

Cold-Cure Rebuild of a Corroded Marine Propulsion Shaft

ID: 10315

Industry: Marine
Application: MPT-Mechanical Power Transmission

Customer Location: Croatia
Application Date: October 2014

Substrate: Carbon steel
Products: Belzona 1111 (Super Metal)

Problem

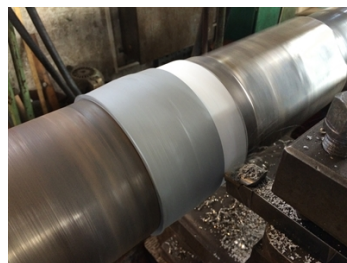
During an inspection of a commercial fishing vessel, heavy localized corrosion was discovered on the carbon steel propulsion shaft. The damage was situated exactly at the seal journal—the critical interface that maintains a watertight barrier between the ocean and the vessel's interior. If this corroded profile were left unaddressed, it would inevitably tear the seal, leading to seawater ingress into the hull. The vessel owner required a rapid, reliable solution to prevent a catastrophic leak without incurring the massive costs associated with prolonged dry-docking.



Damaged shaft



Surface preparation



Machining down



Application finished

Application Situation

During an inspection of, heavy localized corrosion was discovered on the carbon steel propulsion shaft. The damage was situated exactly at the seal journal—the critical interface that maintains a watertight barrier between the ocean and the vessel's interior. If this corroded profile were left unaddressed, it would inevitably tear the seal, leading to seawater ingress into the hull. The vessel owner required a rapid, reliable solution to prevent a catastrophic leak without incurring the massive costs associated with prolonged dry-docking.

Application Method

The shaft was extracted and mounted onto a lathe for a precision repair. To prepare the area, the corroded seal journal was undercut via machining to remove the damaged metal, and the surface was thoroughly roughened to ensure an optimal mechanical grip for the repair composite.

While the lathe rotated at a very low speed, Belzona 1111 was applied. To prevent air entrapment and ensure maximum adhesion, the first layer was aggressively scrubbed into the roughened profile using a short-bristled brush. The composite was then built up in thin, consecutive layers until the outer diameter slightly exceeded the shaft's original dimensions. Once the Belzona 1111 had fully cured, the shaft was machined back down to the exact OEM tolerances and given a final polish with emery cloth to ensure a perfect mating surface for the new seal.

Belzona Facts

Attempting to repair this damage using traditional weld overlay would have introduced extreme heat, almost certainly causing a

For more examples of Belzona Know - How In Action, please visit <https://khia.belzona.com>

ISO 9001:2015
FS 695214
ISO 14001:2015
EMS 695213

Belzona products are
manufactured under an ISO
9000 Registered Quality
Management System.

www.belzona.com


BELZONA
Repair • Protect • Improve

shaft of this diameter to warp and distort. Correcting that thermal stress would have required shipping the shaft to an off-site facility for specialized heat treatment (baking and slow cooling) prior to final machining.

By utilizing the cold-applied Belzona 1111 system, the maintenance team completely bypassed the need for hot work and thermal stress relief. The entire repair and machining process was successfully executed in a single day, eliminating costly shipping delays, minimizing dry-dock fees, and allowing the vessel to return to its revenue-generating operations.

For more examples of Belzona Know - How In Action, please visit <https://khia.belzona.com>

ISO 9001:2015	Belzona products are
FS 695214	manufactured under an ISO
ISO 14001:2015	9000 Registered Quality
EMS 695213	Management System.

www.belzona.com

