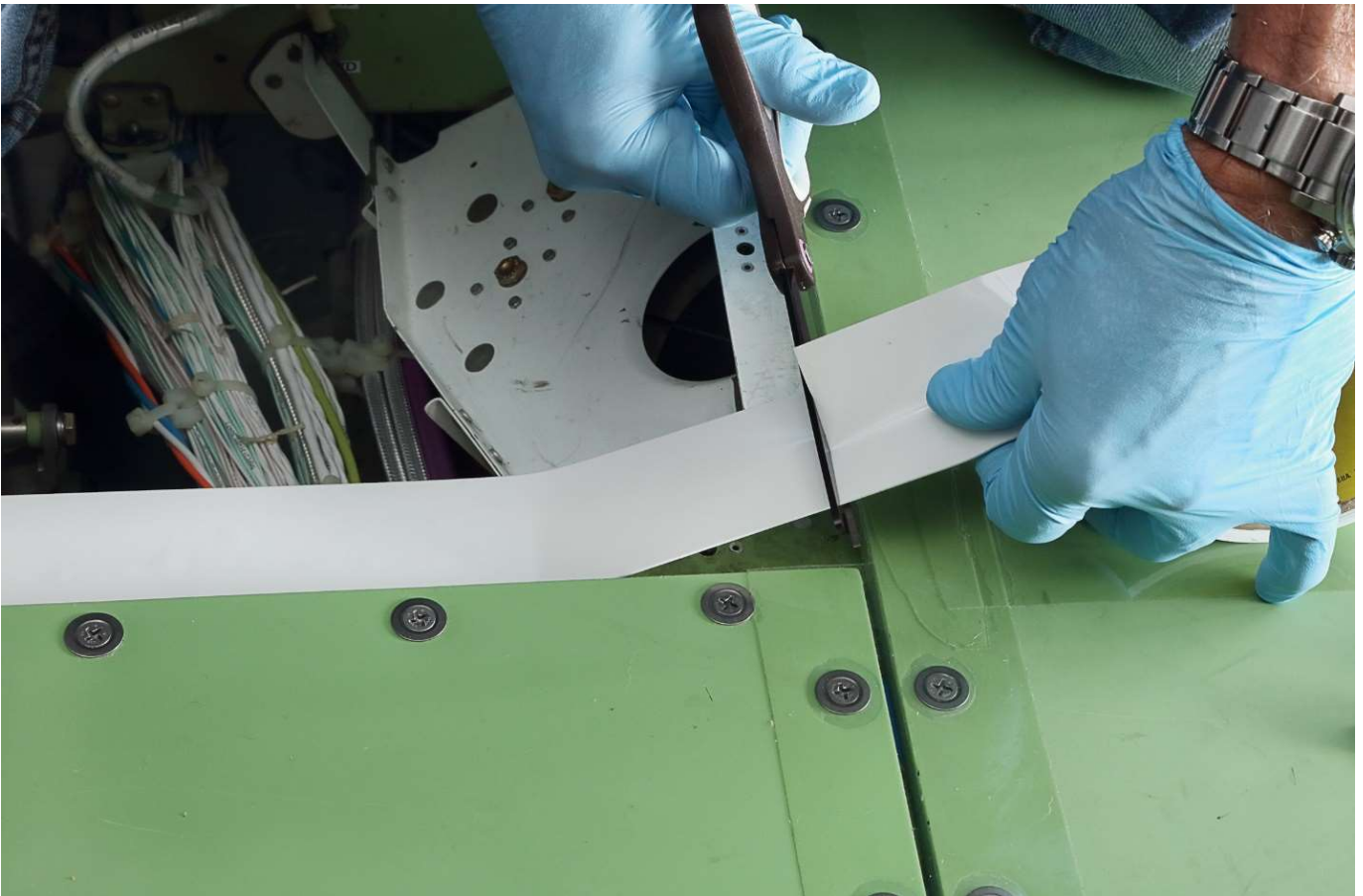


3M™ Corrosion Prevention Sealing Tape 9143FR Technical Report



Contents

1.0	Summary	4
2.0	Purpose	4
3.0	Scope	4
4.0	References	4
5.0	Materials	5
5.1	3M™ Corrosion Prevention Sealing Tape 9143FR	5
5.2	AkzoNobel 10P4-2NF Epoxy Primer	5
5.3	AkzoNobel 446-22-1000 High Solids Epoxy Enamel	5
5.4	Chemetall Ardrox® AV-8 Corrosion Inhibiting Compound.....	5
5.5	7075-T6 Aluminum Panels	6
5.6	Fluid Submersion Liquids.....	6
6.0	Sample Layup and Test Procedures	6
6.1	Thickness	6
6.2	Areal Weight	6
6.3	3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction.....	6
6.4	Accelerated Fluid Immersion	7
6.5	Vertical Burn Flame Resistance	8
6.6	Horizontal Burn Flame Resistance.....	8
6.7	Water Vapor Transmission Rate	8
6.8	90° Peel Adhesion to Primer or Topcoat.....	8
6.9	Removal After Aging in Simulated Floor Construction.....	9
6.10	90° Peel Adhesion to Corrosion Inhibiting Compound.....	10
6.11	One Week Moisture Absorption.....	11
7.0	Results and Discussion	11
7.1	Thickness	11
7.2	Areal Weight	11
7.3	3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction.....	12
7.4	Accelerated Fluid Immersion	13
7.5	Vertical Burn Flame Resistance	21
7.6	Horizontal Burn Flame Resistance.....	30
7.7	Water Vapor Transmission Rate	32
7.8	90° Peel Adhesion to Epoxy Primer	35
7.9	90° Peel Adhesion to Epoxy Topcoat	36
7.10	90° Peel Adhesion After 130 °F Extended Aging on Epoxy Primer	37
7.11	90° Peel Adhesion After 130 °F Extended Aging on Epoxy Topcoat.....	38
7.12	90° Peel Adhesion After 160 °F Extended Aging on Epoxy Primer	39
7.13	90° Peel Adhesion After 160 °F Extended Aging on Epoxy Topcoat.....	40
7.14	Removal After Aging in Simulated Floor Construction.....	41
7.15	90° Peel Adhesion to Corrosion Inhibiting Compound.....	43
7.16	One Week Moisture Absorption.....	45
8.0	Conclusions	45
9.0	Appendix – Individual Test Values	45

9.1	Thickness	45
9.2	Areal Weight	46
9.3	3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction.....	46
9.4	Accelerated Fluid Immersion	46
9.5	Vertical Burn Flame Resistance	48
9.6	Horizontal Burn Flame Resistance.....	49
9.7	Water Vapor Transmission Rate	50
9.8	90° Peel Adhesion to Epoxy Primer	50
9.9	90° Peel Adhesion to Epoxy Topcoat	51
9.10	90° Peel Adhesion After 130 °F Extended Aging on Epoxy Primer	52
9.11	90° Peel Adhesion After 130 °F Extended Aging on Epoxy Topcoat.....	52
9.12	90° Peel Adhesion After 160 °F Extended Aging on Epoxy Primer	53
9.13	90° Peel Adhesion After 160 °F Extended Aging on Epoxy Topcoat.....	54
9.14	90° Peel Adhesion to Corrosion Inhibiting Compound.....	55
9.15	One Week Moisture Absorption.....	57

1.0 Summary

3M™ Corrosion Prevention Sealing Tape 9143FR is a 43 mil thick tape designed to provide a corrosion preventative sealing layer between aluminum aircraft subfloor support structures and floor panels. When applied to aluminum floor beams and subfloor support structures, the tape protects the aluminum structural member from corrosion caused by repeated exposure to various fluids, particularly around doors, galleys, lavatories, and in the cargo compartment. 9143FR is comprised of a polyester backing and a flame retardant acrylic adhesive and is designed to cut easily, be repositionable, and remove cleanly after service. It is flame resistant per 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(ii): 12 second vertical and 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal. This report covers the performance of the multiple lots of 9143FR in a variety of applicable tests.

