ACID•SHIELD™
COMPOSITE REPAIR SYSTEM
WITH SUPERIOR CHEMICAL COMPATIBILITY FOR PROCESS PIPING

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Description

Acid-Shield™ is a custom engineered, ASME PCC-2 4.1,4.2 compliant, composite repair system that utilizes chemically resistant, bi-directional fiberglass in conjunction with NRI's Acid-Shield epoxy system. Acid-Shield was designed to repair corroded or damaged piping with harsh chemical services such as 98% sulfuric acid.

Typical Applications

Repair external or internal corrosion defects on 98% sulfuric acid lines, flare lines, blow down lines, and chemical processing lines

Benefits

- Compatible with 98% sulfuric acid
- Conformable for repairing elbow, tees, nozzles, welds and headers
- Ambient-cured epoxy
- Design conforms to ASME PCC-2, ASME B31, ISO TS24817, DOT, API, and CSA Z662 standards for nonmetallic reinforcing and repair

Limitations

- Application temperature shall be a minimum of 100°F (38°C) and a recommended maximum of 175°F (79°C)
- Relative humidity must be 85% or below during installation
- Pipe surface must be 6˚F (3°C) above dew point during installation
- Maximum service temperature: 212°F (100°C)

Related Products

The following products are system components of the Acid-Shield system:

- Acid-Shield™ Filler
- Acid-Shield™ Epoxy
- Acid-Shield™ Fiberglass
- Compression Film

Composite Laminate Properties

Property	Circumferential Direction	Axial Direction
Tensile Modulus	5.5 Msi (37.7 GPa)	2.3 Msi (16.1 GPa)
Thermal Expansion Coefficient	7.1 ppm/°C (3.9 ppm/°F)	18.9ppm/°C (10.5 ppm/°F)

Property	Typical Test Value
Laminate Thickness	0.018" (0.46mm)
Poisson Ratio	0.11
Glass Transition Temperature	280°F (138°C)
Shear Modulus of Polymer	139 ksi (0.96 GPa)
Shore D Hardness	87
Energy Release Rate	3.10 in.lb/in^2 (543J/m^2)
Lap Shear Strength	1,158 psi (7.98 MPa)

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Design

The Acid-Shield 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.

Coverage

Sold based on square foot of coverage required

Thickness

As determined by NRI engineering calculations

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, or better. 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.

Mixing & Mix Ratio

Power mix Part A, then combine with Part B and power mix. Do not mix partial kits.
Resin to hardener 100:31.3 by weight.

Pot Life

Temperature	Pot Life
75°F (24°C)	150 minutes
100°F (38°C)	71 minutes
130°F (54°C)	35 minutes

Installation

Installation of the Acid-Shield 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	Cure Time
100°F (38°C)	35 minutes	17 hours
130°F (54°C)	17 minutes	9 hours

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 (epoxy and fabric)

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

Acid-Shield is supplied in kits which contain:

- Acid-Shield chemically resistant bi-directional fiberglass available in the following widths: 3” (8cm), 6” (15.2cm) and 12” (30cm)
- Acid-Shield Epoxy Saturant ranging from pint to gallons for the following coverages: 20ft² (1.8m²), 40ft² (3.7m²), 80ft² (7.4m²), and 160ft² (14.8m²)

Warranty

 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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