PRODUCT INFORMATION

Generic Type	Fast curing ceramic modified epoxy novolac designed for mainline and field pipeline joints in high temperature service.
Description	Powercrete® R-95 is a high-build solvent free hybrid novolac epoxy coating designed for protecting new line pipes and pipeline rehabilitation projects that operates at temperatures up to 95 ˚C [203 ˚F]. Powercrete® R-95 can be used for extra protection on top of FBE mainline coatings or as a DTM (direct to metal) coating when an increased temperature-and chemical resistance is required.

PERFORMANCE DATA

Specific Gravity	ASTM D 3289-03	1.78
Compressive Strength	ASTM C 109	14,550 psi (100 MPa)
Hardness	ASTM D 2240	85 ±3 Shore D (Full Cure)
Thin Film Water Absorption	ASTM D 570	< 0.3%
Dielectric Strength	ASTM D 149	730 Volts per mil (29 Volts per µm)
Resistance to Acids and Alkalis	ASTM C 581	Excellent
Cathodic Disbondment	ASTM G8	<4mm (T= 23◦C/77◦F, 30 days, -1.5V) DTM
	ASTM G95	< 8 mm (T= 95◦C/194◦F, 30 days, -1.5V) DTM
Flexibility	CSA Z 245.30	< 0.75 ◦/PD at 25 ◦C/77 ◦F at 25 mils < 0.75 ◦/PD at 0 ◦C/32 ◦F at 25 mils
Impact Resistance	ASTM G 14	>45 in.lb (5 Joules) at 25 ◦C (77 ◦F) at 20 - 40 mils (500- 1000 µm)
Tensile Adhesion Steel	ASTM D 4541	3550 psi (24.5 MPa) at T= 25◦C/77◦F
Tensile Adhesion FBE	ASTM D 4541	3000 psi (20 MPa) at T= 25◦C/77◦F

Tensile Adhesion Polyolefin Coating	ASTM D 4541	500 psi (3.5 MPa) at T= 25◦C/77◦F
Tensile Adhesion Liquid Epoxy Coating	ASTM D 4541	3000 psi (20 MPa) at T= 25◦C/77◦F
Tensile Adhesion Polyolefin Coating Hot Water	ISO 21809-3 ISO 4624 A	290 psi (2.0 MPa) 28 d at 95 °C [203 °F] Test at 23 °C [73 °F]
Indentation Resistance	ISO 21809-3	≤ 15% DFT
Penetration after Hot Water Immersion	ASTM G 17	0.053 mm (0.021”) 28 d at 95 °C [203 °F] Test at 23 °C [73 °F]
Hardness After Hot Water Immersion	ASTM D 2240	85 ±3 Shore D 28 d at 95 °C [203 °F] Test at 23 °C [73 °F]
Abrasion Resistance Taber Test	ASTM D 4060	>850 cycles per mil (>34 Cycles per µm)

PERFORMANCE DATA SUMMARY – ISO 21809-3:2016

Third Party Test Evaluation

Test	Acceptance Criteria	Test Result	Standard
Thickness (µm)	800 – 1000	800 – 1000	IS0 21809-3:2016
Holiday Detection at 5 Kv/mm	No Holiday	Pass	IS0 21809-3:2016 Annex C
Impact resistance (holiday detection at 5Kv/mm) 3J per mm at 23 ◦C	No Holiday	Pass	IS0 21809-3:2016 Annex D
Impact resistance (holiday detection at 5Kv/mm) 1.5 J per mm at -5 ◦C	No Holiday	Pass	IS0 21809-3:2016 Annex D
Indentation resistance at 10 N/mm2 at 95 ◦C	< 30% DFT	Pass 17.6%	IS0 21809-3:2016 Annex E
Indentation resistance at 10 N/mm2 at 150 ◦C	< 30% DFT	Pass 12.2%	IS0 21809-3:2016 Annex E
Hardness Shore D at 23 ◦C	>75 Shore D	Pass > 85 Shore D	IS0 21809-3:2016
Adhesion to Pipe surface at 23 ◦C	>10 MPa	Pass 36 MPa	IS0 21809-3:2016 ISO 4624
Adhesion to Liquid Epoxy Coating at 23 ◦C	>10 MPa	Pass 35.86 MPa	IS0 21809-3:2016 ISO 4624
Adhesion to Polyolefin plant coating at 23 ◦C	>3.5 MPa	Pass 6.06 MPa	IS0 21809-3:2016 ISO 4624