2.0 Purpose

The purpose of this technical report is to provide customers with baseline performance data of 9143FR in a variety of applicable tests.

3.0 Scope

The scope of this report is limited to 9143FR produced in Aberdeen, SD per released process and product standards. The performance tests conducted on 9143FR in this report comprise a list of applicable properties provided in the Technical Datasheet and tests that demonstrate product performance in a laboratory environment.

4.0 References

- 1) 3M Test Method *TM-06-120656 Rev 2*, "TM-4847 Caliper of Aerospace PPT Films and Tapes"
- 2) 3M Test Method *TM-06-120657 Rev 2*, "TM-4848 Basis Weight of Aerospace PPT Films and Tapes"
- 3) 3M Test Method *TM-06-120017 Rev 3*, "Primer Thickness Measurements"
- 4) 3M Test Method *TM-06-120596 Rev 2*, "TM-2349 Vertical Flame Retardance Test"
- 5) 3M Test Method *TM-06-120624 Rev 2*, "TM-7667 Horizontal Flame Retardance Test"
- 6) 3M Test Method *TM-06-120661 Rev 2*, "TM-4855 90 Degree Peel Adhesion to Stainless Steel (Instron)"
- 7) 3M Work Instruction *WI-06-120032 Rev 5*, "Sulfuric Acid Etch Tank and Alkaline Cleaning Tank Preparation and Maintenance"
- 8) 3M Work Instruction *WI-06-896513 Rev 1*, "Quantifying Corrosion Area by use of ImageJ"
- 9) ASTM B117-19 (2019), "Standard Practice for Operating Salt Spray (Fog) Apparatus"
- 10) ASTM F1249-20 (2020), "Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor"
- 11) AkzoNobel Aerospace Coatings 10P4-2NF Fluid Resistant Epoxy Primer Mixing Guide
- 12) AkzoNobel Aerospace Coatings 22 Series High Solids Epoxy Topcoat Mixing Guide
- 13) BAC 8632, Boric-Sulfuric Acid Anodizing
- 14) 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(ii): 12 second vertical
- 15) 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal
- 16) *FAA Aircraft Materials Fire Test Handbook, Appendix F (Laboratories Actively Using Fire Test Procedures)*
- 17) FAA Policy Statement PS-ANM-25.853-01-R2, *Flammability Testing of Interior Materials*, Dated July 3, 2013

5.0 Materials

5.1 3M™ Corrosion Prevention Sealing Tape 9143FR

3M™ Corrosion Prevention Sealing Tape 9143FR is a 0.043 inch thick flame retardant sealing tape. The specific lots used in this technical report are provided in the following table.

Product Name	Description	Lot Number	Date of Manufacture	Expiration Date
3M™ Corrosion Prevention Sealing Tape 9143FR	One Side Tacky, 0.043" thick, white sealing tape	22300214T	10/27/2022	10/27/2024
		23023119	1/23/2023	1/23/2025
		23023219	1/23/2023	1/23/2025

5.2 AkzoNobel 10P4-2NF Epoxy Primer

AkzoNobel 10P4-2NF is an epoxy primer that provides corrosion and chemical resistance for aircraft subassembly parts. 10P4-2N is used as a base primer for interior structural components. It is qualified to multiple aircraft OEM specifications including BMS 10-11, Type I, Class A, Grade A. The primer was mixed and sprayed per the manufacturer’s mixing guide (Reference 11) onto 3 inch x 8 x 0.063 inch thick sulfuric acid etched bare 7075-T6 aluminum panels (Reference 7). The primer was sprayed to a thickness of about 0.0005 inch – 0.0007 inch.

Product Name	Mix Ratio	Lot Number	Date of Manufacture	Expiration Date	Date Sprayed
Fluid Resistant Epoxy Primer 10P4-2NF Base, Component A BAC 452 Green 719727	1 Part	8471053026	03/2021	03/2023	10/20/2022
Fluid Resistant Epoxy Primer EC-117S Curing Solution, Component B	1 Part	8471069009	04/2021	04/2023	

5.3 AkzoNobel 446-22-1000 High Solids Epoxy Enamel

AkzoNobel 446-22-1000 High Solids Epoxy Enamel is a chemically cured two-component epoxy topcoat designed to provide maximum protection from various chemicals, hydraulic fluids, aviation fuels, phosphate ester (Skydrol®) fluids and corrosion causing media. It is qualified to multiple aircraft OEM specifications including BMS 10-11, Type II, Class B, Grade D. The topcoat was mixed and sprayed per the manufacturer’s mixing guide Reference 12) onto 3 inch x 8 inch x 0.063 inch thick sulfuric acid etched bare 7075-T6 aluminum panels (Reference 7) coated with AkzoNobel 10P4-2NF primer. The topcoat was sprayed to a thickness of about 0.001 inch – 0.0015 inch. The same lot of AkzoNobel 10P4-2NF primer was used as in section 5.2 but was sprayed the day before the AkzoNobel 446-22-1000 was sprayed.

Product Name	Mix Ratio	Lot Number	Date of Manufacture	Expiration Date	Date Sprayed
High Solids Epoxy Enamel 446-22-1000 Base, Component A BAC 702 White Gloss 715480	3 Part	8471084026	07/2021	07/2022	11/10/2021
High Solids Epoxy Enamel X-530 Curing Solution, Component B	1 Part	8471084035	05/2021	05/2022	

5.4 Chemetall Ardrex® AV-8 Corrosion Inhibiting Compound

Chemetall Ardrex® AV-8 is a single-component, corrosion inhibiting compound (CIC) applied as a coating to protect metals commonly used in airframe structures and in aerospace components from corrosion. It is qualified to multiple aircraft OEM specifications including BMS 3-23, Type II, Class 2, Grade A.

Product Name	Lot Number	Date of Manufacture	Expiration Date
Ardrox® AV-8 Corrosion Inhibiting Compound	0232296006	Feb 2021	Feb 2024

5.5 7075-T6 Aluminum Panels

7075-T6 Aluminum panels (bare 7075-T6 and clad 7075-T6) were purchased from Erickson Metals (Coon Rapids, MN). Panel dimension was 3 inches x 8 inches with a thickness of 0.063 inch.

