

FEATURED PROJECT

Composite Tank Solutions

REINFORCEMENT OF FIBERGLASS AQUEOUS SOLUTION TANK

CUSTOMER

Aquapharma

LOCATION

USA

APPLICATION TEAM

Performance Contracting, Inc.

DATE OF APPLICATION

August 2020

SYSTEM

Carbon Fiber Composite Tank Reinforcement

SUBSTRATE

Fiberglass

PROBLEM

A fiberglass aqueous solution tank at a chemical processing facility was taken out of service because of an accumulation of solids in the base of the tank. After draining the tank, maintenance staff observed that there was not appropriate access to the base to clean out the accumulated solid and cut a hole in the tank wall to facilitate cleaning procedures. To ensure proper access in the future, the plant decided to modify the tank by installing a 36-inch fiberglass flanged manway to replace the removed tank wall section. There was a limited window to install the new flange and get the tank back online.



Figure 1 Tank with Large Cut-out for Access

SOLUTION

To successfully return to service, the modification needed to be structural, liquid-tight and chemically resistant. The plant opted for a high-strength, chemically-resistant carbon fiber composite repair system to connect the manway to the host tank. The 4-layer composite system provided more than twice the strength of the host tank, ensuring the strength and longevity of the new entry.

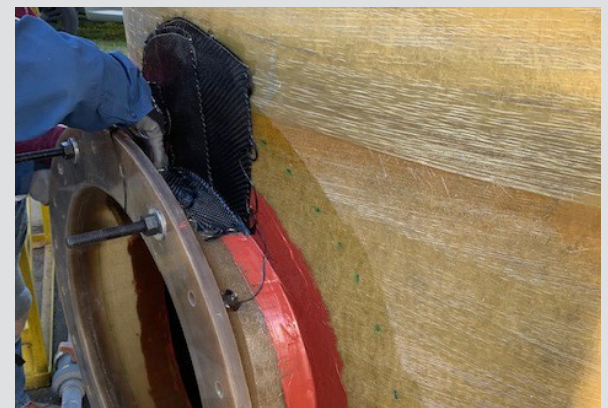


Figure 2 Application of External Composite Reinforcement

STEPS:

1. After expanding the removed section to fit the manway, the repair area was aggressively sanded and wiped down with solvent.
2. FRP Repair Putty, a high build epoxy putty, was used to fill in any voids and create a cove around the pipe exterior..
3. A high strength adhesive, FRP 120 HT, was applied to the repair area.
4. Carbon Fiber was saturated and applied in two double-layers to the inside and outside joint between the manway and tank.
5. The material was allowed to cure 12 hours and HP-300 Epoxy topcoat was installed at 15 – 20 mils.



Figure 3 Final Repair After HP-300 Topcoat Application

BENEFITS

- The entire project was finished in two shifts without delays or issues.
- The carbon fiber and epoxy composite combines outstanding physical strength with excellent adhesion to the fiberglass tank.
- Easy to install despite only virtual training due to Covid-19 travel restrictions.
- Zero-VOC, 100% solids system provided safe working environment even in confined spaces.
- Provides a permanent solution with a maintenance-free service life of over 50 years.