TECHNICAL DATA SHEET

PROTAL 2800CF™

Carbon Fiber Moisture-Cured Urethane Pipeline Repair System

Description

Protal 2800CF™ is a bi-axial carbon fiber, moisture-cured urethane composite repair system engineered to restore or enhance the structural integrity of steel pipelines and other applicable geometries, including straight pipe, elbows, tees, reducers, and similar configurations. The Protal 2800CF System is qualified in accordance with ASME PCC-2 Article 4.1 and ISO/TS 24817. Repairs using the Protal 2800CF System shall be installed in accordance with a Denso Engineered Composite Repair (ECR)* design developed per ASME PCC-2 Article 4.1.

The Protal 2800CF Pipeline Repair System consists of:

Protal 3210 - High-modulus, two-part epoxy structural filler used to restore pipe surface geometry, reinforce corroded areas, and establish a continuous load-transfer interface.

Protal 7300 - A 100% solids, two-part epoxy serving as the corrosion protection layer.

Protal 2800CF Wrap - A factory pre-impregnated, moisture-cured polyurethane carbon fiber reinforcement supplied as a fast, pre-saturated, water-activated system for rapid installation.

Uses

- External corrosion and pitting
- Gouges, scratches and dents
- Weld defects and manufacturing flaws
- Thinned-wall steel requiring structural reinforcement
- Suitable for pipe, elbows and similar geometries
- Suitable for dry, damp, or sweating surfaces

Features

- Engineered composite reinforcement system
- Fast, easy-to-use pre-saturated carbon fiber wrap
- High-modulus structural filler for optimal load transfer
- Moisture-tolerant corrosion barrier epoxy
- Zero VOCs
- Compatible with sweating or wet surfaces
- Maximum operating temperature: 140°F (60°C)
- ASME PCC-2 / ISO 24817 compliant

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Surface Prep

Surface Preperations for the Protal 2800CF Repair System shall be performed only by personnel trained and certified by Denso.

Prepare surfaces by abrasive blasting to a clean near-white finish in accordance with SSPC-SP10 / NACE No. 2 / Sa 2½. Use an appropriate angular abrasive to achieve a 2.5 - 5 mil (63.5 - 12.7 microns) surface profile. Remove all contaminants prior to coating. Oil and grease shall be removed in accordance with SSPC-SP1 using a non-oily solvent such as xylene, MEK, ethanol, or an equivalent cleaner. Allow 1 - 2 minutes for solvent flash-off. After surface preparation, mark and tape the designated repair area in accordance with the Denso ECR Design to define the Protal 3210 filler and Protal 7300 application zone. Verify that final defect dimensions are within the Denso Engineered Composite Repair (ECR) Design parameters.

Application

Installation of the Protal 2800CF Repair System shall be performed only by personnel trained and certified by Denso.

Apply Protal 3210 Load Transfer Filler: Mix Parts A and B thoroughly. Apply the filler to pits, dents, corrosion cavities, and irregular surfaces, ensuring all defect edges are fully filled. Allow the filler to set until it holds its shape and will not shift when Protal 7300 is applied, while remaining tacky to promote proper bonding.

Apply Protal 7300 Corrosion Barrier Epoxy: Independently mix Part A (resin) and Part B (hardener) prior to combining. After adding the hardener to the base, mix at slow speed until a uniform, constant color is achieved, ensuring all sides of the container are scraped. Apply immediately after mixing. Apply the epoxy using a brush or applicator pad, spreading the material evenly over the repair zone. When applying to wet or sweating surfaces, displace water as the coating is applied. Use a wet-film thickness gauge to verify the required wet-film thickness of 30 mils (0.76 mm). For complete installation requirements, refer to the Protal 7300 Brush Application Specifications.

Apply the Protal 2800CF Carbon Fiber Wrap: While the Protal 7300 epoxy remains tacky. If the Protal 7300 has fully cured, lightly abrade the surface before wrapping. Activate and apply the wrap: Remove the Protal 2800CF wrap from its nitrogen-filled pouch and submerge it in water for 30 seconds to activate the resin. Apply the wrap under tension, spraying water continuously during installation. Install the number of layers, overlap, and orientation specified in the Denso ECR Design.

Install Denso ILI Markers and Consolidate the System: Place Denso ILI Markers (magnets or stainless-steel bands) between wrap layers as specified in the ECR Design. These markers may be required to ensure the repaired area can be located during future in-line inspections. Apply 4 to 6 layers of Denso Poly-Wrap under tension to consolidate the composite and allow the system to cure for 3 to 8 hours, depending on temperature. Perforate the Poly-Wrap as required to relieve trapped moisture. Remove the Poly-Wrap after the composite has cured.

Archco 15 or 65 Topcoat (When Required): For UV-exposed above-ground applications, topcoat the cured composite with Archco 65 or Archco 15. For buried applications, the Protal 2800CF System provides complete protection as installed.

Optional Outerwrap: Denso ViscoWrap or Densyl Tape may be applied when preferred by the client or when required by project specifications for additional mechanical or environmental protection.

**Please contact a Denso representative for any installation training needs or technical questions.*

Storage

Protal 7300 & Protal 3210: Store in a dry, well-ventilated area between 41°F (5°C) and 90°F (32°C) in original, unopened packaging. Do not store in direct sunlight. Shelf Life of 2 years (24 months) from manufacturing date when stored as instructed.

Protal 2800CF Wrap: Store in a dry, well-ventilated area between 41°F (5°C) and 90°F (32°C) in original, unopened packaging. Protal 2800CF Tape is sensitive to temperature and when stored above the recommended storage temperature for long periods of time the shelf life of the product could be reduced. Do not open bag containing Protal 2800CF Tape until you are ready to use it, as it cures when exposed to atmospheric moisture/humidity. Care must be taken when handling the sealed bags to prevent puncturing or scuffi ng. If the protective foil pouch is punctured, the composite wrap will cure within the sealed foil pouch. Do not store in direct sunlight. Shelf life of 1 year (12 months) from manufacturing date when stored as instructed.

HSE

Wear protective clothing and ensure adequate ventilation. Avoid contact with skin and eyes. See Safety Data Sheet (SDS) for further information.

Packaging

Protal 2800CF Tape is supplied in sizes 2" (50.8 mm), 4" (101.6 mm), 6" (152.4 mm), and 12" (304.8 mm) wide and lengths of 5' (1.5 m), 15' (4.57 m), 30' (9.14 m), or 60' (18.3 m). The material is sealed in a nitrogen filled foil bag.

Protal 7300 Primer is supplied in size 1 (1 Quart). Protal 3210 Filler is supplied in sizes 0.5 Pint (284 ml) and 1 Pint (568 ml). Other sizes available upon request.

TECHNICAL DATA SHEET

Tech Data

Properties	Imperial	*Metric*
Ply Thickness	0.038”	*0.97 mm*
Tensile Strength (ASTM D3039)	66,180 psi	*456 MPa*
Ultimate Tensile Strain (ASTM D3039)	1.05%	*1.05%*
Elasticity Modulus (ASTM D3039)	6.93 Msi	*47.78 GPa*
Filler Compressive Strength (ASTM D695)	12,600 psi	*86 MPa*
Filler Compressive Modulus (ASTM D695)	556,000 psi	*3,834 MPa*
Lap Shear Strength (ASTM D5868)	1,086 psi	*7.4 MPa*
Cathodic Disbondment (ASTM G95)	Completed	*Completed*
Installation Temperature – Min	50°F	*10°C*
Installation Temperature – Max	120°F	*48°C*
Max Operating Temperature	140°F	*60°C*

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