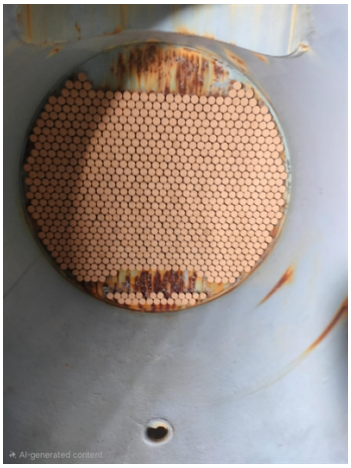
Heat Exchanger Repair and Protective Coating Application in a Commercial Facility

ID: 10272

Industry:	*Commercial Facilities*	Customer Location:	*Dammam, Saudi Arabia*
Application:	*HEX-Heat Exchangers*	Application Date:	*March 2026*
Substrate:	*Carbon steel*		
Products:	*Belzona 1311 (Ceramic R-Metal),Belzona 1321 (Ceramic S-Metal)*		

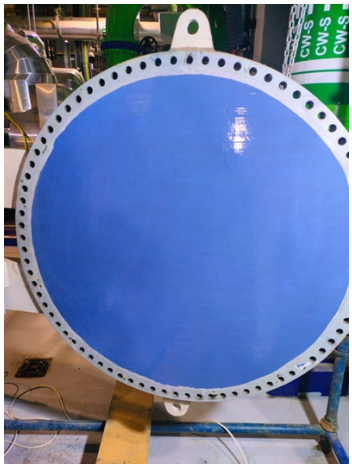
Problem

A chiller heat exchanger tube sheet was suffering from accelerated corrosion caused by galvanic action between dissimilar metals at the tube sheet face. The water box and cover also exhibited extensive pitting due to continuous exposure to saltwater and process fluids. If left untreated, the damage could have resulted in the need for full component replacement.

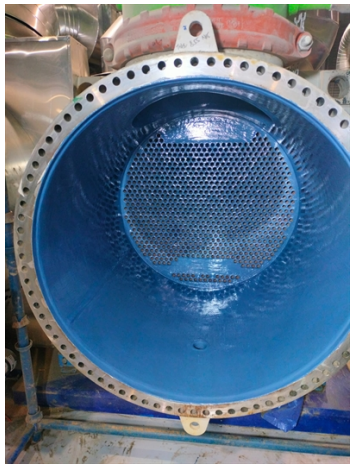


Prior to surface preparation, visible signs of corrosion were observed.

Rebuilding the damaged areas and pitting using Belzona 1311 (Ceramic R-Metal).



The cover was coated with Belzona 1321 (Ceramic S-Metal).



The final protective coating was applied over the tube sheet.

Application Situation

The customer had previously tried several coating systems over the years; however, these failed within 6–12 months. We recommended Belzona 1321 (Ceramic S-Metal) due to its excellent resistance to saltwater erosion and its ability to provide long term corrosion protection. This solution helped avoid costly shutdowns and frequent repair work throughout the year.

Application Method

1. The surface was prepared by abrasive blasting to achieve SSPC-SP10 / ISO 8501-1 Sa 2.5 cleanliness, removing all corrosion products and achieving the required anchor profile.
2. The pitted areas and tube sheet face were rebuilt to the original profile using Belzona 1311 (Ceramic R-Metal), applied using a Belzona spatula.
3. Belzona 1311 (Ceramic R-Metal) was allowed to cure fully before overcoating.
4. Two full coats of Belzona 1321 (Ceramic S-Metal) were applied by brush and roller to the tube sheet face, water box interior and cover.
5. The final coat was inspected for continuity and holiday testing was carried out before returning the unit to service.

Belzona Facts

The tube sheet, water box, and cover were fully restored and protected with a continuous ceramic-grade epoxy lining. The unit was returned to service without the need for welding, hot work, or component replacement. Long term corrosion and erosion resistance was achieved using a two coat system of Belzona 1321 (Ceramic S-Metal).