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# CRITICAL OUTLIERS

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SOLVING THE MOST  
CHALLENGING CASES WITH  
COMPOSITE SOLUTIONS



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a lexxel company

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## COMPOSITE PIPE REPAIR

# REINFORCING A CRITICAL COOLING WATER PIPE WITH CARBON FIBER



## PERMANENT REINFORCEMENT EXTENDS SERVICE LIFE OF CRITICAL PIPELINE BY 50 YEARS

Inspectors at a sugar processing facility found frequent leaks in a critical cooling water pipe. The pipe's ultra-thin wall was severely dented from an over-tightened repair clamp and had to be restored to shape with filler putty prior to any repairs. Advanced FRP recommended a repair using a structurally independent, carbon fiber reinforcement system

that would be installed around the existing pipe. High ambient temperatures made the carbon fiber fabric extremely hot to touch during application. Despite these challenges, the composite system delivered permanent reinforcement without service disruption, providing a 50-year life extension to the critical pipeline.

**FRP Repair Putty - CF-500 BD - FRP 211 HT Saturant  
- HP 300 Epoxy**

COMPOSITE PIPE REPAIR

# HYDROGEN PIPELINE REPAIR



## 6-LAYER, CARBON FIBER REINFORCEMENT SYSTEM

A major gas company found defects on the weld seams of a stainless-steel pipe that transported pure hydrogen gas. The defects were likely stress corrosion related so the company turned to a high-modulus carbon fiber system to reinforce their critical stainless-steel

hydrogen pipeline. In this case it was important to use materials that wouldn't react adversely with hydrogen, as some steels can. A six-layer carbon fiber reinforcement system was applied to a two-meter length to enclose both problematic areas and provide a long-term life extension.

**CF-500 BD - FRP 210 HT Saturant - FRP 120 HT Adhesive - FRP Repair Putty - HP 300 Epoxy**

## COMPOSITE PIPE REPAIR

# LONG-LASTING REPAIR FOR NUCLEAR POWER PLANT



## Carbon Fiber Repairs Leak in Circulating Water Pipe

Nuclear power facility managers discovered a pinhole-sized leak in a 42-inch diameter circulating water pipe. Nuclear environments present unique challenges, including limited access windows, strict regulatory oversight, and zero tolerance for failure. As a result, the repair had to be fast, durable, and non-disruptive to operations.

**CF-500 BD - FRP 210 HT - HP-300 Epoxy  
- FRP 120 HT**

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# Composite Reinforcement of Pinhole-Sized Leak

First, the large diameter water pipe was bristle blasted, followed by the installation of 3 layers of high-strength carbon fiber and a 100% solids epoxy topcoat. This composite repair restored structural integrity without hot work or extended downtime.



**COMPOSITE PIPE REPAIR**

# REPAIR FOR COAL HANDLING PIPE



## **INTERIM SOLUTION - CERAMIC-LINED, CARBON FIBER PATCH APPLICATION OVER EXISTING Y-SECTION**

Inspectors at a concrete facility found frequent leaks in a Custom Y section of their coal handling area. The operators wanted to replace the custom pipe but faced an extended lead-time for the item. A temporary solution was created where a ceramic-

lined, carbon fiber patch would be applied over the existing Y-section. The repair was installed while the system was online and during surface temperatures of 150°F. The patch provided a 2-year service extension.

**Ceramic Repair Putty HT - FRP 210 HT Saturant - CF-300 BD - CF-500 BD - HP 300 Epoxy**

COMPOSITE PIPE REPAIR

# SMALL DIAMETER HPFF CARBON FIBER REPAIR



## 6-LAYER, CARBON FIBER WRAP REPAIR

A dielectric fluid leak was found in several small diameter high-pressure, fluid-filled feeders near a substation. The pipe-type cables had a copper outer pipe and very low clearance around each pipe. A typical welded sleeve or clamp could not be used because of the

tight clearance. After a temporary leak stop was installed, six layers of high strength carbon fiber was wrapped around the pipes. This six-layer system provided a permanent repair for these copper, pipe-type cables.

**CF-500 BD - FRP 210 HT Saturant - Repair Putty - HP  
300 Epoxy - FRP 120 HT**



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