

Restoration of Severely Corroded Chiller Components with Belzona

ID: 10119

Industry: Heating, Ventilation & Air Conditioning
Application: HEX-Heat Exchangers
Substrate: Carbon steel
Products: Belzona 1121 (Super XL-Metal), Belzona 1321 (Ceramic S-Metal)

Customer Location: Orlando, Florida
Application Date: December 2025

Problem

The tube sheets of the chiller were severely corroded due to long-term exposure to water flow and chemical treatment, causing metal loss around the tube entrances and compromising the integrity of the heat exchanger. The internal water boxes were also deteriorated, creating leakage risks and reducing system efficiency. The client needed a durable repair solution without removing or replacing the equipment.



The initial condition of the heat exchanger access covers is shown prior to repair. The surfaces exhibit severe corrosion, material loss, and deterioration around the tube sheet, resulting in leaks and unsafe operating conditions.

Interior of the chiller water box section after removal, showing severe rust, coating failure, and subsurface corrosion across internal surfaces, especially around flow paths and flange edges. The lining had lost adhesion and exposed the steel.

Application of the Belzona coating to the prepared tube sheet. The first layer is being applied to seal and protect the tube ends, ensuring uniform coverage and restoring corrosion resistance.

Final condition of the water box after surface preparation and application of two full coats of Belzona coating. The internal surfaces, flow channels, and flange areas are now fully rebuilt and protected, providing long-term corrosion resistance.

Application Situation

The chiller water boxes and tube sheets exhibited advanced corrosion, pitting, and widespread coating failure, compromising sealing surfaces and reducing overall system efficiency. Replacing these components would have required extended downtime, heavy equipment, and significantly higher costs.

Using Belzona allowed the facility to restore the equipment in place, reduce labor and material expenses, and avoid the operational interruption associated with traditional replacement. The Belzona system provided a long-term protective lining capable of resisting corrosion and extending service life.

Application Method

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

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

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All surfaces were prepared by removing loose corrosion and existing failed coating, followed by abrasive and mechanical preparation to achieve a clean, profiled substrate. Tube sheets were masked, seams reinforced, and surfaces cleaned with Belzona 9111.

Belzona materials were applied using brushes and applicators to ensure complete wet-out and full coverage. Multiple coats were applied to the tube sheets, water boxes, and internal sealing surfaces. Application steps included lighting, temperature control, and restricted-space procedures to achieve consistent film thickness and uniform curing.

Belzona Facts

Belzona offered a significantly more cost-effective solution compared to replacing the corroded water boxes and tube sheets, eliminating the need for heavy equipment, fabrication, and extended shutdown. The polymeric repair system allowed the components to be rebuilt in place with minimal disruption and significantly reduced labor costs.

Unlike traditional coatings or welding repairs, Belzona materials offer strong adhesion, corrosion resistance, and long-term durability in wet and immersed service. This solution extended equipment life, improved reliability, and delivered a faster return to service compared to conventional methods.

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