5.6 Fluid Submersion Liquids

The fluids used for fluid submersion testing are shown in the following table.

Fluid Designation	Brand Name	Lot Identifiers	Date Code
Coke	Coca-Cola®	CRC17493	APR1723
Red Wine	Franzia® "Chillable Red"	L1302 L21 3 2000	Best By May 10 2023
Synthetic Urine	Ricca Chemical Company® Synthetic Urine Solution CAT# 8361-1	Lot 4209D35	Exp Sep 2023

6.0 Sample Layup and Test Procedures

6.1 Thickness

Product thickness was measured via TM-06-120656 Rev 2 (Reference 1) using a Mitutoyo ID-H0530E Digimatic Indicator. This test method corresponds to ASTM D6988-13, "Standard Guide for Determination of Thickness of Plastic Film Test Specimens" and closely aligns with ASTM D 3652-12, "Standard Test Method for Thickness of Pressure-Sensitive Tapes".

6.2 Areal Weight

Product areal weight (mass per unit area) was measured via TM-06-120657 Rev 2 (Reference 2). In this test method, a 4 inch x 6 inch rectangle is cut and weighed. The areal weight is converted to grams per square inch by dividing the measured mass in grams by 24. A verified 4 inch x 6 inch die is used to stamp out the sample to be measured.

6.3 3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction

To simulate the aircraft interior floor construction, 7075-T6 bare aluminum panels with a thickness of 0.063 inch and nominal dimensions of 3 inch x 8 inch were machined with two 13/64 inch holes spaced in the middle of panel, one inch from the ends as shown in Figure 1. The machined panels were boric – sulfuric acid anodized per BAC 5632 Class 5 Unsealed (Reference 13). For each construction, one panel was primed on both sides with AkzoNobel 10P4-2NF epoxy primer as described in Section 5.2 except using the boric-sulfuric acid anodized machined panels. Another panel was primed with AkzoNobel 10P4-2NF epoxy primer on one side with the other side remaining uncoated. 9143FR was applied manually to the uncoated surface of the panel using a squeegee with light pressure and then rolled with a 4.5 lb roller 4 times in each direction. The 9143FR was pierced in the locations of the machined holes and the panel that was primed on both sides was placed on top of the 9143FR. Using the fasteners (screws, washers, and nuts) in the following table, each construction was fabricated as shown in Figure 2.

Description	Part Number	Control Number	Lot Number
Self-Locking Extended Washer Nut	BACN10YR3CD HOWMET/ALCOA/ARCONIC	2021GMFKXB	M087775-000
Standard Flat Washer Size #10	AN970-3 Anillo Industries	2022CMLES8	SB8106

Machine Screw 5/8 inch Length, 10-32 Thread	NAS1801-3-10 Mac Fasteners	2014G26479	72477
---	-------------------------------	------------	-------

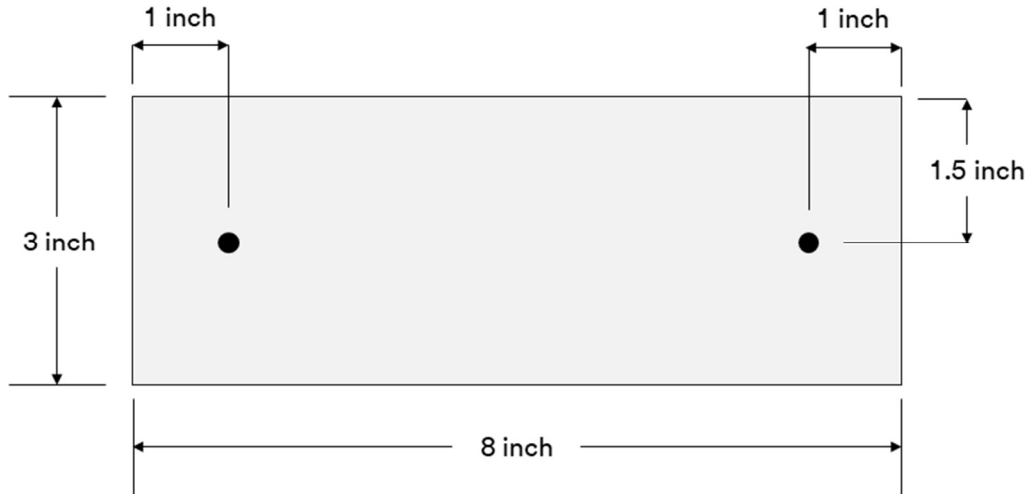


Figure 1 Schematic of substrate used in simulated floor construction salt spray testing

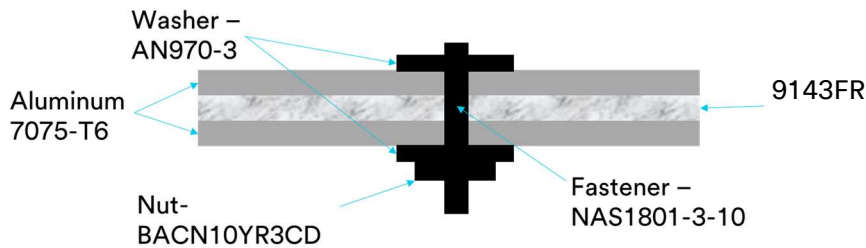


Figure 2 Schematic of fastened construction used in simulated floor construction salt spray testing

The fabricated constructions were allowed to dwell at room temperature for 3 – 5 days prior to conditioning in an Ascott S1000XP Salt Spray Chamber operating according to ASTM B117-19 (35° C / 100% RH) (Reference 9). The panels were allowed to dwell for 3000 hours (125 days) in the salt spray chamber. After 125 days, the panels were removed from the chamber, dried, and allowed to sit for approximately 24 hours. The constructions were disassembled and the 9143FR was removed from the panel and the corroded area under the 9143FR was measured by WI-06-896513 (Reference 8).

6.4 Accelerated Fluid Immersion

7075-T6 Bare aluminum panels and 7075-T6 clad aluminum panels with a thickness of 0.063 inch and nominal dimensions of 3 inch x 3 inch were cleaned with methyl ethyl ketone followed by isopropanol. A 2.5 inch x 2.5 inch piece of 9143FR was cut and applied to each aluminum panel. The 9143FR was applied manually, using a squeegee with light pressure with care taken not to impart stress on the tape. Once applied, the 9143FR was rolled with a 4.5 lb roller 4 times in each direction. The tape was allowed to dwell on the aluminum panel for 3 days prior to submersion in the desired fluid.

Each sample was laid flat individually in a 3.75 inch x 3.75 inch flat plastic container. 40 g to 50 g of fluid was added to each container to completely submerge the sample. Example images of the samples submerged in the representative fluids prior to exposure are shown in Figure 3. The containers were placed flat in an oven

maintained at a temperature of 95° F for 2 weeks. After 2 weeks, the panels were removed from the fluid and rinsed with water. They were allowed to dry for 2 – 4 hours before the 9143FR was removed and the panel inspected. The area under the 9143FR that was corroded due to fluid ingress was measured by WI-06-896513 (Reference 8).



