Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

Pure Epoxy Structural Rehabilitation

Heat Resistant Epoxy

— Structural Coatings & Liners —

Versions To > 300°F

Manufactured To Meet ASTM F-1216 Section X1 Design ConsiderationsFor Deteriorated Gravity & Pressure Systems.

Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

Pure Epoxy Structural Rehabilitation

High Viscosity Heat and Chemical Resistant Epoxy System NPR-1551

Typical Physical Properties

NPR-1551 is a moderately fast curing, high strength, and high corrosion resistant modified epoxy resin, designed for high temperature application. Film thickness of 100–300 mils in a single pass by spray, brush or trowel. Typically develops a hard surface in 1-2 hr at ambient temperature. Rapid development of physical properties during post cure process

Glass Transition Temperature (180˚F Post Cure)	100˚C (212˚F)
Glass Transition Temperature (300˚F Post Cure)	130˚C (265˚F)
Maximum Service Temperature (300˚F Post Cure)	120˚C (250˚F)
Specific Gravity (resin)	1.06 – 1.09 G/ml.
Weight Per Gallon (resin)	8.9 – 9.2 Lb
Specific Gravity (hardener)	1.53 – 1.57 G/ml.
Weight Per Gallon (hardener)	15.2– 15.4 Lb
Weight Per Gallon (mixture)	12.0 – 12.3Lb
Viscosity, Resin @ 25˚C, 20 rpm	100,000 cPs
Viscosity, Hardener @ 25˚C, 20 rpm	100,000 cPs
Mix Ratio (Resin/Hardener)	1.5 to 1 By Volume
Mix Ratio (Resin/Hardener)	1 to 1 By Weight
Flexural Modulus (ASTM D-790)	570,000 psi
Flexural Strength (ASTM D-790)	11,000 psi
Tensile Elongation	3%
Tensile Strength (ASTM D-638)	6,000 psi
Coefficient of Linear Thermal Expansion	3.7×10^{-6} cm/cm/^{O}C
Shore D Hardness (ASTM D-4541-95el)	>87
Shrinkage	<0.5%
Adhesion to concrete (ASTM D-4541-95el)	Concrete Fails
Adhesion to steel (ASTM D-4541-95el)	3000 psi

Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

Pure Epoxy Structural Rehabilitation

NPR-1551 Curing With Hot Air, Hot Water Or Combination Steam/Air

This epoxy system designed for high temperature application. In its initial ambient cure state all physical and chemical resistance properties are low. It requires an elevated temperature post cure to develop high strength and chemical resistance. The purpose of this test was to determine the best method of providing a post cure in a manhole or pipeline structure.

Three heat delivery methods are considered as candidates; hot water, hot air and a steam/air combination. A batch of NPR-1551 was mixed then cast into three separate bars. Each bar was allowed to cure at room temperature. One bar was placed into cold water, which was subsequently heated to 90˚C (194F). The second bar was placed in a container with 100˚C (212˚F) steam at ambient pressure. The third bar was placed into an oven at temperature100˚C (212˚F). All post cures were for one hour.

Results were excellent in all cases. Even thought the samples were very much under cured, when place in water and steam/air, there was no visual physical influence the samples when compared to the sample cured in hot air.

Cure Method	Flexural Modulus (NPR-1551)
Hot Air post Cure	596,530 psi
Hot Water Post Cure	584,130 psi
Steam/Air Post Cure	571,350 psi

The results demonstrate that NPR-1551 may be post cured in a number of acceptable process techniques. Steam is generally available at industrial and commercial plants and factories. Steam can be used as a spurge to heat water, or may be mixed with compressed air to circulate though a tank or pipe and thereby thoroughly cure the epoxy.

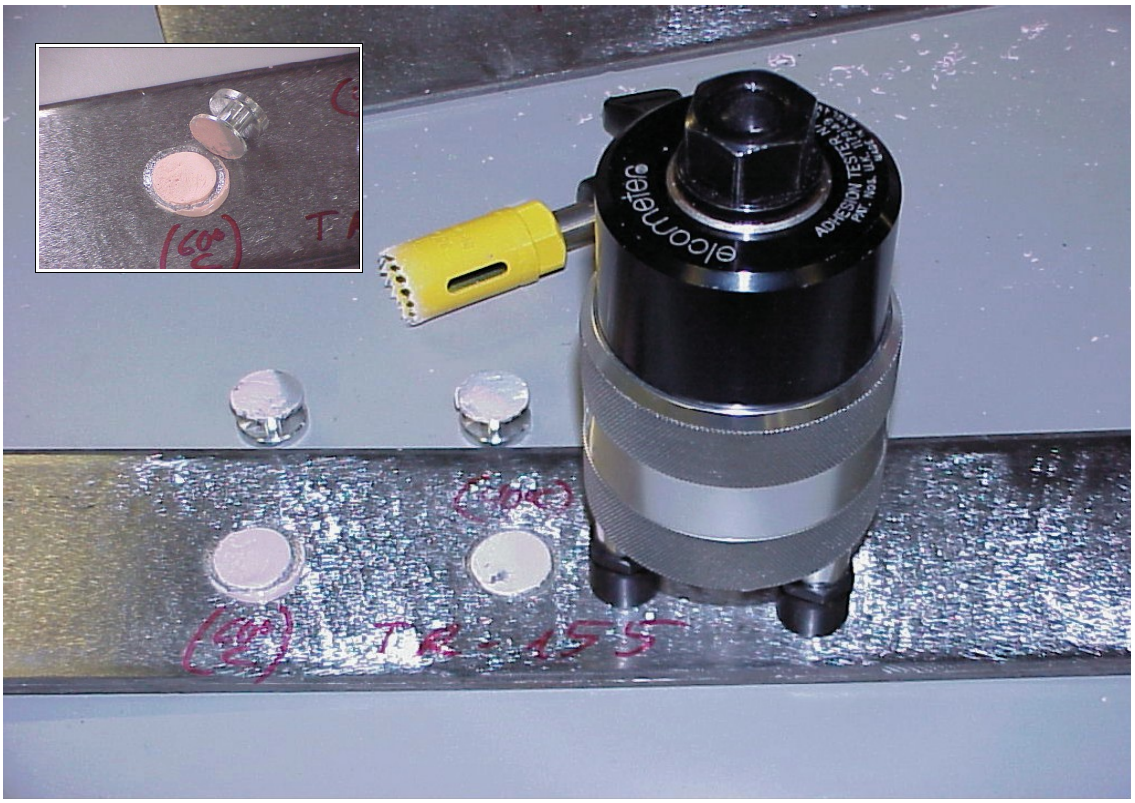
Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

