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TANK SPOT REPAIRS

COMPOSITE TANK REPAIR



REPAIRING SMALL DIAMETER TANKS FOR OIL & GAS



ADVANTAGES

Composite installation is a cold process that doesn't harm internal coatings. Its flexibility suits tanks of all sizes, compatible with corrosion prevention like coatings and cathodic protection. Carbon fiber composites outperform steel mechanically due to higher fatigue resistance and strength. They resist vibrations, thermal cycles, and chemicals. These repairs have a 20 year life.



TANK SPOT REPAIRS

01

BACKGROUND & CHALLENGE

In this project, small diameter (10-foot) tanks procured from major oil companies needed repairs. After inspecting the tank, several issues were discovered, including throughwall holes and major corrosion pitting.

The tanks required refurbishment to be repurposed effectively. The leaks and deterioration from corrosion required an easy-to-apply and cost-effective solution that could address the issues efficiently.



SOLUTION & INSTALLATION

The selected solution involved using composite repair techniques, which included reinforcing fabric and epoxy resin binders, to restore the structural integrity of the tanks. These composite repair patches not only halted ongoing corrosion but also served as a protective barrier against future deterioration.

The installation process included grit blasting and inspecting the tank floors for damage. Identified through-wall failures were swiftly repaired using composite materials, reinforcing the tank and sealing leaks. An epoxy flood coat was applied to halt ongoing corrosion and provide protection.

CHEMICAL

REPAIR FOR FIBERGLASS CHEMICAL STORAGE TANKS



ADVANTAGES

The chemically resistant composite system extends structures' service life by around 20 years, all without requiring tank drainage. Its adaptable epoxy-based resin system works well under various conditions, eliminating costly environmental controls. Moreover, it can be applied via wet lay-up, ensuring a precise fit for all repair shapes and orientations.



TANK SPOT REPAIRS

02

BACKGROUND & CHALLENGE

A chemical distribution facility housed older fiberglass chemical storage tanks in need of repair.

The tanks suffered from chemical and UV degradation, leading to problems like cracking and delamination, primarily affecting the roof and side walls. The facility needed a long-term reinforcement solution that could be applied while the tanks were operational.



SOLUTION & INSTALLATION

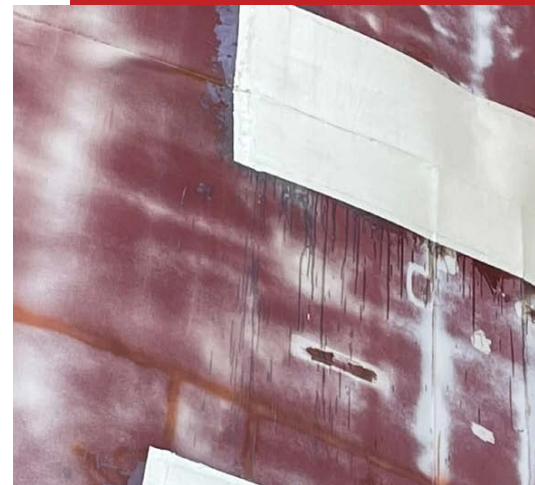
The solution chosen was a long-term reinforcement approach capable of addressing existing issues and enduring chemical exposure. Importantly, it allowed for online installation, ensuring the tanks could stay operational during reinforcement. The selected carbon fiber composite system offered a high modulus, strong adhesion, and long-term fatigue resistance.

The reinforcement was successfully installed without the need for scaffolding, which lowered the overall cost of the repair.

SCAVENGER TANK SPOT REPAIR

ADVANTAGES

Replacing the tank was expensive, and welding posed a risk to the internal coating. A composite repair solution with a cold application process and lightweight materials was the perfect fit. The repair was done while the tank was still in use, and it will extend the asset's service life by 20 years while providing structural reinforcement.



03

BACKGROUND & CHALLENGE

A pulp and paper facility faced issues with a large scavenger tank, including corrosion, buckling, and pinhole leaks. An assessment revealed that spot reinforcement was sufficient. The facility sought a solution to strengthen the tank structurally while also addressing corrosion and pinhole leaks.