Figure 3 Images of submerged fluid soak sample prior to exposure

6.5 Vertical Burn Flame Resistance

Vertical burn flame resistance was determined via TM-06-120596 (Reference 4). This test method measures the resistance to burning of a free-standing film, mounted vertically over a bunsen burner with a 12 second ignition time. This test method corresponds to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(ii): 12 second vertical (Reference 14). Passing materials will self-extinguish within 15 seconds of flame removal, have an average burn length of less than 8 inches, and dripping must self-extinguish within 5 seconds after falling.

Vertical burn flame resistance testing was also completed by an FAA Designated Engineering Representative (FAA DER) at Aearo Technologies LLC, a 3M company (Indianapolis, IN). Aearo Technologies is recognized by the FAA as a laboratory actively using fire test procedures (Reference 16). 9143FR was tested according to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(ii): 12 second vertical (Reference 14). Testing was completed in a free-standing configuration and bonded to a 0.020 inch thick bare 7075-T6 panel per FAA Policy Statement PS-ANM-25.853-01- R2, Reference 21, Option 3 (bonded to a worst case substrate) (Reference 17).

6.6 Horizontal Burn Flame Resistance

Horizontal burn flame resistance was determined via TM-06-120624 (Reference 5). This test method measures the resistance to burning of a free-standing film, mounted horizontally over a bunsen burner with a 15 second ignition time. This test method corresponds to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal (Reference 15). Passing materials will have an average burn rate less than 2.5 inches per minute.

Horizontal burn flame resistance testing was also completed at Aearo Technologies LLC, a 3M company (Indianapolis, IN). Aearo Technologies is recognized by the FAA as a laboratory actively using fire test procedures (Reference 16). 9143FR was tested according to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal (Reference 15). Testing was completed in a free-standing configuration.

6.7 Water Vapor Transmission Rate

Water Vapor Transmission Rate was measured via ASTM F1249-20 (2020) (Reference 10). A test temperature of 38 °C and a test gas concentration of 100% RH were used. The carrier gas was 100% Dry N₂. Water Vapor Transmission Testing was completed by Ametek Mocon, 7500 Mendelssohn Avenue N., Minneapolis, MN 55428.

6.8 90° Peel Adhesion to Primer or Topcoat

Panel substrates were prepared as described in the Section 5.2 or 5.3. The coated panels were cleaned with methyl ethyl ketone followed by isopropanol. One inch wide strips of 9143FR were applied on the 3 inch x 8 inch panels with the length of the tape traversing the 3 inch length of the panel as shown in Figure 4. Each strip of tape was rolled by hand 4 times in each direction using a 4.5 lb roller. The panels were allowed to dwell under 5 different conditions:

- 1) Room Temperature - 24 ± 2 hours at 74 °F / 50% RH
- 2) Dry Heat - 24 ± 2 hours at 74 °F / 50% RH then 7 days ± 4 hours at 180 ± 10 °F then 24 ± 2 hours at 74 °F / 50% RH
- 3) Hot/Wet - 24 ± 2 hours at 74 °F / 50% RH then 7 days ± 4 hours at 140 °F and 95% RH then 24 ± 2 hours at 74 °F / 50% RH
- 4) 130 °F Extended Aging - 24 ± 2 hours at 74 °F / 50% RH then 1 month, 3 months, or 6 months at 130 ± 5 °F then 24 ± 2 hours at 74 °F / 50% RH
- 5) 160 °F Extended Aging - 24 ± 2 hours at 74 °F / 50% RH then 1 week, 2 weeks, 6 weeks, or 12 weeks at 160 ± 5 °F then 24 ± 2 hours at 74 °F / 50% RH

Peel adhesion was tested according to TM-06-120661, (Reference 6) at a 90° angle and a peel rate of 10 in/min after the conditions and exceptions stated above.

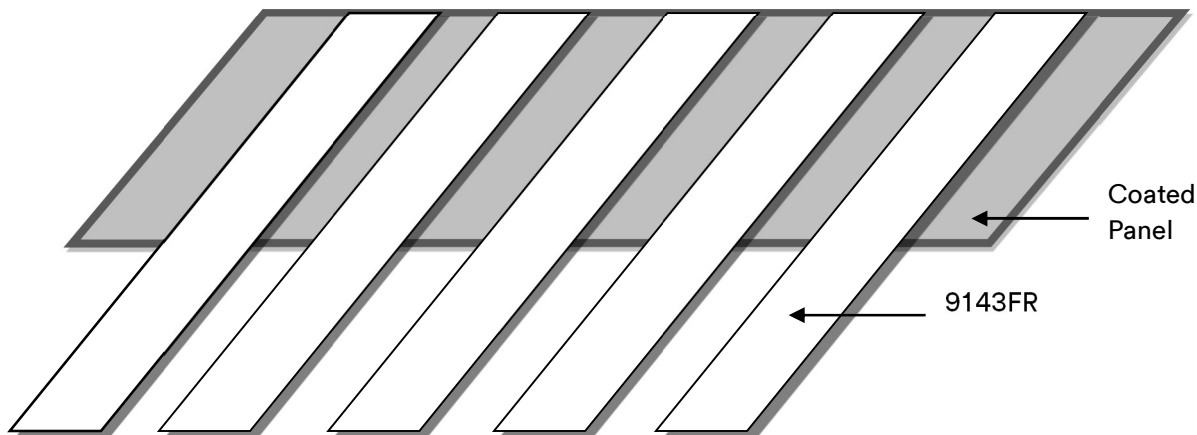


Figure 4 Schematic of Peel Adhesion Specimen

6.9 Removal After Aging in Simulated Floor Construction

To simulate 9143FR removal after an extended period in an aircraft interior floor construction, a 7075-T6 bare aluminum beam with a thickness of 0.063 inch and nominal dimensions of 2 inch x 6 inch was machined with four 15/64 inch holes spaced 0.4 inch from the edge and 0.8 inch from the end, as shown in Figure 5. The machined beam was sulfuric acid etched (Reference 7) and sprayed with AkzoNobel 10P4-2NF per the manufacturer's mixing guide to a thickness of about 0.0005 inch to 0.0007 inch (Reference 11). A 2 inch x 6 inch piece of 9143FR was applied to the surface of the primed beam with a squeegee. Clip nuts (part number BACN11AL2) were placed on the 9143FR in the location of the predrilled holes. Two pieces of 1.15 inch wide x 6 inch long x 0.5 inch thick acrylic panels with countersunk 15/64 inch holes aligning to the holes in the beam were placed on top of the 9143FR (see Figure 6). Titanium screws (part number BACS12GP3L15) were used to puncture the 9143FR and affix the acrylic panel to the primed beam with the nut clips at a torque of 15 – 20 in-lbs. 3M™ AC-350 B-1/2 (Lot # 1320L) was used to seal the gap between the acrylic panels, and on top of the 9143FR. A side-view schematic of the construction is shown in Figure 7 and Figure 8.

The fabricated construction was allowed to dwell at room temperature for 5 days prior to conditioning at 130 °F for 3 months. After removal from the oven, the construction was disassembled. Photos were taken to document the clean removal of the 9143FR.

