

Components **LEG**Thrust

Shoes

Kingsbury LEG bearing shoes are designed with offset pivots, 60% of the effective length of the shoe. Standard materials of construction of shoe body are low carbon steel with high tin content babbitt. Material selection can be engineered to meet unusual applications. Kingsbury utilizes a distinctive raised spherical support on the back of the shoe to allow full 360° pivot, rather than a raised strip which only allows shoe tilt in one direction. Shoe supports 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 allows self-aligning of the shoe which lowers the difference between shoe temperatures.



Base Ring

Made of structural steel plate or forged steel, the base ring holds the shoes and leveling plates in their operating positions. An oil inlet annulus, at the back of the base ring, distributes oil to axial holes through the base ring outer wall and into the oil feed tube.

Oil Feed Tube

The oil feed tube, connecting the base ring and shoe, is uniquely designed so that the shoe is free to pivot. This allows freedom of movement in the shoe and ensures that oil is fed directly to the shoe face.



Leveling Plate Assembly

The equalizing feature of the Kingsbury thrust bearing allows each shoe to carry an equal amount of the total thrust load. That is, the leveling plate feature reduces the chance of one shoe being more highly loaded than another shoe. The leveling plates working with the spherical shoe supports ensure that the thrust bearing face becomes perfectly aligned with the rotating thrust collar.

Shoe Retention

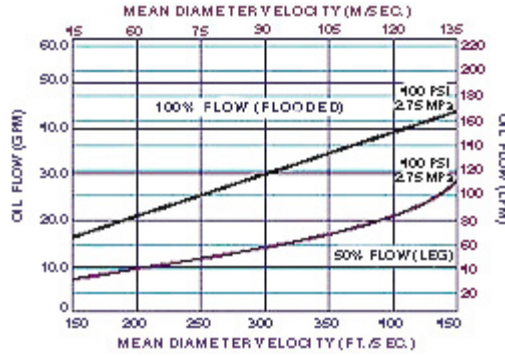
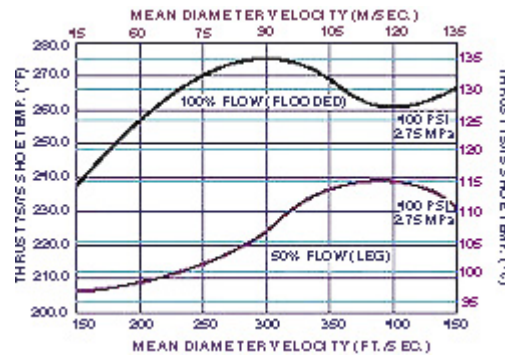
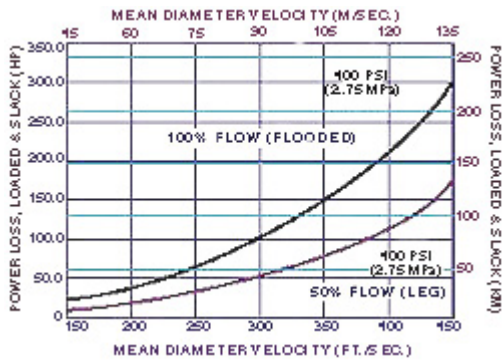
Shoes are retained to facilitate assembly.

LEG BEARINGS OUTPERFORM FLOODED AND OTHER DIRECTED LUBE TYPES

Kingsbury's LEG bearing design has proven itself through exhaustive testing and years of trouble-free operation to represent the ultimate in directed lubrication technology. Yet the design concept is remarkably simple. The bearing shoes and base ring are constructed so that cool undiluted inlet oil flows from the leading edge groove in the bearing shoe 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. Because of these features, LEG thrust bearings can:

- Reduce operating temperatures at the 75/75 location by 8 to 28° C, depending on load and shaft speed.
- Provide a load capacity increase of 15 to 35%.
- Operate at oil flow rates as much as 60% lower, with an accompanying reduction in power losses of 45%.

Power loss is lower than both flooded and spray feed bearings due to the elimination of parasitic losses. The flow of cool oil over the leading edge lowers shoe surface temperatures, increasing the LEG bearing's capacity. The resulting performance improvements are shown in these graphs.



