

GLASS FUSED LINED STEEL TANK REPAIRS WITH BELZONA GOING STRONG AFTER 10 YEARS OF SERVICE

ID: 10270



PROBLEM

Glass-fused lined steel tanks are widely used due to their excellent chemical resistance; however, damage to the substrate can present significant operational challenges. In this instance, the tank had developed extensive through-wall defects caused by external corrosion in the lower sections of the structure, combined with H₂S (hydrogen sulphide) attack within the upper internal gas phase areas. The deterioration had reduced the client's operational capacity to just 50%, while also creating a serious risk that the asset could be taken completely out of service. Previous repair attempts had proven ineffective and, in some cases, introduced additional defects into the tank wall. Traditional repair methods such as welding, riveting and adhesive patches either damaged the glass lining further, lacked long-term reliability or were only suitable as temporary emergency measures. The financial implications were also significant. A replacement tank was estimated to cost in excess of £100,000, while additional tankering costs resulting from reduced capacity had already exceeded £30,000.

APPLICATION SITUATION

The water authority required a repair solution that could be carried out externally in order to avoid the operational disruption and safety concerns associated with internal repairs. Draining, cleaning and entering the tank would have required confined space access and introduced additional cost and complexity to the project. Hot works were also considered unacceptable due to the potential presence of methane and H₂S gases on site. Furthermore, bonding to glass-fused steel is notoriously difficult without removing the coating and exposing the underlying steel substrate. The client therefore required a safe, rapid and durable repair system that could be implemented without compromising the integrity of the lining and could ultimately be rolled out across multiple assets within the network.

APPLICATION METHOD

Working closely with the water authority, a series of Belzona materials and application techniques were trialled to determine the most effective long-term solution. The final repair system utilised Belzona 1111 as the adhesive, combined with Belzona 5831 as the coating system for manually prepared substrates. Surface preparation proved critical to the success of the application. The most effective method involved etching the glass surface to remove the gloss using 40-grit alumina zirconia abrasive paper. This abrasive was selected due to its angular particle profile and hardness, which exceeds that of the glass lining on the Mohs scale, creating a superior mechanical key for adhesion. In addition to identifying suitable bonding and coating materials, the decision was made to utilise pre-formed Belzona SuperWrap II plates instead of traditional steel reinforcement plates. This approach eliminated the risk of future corrosion, removed the need for on-site preparation of steel plates and avoided introducing significant additional weight to the tank structure due to the volume of repairs required.

BELZONA FACTS

The completed repair provided the client with a safe, externally applied and long-lasting solution without the need for hot works or confined space entry. Belzona 1111 demonstrated excellent bonding performance on manually prepared glass-fused steel substrates, while Belzona 5831 provided a compatible and durable coating system for the application. The success of this project led to wider adoption of the repair methodology by the water authority, with Belzona subsequently completing thousands of similar repairs across comparable tank assets. Notably, this original application was one of the first of its kind and remains in excellent condition more than 10 years after installation, demonstrating the long-term reliability and effectiveness of the solution.

INDUSTRY

Water / Wastewater

LOCATION

Yorkshire

APPLICATION DATE

April 2016

PRODUCTS

Belzona 1111 (Super Metal)
Belzona 1981 (SuperWrap II)
Belzona 5831 (ST-Barrier)

SUBSTRATE

Other

PHOTOS

1. Testing of Belzona and alternative application methods
2. Example of defect from inside the tank
3. Example of defects from the external
4. Repairs still in great shape 10 years on.

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

Belzona products are manufactured under an ISO 9001 Registered Quality Management System.

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