CERTIFICATE OF COMPLIANCE

Ceramic Epoxy for Pipe and Fittings

ELECTROSTEEL USA

DATE

Electrosteel USA certifies that our Ceramic Epoxy (Perma Shield 431) adheres to wastewater industry standards. Perma Shield 431 lining is applied to manufacturers' requirements. Please refer to our website www.electrosteelusa.com for up to date product data and technical advisories.

MATERIAL

Perma Shield 431 is an Amine cured epoxy containing at least 20% by volume ceramic quartz pigment (Ceramic Epoxy) used for sewer service. Not recommended for potable water applications.

COMMON USAGE

A 100% solids, abrasion-resistant lining specifically designed for wastewater immersion and fume environments and exposure to corrosive soils. Provides low permeation to H2S gas, protects against MIC and provides chemical resistance to steel, ductile iron pipe and fittings for severe wastewater or buried exposures. A coal-tar free, resin-rich formulation with low pigment volume concentration (PVC) for maximum performance.

SPECIAL QUALIFICATIONS

Contains 20% ceramic microspheres for increased abrasion resistance. Compatible with high-velocity jet sewer cleaning (hydrocleaning) with 0-degree tips (Reference Technical Bulletin No. 11-86). Meets the performance requirements of AWWA C 210 (not for potable water contact).

FILM PROPERTIES

TEST	METHOD	CONDITIONS	RESULT
Permeability	ASTM E-96-66, Procedure A	30 Days	0.00
Salt Spray	ASTM 8117 (Measured) ASTM D714 (Rated)	2 years	0.0 Undercutting
20% Sulfuric Acid Immersion	ASTM D714-87	2 years	No Effect
25% Sodium Hydroxide Immersion	ASTM D714-87	2 years at 140°F	No Effect
Distilled Water Immersion	ASTM D714-87	2 years at 160°F	No Effect
Tap Water Immersion	ASTM D714-87	2 years at 120°F	0.0 Undercutting
Abrasion Resistance	European Standard EN 598: 1994 Section 7.8	One million cycles on a ± 22.5° sliding aggregate slurry abrasion tester using a sharp natural siliceous gravel with a particle size between 2mm and 10 mm.	s 3 mils Loss
Cathodic Disbandment	Cathodic Disbandment	1.5 volts at 77"F for 30 days	s 0.5 mm Undercutting
Resistance to Bacteria	ASTMG-22 90	7 Days at 30°C on a minimum of 4 panels	Limited only to trace amounts of Bacteria

Sincerely,

Danny Swalley
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5+M' SUPPLIED IN THE USA

Project Name

Project Location

Distributor

Contractor

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