**PRODUCT PROFILE**

**GENERIC DESCRIPTION**
Modified Polyamine Ceramic Epoxy

**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 (FVC) for maximum performance.

**COLORS**
5024 Sewer Pipe Green. **Note:** Epoxies chalk with extended exposure to sunlight.

**FINISH**
Gloss

**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).

**SURFACE PREPARATION**

**STEEL**
- **Wastewater Service:** SSPC-SP5/NACE 1 White Metal Blast Cleaning or ISO Sa 3 Blast Cleaning to Visually Clean Steel with a minimum angular anchor profile of 3.0 mils (76.2 microns).
- **Raw water or Buried Service:** SSPC-SP10/NACE 2 Near-White Blast Cleaning or ISO Sa 2 1/2 Very Thorough Blast Cleaning with a minimum angular anchor profile of 3.0 mils (76.2 microns).

**Ductile Iron**
All surfaces of ductile iron pipe and fittings shall be delivered to the application facility free of asphalt or any other protective lining on the interior surface. All oils, small deposits of asphalt paint, grease, and soluble deposits shall be removed in accordance with NAPF 500-03-01 Solvent Cleaning prior to abrasive blasting.

**Pipe Interior:** Uniformly rotary-abrasive blast using angular abrasive to a NAPF 500-03-04: Internal Pipe Surface Condition, full removal of annealing oxide layer. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Random staining shall be limited to no more than 5 percent and may consist of light shadows, rust stains, oxide stains, or stains of previously applied coating. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE RP0287 or ASTM D 4417, Method C).

**Pipe Exterior:** Uniformly abrasive blast the entire surface using angular abrasive to an NAPF 500-03-04: External Pipe Surface Condition. When viewed without magnification, the exterior surfaces shall be free of all visible dirt, dust, loose annealing oxide, mold coating, rust, and other foreign matter. Tightly adherent annealing oxide and rust staining may remain on the surface provided they cannot be removed by lifting with a dull putty knife. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE RP0287 or ASTM D 4417, Method C).

**Fittings:** Uniformly abrasive blast using angular abrasive to a NAPF 500-03-05: Fitting Blast Clean #1 condition, no staining. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE RP0287 or ASTM D 4417, Method C).

**ALL SURFACES**
Must be clean, dry and free of oil, grease and other contaminants.

**TECHNICAL DATA**

**VOLUME SOLIDS**
100% (mixed)

**RECOMMENDED DFT**
- **Carbon Steel:** 30.0 to 50.0 mils (762 to 1270 microns) in one or more coats.
- **Ductile Iron:** 40 mils (1015 microns) (nominal) in one or more coats.

**Note:** Number of coats and thickness requirements will vary with substrate, application method and exposure. Use Series 44-721 to increase film build. Amounts vary by kit size; refer to the Series 44-721 product data sheet. Contact your Tnemec representative for more information.

**CURING TIME**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Set to Touch</th>
<th>Max. Recoat</th>
<th>To Place in Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°F (32°C)</td>
<td>1-2 hours</td>
<td>7 days</td>
<td>24 hours</td>
</tr>
<tr>
<td>75°F (24°C)</td>
<td>2-3 hours</td>
<td>7 days</td>
<td>2 days</td>
</tr>
<tr>
<td>55°F (13°C)</td>
<td>2-3 hours</td>
<td>7 days</td>
<td>3 days</td>
</tr>
</tbody>
</table>

**Note:** If more than 7 days have elapsed between coats, the Series 431 coated surface must be mechanically abraded (scarified) before topcoating. Curing time will vary with surface temperature, air movement, humidity and film thickness.

**VOLATILE ORGANIC COMPOUNDS (HAPs)**
0.00 lbs/gal solids

**THEORETICAL COVERAGE**
1,604 mil sq ft/gal (39.4 m²/L at 25 microns). See APPLICATION section for coverage rates.

**NUMBER OF COMPONENTS**
Two: Part A (amine) and Part B (epoxy)

**MIXING RATIO**
By volume: One (Part A) to one (Part B)
The surface temperature should be dry and at least 5°F (3°C) above the dew point. The coating will not cure properly below 50°F (10°C) or higher than 130°F (54°C).

**Brush:**
Recommended for bell sockets, spigot ends, and small repairs. Outfitted with a gravity fed material hopper (material will not feed through a suction tube).

**Note:**
Pump assembly should include a moisture trap and oiler, air regulator with gauge and fluid outlet drain valve and spray gun. Spray-Quip (Houston, TX), Model 712-216, or similar rotary lance, to produce a monolithic and level film.

**Rotary Spray Gun:**
Series 431 shall be applied to the interior surfaces of pipe or fittings using a rotary coater pistol using plural component equipment. Plural component equipment reduces material waste, solvent consumption and improves coating performance. Note: Consult Technical Services for specific details.

**Touch-Up Kit:**
Equipment: A dispensing gun with a thrust ratio of 26:1 is required (F100-TKAP). Material tube must be heated to an adequate temperature. Use a 1 (Part A amine) to 1 (Part B epoxy) mix ratio of heated plural component airless spray unit. Note: Product component A (amine) must be heated to 110°F to 120°F (43°C to 49°C) and component B (epoxy) must be heated to 100°F to 110°F (38°C to 43°C) prior to and during plural component application. Do not exceed 120°F (49°C) for either component. Keep containers tightly sealed prior to use. Consult Technical Services for specific details.

**DO NOT THIN:**
A large volume of material will gel quickly if not applied or reduced in volume. Use a 1 (Part A amine) to 1 (Part B epoxy) mix ratio of heated plural component airless spray unit. Note: Product component A (amine) must be heated to 110°F to 120°F (43°C to 49°C) and component B (epoxy) must be heated to 100°F to 110°F (38°C to 43°C) prior to and during plural component application. Do not exceed 120°F (49°C) for either component. Keep containers tightly sealed prior to use. Consult Technical Services for specific details.

**DO NOT MIX PART A WITH PART B:**
Do not mix Part A with Part B. Do not exceed 120°F (49°C) for either component. Do not exceed 120°F (49°C) for either component. Keep containers tightly sealed prior to use. Consult Technical Services for specific details.

**APPLICATION EQUIPMENT**
**PLURAL COMPONENT AIRLESS EQUIPMENT:** The preferred application method for Series 431 Perma-Shield PL is using plural component equipment. Plural component equipment reduces material waste, solvent consumption and reduces material viscosity. Contact Tnemec Technical Service for complete Series 431 Plural Component Recommendations.

**Airless:**
- **Pump Size:** 45.1 or 56.1
- **Rotary Gun †** Model 712-216
- **Mat'l Hose ID** 3/8" (9.5mm)
- **Manifold Filter** 30 Mesh

**Note:**
Pump assembly should include a moisture trap and oiler, air regulator with gauge and fluid outlet drain valve and outfitted with a gravity fed material hopper (material will not feed through a suction tube).

**Brush:**
Recommended for bell sockets, spigot ends, and small repairs.

**Surface Temperature**
Minimum of 50°F (10°C) Maximum of 130°F (54°C).

The surface temperature should be dry and at least 5°F (3°C) above the dew point. The coating will not cure properly below minimum surface temperature.
HOLIDAY TESTING
High Voltage Discontinuity (spark) testing shall be performed in accordance with ASTM D 5162 or NACE SP0274 with a minimum voltage setting of 100 to 125 V/mil.

CLEANUP
Flush and clean all equipment immediately after use with Tnemec’s No. 4 Thinner or MEK.