

Comparison Protecto 401 vs Perma Shield PL431

Test	Protecto 401 Results	PermaShield PL431
SEVERE WASTE WATER ANALYSIS (S.W.A.T.) 28 Days	10,950 days Actual sewer use in partially full sewer force main & gravity sewers on ductile iron substrate No Failures	28 days reduction in log-z Electrical impedance .05 Loss Tested on Steel
Abrasion BS EN598 Rocking Abrasion 1,000,000 cycles Ductile Iron Pipe	2 mils Loss	5.5 mils Loss
Adhesion Ductile Iron Pipe	1000 psi Failure in cohesion (Film remains on surface)	1131 psi Failure to surface (Delamination)
Cathodic Disbondment	0.17mm (.026") Average Disbondment - 3 test on Ductile Iron Pipe	22.86 mm (.9 inch) Average Disbondment-2 test on Ductile Iron Pipe (Reported on Steel 0.00)
Chemical Resistance Immersion Ductile Iron Pipe	2 years 20% Sulfuric Acid 25% Sodium hydroxide	6 months duration PH-3 (0.065 sulfuric acid) PH-13 (0.4% sodium hydroxide)
Shore DHardness	71 (Ductile Iron)	78 (Steel)
D.I. Water Immersion	2 years (17,520 hrs) No Effect (Ductile Iron Pipe)	4000 hours No effect (Steel)
Salt Fog ASTM B-117 Unscribed	7 years (61,320 hrs) No effect Ductile Iron Pipe	5,000 hrs (Steel) No effect
Salt Fog ASTM B-117 Scribed to Substrate	2 years (17,520 hrs) No effect on unscribed surface No undercutting at scribe Ductile Iron Pipe	No report
Water absorption ASTM C 413-01 (2006)	No water absorption	No water absorption
Water Vapor Transmission ASTM E-96 / E96 M-05	0.00	0.09
120° Hot Water Immersion Ductile Iron Pipe	2 years No Effect	No report
Impact Resistance ASTM G-14 Ductile Iron Pipe	72 in/lbs	No report
Chemical Resistance ASTM D-1308 Ductile Iron Pipe	Passed	No report