

THERMO-WRAP™ CF

CARBON FIBER COMPOSITE REPAIR SYSTEM FOR HIGH TEMPERATURE & PROCESS PIPING

Description Thermo-Wrap™ CF is a custom-engineered, carbon-fiber composite system utilizing a high strength, biaxial hybrid carbon and glass fiber in conjunction with NRI's proprietary Thermo-Poxy™ epoxy system for the repair and restoration of pipes, structural integrity, and corrosion protection. A unique advantage is that Thermo-Wrap CF is designed to maintain high tensile strength at high temperatures.

Typical Applications

- Flare lines, blow down lines, steam piping, chemical processing lines
- Girth welds, elbows, tees
- High temperature environments

Benefits

- High temperature rating with an ambient-cured epoxy
- No heating or post-curing required
- High tensile strength and stiffness vs glass systems
- Design conforms to ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for nonmetallic reinforcing and repair

Coverage Sold based on square foot of coverage

Thickness As determined by NRI engineering calculations

Mixing & Mix Ratio Power mix Part A, then combine with Part B and power mix. Do not mix partial kits. Resin to hardener 100:27 by volume.

Pot Life 75 minutes @ 75°F (24°C), less at higher temperatures

Limitations

- Epoxy application temperature: minimum of 50°F (10°C) and maximum of 200° (93°C)
- Maximum allowable sustained humidity must be less than 90%

Related Products The following products are system components of the Thermo-Wrap CF system:

- Thermo-Fill HC
- Thermo-Poxy
- Syntho-Coat or Syntho-Glass UV

Composite Laminate Properties	Property	Circumferential Direction	Axial Direction
	Tensile Modulus	8 Msi	2.29 Msi (15.8 GPa)
Thermal Expansion Coefficient	3.2ppm/°F	10.31 ppm/°F	
Property		Typical Test Value	
Laminate Thickness	0.018 "		
Poisson Ratio	0.132		
Shore D Hardness	90@ 75°F (24°C)		

Design Thermo-Wrap CF was designed to conform to ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for nonmetallic reinforcing solutions. Consult NRI Engineering for specified use.



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Surface Preparation Surface preparation and profiling shall promote continuous intimate contact between the CFRP system and pipe by providing a clean, smooth, and circumferential surface. Surface preparation shall be in accordance with SSPC-SP1 "Solvent Cleaning" and SSPC-SP10 / NACE 2 "Near White Blast Cleaning" 1-3 mil surface roughness (25-75 microns). The Thermo-Wrap CF composite repair system is a bond-critical composite repair system requiring a strong adhesive bond between the clean pipe and the Thermo-Wrap CF system.

Installation Installation of the Thermo-Wrap CF system shall be performed by NRI qualified applicators only. Surface preparation, mixing of epoxy, material saturation, and installation of the system are to be in accordance with NRI's Thermo-Wrap CF Installation Guide, latest revision. Quality control inspection during and after installation of the Thermo-Wrap CF system shall be performed per NRI's Installation Validation Procedure: Quality Control Records, latest revision.

Cure Schedule	Temperature	Working Time	Set Time
	50°F (10°C)	3.75 hours	24 hours
	60°F (16°C)	2.5 hours	12 hours
	75°F (24°C)	1.25 hours	4-6 hours
	90°F (32°C)	35 minutes	3 hours
	200°F (93°C)	30 seconds	1 minute

Cleanup and Safety For proper information regarding the safe handling, storage, and disposal of chemical products, users shall refer to the most recent SDS, latest revision, containing physical, ecological, toxicological, and other safety-related data.

Shelf Life Epoxy: 12 months with proper storage
Fabric: 12 months with proper storage

Storage Conditions Epoxy: store in original, unopened containers, indoors at a max temp of 95°F (35°C).
Fabric: store at temperatures below 100°F (38°C) away from moisture or any contaminants, in original packaging

Packaging Thermo-Wrap CF is supplied in kits which contain:

- Thermo-Wrap CF dry fiber ranging in widths from 2" (5cm) to 12" (30cm)
- Thermo-Poxy ranging from pint to gallons for the following coverages: 20ft² (1.8m²), 40ft² (3.7m²), 80ft² (7.4m²), 160ft² (14.8m²)
- Typically ships in 17" x 15" x 14" boxes (43cm x 38cm x 36cm)

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