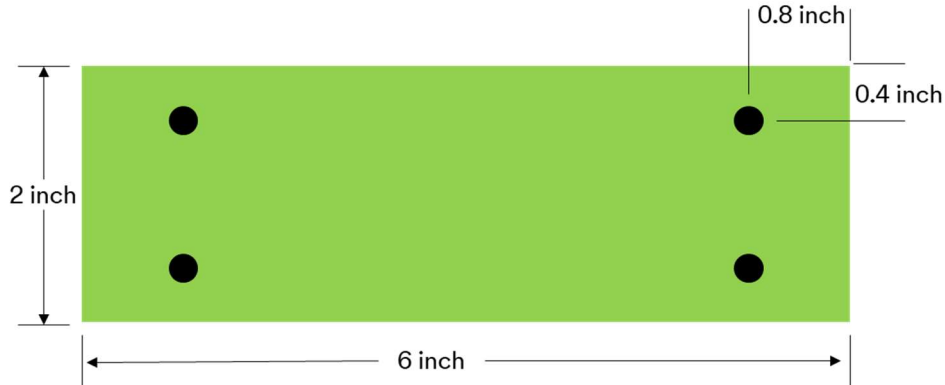


Figure 5 Schematic of Primed Beam Surface

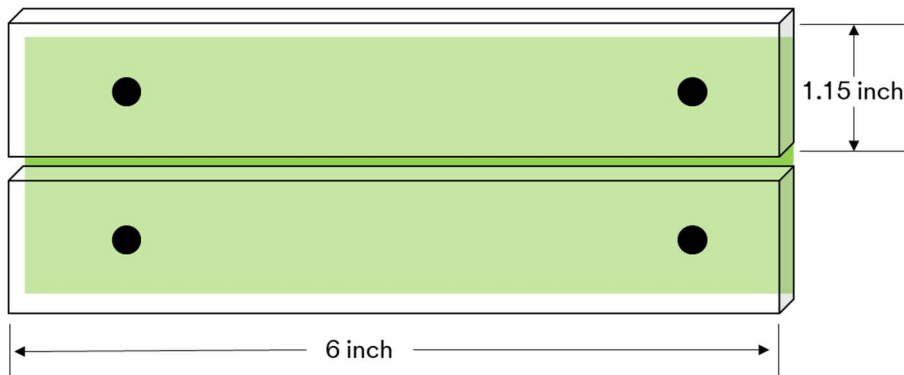


Figure 6 Schematic of Acrylic Panel on Primed Beam Surface

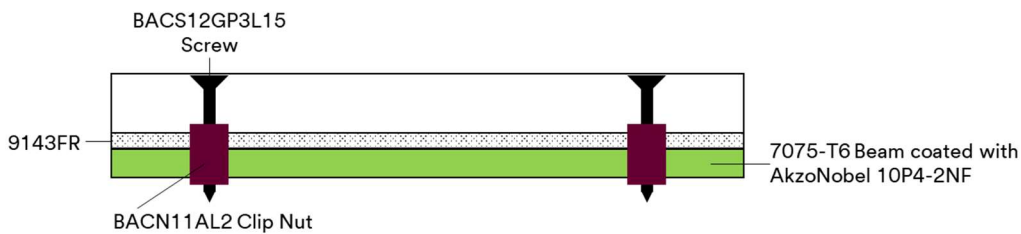


Figure 7 Side-view Schematic of Simulated Floor Construction

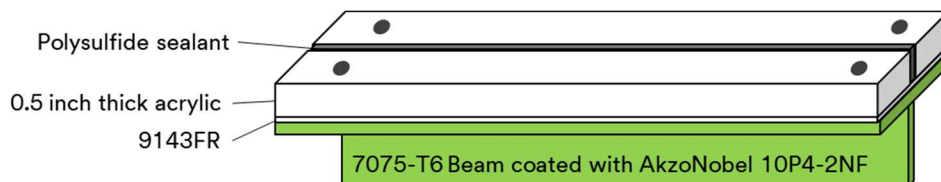


Figure 8 Schematic of Simulated Floor Construction

6.10 90° Peel Adhesion to Corrosion Inhibiting Compound

Panel substrates were prepared as described in Section 5.2. The primed panels were cleaned with methyl ethyl ketone followed by isopropanol. Ardrox® AV-8 was applied onto the primed panel using a 3 inch wide foam brush.

Two sets of panels were prepared. For the first set of panels, 9143FR was applied on the Ardrox® AV-8 coating one hour after application. For the second set of panels, 9143FR was applied on the Ardrox® AV-8 coating 24 hours after application. For all samples, one inch wide strips of 9143FR were applied to the 3 inch x 8 inch panels with the length of the tape traversing the 3 inch length of the panel as shown in Figure 4. Each strip of tape was rolled by hand 4 times in each direction using a 4.5 lb roller. The panels were allowed to dwell under three different conditions:

- 1) Room Temperature - 24 ± 2 hours at 74 °F / 50% RH
- 2) Dry Heat - 24 ± 2 hours at 74 °F / 50% RH then 7 days ± 4 hours at 180 ± 10 °F then 24 ± 2 hours at 74 °F / 50% RH
- 3) Hot/Wet - 24 ± 2 hours at 74 °F / 50% RH then 7 days ± 4 hours at 140 °F and 95% RH then 24 ± 2 hours at 74 °F / 50% RH

Peel adhesion was tested according to 3M TM-06-120661, (Reference 6) at a 90° angle and a peel rate of 10 in/min after the conditions and exceptions stated above.

6.11 One Week Moisture Absorption

7075-T6 Clad aluminum panels with a thickness of 0.063 inch and nominal dimensions of 3 inch x 8 inch were cleaned with methyl ethyl ketone followed by isopropanol. The panels were weighed and then a 2 inch x 6 inch piece of 9143FR was cut and applied to each aluminum panel. The 9143FR was applied manually, using a squeegee with light pressure with care taken not to impart stress on the tape. Once applied, the 9143FR was rolled with a 4.5 lb roller 4 times in each direction. The tape was allowed to dwell on the aluminum panel for 3 days and the panels were weighed with the tape installed. The panels were then conditioned at 120 °F and 95% relative humidity for 7 days. The panels were removed from the humidity chamber and weighed within 5 minutes of removal from the chamber. The % moisture absorbed is derived from the following equation:

$$\% \text{ Absorption} = \frac{(\text{Final mass of taped panel} - \text{Initial mass of taped panel})}{(\text{Initial mass of taped panel} - \text{Initial mass of aluminum panel})}$$

7.0 Results and Discussion

The average test results for 9143FR are provided in the following sections. The individual test results used to calculate the averages are provided in the Appendix, Section 9. Where applicable, the actual test reports and images used for calculating % corrosion are available upon request.