Adhesion to pipe surface after HWI, 28 days at 95 ◦C (Test at 23 ◦C)	>7 MPa	Pass 19.60 MPa	ISO 21809-3:2016 ISO 4624
Cathodic disbondment after 28 days at 95 ◦C	< 15 mm	Pass 2.0 mm	ISO 21809-3:2016
++Cathodic disbondment after 28 days at 23 ◦C	< 8 mm	Pass 0.46 mm	ISO 21809-3:2016
Adhesion to Polyolefin Plant Coating after HWT, 28 days at 95 ◦C	>2MPa	Pass 2.10 MPa	ISO 21809-3:2016
Specific Electrical insulation	$>10^6$ Ωm^2 $RS_{(100)}/RS_{(70)} > 0.8$	10^8 Ωm^2 passes	EN 10289

PERFORMANCE DATA SUMMARY – EN 10289

Third Party Test Evaluation (2016)

Test	Acceptance Criteria	Test Result	Standard
Thickness (µm)	>1500 µm	>1500 µm	EN 10289
Visual inspection	Continuous and uniform film free of defects	Pass	EN 10289
Holiday Detection at 8 V per µm	No Holiday	Pass	EN 10289
Impact resistance (holiday detection)	No Holiday	7.5 J at 23 C	EN 10289
Indentation resistance 10 N/mm2 at 95 ◦C	< 30% of DFT	16%	EN 10289
Indentation resistance 10 N/mm2 at 23 ◦C	< 0.2 mm	0.1 mm	EN 10289
Cathodic Disbondment at 30 day and 23◦C	< 6 mm	1.2 mm	EN 10289
Cathodic Disbondment at 28 day and 95◦C	< 8 mm	7.3 mm	EN 10289
Hardness (Shore D) at 23 ◦C	80 ± 3	85	EN 10289
Adhesion to pipe surface at 20◦C – Pull Method	>7 MPa	>12.5 MPa	EN 10289
Adhesion test resistance to removal pipe surface at 20 ◦C	Rating 1	Rating 1	EN 10289
Specific Electrical Insulation Resistance RS 100 (23◦C)	107 Ωm2	108 Ωm2	EN 10289
RS100/RS70	>0.8	Passes	EN 10289
Thermal Aging – Dry Heat	Not Specified Value	14 MPa	EN 10289

95 ◦C and 100 days		Glue Failure	
Adhesion to Pipe Surface 95 ◦C Pull off method	Not Specified Value	5 MPa Glue Failure	EN 10289
Adhesion test resistance to removal pipe surface 95 ◦C	Not Specified Value	Rating 2	EN 10289
Infrared Scan	Recorded	Match	EN 10289

INSPECTION PARAMETERS

The following is only guide to stablish acceptance criteria for inspection parameters during quality control procedures for the installation and evaluation of POWERCRETE J.

Test	Standards	Observations	Value
Surface Profile Steel	ASTM D 4417 NACE SP 0287	Replica tape Method C is preferred. The frequency of 3 test per area evaluated.	Range of 2.5 – 4.5 mils
hyjSurface Profile FBE	ASTM D 4417 NACE SP 0287	Method C is preferred. Profile shall be dense and angular	Range of 2.0 – 4.5 mils
		Sweep blasting shall completely de-glossed the surface with a dense anchor profile. The use of replica tape to estimate the anchor profile is preferred.	
Surface Contaminants Before Coating	ISO 8502-3	Clear tape test on FBE and Steel Surface	Cleaner than level 3 as per the standard
Dry Film Thickness	SSPC PA2 ISO 19840 ISO 2808	Evaluation of FBE layer is critical for the evaluation of the System	Most applications 20 mils (500 µm)
Hardness	ASTM D 2240	Follow standard recommendations. Thickness of 40 mils minimum at 23 – 25◦C (73 – 77 ◦F)	Minimum results of 75 ± 3 Shore D Full Cure
Discontinuity Test (Holiday)	NACE SP 0188 NACE SP 0274 NACE SP 0490 ISO29601 ASTM D 5162	High Voltage test modality. On dry coating surfaces. Follow Standard Procedures	125 Volts per mil 5 Volts per µm Recommended
Tensile Adhesion Test	ASTM D 4541 ISO 4624	Test perform at temperatures of 20 to 25 ◦C (70 – 77 ◦F) Select the fixture (dolly) with pipe diameter, (14 mm preferred)	> 2000 psi (13.8 MPa)

Note:

1- All standards are referred to the latest version issued and approved.
2- The guide is intended as base-line for minimum values.

DISCLAIMER

Seal For Life Industries warrants that the product(s) represented within conform(s) to its/their chemical and physical description and is appropriate for the use as stated on the respective technical data sheet when used in compliance with Seal For Life Industries written instructions. Since many installation factors are beyond the control of Seal For Life Industries, the user is obligated to determine the suitability of the products for the intended use and assume all risks and liabilities in connection herewith. Seal For Life Industries liability is stated in the standard terms and conditions of sale. Seal For Life Industries makes no other warranty either expressed or implied. All information contained in the respective technical data sheet(s) should be used as a guide and is subject to change without notice. This document supersedes all previous revisions. Please see revision date on the left. Powercrete® is a registered trademark of Seal For Life Industries.