

VIPER-SKIN™

CARBON FIBER COMPOSITE REINFORCEMENT SYSTEM

Description Viper-Skin™ is the first bi-axial, hybrid carbon and glass fiber polyurethane pre-impregnated system that blends the unsurpassed strength and stiffness of carbon with the ease and use of a moisture-cured, factory-saturated fiber.

- Typical Applications**
- Transmission and distribution pipelines
 - Oil and gas risers
 - Mechanical dents and defects
 - Girth welds on vessels and pipelines
 - Process piping: chemicals, oil, gases, water and steam

- Benefits**
- Moisture-cured polyurethane resin reduces composite preparation time by over 50%
 - Factory-saturation optimizes fiber to resin ration and provides a material with a constant strength property
 - Non-shielding
 - Can be applied to damp, sweating, or immersed surfaces
 - No heating or post-curing required
 - Can be applied to any geometry including, but not limited to elbows, Tees, and flanges
 - Design conforms to ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for nonmetallic reinforcing solutions

Coverage As determined by NRI engineering calculations

Thickness As determined by NRI engineering calculations

Mixing & Mix Ratio No mixing required

Pot Life 20 minutes @ 75°F (24°C), less at higher temperatures

- Limitations**
- Application temperature: minimum of 32°F (0°C) and maximum of 150° (66°C)

- Related Products** The following products are system components of the Viper-Skin system:
- Load Transfer Epoxy: Syntho-Poxy™ HC Reinforcing
 - Anti-Corrosion Primer: Syntho-Subsea™ LV Epoxy
 - Insulating Glass Layer: Syntho-Glass® XT
 - UV protection: Syntho-Coat or Syntho-Glass® UV
 - Compression Film

Composite Laminate Properties	Property	Circumferential Direction	Axial Direction
	Tensile Modulus	8 Msi	2 Msi
Thermal Expansion Coefficient	1.79 ppm/°F	13 ppm/°F	
Property		Typical Test Value	
Laminate Thickness	0.018 "		
Poisson Ratio	0.132		
Shore D Hardness	83		

Design Viper-Skin 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 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). If an existing coating is present, roughen to degloss. The Viper-Skin composite repair system is a bond-critical composite repair system requiring a strong adhesive bond between the clean pipe and the Viper-Skin system.



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Installation Installation of the Viper-Skin System shall be performed by NRI qualified applicators only. Surface preparation, mixing of epoxy, and installation of the system are to be in accordance with NRI's Viper-Skin Installation Guide, latest revision. Quality control inspection during and after installation of the Viper-Skin 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)	60 minutes	120 minutes
	60°F (16°C)	40 minutes	75 minutes
	75°F (24°C)	20 minutes	40 minutes
	90°F (32°C)	12 minutes	20 minutes
	150°F (66°C)	2 minutes	10 minutes

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 in a cool, shaded area at an ambient temperature of 95°F (35°C)

Packaging Refer to individual data sheet for product packaging

Warranty ©Neptune Research Inc. (NRI) NRI® is a registered trademark, while Viper-Skin is a trademark 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.

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