

Leak Stopper, DiamondWrap® Restore Leaking Pipe to Safe Service

PIPE DETAIL

A 12-inch (305-mm) carbon steel pipe transporting harsh chemicals suffered a pinhole leak caused by internal corrosion

43° C (109.4° F)
Operating Temperature

148 C (298.4° F) Design
Temperature

-5° C (23° F) Ambient
Temperature During
Installation

SUMMARY

- Internal corrosion caused a pinhole leak on a 12-inch (305-mm) carbon steel pipe transporting harsh chemicals
- 4 layers of axial strips of carbon fiber were applied over 18 inches (46 cm) to repair the nozzle
- 2 technicians completed the repair in less than 1 hour
- No hot work was required
- No negative environmental impact

Stopping leaks quickly is vital to maintaining critical infrastructure. When a refinery owner in North America discovered a pinhole leak on a 12-inch (305-mm) carbon steel pipe, there was an immediate move to address the problem. The leak, caused by internal corrosion, was in a weld on a nozzle, and the refinery was at risk of a shutdown. A hose clamp had failed at providing a stopgap fix, so in order to avoid interrupting operations, it was essential to find a better solution.

Having used ClockSpring|NRI products in the past, the owner immediately contacted a representative and requested a Leak Stopper to arrest the leak and a DiamondWrap® repair to reinforce the defect. This solution offered a low-cost, fast turnaround repair that would provide the required chemical resistance and address complex geometries.

The DiamondWrap® system includes a bidirectional weave of carbon fiber and a 100% solids epoxy that delivers a repair that is stronger than steel. The structural system forms a



Installers secured Leak Stopper on the pipe, creating a low-profile repair that was ready to be overwrapped with the DiamondWrap® for a lasting repair. (Photo courtesy of ClockSpring|NRI)

pipe around a pipe, with each successive wrap increasing the pressure rating. The bidirectional weave allows for strength in both the hoop and axial directions, and the finished repair delivers superior creep properties that ensure there is no reduction in strength over time. Its low profile allows installation on tees, elbows, and irregular surfaces that require structural reinforcement or leak containment.



Technicians applied 4 axial strips of carbon fiber over a length of 18 inches (46 cm) to repair the nozzle and achieve the final design, restoring safety within 1 hour without requiring the line to be shut in. (Photo courtesy of ClockSpring|NRI)

The owner believed a DiamondWrap® repair was the best solution for rapidly restoring the damaged line to safe operations without introducing hot work into the repair environment. Experts at ClockSpring|NRI designed a DiamondWrap® solution that could be installed on top of the Leak Stopper - a proven solution for arresting leaks - which would replace the failed hose clamp stopgap attempt. The Leak Stopper is designed with a plug to quickly cover a hole in the pipe and an optimized strap to secure plug placement.

A team of 2 trained and certified installers secured the band of the Leak Stopper on the pipe to cover the leak and used a ratchet to tighten the band until the leak was stopped, stopping the leak within less than a minute. Using the back of the tightening tool to trim the excess slack from the band, the team created a repair with

a finished profile that is only 1 inch (25.4 mm) wide that was ready to be overwrapped with the DiamondWrap® for a lasting repair.

With the leak safely arrested, the installers proceeded with the application of four layers of axial strips of carbon fiber over a length of 18 inches (46 cm) to repair the nozzle and achieve the final design, restoring safety within 1 hour without requiring the line to be shut in.

There are nearly 3,000 trained Clock Spring installers around the world who are qualified to provide repairs with Clock Spring products. Clock Spring regularly offers [training classes](#) for installers and can custom design training for individual company needs.