

CURED-IN-PLACE (CIP) LINING SYSTEM FOR HIGH-PRESSURE GAS PIPELINES UP TO 250 PSI MAOP



Our starline®20000 Technology Is Coming to America!

After five years of R&D work, the Karl Weiss GmbH & Co. of Berlin, Germany now introduces the first approved process for rehabilitation of high-pressure gas pipelines up to 250 psi MAOP. In May 2002, the starline®20000 technology successfully completed all tests in a project led by Ruhrgas AG and supported by DVGW (German Technical and Scientific Association on Gas and Water). The starline®20000 technology is a cost-effective solution for applications, such as

- *ACTUAL OR POTENTIAL CORROSION FRACTURES,*
- *PREVENTIVE PROTECTION AGAINST INTERNAL CORROSION*
- *SEALING OF CULVERTS, RAILROAD UNDERPASSES AND NATURE RESERVES*
- *PREVENTIVE SEALING OF FRACTURE-PRONE WELD SEAMS*

Long-term tests show that after 30 years the burst pressure at 2-inch holes is more than 870 psi. In view of an additional safety factor of 2, a maximum operating pressure of 435 psi can be applied to the rehabilitated pipeline with a service life of at least 30 years. The simulated 2-inch corrosion holes are worst case scenarios, the actual size of potential corrosion fractures are usually much smaller, i.e. the safety factor will be much higher in the field.



A 12" steel pipe was lined with the starline®20000 process covering a 2" hole to demonstrate a stress and time-to-rupture test. The result of this testing proved the lined pipe held a maximum operating pressure, even in the presence of severe corrosion, of 435 psi.

No material is completely gas-tight. If the adhesive contains pores, gas permeates from the pipeline into these pores as long as these pores are pressurized. If the pipeline is depressurized, the operating pressure may push the liner off the pipeline wall damaging potentially the liner. This phenomenon is known as *Blistering*. Tests on the Ruhrgas AG premises showed that no blistering occurred in a lined pipe section of 230 feet with an expansion and 30° mitered bend after repeated depressurization.



Practical test on Ruhrgas AG premises under supervision of project management witnessing that no blistering occurs with the starline[®]20000 system; 230 ft long test section with pipe expansion and mitered bend in the background.

Simulation of weld seam fractures proved that the liner remains tight at a pressure of 435 psi over the test period of one week. In addition, the starline[®]20000 technology fulfills all requirements of chemical and aging strength.

Practical test on Ruhrgas AG premises under supervision of project management witnessing that no blistering occurs with starline[®]20000 system; Winding the liner into the mobile pressure drum.





Certified Fabric Hose Relining System for High-Pressure Gas Pipelines Up To 250 psi

Our starline[®]20000 technology fulfills all above-mentioned tests which are established in the Preliminary Test Principles VP 404 of DVGW. Based on the excellent test results which were determined by recognized German testing institutes (EBI, IKP, and DBI), the starline[®]20000 technology has been approved by DVGW for the pressure range up to 435 psi (30 bar).

The rehabilitation technique is largely based on our reliable starline[®]2000 process for rehabilitation of gas mains up to 60 psi, which has been applied in more than 300 miles of natural gas pipelines. Please contact our North American licensee, Progressive Pipeline Management for more details.

In conjunction with the Gas Technology Institute, we would be pleased to demonstrate the benefits of the starline[®]20000 technology to you and your company. Please contact Allen Spivey of GTI if you are interested in taking advantage of the next evolution in *Cured-In-Place* lining for the rehabilitation of corroded and leaking gas pipelines.



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