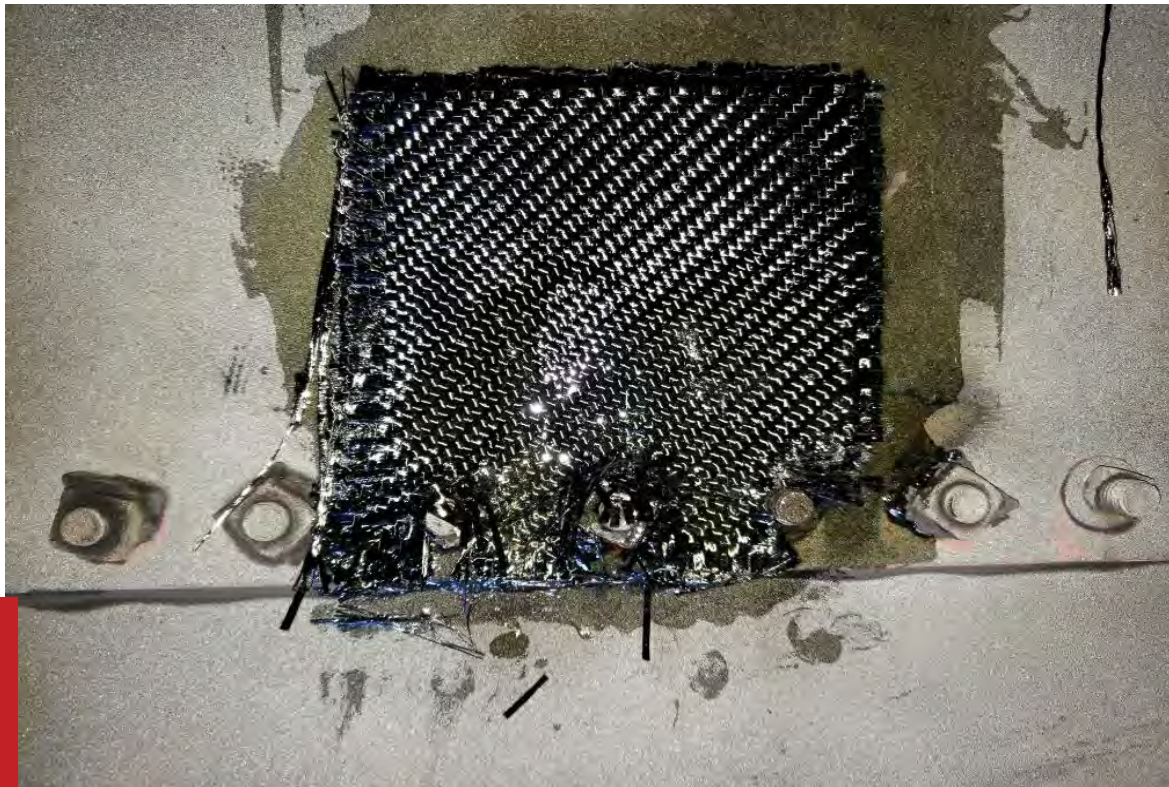


SOLUTION & INSTALLATION

An 8 ft x 12 ft composite carbon fiber patch proved to be an excellent alternative to externally welding a steel plate. This innovative repair solution incorporated a combination of materials, including FRP Repair Putty, CF-500 BD fabric, FRP 210 HT, and HP-400 Novo.

The incorporation of bidirectional fabric in this repair process was perfect because of its versatility and ease of installation, ensuring an effective and efficient solution for the repair.

REPAIR OF CORROSION & LEAKS IN A BOLTED OILY WATER TANK



SOLUTION & INSTALLATION

An immersion-grade, chemically-resistant epoxy novolac coating system, HP-410 GF, was installed inside the tank. The coating was allowed to cure at room temperature, and the entire tank was subjected to high voltage holiday detection. Any holidays were repaired, and the tank was returned to service.

Upon return to service, multiple leaks in the tank were observed. After further review, it was found that the leaks were coming from a new area — the tank walls. After a consultation with the tank manufacturer, Advanced FRP Systems recommended that the bolts be tightened. After two rounds of tightening the wall bolts, the leaks were resolved, and the tank was officially returned to service.



04

BACKGROUND & CHALLENGE

A company in the oil and gas industry specializing in wellsite wastewater removal and processing was experiencing through-wall failures and leaks of oily water in one of its storage tanks.

