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The Clock Spring composite repair sleeve and reinforcement system is uniquely designed for high pressure transmission pipelines. Made up of a pretensioned and pre-cured unidirectional e-glass composite coil, a high-modulus filler material, and a high lap-shear strength methyl methacrylate adhesive, it is proven to 8000 psi burst pressure, has a design life of beyond 50 years, and an installation history of more than 30 years, qualifying it as the first permanent repair in the industry.

Each Clock Spring coil is made up of 8 layers, providing a repair with a higher failure pressure than the original pristine pipe. Designed to structurally reinforce and permanently restore external anomalies to beyond original pipe strength, the Clock Spring sleeve can repair a broad range of metal loss up to 80% depth, deformation and mechanical damage, and mill defects. Clock Spring is available in 4-inch through 56-inch diameter kits.

Applications
- Corrosion
- Gouges
- Dents
- Manufactured defects

Compliant with (standards/regulations):
US DOT CFR 192 and CFR 195
CSA Z662
ASME PCC-2, Article 401
ISO 24817

Benefits

- Installs without disrupting operations
- Two hours to backfill from installation
- Enhances short-term and long-term safety
- Marking band system makes repairs visible to inline inspection tools
- No environmental hazards
- Easy transportation to site and no special tools to install
- No hot work or heavy lifting
- Can be installed under water
- Available in high-temperature system

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Qualification data

Properties	Values
Nominal thickness	0.065” (1,6 mm)
Complete 8-layer System	0.5” (13 mm)
Width	12” ± 0.5” (305 mm)
Lap Shear Strength	> 1,200 psi (8.27 MPa)
Compressive Strength	> 12.500 psi (86.18.MPa)
Circular tensile strength	6.800 psi (468.8 MPa)
Circular tensile modulus	5.000.000 psi (34473.8 MPa)
Max. Temperature	94°C
Shelf life	12 months
Storage	Do not freeze. Shelf life is based on continuous storage between +10°C to +22°C, long term exposure above +22°C, will reduce the shelf life of these materials Prolonged exposure above +35°C quickly diminishes the reactivity of the product and should be avoided. Keep container tightly closed (do not open until ready to use). For industrial use only.

History

The Clock Spring sleeve was the subject of an extensive 10-years research and development program and was the pioneer for the approval of composite repairs across the industry. It is the most tested, investigated, and documented composite repair solution ever developed and has earned it´s place as the industry´s most trusted composite repair system. Clock spring sleeves have been installed in more than 75 countries in practically every environment for more than three decades.

Proven performance: 25 years of Reliable Pipeline Repair with Clock Spring
In 1995, a major natural gas pipeline operator discovered severe corrosion - up to 63% wall loss - on a carbon steel pipeline operating at 750 psi (51,7 bar). To restore integrity, they installed Clock Spring composite repair sleeves without shutting down the line. After surface prep and filler application, the sleeves were installed and fully cured in under an hour, safely returning the line to service.

25 years later, in 2020, the same repaired pipe section was removed for testing. The results:

- Successfully held 1,5 x MAOP (1455 psi/100,3 bar) for 5 minutes
- Ultimate failure at 2180 psi (150,3 bar), outside the repaired area
- Tensile tests showed the 25-year old repair sleeve maintained 90.000 psi strength

This real-world validation proves Clock Spring composite sleeves is a durable, permanent repair solution, with performance lasting 25+ years - and beyond.

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Cobalch ApS ● Hejreskovvej 24 ● DK-3490 Kvistgård ● Denmark ● Tel.: +45 4582 0533
Danske Bank: 1471 4130088031 ● IBAN - DKK: DK3130004130088031 - EUR: DK4730004130088228 ● Swift code: DABADKKK
CVR nr. DK70614316 ● cobalch@cobalch.com ● www.cobalch.com