| Product Comparisons | | | |
|---|---|---|---|
| **Company** | **Tnemec** | **Induron** | **Ergon/NovoCoat** |
| **Product** | **Series 431** | **Protecto 401** | **SP-2000W** |
| **PDS Comparisons** | | | |
| **Generic Type** | Modified Polyamine Ceramic Epoxy | Amine Cured Novolac Ceramic Epoxy | Amine-cured Hybrid Novolac Epoxy |
| **Recommended DFT** | 30–50 mils | 40 mils nominal (miniumum) | 8–20 mils (2 coats) |
| **Surface Temperature Requirements (ºF)** | 50–130ºF | 45ºF | X |
| **VOC Content** | .75 lbs/gal (90 g/l) | 0.68 lbs/gal (82 g/l) | 0 g/l |
| **HAPs** | 0 g/l | 0.005 lbs/gal (0.60 g/l) | X |
| **Volume Solids** | 100% | 87% ±2 | 100% |
| **Packaging** | Large Kit= 8 gallons<br>Touch-up kit=8 ounces | X | 1, 2 & 5 gallons |
| **Maximum Service Temperature** | 140°F (60°C) | 120°F (48°C) | Dry: 250ºF<br>Immersion: 170ºF |
| **Holiday Testing** | 100–125 V/mil recommended (per NACE SP0188) | 2500 V Max | 7500 V |
| **Notes** | All test data up-to-date and current | Test methods and data may be out of date | 1–8 hour pot life depending on temp. |

| PFC Comparisons | | | |
|---|---|---|---|
| **Color Data Reported** | 5024 Sewer Pipe Green | Black | Dark Brown, Dark Gray, Light Gray, Blue |
| **Abrasion—ASTM D 4060-07 (CS-17, 1000g)** | 76 mg loss | 340 mg (ASTM D 4060-1990) | 310 mg loss (ASTM D 4060-1995) |
| **Abrasion—ASTM D 4060-07 (H-22, 1000g)** | 2.38 mils depth of wear | 11 mils depth of wear (ASTM D 4060-1990) | X |
| **Rocking Abrasion—BS EN 598-1994** | X | 2 mils after 1 million cycles (Induron results from old test version) | X |
| **Rocking Abrasion—BS EN 598-2007** | 0.57 mil loss after 50,000 cycles | X | X |
| | 5.5 mils loss after 1,000,000 cycles | X | X |
| **Adhesion to ductile iron—ASTM D 4541-09 (Method E, Type V)** | 1,131 psi (7.8 MPa) | X | X |
| **Adhesion to steel—ASTM D 4541-09 (Method E, Type V)** | 1,769 psi (12.2 MPa) | X | 2,000 psi (test version unk.) |
| **Adhesion—ASTM D 6677-07 (Knife)** | 10 rating | X | X |
| **Tensile Strength (ASTM D 638 or ASTM D 2370)** | X | 250–300 psi (test unk.) | X |
| **Cathodic Disbondment—ASTM G 8-96 (2003)** | Group A Classification. 0.00 inch disbonded circle equivalent. | 0.17 mm (ASTM G95) | 0.5 mm (ASTM G95-87) |
| **Chemical Immersion—20% H2SO4 half-filled in production lined pipe** | No blistering, cracking, checking, erosion or delamination after 30 days exposure im immersion or vapor phase. | X | X |
| **Chemical Resistance—NACE TM 0174-2002** | No blistering, cracking, checking, erosion or delamination after 1 year exposure in: 5% HCl, 10% HCl, 13% NaOCl, 5% H2SO4, 25% H2SO4, 50% H2SO4 | X | X |
| **Effects of Household Chemicals—ASTM D-1308** | X | Passed ASTM D-1308 (1080 hour immersion) 2 years 20% $H_2SO4$ immersion, no effect. | X |
| **Deflection (5% Ring)--8 in dia (DN 200) DIP** | Passed. No checking, cracking or other detectable film damage | Failed. Checking and spider cracking (test conducted by Tnemec) | X |
| **Dielectric Strength—ASTM D 149-09** | 618 volts/mil | 448 volts/mil | 684 volts/mil (1991 test version) |
| **Hardness—ASTM D 2240-05 (Shore D)** | 78 | 71 | 80 |
| **Immersion—ASTM D 870-09** | No rusting, cracking, checking, delamination of film after 2,000 hours in 140º F DI water. | 1 year distilled water/salt water immersion, no blisters/undercutting | 60 days water immersion at 190º F, no effect (Atlas Cell) |
| **Impact—ASTM D 2794-93 (2004)** | No visible cracking or delamination of film after 160 inch-pounds direct impact on steel | 72 inch-pounds DIP panels (ASTM G14-88) | 140 in./lbs. |
| **Sag Resistance—ASTM D 4400-99 (2007)** | 90 mils at 100º F | X | X |
| **Salt Fog—ASTM B 117-09** | 2,500 hours, no blistering, rusting, cracking or delamination | 2 years, no undercutting (ASTM B 117-1985) | 2 years, 0.00 undercutting (ASTM B117-1985) |
| **SWAT Testing** | 0.5 (log-Z) impedance loss after 28 day S.W.A.T. Final impedance 10.7 (log-Z) | 5.5 (log-Z) impedance loss after 28 day S.W.A.T. Final impedance 5.7 (log-Z) | X |
| **Water Absorption—ASTM C 413-01 (2006)** | 0.01% | X | X |
| **Water Vapor Transmission—ASTM D 1653-03 (2008), Method B, Condition C** | 1.25 $g/m^2$ per 24hr WVT, 0.09 perms (0.06 metric perms) WVP | X | X |
| **Water Vapor Transmission—ASTM E 96/E96M-05, Procedure D** | 0.09 perms (0.06 metric perms) WVP | X | X |