

THERMO-WRAP™ 500

COMPOSITE REPAIR SYSTEM

FOR EXTREME TEMPERATURES IN PROCESS PIPING



Description

Thermo-Wrap™500 is a factory-saturated, custom engineered composite repair system compatible with temperatures reaching 500°F (260°C). NRI's patented factory-saturation process ensures the right fiber-to-resin content ratios are achieved. By eliminating the need for field-saturation, this product can be applied faster and more efficiently on pipes with elevated operating and design temperatures. Thermo-Wrap 500 has been tested in accordance with ASME PCC-2 Article 4.1.

Typical Applications

- Repairs at extreme temperatures
- Flare lines, blow down lines, steam piping, chemical processing lines
- Girth welds, elbows, tees

Benefits

- Qualified at extreme temperatures
- Factory-saturated, no mixing required
- 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 required

Thickness

As determined by NRI engineering calculations

Mixing & Mix Ratio

N/A

Working Time

Unlimited at ambient conditions. 2 hours @ 446°F (230°C)

Limitations

Product will not cure at ambient temperatures. Temperature shall be a minimum of 400°F (205°C) and a recommended maximum of 500°F (260°C) in order for curing to occur.

Related Products

The following products are system components of the Thermo-Wrap 500 system:

- Filler: Thermo-Wrap™500 Filler
- Primer: Thermo-Wrap™500 Primer
- High-temperature compression film
- UV Protection, if necessary: Syntho-Coat™



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Composite Laminate Properties	Property	Circumferential Direction	Axial Direction
	Tensile Modulus	4.60 Msi (31.7 GPa)	2.80 Msi (19.3 GPa)
Thermal Expansion Coefficient	5.04 ppm/°F (9.07 ppm/°C)	6.17 ppm/°F (11.1 ppm/°C)	
	Property	Typical Test Value	
Laminate Thickness		0.027" (0.69mm)	
Poisson Ratio		0.107	
Glass Transition Temperature		554°F (290°C)	
Shear Modulus of Polymer		189 ksi (1.3 GPa)	
Shore D Hardness		92	
Energy Release Rate @ 500°F		0.52 in.lb/in ² (91 J/m ²)	

Design The Thermo-Wrap 500 composite repair system 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.

Surface Preparation Surface preparation and profiling shall promote continuous intimate contact between the FRP system and pipe by providing a clean, smooth, and circumferential surface. Surface preparation shall be in accordance with SSPC-SP1 "Solvent Cleaning" and SSPC-SP11 "Power Tool Cleaning" with a 1-3 mil surface roughness (25-76 microns) minimum. NRI's composite repair systems are bond-critical and require a strong adhesive bond between the clean pipe and the composite system for maximum effectiveness.

Installation Installation of the Thermo-Wrap 500 composite repair system shall be performed by NRI qualified applicators only. Surface preparation, mixing of epoxy, material saturation, and installation of the system shall be in accordance with NRI's product specific installation guides, latest revision. Quality control inspection during and after installation of the system shall be performed per NRI's Installation Validation Procedure: Quality Control Records, latest revision.

Cure Schedule The following cure schedule must be met in order for the product to achieve its full properties.

Initial Cure	Post Cure
1 hour @ 356°F (180°C)	4 hours @ 500°F (260°C)

Measure Shore D hardness to confirm full set has been achieved before returning line to service.

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 12 months

Storage Conditions Store at temperatures below 77°F (25°C) away from moisture or any contaminants, in original packaging

Packaging Thermo-Wrap 500 is available in sizes ranging from 2" to 12" (5 to 30cm) in width and 15' to 60' (4.6 to 18.3m) in length. Typically ships in 17" x 15" x 14" boxes (43cm x 38cm x 36cm) Refer to individual data sheets for system component's product packaging.

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