ElectroFin® heat transfer coatings

MODINE®

TECHNICAL DATA SHEET

GENERAL DESCRIPTION
– SUBJECT TO CHANGES OR DEVIATIONS

EFIN℠ Pro Shield™ 5: ElectroFin® E-coat

PRODUCT DESCRIPTION

EFIN℠ Pro Shield™ 5: ElectroFin® E-coat is a single layer corrosion resistant coating for heat exchangers called Electrodeposition (E-coat). ElectroFin® E-coat is a water-based, flexible cationic epoxy polymer that utilizes a process specifically engineered for Heat Exchangers. The current cationic ElectroFin® E-coat improves fin edge coverage through a unique polymer that controls the coating flow characteristics.

SPECIFICATIONS

Heat exchangers (HX) shall have a flexible cationic ElectroFin® E-coat uniformly applied to all metallic surfaces with no material bridging between fins. The E-coat process shall ensure complete HX encapsulation of all conductive surfaces with uniform dry film thickness from 0.5-1.2 mils (12-30 µm). ElectroFin® E-coat meets a 5B rating for cross-hatch adhesion per ASTM B3359. Corrosion durability was confirmed through testing to no less than 15,000 hours salt spray resistance per ASTM B117 using scribed aluminum test coupons. EFIN℠ Pro Shield™ 5: ElectroFin® E-coat can be used as a single layer coating or it can be combined with a Conversion Coat and/or a Topcoat as needed for addtional corrosion and UV protection, see EFIN℠ Pro Shield™ 7: ElectroFin® E-coat + Insitu® Topcoat and EFIN℠ Pro Shield™ 10: TCP + ElectroFin® E-coat + Insitu® Topcoat.

EFIN℠ PRO SHIELD™ 5: ELECTROFIN® E-COAT MEETS THESE TEST STANDARDS

- ASTM B117 / DIN 53167 Salt Spray - 15,000+ hours
- ASTM G85 Annex A3 SWAAT Modified Salt Spray - 3,000 hours
- VA Master Construction Specification Division 23 for High Humidity Installations
- CID AA-52474A (GSA)

EFIN℠ PRO SHIELD™ 5 TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	PERFORMANCE
Salt Spray	DIN 53167/ASTM B117	15,000 hours
Water Immersion	ASTM D870	1000 hours minimum
Pencil Hardness	ASTM D3363	2H minimum
Cross Hatch Adhesion	ASTM D3359	5B
Humidity	ASTM D2247	1000 hours minimum
UV Resistance	ASTM D4587	1000 hours minimum
SWAAT Corrosion	ASTM G85-A3	3000 hours
Dry Film Thickness	ASTM D7091	0.5-1.2 mils / 12-30 µm
Direct Impact	ASTM D2794	160 in/lb
Heat Transfer Reduction	—	Less than 1%
Bridging	—	No bridging including enhanced & micro-channel fin designs
Coating of Enhanced Fins	—	Up to 30 fins per inch
pH Range	—	3-12
Temperature Limits	—	-40ºF to 325ºF / -40ºC to 163ºC (dry load)
Gloss – 60 Degree	ASTM D523	55-75

EFIN℠ PRO SHIELD™ 5: ELECTROFIN® E-COAT VS. OTHER HX COATINGS

	ELECTROFIN® E-COAT	DIP PHENOLICS	ELASTOMERICS	OTHER E-COATS
Application Method	Complete Immersion Cathodic Deposition	Manual Dip or Flow	Manual Dip or Flow	Anodic or Cathodic Deposition
Flexibility	Excellent	Poor – Good	Excellent	Good
Coating Uniformity	Computer controlled Consistent (0.5-1.2 mils)	Manual Inconsistent (2-6 mils)	Manual Inconsistent (2-6 mils)	Inconsistent (0.4-1.5 mils)
Coating Penetration	Computer controlled Consistent	Uncontrolled/Potentially Inconsistent	Uncontrolled/Potentially Inconsistent	Inconsistent to Bare Metal
Bridging	None – up to 30 fpi & 16 rows	Limited to 16 fpi with some bridging	Limited to 14 fpi with some bridging	Limited to 14 fpi with some bridging
Thermal Loss	< 1%	2% – 6%	2% – 6%	1% – 4%