7.1 Thickness

Product thickness was measured on 4 inch x 6 inch sections of tape from 5 locations across the roll width of 9143FR. Within each 4 inch x 6 inch section, 5 individual measurements were taken across each sample. The average thickness for each lot of 9143FR is shown in the table below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Average Thickness (in)
aegr110422-790	22300214T	0.0427
aegr012623-927	23023119	0.0440
aegr012623-928	23023219	0.0430

7.2 Areal Weight

Product areal weight was measured on 4 inch x 6 inch sections of tape from 5 locations across the roll width of 9143FR. The average areal weight for each lot of 9143FR is shown in the table below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Avg Areal Weight (g/sqin)
aegr110422-790	22300214T	0.85
aegr012623-927	23023119	0.87
aegr012623-928	23023219	0.85

7.3 3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction

The resistance to salt spray corrosion on bare 7075-T6 aluminum panels in a simulated floor construction was measured as described in section 6.7. The average results for two lots of 9143FR are provided in the following table. Individual measurements are provided in Section 9. Applicable images are also provided in Figures 9, 10, and 11.

Sample ID	Lot #	Time in Salt Spray Chamber	Avg Corrosion Area (%)
rema022723-101	22300214T	125 days	0.01%
rema022723-102	23023219	125 days	0.01%



Figure 9 Example images of each step of corrosion construction disassembly after 3000 hours salt spray

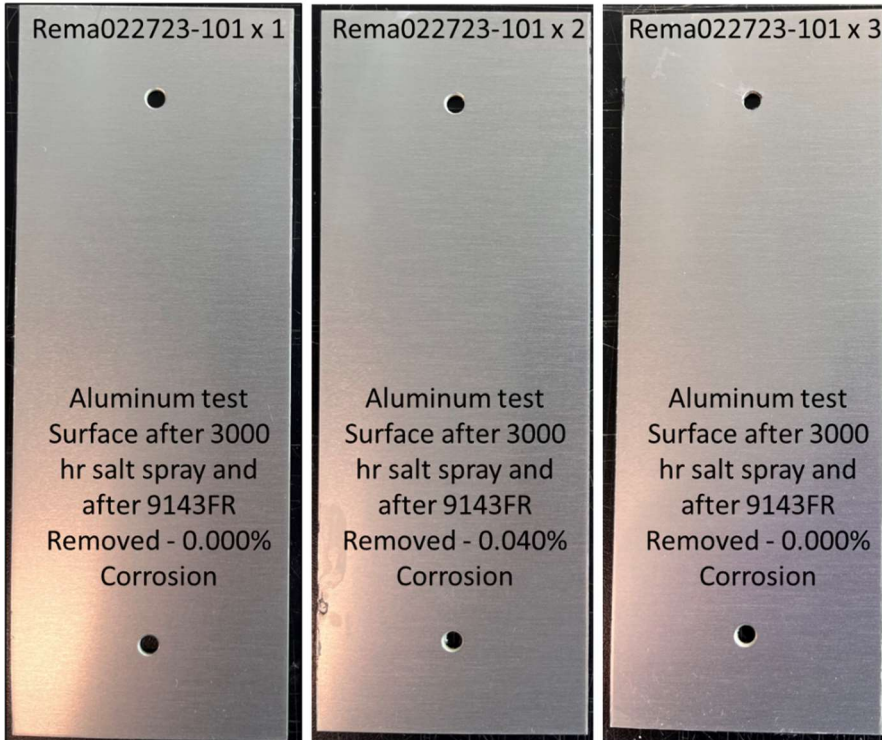


Figure 10 Images of aluminum test surface protected by 9143FR Lot 22300214T after 3000 hours salt spray

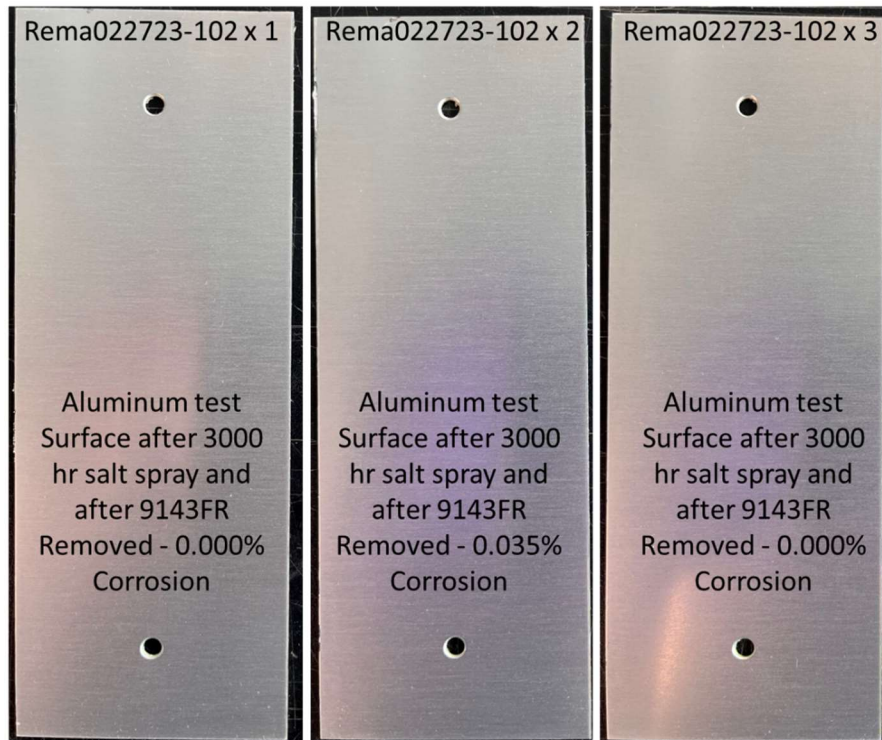


Figure 11 Images of aluminum test surface protected by 9143FR Lot 23023219 after 3000 hours salt spray

7.4 Accelerated Fluid Immersion

Accelerated fluid immersions of 9143FR were conducted in several fluids to which the tape may be exposed inside an aircraft cabin. These fluids included deionized water (to simulate condensation expected inside an aircraft), tap water, red wine, Coca-Cola®, and synthetic urine. The average percent corrosion under the 9143FR

for each fluid is shown in the following table. Individual measurements are provided in Section 9. Images of the samples before and after removal of the 9143FR after exposure are shown in in Figures 12 through 23.