How to Select an **LEG** Thrust Bearing

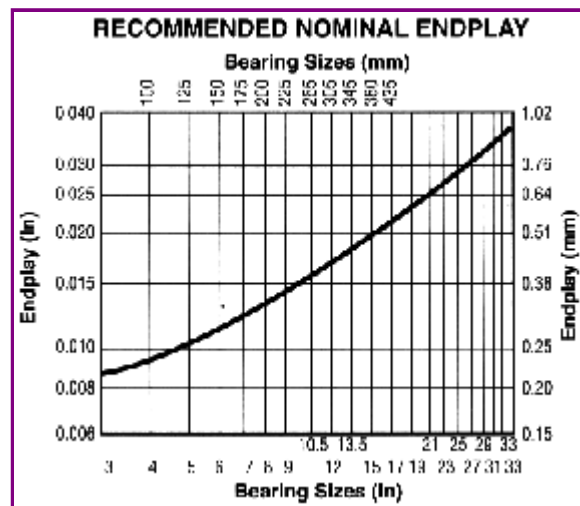
Thrust load, shaft RPM, oil viscosity and shaft diameter will determine the bearing size selected. Size the bearing for normal load and speed when transient load and speed are within 20% of normal conditions. If transients exceed 120% of normal, please consult our engineering department for specific recommendations. The selection curves for load capacity, friction power loss, and oil flow requirements in this site are divided into English and Metric groupings and are based on an oil viscosity of 150 SSU @ 100° F (ISO VG32), with an inlet oil temperature of 120° F (50° C). We recommend ISO VG32 oil viscosity for moderate and high speed applications. For other oil viscosities consult our engineering department for assistance in bearing selection.

Step-by-Step Sizing

1. Enter the load capacity curves, with the required bearing rated load and move horizontally along the corresponding rated load line until it intersects the vertical line representing the shaft RPM. The bearing size curve immediately above the intersection is the selected bearing size.
2. Next, find the selected bearing dimensions. Check to see if your shaft diameter is smaller than the maximum shaft diameter listed for the selected bearing.
3. Enter the power loss and oil flow curves, with the selected bearing size and the normal RPM to determine the power loss and oil flow.
4. Using the shoe temperature curves, determine that shoe temperatures are within acceptable limits. If you need help selecting a bearing, contact Kingsbury's engineering department.

Bearing Clearance (Endplay)

A certain amount of clearance is required for proper bearing operation. Clearance is typically adjusted by use of filler plates and/or shims during installation. The accompanying graph provides recommended values.



Ring Illustration

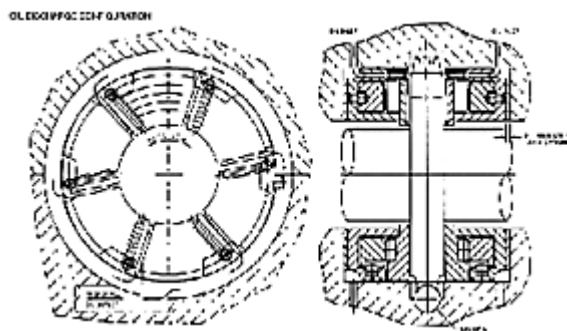
Aligning

Lubrication Requirements

LEG bearings, like other Kingsbury bearings, are designed to operate with a continuous supply of oil to the bearing shoe faces. An orifice is required before the bearing to properly regulate flow and pressure (See page 50, "Pressure and Flow Orifice"). The oil supplied to the bearing should be cooled and filtered to a normal of 25 microns.

Bearing Housing Requirements

The bearing housing requirements for the LEG thrust bearing are similar to those of standard thrust bearings. No oil seal rings are required since the inlet oil is confined to passages within the base ring assembly. Fresh oil enters the bearing through an annulus located at the bottom of the base 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. The typical bearing housing provides our recommendations for sizing the discharge annulus. Kingsbury recommends a tangential discharge opening, equal to 80% of the collar thickness. If possible the discharge outlet should be located in the bottom half of the bearing housing.



Oil Discharge Configuration

[Back to Top](#)

