

# THERMO-WRAP™ INSPECTABLE

## INSPECTABLE COMPOSITE REPAIR SYSTEM

### FOR HIGH TEMPERATURE & PROCESS PIPING

**Description** Thermo-Wrap™ Inspectable is a custom engineered composite repair system that utilizes high stiffness, non-crimped bi-directional fiberglass architecture in conjunction with NRI's patented Thermo-Poxy™ Inspectable epoxy system. Using common radiographic inspection methods, owners and operators have the ability to monitor the integrity of an "in-service" Thermo-Wrap Inspectable repair through the course of its intended design life. Thermo-Wrap is used to repair corroded or damaged piping with harsh chemical services and elevated temperatures.

**Typical Applications**

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

**Benefits**

- Inspectable via radiography
- High temperature rating with an ambient-cured epoxy
- Non-shielding
- Patented polymer inspection capability
- Design conforms to ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for nonmetallic reinforcing solutions

**Coverage** Sold based on square foot of coverage required

**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 5:1 by volume.

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

**Limitations**

- Application temperature shall be a minimum of 50°F (10°C) and maximum of 280°F (138°C)
- Relative humidity must be 85% or below
- Pipe surface must be 6°F (3°C) above dew point

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

- Filler: Thermo-Fill™ HT
- Primer / Saturant: Thermo-Poxy™ Inspectable
- UV Protection, if necessary: Syntho-Coat™ or Syntho-Glass® UV
- Compression Film

Composite Laminate Properties	Property	Circumferential Direction	Axial Direction
	Tensile Modulus	4.29 Msi (29.6 GPa)	2.29 Msi (15.8 GPa)
Thermal Expansion Coefficient	5.72ppm/°F (10.3 ppm/°C)	8.41 ppm/°F (15.14 ppm/°C)	
	Property	Typical Test Value	
Laminate Thickness		0.027 " (0.69mm)	
Poisson Ratio		0.132	
Glass Transition Temperature		367°F (186°C)	
Shear Modulus of Polymer		177 ksi (1.22 GPa)	
Shore D Hardness		87	
Energy Release Rate		2 in.lb/in <sup>2</sup> (350J/m <sup>2</sup> )	

**Design** The Thermo-Wrap composite repair system was designed to conform to, and is recognized by ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for non-metallic reinforcing solutions. Consult NRI Engineering for specified use.



# THERMO-WRAP<sup>™</sup> INSPECTABLE

## INSPECTABLE COMPOSITE REPAIR SYSTEM

### FOR HIGH TEMPERATURE & PROCESS PIPING

**THERMO-WRAP<sup>™</sup> INSPECTABLE**  
**INSPECTABLE COMPOSITE REPAIR SYSTEM**  
**FOR HIGH TEMPERATURE & PROCESS PIPING**

**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 Inspectable 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	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	6 hours
	90°F (32°C)	35 minutes	3 hours
	150°F (66°C)	10 minutes	1 hours
	200°F (93°C)	5 minutes	30 minutes
	280°F (138°C)	30 seconds	1 minute

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**  
 Epoxy: 12 months  
 Fabric: 12 months

**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 Inspectable is supplied in kits which contain:

- Thermo-Wrap dry fiber ranging in widths from 3" (8cm) to 12" (30cm)
- Thermo-Poxy ranging from pint to gallons for the following coverages: 20ft<sup>2</sup> (1.8m<sup>2</sup>), 40ft<sup>2</sup> (3.7m<sup>2</sup>), 80ft<sup>2</sup> (7.4m<sup>2</sup>), 160ft<sup>2</sup> (14.8m<sup>2</sup>)
- Typically ships in 17" x 15" x 14" boxes (43cm x 38cm x 36cm)

**Warranty** ©Neptune Research Inc. (NRI) NRI® is a registered trademark, while Thermo-Wrap<sup>™</sup>, Thermo-Wrap<sup>™</sup>Inspectable, Thermo-Fill<sup>™</sup>HT, Thermo-Poxy<sup>™</sup> and Syntho-Coat<sup>™</sup> are trademarks of NRI. NRI utilizes a process of continuous product improvement for all of our products. While we do strictly adhere to our products' specifications, we routinely implement product improvements. Therefore, please contact your local NRI distributor or office for the most current product specifications. NRI warrants the quality of this product when used according to directions. Apply protective coatings per company standards. User shall determine suitability of product for use and assumes all risk. The seller will not accept liability for more than product replacement.