

PIPE REPAIR USING BELZONA 1161 AND SUPERWRAP II

ID: 10239



PROBLEM

A copper-nickel main motor cooler pipe developed an active leak while the vessel was at sea. The 3-inch diameter pipe had experienced through-wall corrosion, resulting in a breach that compromised cooling system integrity and threatened continued operation of the main motor. A temporary repair was performed at sea to stop the leak and get the vessel back underway. Copper-nickel piping in seawater cooling service is subject to accelerated corrosion driven by flow velocity, turbulence, and the corrosive marine environment, and once wall loss progresses to a through-wall failure, the risk of uncontrolled flooding, equipment damage, and loss of propulsion capability increases significantly. While the temporary repair restored immediate operability, it was not a long-term solution, and a permanent engineered repair was required once the vessel reached port to restore full structural integrity and pressure rating to the pipe.

APPLICATION SITUATION

Upon arrival in port in Seattle, a permanent repair to the main motor cooler pipe was scheduled during the vessel's maintenance availability. Traditional repair methods such as pipe section replacement or brazing were not viable because hot work was not permitted in the vicinity of the equipment. This no-hot-work restriction, common aboard Coast Guard vessels near machinery spaces and fuel systems, eliminated welding and brazing as options and required a cold-applied engineered solution. Belzona 1984 (SuperWrap II) was selected because it provides a permanent, pressure-rated composite repair that can be applied without hot work, open flame, or specialized heavy equipment. The SuperWrap II system allowed the repair to be completed in approximately two hours of application time, minimizing the impact on the vessel's maintenance schedule and enabling the crew to prioritize other work during the availability. By avoiding pipe replacement, the repair also eliminated pipe fabrication lead times and the additional trade labor associated with a traditional piping modification.

APPLICATION METHOD

The temporary at-sea repair was removed and the damaged area of the 3-inch copper-nickel pipe was cleaned and prepared using mechanical methods including rotary tools and flap discs to remove corrosion products, expose bright base metal, and establish an adequate surface profile for adhesion. The prepared area was solvent cleaned to remove any residual contaminants. Belzona 1161 (Super UW-Metal) was mixed and applied to the damaged section of the pipe to fill the through-wall defect, rebuild lost wall thickness, and create a smooth, uniform surface geometry suitable for overwrapping. Once the Belzona 1161 filler had been shaped and the substrate contour restored, the Belzona 1984 (SuperWrap II) composite system was applied over the repair area. Belzona 9381 reinforcement sheet was saturated with the Belzona 1984 resin and wrapped around the pipe in accordance with Belzona's Instructions for Use (IFU's), with Belzona 9382 release film applied as the final outer layer. The total application time was approximately two hours. The completed repair was allowed to cure for four days before the system was returned to service.

BELZONA FACTS

The no-hot-work restriction made Belzona 1984 (SuperWrap II) the clear solution for converting a temporary at-sea repair into a permanent, pressure-rated fix. The cold-applied composite system delivered an engineered pipe repair in just two hours of application time, eliminating the need for welding, brazing, or pipe replacement. The SuperWrap II system avoided fabrication lead times and allowed the vessel to maintain its operational readiness schedule.

INDUSTRY

Marine

LOCATION

Seattle

APPLICATION DATE

June 2025

PRODUCTS

Belzona 1161 (Super UW-Metal)
Belzona 1984

SUBSTRATE

Other

PHOTOS

1. Temporary Repair Made at Sea
2. Surface Prep
3. Belzona 1161 Being Applied
4. SuperwrapII being applied

For more examples of Belzona Know-How in Action, please visit khia.belzona.com

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