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Testing Considerations for Evaluating a PolyLube™ Greaseless Bearing as a Replacement for a Greased Bearing.

When considering a PolyLube™ greaseless bearing system, it is important to identify design details that will not allow for a fair test. The features to consider are associated with the grooves, holes, flats, bearing dimensions; surface finishes, and surface treatments.

A greased system will usually incorporate a grease groove or hole in the housing, as the delivery system for the lubrication. These details are not necessary when using the PolyLube™ greaseless bearings. The presence of these details will adversely affect the PolyLube™ bearings. The stress risers that are associated with the edges of the grooves or holes will significantly decrease the design life of the bearing. There are a few options to consider when initial testing is to begin. Provided the pressures have been considered, the PolyLube™ bearing may be shortened and inserted on either side of the radial groove on the housing. This will allow the same housing that is used in production to be used in the evaluation. This solution is also applicable to a hole in the housing. The best solution is a housing that has neither of these features. This will allow the use of a full-length bearing to keep the operating pressure as low as possible.

Some of the features that are typically associated to a shaft that is used in a greased system are poor surface finish, no surface treatment, holes to deliver grease, flat to circulate grease, and added clearance to aid in lubrication circulation. Holes and flats should be eliminated on the shaft to decrease fatigue conditions at the surface of the bearing. The problems that are caused from holes and flats are large pressure variations through each cycle. These variations will contribute to fatigue in the laminate structure of the bearing backing. The next details to be considered are the surface of the shaft. Polygon Company recommends a surface finish of between 16 and 32 Ra. The surface finish of the shaft is important to the PTFE transfer process that is the dry lubrication system utilized by PolyLube™ bearings. A surface finish that is in excess of this recommendation will lead to excess wear and a diminished bearing life. The surface treatment of the shaft is important to prevent bearing contamination from corrosion as well as reduced shaft wear. Polygon Company recommends a surface treatment that has a hardness of at least 50 Rc. Some of the treatments that are currently being utilized are salt bath nitride, chrome plating, and electroless nickel. The final consideration for incorporating a PolyLube™ greaseless bearing into a design is the clearance between the shaft and the bearing. A PolyLube™ application engineer should be consulted to recommend a bearing design that considers the application. Operating environment, loads, speeds, and impact conditions, are considerations that are used in recommending minimum clearances and interference fits.

There are many considerations to be made when testing PolyLube™ greaseless bearings in a previously greased joint. Most of the features that are to be eliminated will ultimately pay for the added cost of a better pin surface finish and treatment. Ultimately the total cost of ownership to the end user will be substantially lowered as a result of reduction in maintenance.