Temperatures on the order of 160° C cause plastic flow of the babbitt. Maximum temperatures are conservatively limited to 135° C. Allowing 8° C for alarm and 15° C for trip settings, maximum operating babbitt temperature is 120° C. It is important to note that alarm and trip are set relative to normal design temperatures. Specifically, if the design temperature is 85° C, the trip should be set at 100° C, not 120° C.

In addition to the bearing, consideration has to be given to the temperature limitations of the lubricant. Consult the lubricant supplier for information on the lubricant's limitation.

Maximum Speeds

It is difficult to set a rule of thumb on maximum speed because of the many factors that affect the limits. The curves and charts listed in this catalog are purposely limited to conservative speeds. The bearings are suitable for higher speeds, but may require special consideration in regard to pad material, oil flow, flow paths, and housing configuration. Therefore, if your application exceeds the speeds shown in the charts, please contact us for assistance.

Optimized Offset

A 60% offset is designed as standard because it is suitable for most of the speeds and loads covered in this catalog. For other applications, or for special requirements, the offset can be optimized for the specific application.

In order to achieve the best performance from a bearing, it should be optimized for one direction of rotation. Significant gains in performance are realized by offsetting the pivot and using leading edge groove lubrication. Bearings designed this way, such as the LEG, will operate in reverse with approximately 60% of the load capacity of the forward direction depending on the speed. Since most reversals are temporary, the lower reverse load capacity is not usually a problem. Center pivot, bi-rotational bearings are typically instrumented with temperature detectors toward the trailing edge of the pad. This makes them unidirectional in the sense that they must be purchased, labeled, and installed for one direction. As long as the thrust bearing is going to be operated and instrumented for one direction, it is logical to optimize the design for that rotation, especially at high speeds.

Backing Material

Data is presented in the catalog for steel and chrome copper pads which are suitable for most applications. Other materials are available for special applications.

LEG JOURNAL BEARINGS

We have also applied our Leading Edge Groove technology to our pivoted pad journal bearings. LEG journal bearings use less oil than standard journal bearings, reducing friction power loss and oil system requirements. They also operate with significantly lower babbitt temperatures. For sizing details and technical information, please request Catalog LEG-1, or consult our Engineering Department.

Kingsbury LEG Journal Bearing

Combination LEG Thrust and LEG Journal Bearing