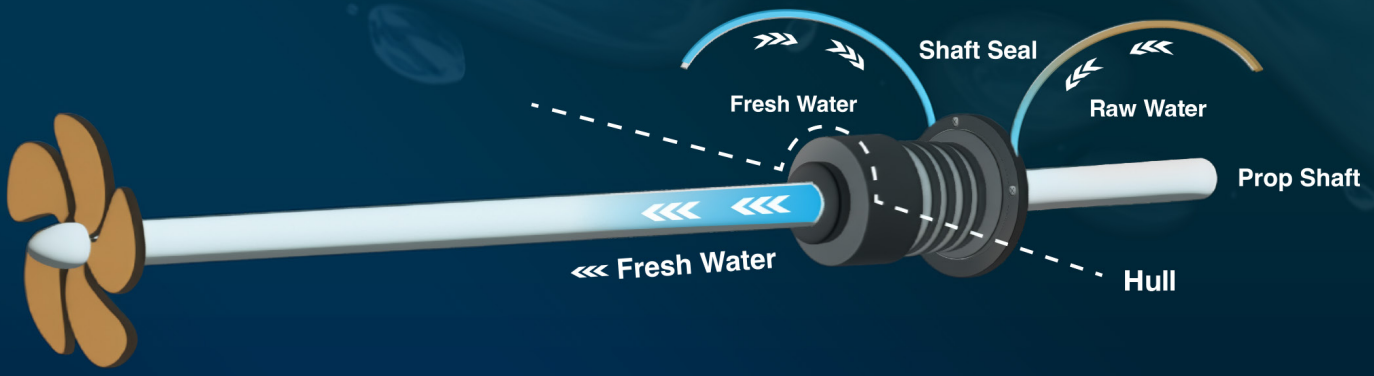
FRESHWATER MAINTENANCE FOR **PROPELLER SHAFT SEALS**

PHIBER® SYSTEMS



DEFINING THE **PROBLEM**

Mechanical and performance systems aboard vessels are always evolving to offer us better “quality of life” on the water.

On larger vessels that remain in the water for most of their service life, these systems often employ “wet” seawater (raw water) cooling networks that remain submerged in seawater for long durations.

Wet systems cleverly use the flow of seawater for both cooling and lubrication of internal surfaces, where friction and heat inevitably increase during operation. Raw water is pumped through equipment or gear and then dumped overboard carrying excess heat with it.

Systems that use raw water are subject to a common corrosion caused by naturally-occurring changes in seawater. When the flow of raw water stops, seawater that remains in confined spaces within the network often deoxygenates very quickly, becoming acidic (low pH). If left unchecked, exposure to acidic water can lead to a downward spiral of chemical reactions and electrolysis that are expensive and laborious to rectify.

The costs of servicing propeller shafts will include haulout of the vessel, heavy machinery, and manual labor, increasing the operation/ownership costs every year the vessel is in service.







PHIBER® SYSTEMS

Ready to protect your investment on the water? Visit our website today to find a dealer near you.

US Patents Pending

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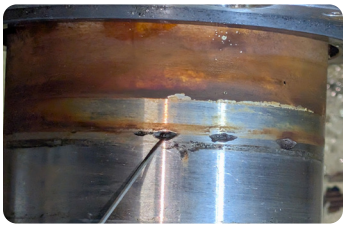
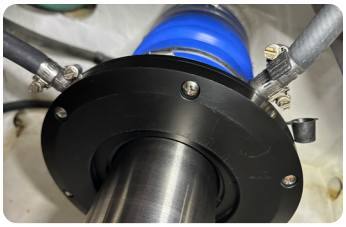
MADE IN USA

CREVICE & PITTING CORROSION





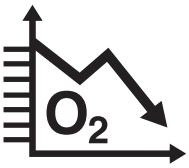




(Ask your PHIBER Dealer to view the motion-graphic that demonstrates FWF on shaft seals)



Seawater typically has 35,000 to 50,000 Parts-Per-Million (PPM) of dissolved solids, minerals, and microscopic life forms in it. The presence of Oxygen in seawater keeps the average pH of surface seawater around 8, however, when seawater becomes trapped in a confined space, the Oxygen naturally depletes causing the pH levels of the trapped seawater to drop and the seawater to become more acidic.



In a typical modern raw water network, stainless steel, titanium, and other exotic alloys are used in their construction, which rely on the presence of Oxygen in the seawater to help form an Oxide layer on their surfaces, preventing corrosion. If the Oxygen depletes and the pH drops, then the protective Oxide layer breaks down and the risk of corrosion damage to the alloys is significantly enhanced.

As seawater deoxygenates and pH levels drop, “oxygen depletion” corrosion caused by elevated levels of acidic water will degrade the alloys used in critical running gear and systems. “Crevice & Pitting” corrosion begins to form on surfaces where seawater is trapped or confined, and access to seawater with higher oxygen (pH) levels is restricted.

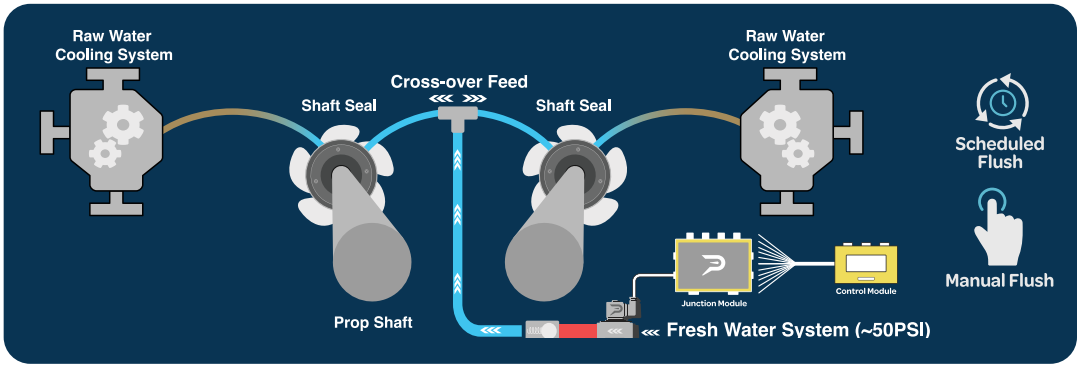




This damage is most prevalent in systems where close contact between working surfaces is necessary such as complex propeller shafts seal and bearing assemblies that require tight tolerances between rubber, phenolic, and metallic surfaces during operation.

On **propeller shafts**, crevice and pitting corrosion typically occur within the stern tube, bearing or seal areas where exposure higher concentrations of acidic water occurs in shorter timeframes than other wet systems.

Unfortunately, crevice corrosion and pitting often cannot be detected until it is already well underway. Evidence would include leaking around the shaft seal where the surfaces of the metal are compromised and water can seep past the seal. Only once the vessel is hauled out of the water and the seals can be safely removed for inspection can the full extent of the corrosion be known.



THE “FRESHWATER MAINTENANCE” SOLUTION

The PHIBER System offers ABYC-compliant, low-cost, hands-free “freshwater flushing” maintenance for the prevention of crevice and pitting corrosion problems on critical systems. It safely connects a vessel’s native freshwater system to the seawater network and allows for routine injections of freshwater into critical components at appropriate intervals.



A revolutionary Control Module allows the operator to program “automatic” maintenance cycles using a Scheduler, or it can be done “at the touch of a button” any time the operator chooses.



Minimum resources are necessary for flushing seal assemblies... typically 1 US gallon or less per seal, per flush, executed 1-2 times daily.