Pure Epoxy Structural Rehabilitation

NPR-1551 Adhesion To Hot Steel

A flat steel bar was surface prepared then three Elcometer dollies were adhesively bonded with NeoPoxy NPR-1551. The strucutral epoxy was cured at room temperature, then placed into an oven at 40C (120°F) and later post cured at 100°C 9212°F) for 6 hours. The steel bar was removed from the hot oven and allowed to cool until reaching 60°C (140°F) Pull off test was performed at 60°C per ASTM D-4541-95el.

Adhesion to steel at 60°C (140°F) is greater than 20 MPa (3,000 psi). Failure was within the cohesive and to the dolly partially adhesive. There was no failure at the steel surface.



Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

NeoPoxY™

Pure Epoxy Structural Rehabilitation

High Heat, Strength and Chemical Resistant Epoxy System NPR-1571

NPR-1571 is a slow curing epoxy system designed for medium and large diameter curing-in-place pipes (CIPP), where continuous heat resistance, structural strength and improved chemical resistance are required. Low viscosity makes for rapid wet-out of traditional PET felt liner materials. Initial cure is accomplished at ambient temperatures and followed with post cure at 70˚C or higher.

Typical Physical Properties*

Initial Cure Time, 100 Grams @ 25˚C……	500 Minutes
Max. Service Temp. (100˚C Post Cure) ……	300˚F (150˚C)
Flexural Modulus Clear Cast (ASTM D-790) ……	450,000 psi
Flexural Strength Clear Cast (ASTM D-790) ……	16,000 psi
Flexural Modulus Laminate (ASTM D-790).....	470,000 psi
Flexural Strength Laminate (ASTM D-790).....	11,000 psi
Shore D Hardness (ASTM D-2240)…… ……	>85
Shrinkage…… ……	<0.1 of 1%
Adhesion: Concrete (ASTM D-4541-95el)… ……	Concrete Fails
Adhesion: Steel (ASTM D-4541-95el)…… ……	2,500 psi
Abrasion Resistance (D4060-95, CS17)… ……	50mg/1000 cycle @ 1000 g load
Viscosity, Resin @ 20 RPM……	12,000 cPs
Viscosity, Hardener @ 20 RPM……	13,000 cPs
Mix Ratio (Resin/Hardener……	1.5 Part A, to 1 Part B (Volume)
Specific Gravity, Resin……	1.17 G/ml
Weight per gal, Resin……	9.7 lb
Specific Gravity, Hardener……	1.50 G/ml
Weight per gal, Hardener……	12.5 lb
Coefficient of Linear Thermal Expansion……	3.738 x 10^{-} cm/cm/˚C

*Physical properties for samples post cured for 4 hr @ 176˚F (80˚C)

Neopoxy International
27057 Industrial Blvd. Suite 208
Hayward, California 94545
Phone (510) 782-1290
Fax (510) 782-1292
www.neopoxy.us

NeoPoxY™

Pure Epoxy Structural Rehabilitation

Corrosion Test ASTM F1216 for Laminate

Chemical Solution	Initial Flexural Strength, psi	Initial Flexural Modulus, psi	Flexural* Weight Change, %	Flexural* Strength Change, %	Modulus* Change, %
Sulfuric Acid, 10%	10,400**	522,300***	0.81	-16.4	-1.5
Sodium Hydroxide, 5%	10,400	498,700	0.03	-0.1	-3.2
Phosphoric Acid, 10%	10,400	525,400	0.26	-12.6	-5.7
Gasoline, 100%	10,400	532,300	-0.05	2.9	-2.2
Vegetable Oil, 100%	10,400	517,000	0.11	1.9	-3.6
Detergent, 0.1%	10,400	521,000	0.27	-2.7	-4.3
Soap, 0.1%	10,400	511,000	0.19	-1.6	-2.8
Tap Water	10,400	513,200	0.16	-1.4	-1.4
Control	10,400	509,800	0	N/A	-1.2

During 1 month, CIPP test specimens should lose no more than 20% of their initial flexural stregth and flexural modulus when tested in accordance with ASTM D 790

*One month exposure
** All results were calculated as average of 3 samples
*** Non-distructive test. Same samples were used before and after exposure to chemicals