AQUALUBE™

WATER LUBRICATED BEARINGS

- Sterntubes and Struts
- Turbine Pumps
- Jet Drives
- Irrigation Systems
- Water Pumps
- Chemical Processing

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AQUALUBE™

High Performance Water Lubricate Bearings

The Aqualube™ range of rubber-sleeved bearings are designed for marine and industrial applications. The bearings feature a specially formulated rubber, moulded into various shell materials. The rubber is an extremely tough, chemical and oil resistant nitrile which offers outstanding resistance to abrasion and wear, even in the most adverse conditions.

Brass Shelled Series

Brass Shelled Series shelled bearings are manufactured to suit imperial and metric shafts. The metric range covers shaft sizes from 20mm up to 150mm diameter. The imperial range covers all standard shafts from 3/4" up to 6" diameter. Special bearings and sizes can be supplied to suit customers' requirements

Non-metallic Shelled Series

This range of bearings is manufactured to suit applications where electrolysis is a problem through metal-to-metal contact. Available to suit imperial and metric shafts up to 6" diameter or 150mm diameter. Special bearings and sizes can be supplied to suit customers' requirements.

APPLICATIONS

Marine

Aqualube bearings are supplied to many of the world's leading leisure and commercial vessels. Aqualube bearings are fitted to shaft struts, jet drives and sterntubes.

Industrial

Bearings for use with various types of pumps and turbines can be supplied. Water lubricated bearings offer considerable advantages due to their ability to resist abrasion when in contact with contaminated liquids.

MANUFACTURING PROCESSES

Shell Preparation

Bearing shells are machined, internally shotblast and degreased in preparation for the application of a bonding agent prior to rubber moulding.

Moulding

Shearwater's rubber moulding presses have heated top and bottom platens which combined with specialist tooling helps to reduce the rubber curing time. Presses up to 250 tonnes capacity are used for moulding the larger sized bearings.

- **Consistent high quality**
- **High grade materials**
- **Cylindrically ground outside diameter**
- **Cylindrically ground bore diameter**
- **Hydrodynamic wedge formation**
- **Engineering Excellence**

Inspection

Prior to shipping, each bearing is subjected to a 100%inspection procedure. Bearings are thoroughly inspected for dimensional accuracy, rubber hardness and integrity of bond between rubber and the shell.

Precision Grinding

All Aqualube bearings are precision ground to give a smooth, accurate finish and to maintain the correct clearance between the bearing and the propeller shaft.

Principle of Operation

Rubber and water make the perfect combination for a bearing material and lubricant. The natural resilience of rubber gives the bearing its shock, vibration and nose absorption properties. The shape of the Aqualube bearing is the main reason for its success. Unlike many other bearings in the market the Aqualube bearing strips are shaped in such a way that a hydrodynamic water wedge is formed between shaft and bearing, even at very low shaft speed. Water is the perfect lubrication medium, particularly for marine craft, because of its natural abundance, non-compressibility, cooling properties, and low coefficient of friction between bearing strip and shaft.

The water enters the bearing through the longitudinal grooves and moves radially between the propeller shaft and the bearing face in a thin film. Once this film, or wedge, has developed the shaft does not actually come into contact with the bearing.

Construction of Aqualube Bearings

Aqualube bearings are moulded from a specially compounded oil and chemical resistant nitrile rubber. The nitrile rubber displays an excellent resistance to wear and abrasion and is also tough and durable. Bonding techniques developed by Shearwater ensure that the strength of the bond to the shell is at least equal to the strength of the rubber itself.

The finished product has a smooth, shiny surface to the rubber lining which, when compared with similar products on the market, provides visual testament to the quality of the bearing. Bearing shells can be manufactured from a wide range of materials to suit special applications. The standard range bearings are made from marine brass and non-metallic shells. Each and every bearing is centreless ground on the outside diameter and the bore is also ground to ensure concentricity and that the correct clearance between bearing and shaft is maintained.

Abrasion Resistance

The unique shape of the Aqualube bearing gives it an excellent resistance to abrasion. This helps to reduce wear on the bearing surfaces in environments where sand and other abrasive particulate are held in suspension, as found in shallow water. The bearing is designed to let these abrasive particles across its surface and into the grooves where it is flushed out by the water feed pressure. This system prevents the particles from getting embedded into the bearing surface and causing severe wear on the propeller shaft.

Shaft Speed

The maximum operating speed of an Aqualube bearing is excess of 35 metres per second, or 7,000 feet per minute. The minimum speed is 0.5 metres per second or 10 feet per minute. For applications outside these parameters the Shearwater Technical Department should be consulted as special provision for lubrication may be required.

Lubrication - Wear and Durability

All types of water lubricated rubber bearings will eventually experience wear in service. For bearings operating in clean water the wear down effect will be less rapid than when operating in shallow, heavily contaminated water.
In any event it is recommended that bearings should be inspected for wear whenever the vessel is hauled out. In cases where the bearing is operating in shallow water an annual inspection is recommended.

Bearings fitted to struts and completely immersed pump bearings have adequate lubrication. However, where bearings are installed in a position where the water flow is not good they should be lubricated by a forced water flow system. This also applies to bearings which have to cope with low shaft speed and high loads.

Load and Deflection

Aqualube water lubricated bearings have a shore hardness of 70±3 and are suitable for operation in the temperature range of -25°C to 85°C. Special compounds are available which will allow the working temperature to increase to 200°C. For temperatures above 30°C advice should be sought from the Technical Department relating to the clearance between bearing and shaft.

The load which can be carried by an Aqualube bearing is dependant upon the quality of the lubricating water and the tolerance or deflection of the shaft. A normal working load of 2.5 kgs/cm^2 (35PSI) is acceptable. Higher loadings of up to 5 kg/cm^2 have been recorded on segmental bearings. For further details on loads and deflection contact the Technical Department.

QUALITY & PRECISION

STOCKIST / DISTRIBUTOR

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