Sample ID	Lot Number	Metal	Liquid	Avg % Corrosion
rema022723-108	22300214T	Clad 7075-T6	Deionized Water	1.6%
rema022723-112			Tap Water	5.5%
rema022723-116			Red Wine	15.8%
rema022723-120			Coke	0.3%
rema022723-124			Synthetic Urine	0.1%
rema022723-107		Bare 7075-T6	Deionized Water	0.2%
rema022723-111			Tap Water	0.5%
rema022723-115			Red Wine	43.4%
rema022723-119			Coke	5.6%
rema022723-123			Synthetic Urine	0.1%
rema022723-110	23023219	Clad 7075-T6	Deionized Water	0.0%
rema022723-114			Tap Water	0.4%
rema022723-118			Red Wine	0.0%
rema022723-122			Coke	0.0%
rema022723-126			Synthetic Urine	0.0%
rema022723-109		Bare 7075-T6	Deionized Water	0.0%
rema022723-113			Tap Water	0.1%
rema022723-117			Red Wine	15.5%
rema022723-121			Coke	0.5%
rema022723-125			Synthetic Urine	0.0%
rema040423-160	23023119	Clad 7075-T6	DI Water	0.0%
rema040423-161			Tap Water	0.0%
rema040423-162			Red Wine	0.8%
rema040423-163			Coke	0.1%
rema040423-164			Synthetic Urine	0.0%
rema040423-155		Bare 7075-T6	DI Water	0.0%
rema040423-156			Tap Water	0.0%
rema040423-157			Red Wine	9.1%
rema040423-158			Coke	0.3%
rema040423-159			Synthetic Urine	0.0%

9143FR Lot# 22300214T	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-108	Rema022723-112	Rema022723-116	Rema022723-120	Rema022723-124
Clad 7075-T6 Aluminum					

Figure 12 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 22300214T after fluid exposure and prior to tape removal

9143FR Lot# 22300214T	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-108	Rema022723-112	Rema022723-116	Rema022723-120	Rema022723-124
Clad 7075-T6 Aluminum	0.0% 	4.3% 	41.9% 	0.4% 	0.0%
	0.7% 	12.1% 	5.0% 	0.4% 	0.4%
	4.2% 	0.0% 	0.7% 	0.2% 	0.0%

Figure 13 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 22300214T removed after fluid exposure



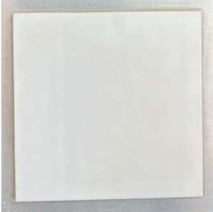





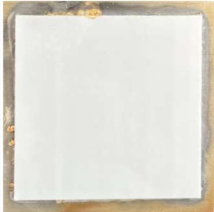






9143FR Lot# 22300214T	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-107	Rema022723-111	Rema022723-115	Rema022723-119	Rema022723-123
Bare 7075-T6 Aluminum					
					
					

Figure 14 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 22300214T after fluid exposure and prior to tape removal

9143FR Lot# 22300214T	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-107	Rema022723-111	Rema022723-115	Rema022723-119	Rema022723-123
Bare 7075-T6 Aluminum	0.5%	0.1%	40.7%	2.6%	0.2%
	0.0%	0.5%	39.9%	9.5%	0.0%
	0.2%	1.0%	49.6%	4.8%	0.0%

Figure 15 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 22300214T removed after fluid exposure












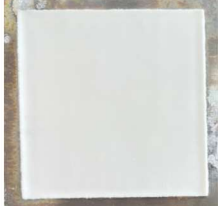
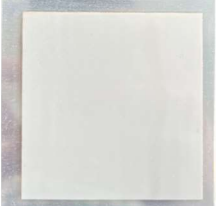


9143FR Lot# 23023219	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-110	Rema022723-114	Rema022723-118	Rema022723-122	Rema022723-126
Clad 7075-T6 Aluminum					
					
					

Figure 16 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 23023219 after fluid exposure and prior to tape removal


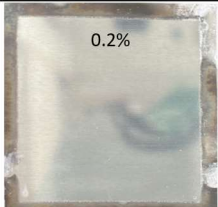
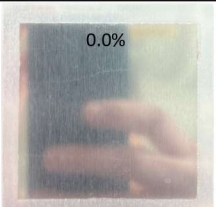




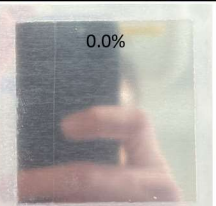


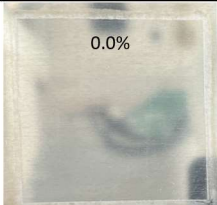
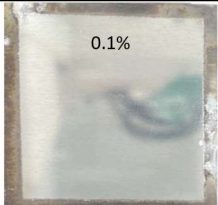


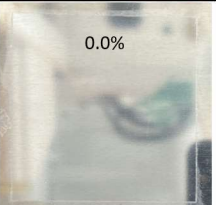
9143FR Lot# 23023219	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-110	Rema022723-114	Rema022723-118	Rema022723-122	Rema022723-126
Clad 7075-T6 Aluminum	0.0% 	0.2% 	0.0% 	0.0% 	0.0% 
	0.0% 	0.9% 	0.0% 	0.0% 	0.0% 
	0.0% 	0.1% 	0.1% 	0.0% 	0.0% 

Figure 17 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 23023219 removed after fluid exposure

9143FR Lot# 23023219	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-109	Rema022723-113	Rema022723-117	Rema022723-121	Rema022723-125
Bare 7075-T6 Aluminum					

Figure 18 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 23023219 after fluid exposure and prior to tape removal

9143FR Lot# 23023219	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema022723-109	Rema022723-113	Rema022723-117	Rema022723-121	Rema022723-125
Bare 7075-T6 Aluminum	0.0%	0.1%	13.3%	0.1%	0.0%
	0.0%	0.1%	16.8%	0.9%	0.0%
	0.0%	0.0%	16.4%	0.4%	0.0%

Figure 19 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 23023219 removed after fluid exposure

9143FR Lot# 23023119	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema040423-160	Rema040423-161	Rema040423-162	Rema040423-163	Rema040423-164
Clad 7075-T6 Aluminum					

Figure 20 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 23023119 after fluid exposure and prior to tape removal

9143FR Lot# 23023119	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema040423-160	Rema040423-161	Rema040423-162	Rema040423-163	Rema040423-164
Clad 7075-T6 Aluminum	0.0% 	0.0% 	0.6% 	0.1% 	0.0%
	0.0% 	0.0% 	1.0% 	0.1% 	0.0%
	0.0% 	0.0% 	0.7% 	0.1% 	0.0%

Figure 21 Images of clad 7075-T6 aluminum panels with 9143FR Lot # 23023119 removed after fluid exposure
















9143FR Lot# 23023119	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema040423-155	Rema040423-156	Rema040423-157	Rema040423-158	Rema040423-159
Bare 7075-T6 Aluminum					
					
					

Figure 22 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 23023119 after fluid exposure and prior to tape removal