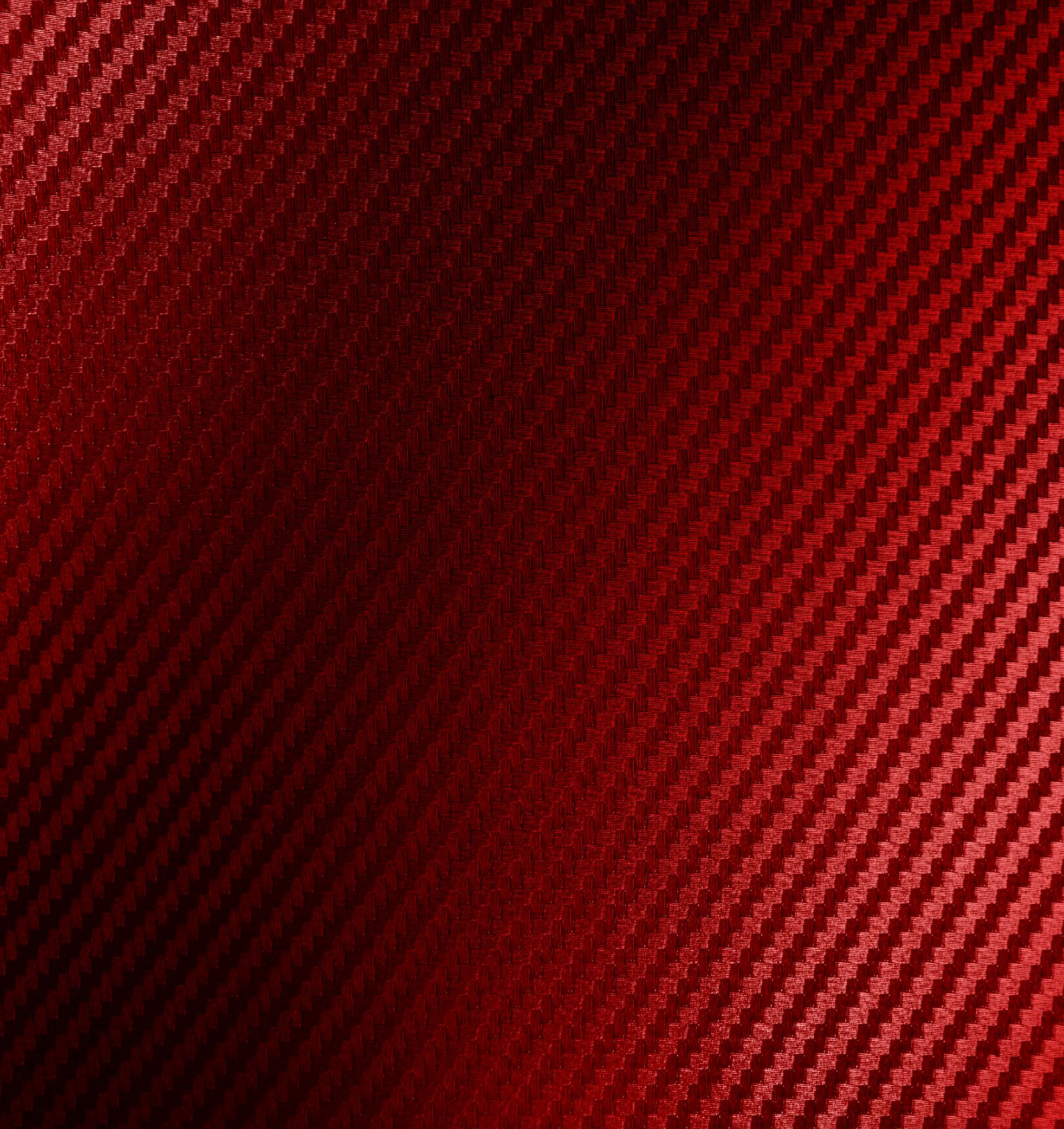
Bolted tank designs often include an internal coating when the tanks are built. Unfortunately, these internal coating systems are often inadequate for long-term water-immersion service. Finding the root cause of a leaking tank is difficult to determine without a detailed inspection that can only be performed after a storage tank is drained.



ADVANTAGES

The tank has a MIC-resistant novolac epoxy coating system over the entire tank surface to protect the tank from further corrosion. The carbon fiber composite patches used to repair through-wall failures extend at least six inches past the holes in all directions and provide greater than 3,000 psi adhesion to blasted steel, ensuring the repairs' longevity.

The repair offered a solution that stopped the leaks, prevented further corrosion, and preserved the company's storage tank.



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