DMR™

Fiber-Lube™

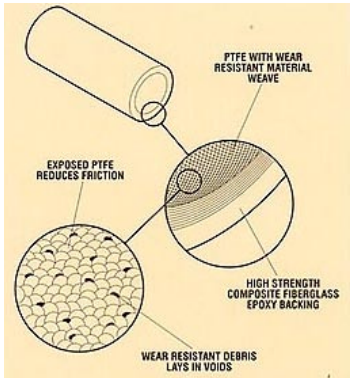
FW Series

Product Description

The DMR Fiber Wound Series bearing is a high load, low RPM bearing designed for rigorous industrial equipment applications. The bearing is manufactured by a filament winding process that results in a continuous fiberglass filament backing. This composition yields excellent mechanical properties especially fatigue resistance. The filament wound fiberglass structure uses a high strength, corrosion resistant epoxy resin as the matrix material. The high strength backing permits the use of a thin wall (1/16" to 1/8") bearing which can often reduce the size and weight of the finished bearing assembly. Our FW Series will support a bearing load of 30,000 PSI, while handling high radial and axial stresses. They resist high shock loading and impact fatigue due to their unique high strength continuous fiberglass backing. These qualities make the FW bearings ideal for high load operation in rotational and linear motion as well as in oscillation. This family of materials exhibits exceptional dimensional stability and performance predictability over wide temperature ranges (±325°F).

Product Design

The high strength composite fiberglass backing permits optimal strength and rigidity, with a modulus of elasticity of approximately 6 x 106 PSI. This property allows the FW bearing to be rigid enough to support heavy loads and pliant enough to tolerate moderate shaft misalignments without over-stressing the bearing edges. The bearing surface is composed of a uniquely designed woven structure of PTFE filaments, which exhibit tensile strengths twenty times greater than PTFE resins. As a result, the bearing is not subject to cold flow under high loading conditions. These PTFE super-filaments are also the primary mechanism for allowing the FW product to operate in a true self-lubricating mode. No secondary



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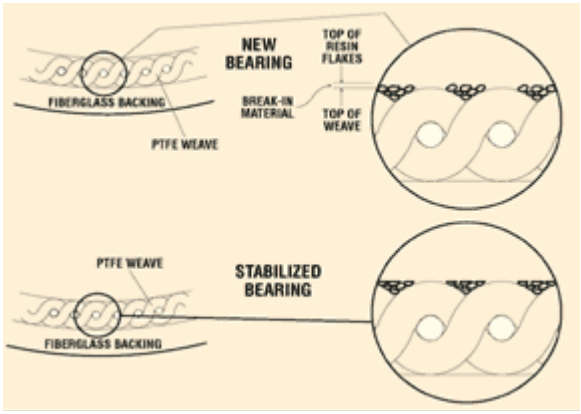
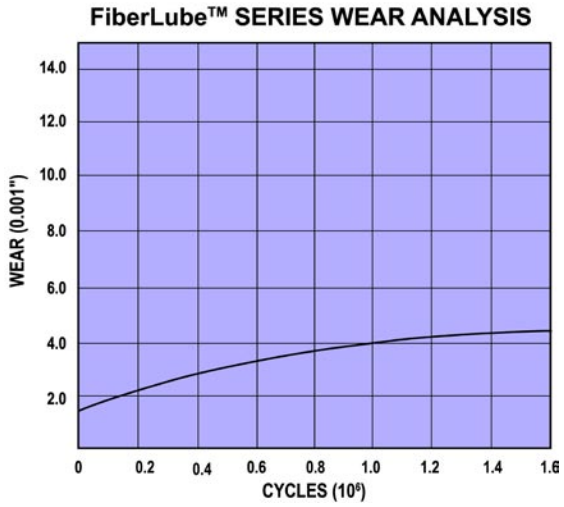
lubrication is necessary, even during start-up conditions, due to the film transfer self-lubrication process.

At start-up the, the PTFE undergoes a phase change and smears around the mating pin surface. As the PTFE film develops, it transfers from the inner diameter to the outer diameter of the pin, smoothing out any macroscopic surface imperfections and allowing the bearing to have a very low coefficient of friction and minimal long-term wear, even under high loading conditions. In some conditions, as much as 0.001" of wear may occur during the break-in period, while in other operations, break-in wear may be negligible. The elapsed time for break-in is PV (Pressure and Velocity) dependent. The equilibrium wear rate varies from operation to operation, due to a number of factors including: loads, speeds, shaft hardness, material, and shaft surface finish. For more specific guidance on the break-in period to anticipate given your specific application, please contact Daemar.



As the bearing begins to cycle, the initial coefficient of friction will increase in relationship to the longer term, "broken-in" frictional values. This is due to the fact that a small layer of resin, generated by the manufacturing process of the composite backing, is being slowly worn away.

Following the break-in period, the wear rate stabilizes, remaining relatively constant for the bearings' life. Testing of the Fiber Series Bearing at 22,500 pounds, with 50° oscillation angle, resulted in stable wear under 0.005" at over 1.5 million cycles.



Test Conditions

Bearing: 1.5" Bore x 0.75" Wide
Wear Surface: 4140 Steel
5-8 Microinch Ra 50-55 Rc
Test Conditions: 22,500 lbs
Radial Load (20,000 lbs)
50 Degree Oscillation Angle
50 Cycles Per Minute

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Daemar's FW Series bearings are designed to minimize wear; however, the bearing wear is affected by the general operating conditions, such as speed, sliding distance and load. With intermittent rotation or oscillation, radial wear should be negligible over thousands of hours. Hard chrome plating gives excellent wear performance and protects the shaft from corrosion. Coatings such as chrome, electroless nickel, or nitro carbonizing are all common treatments for shaft materials used with these bearings.

Mechanical & Physical Properties

The FW bearing can withstand static loads of approximately 60,000 PSI and 30,000 PSI under dynamic loading. At these loading levels, minimum distortion will occur. For dry running applications, the maximum speed is approximately 10 surface feet per minute.

This bearing's operating temperature range is ±325°F. Maximum continuous operational surface temperature for the standard formulation is 325°F, depending upon load characteristics. The bearing has been heat stabilized at these temperatures, so that little dimensional change will occur in the bearing during operation. In a free state, the coefficient of expansion of the FW Series bearing is approximately 7 x 10^{-6} in/in/°F, similar to the coefficient of expansion for steel, and actually less than some metals.

Ultimate Compression Strength (PSI)	**60,000**
Unit Load Limit (PSI)	**30,000**
Temperature Range (Standard Formulation)*	**±325°F**
Coefficient of Thermal Expansion (in/in/°F)	**$7x10^{-6}$**
Thermal Conductivity (BTU • in/(hr • Ft^2 • °F)	**1.8-2.3**
Water Absorption (2 hours)	**0.12%**
Water Absorption (24 hours)	**0.16%**
Specific Gravity	**1.87**
Maximum Velocity (SFM)	**10**

Note: Special resin formulation available up to 500°F

Fiber-Lube™ Applications

FW bearings are used in highly loaded bearing joints where a life cycle of over 500,000 cycles is desired. Testing has shown this bearing has wear under 0.006" after 1.6 million cycles. Applications include material handling equipment, heavy-duty cranes, earth-moving equipment, construction equipment, agriculture equipment, 4 post automotive lifts, and food processing systems.

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