



ElectroFin[®] heat transfer coatings



TECHNICAL DATA SHEET

GENERAL DESCRIPTION
– SUBJECT TO CHANGES OR DEVIATIONS

EFINSM Pro ShieldTM 10: TCP + ElectroFin[®] E-coat + Insitu[®] Topcoat

PRODUCT DESCRIPTION

EFINSM Pro ShieldTM 10: TCP + ElectroFin[®] E-coat + Insitu[®] Topcoat is three layers of coating protection combining a nano-scale conversion coating (TCP), ElectroFin[®] E-coat, a water-based, flexible cationic epoxy polymer E-coat, and Insitu[®] Topcoat, a water based/water reducible synthetic flexible polymer Topcoat. This coating combination provides the best UV and corrosion protection level for RTPF (Round Tube Plate Fin) and Microchannel Heat Exchangers (MCHE) that Modine offers.

SPECIFICATIONS

Heat exchangers first have a completely transparent, nano-scale conversion coating (TCP) uniformly applied to all metallic surfaces with a coating thickness of <.5 microns. This conversion coating layer is non toxic, safe, completely free from hexavalent chromium, and is REACH/ ROHS compliant. The corrosion durability of the conversion coating layer was confirmed through 2,400 hours of ASTM G85A3 (SWAAT) testing. The heat exchangers will next have a flexible cationic ElectroFin[®] E-coat uniformly applied to all metallic surfaces with no material bridging between fins. The 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 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. After curing, the Heat Exchangers shall receive Insitu[®] Topcoat, a spray-applied, Water Based/Water Reducible Synthetic Flexible Polymer Topcoat to prevent UV degradation of the ElectroFin[®] E-coat film. The Insitu[®] Topcoat shall have a 60 degree gloss (>75) and a dry film thickness of 0.5-4.0 mils (13-101 μm). Color options are available for Insitu[®] Topcoat.

EFINSM PRO SHIELDTM 10: TCP CONVERSION COAT TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	PERFORMANCE
Salt Spray	DIN 53167/ASTM B117	336 hours
SWAAT Corrosion	ASTM G85-A3	2400 hours
Coating Thickness	—	< .5 microns

EFINSM PRO SHIELDTM 10: ELECTROFIN[®] E-COAT 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	—	-40°F to 325°F / -40°C to 163°C (dry load)
Gloss – 60 Degree	ASTM D523	55-75

E-FINSM PRO SHIELDTM 10: INSITU[®] TOPCOAT TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	PERFORMANCE
Salt Spray	DIN 53167/ASTM B117	See Note 1: Below
Water Immersion	ASTM D870	>500 hours minimum
Pencil Hardness	ASTM D3363	HB
Cross Hatch Adhesion	ASTM D3359	5B
Humidity	ASTM D2247	500 hours minimum
UV Resistance	ASTM D4587	500 hours minimum
Mandrel Bend (Flexibility)	ASTM D522M	Pass

EFINSM PRO SHIELDTM 10: ELECTROFIN[®] E-COAT + INSITU[®] TOPCOAT MEETS THESE TEST STANDARDS

- ASTM B117 / DIN 53167 Salt Spray:
 - TCP: 336 hours
 - ElectroFin[®] E-coat: 15,000+ hours
 - Insitu[®] Topcoat: 2,000+ hours (heat exchangers)
15,000+ hours (aluminum test coupons)
- ASTM G85 Annex A3 SWAAT Modified Salt Spray:
 - TCP: 2400 hours
 - ElectroFin[®] E-coat: 3,000 hours
 - Insitu[®] Topcoat: Not Applicable
- ASTM D4587 UV Resistance:
 - TCP: Not Applicable
 - ElectroFin[®] E-coat: Not Applicable
 - Insitu[®] Topcoat: 500 hours minimum

NOTE 1:

EFINSM Pro ShieldTM Insitu[®] Topcoat has been ASTM B117 Salt Spray tested to 2,000+ hours on Heat Exchangers and 15,000+ hours on aluminum test coupons.

APPLICATIONS SUITED FOR EFINSM PRO SHIELDTM 10: ELECTROFIN[®] E-COAT + INSITU[®] TOPCOAT

- RTPF and Microchannel Heat Exchanger applications that require severe corrosion and UV protection.
- RTPF and Microchannel Heat Exchanger applications that are in mission critical applications.