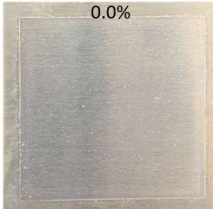

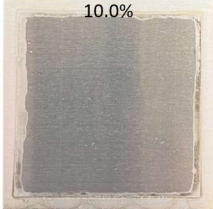
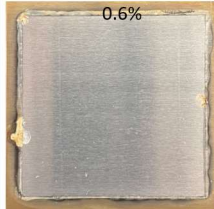
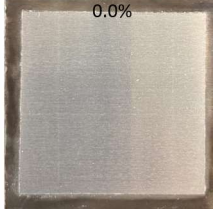
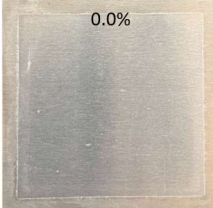
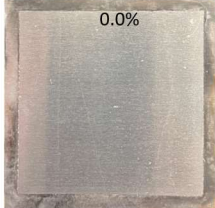
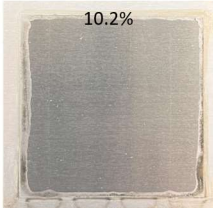
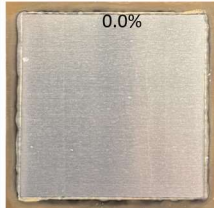
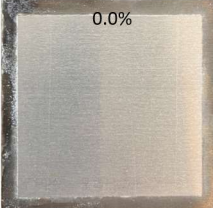
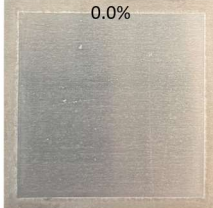
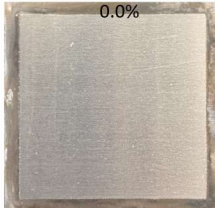
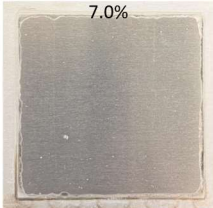
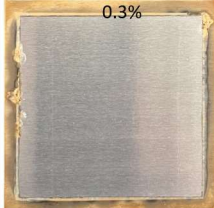
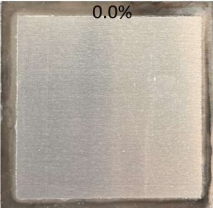
9143FR Lot# 23023119	Deionized Water	Tap Water	Red Wine	Coke	Synthetic Urine
Sample ID	Rema040423-155	Rema040423-156	Rema040423-157	Rema040423-158	Rema040423-159
Bare 7075-T6 Aluminum	0.0% 	0.0% 	10.0% 	0.6% 	0.0% 
	0.0% 	0.0% 	10.2% 	0.0% 	0.0% 
	0.0% 	0.0% 	7.0% 	0.3% 	0.0% 

Figure 23 Images of bare 7075-T6 aluminum panels with 9143FR Lot # 23023119 removed after fluid exposure

7.5 Vertical Burn Flame Resistance

12 second vertical burn resistance was completed on 3 inch wide converted rolls for each lot of 9143FR. The average results as tested per TM-06-120596 (Reference 4) are provided in the following table. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Avg Extinguish time (s)	Avg Drip time (s)	Avg Burn Length (in)
aegr110322-778	22300214T	3.2	0.0	1.8
aegr012623-922	23023119	1.7	0.0	1.6
aegr012623-923	23023219	2.5	0.0	1.6

Flammability testing of 9143FR was also completed by an FAA Designated Engineering Representative (FAA DER) at Aearo Technologies LLC, a 3M company (Indianapolis, IN). Aearo Technologies is recognized by the FAA as a laboratory actively using fire test procedures (Reference 16). 9143FR was tested according to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(ii): 12 second vertical (Reference 14). Testing was completed in a free-standing configuration and bonded to a 0.020 inch thick bare 7075-T6 panel per FAA Policy Statement PS-ANM-25.853-01- R2, Reference 21, Option 3 (bonded to a worst case substrate) (Reference 17). Images of the test reports are provided in Figures 24-31.

Note - The Aearo Technologies and 3M test results in this technical report are for informational use only and installation approval is the responsibility of the aircraft owner/operator. The data provided are specific to the lot tested on the date specified and cannot be relied upon for future customer installation approvals.



Vertical Flammability Test Results - 12 Second Test

FAR 25.853(a) Appendix F Part 1 (a) (1) (ii)

Material: 9143FR

Lot #: 22300214T

Conditioning Room: Date In: 3/5/24

Time In: 8:00 am

Date Out: 3/6/24

Time Out: 2:00 pm

Number	Flame Time (Seconds)	Burn Length (Inches)	Drippings (Seconds)
1	2.5	1.6	0
2	4.0	2.2	0
3	2.0	2.2	0
AVERAGE:	2.8	2.0	0

Vertical 12 Second Burn Test Requirements:

Average Self-Extinguish times may not exceed 15 seconds.

Average Burn Length may not exceed 8 inches.

Average Dripping may not exceed 5 seconds after falling.

Additional Comments/Observations:

PASSED: XXX

FAIL:

Tested by: *May Colston*

Date: 3/6/24

This test data only represents the material and lot number listed above.

Aearo Technologies LLC • a 3M company

Figure 24 FAA DER – tested vertical burn results for 9143FR Lot # 22300214T



***Statement of Compliance with Federal Aviation
Flammability Requirements***

Date Tested: 3/6/24

Material: 9143FR Lot #: 22300214T

The above material has been tested and complies with the flammability requirements of:

- FAR 25.853(a) Appendix F Part I (a) (1) (i)
- FAR 25.853(a) Appendix F Part I (a) (1) (ii)

Tested by: *Mary Colston*

Aearo Technologies LLC • a 3M company

Figure 25 FAA DER Statement of Compliance to Federal Aviation Flammability Requirements



Vertical Flammability Test Results - 12 Second Test

FAR 25.853(a) Appendix F Part 1 (a) (1) (ii)

Material: 9143FR

Lot #: 23023119

Conditioning Room: Date In: 3/5/24

Time In: 8:00 am

Date Out: 3/6/24

Time Out: 2:00 pm

Number	Flame Time (Seconds)	Burn Length (Inches)	Drippings (Seconds)
1	2.3	3.0	0
2	1.1	2.5	0
3	2.0	2.2	0
AVERAGE:	1.8	2.6	0

Vertical 12 Second Burn Test Requirements:

Average Self-Extinguish times may not exceed 15 seconds.

Average Burn Length may not exceed 8 inches.

Average Dripping may not exceed 5 seconds after falling.

Additional Comments/Observations:

PASSED: XXX

FAIL:

Tested by:

Date: 3/6/24

This test data only represents the material and lot number listed above.

Aearo Technologies LLC • a 3M company

Figure 26 FAA DER – tested vertical burn test results for 9143FR Lot # 23023119



***Statement of Compliance with Federal Aviation
Flammability Requirements***

Date Tested: 3/6/24

Material: 9143FR Lot #: 23023119

The above material has been tested and complies with the flammability requirements of:

- FAR 25.853(a) Appendix F Part I (a) (1) (i)
- FAR 25.853(a) Appendix F Part I (a) (1) (ii)

Tested by:

Mary Colston

Aearo Technologies LLC • a 3M company

Figure 27 FAA DER Statement of Compliance to Federal Aviation Flammability Requirements



Vertical Flammability Test Results - 12 Second Test

FAR 25.853(a) Appendix F Part 1 (a) (1) (ii)

Material: 9143FR

Lot #: 22300214T

Bonded to 7075-T6 Aluminum

Conditioning Room: Date In: 3/5/24

Time In: 8:00 am

Date Out: 3/6/24

Time Out: 2:00 pm

Coupon Number	Flame Time (Seconds)	Burn Length (Inches)	Drippings (Seconds)
06-844106-3a	1	1.8	0
06-844106-3b	1	1.9	0
06-844106-3c	1	2.6	0
AVERAGE:	1	2.1	0

Vertical 12 Second Burn Test Requirements:

Average Self-Extinguish times may not exceed 15 seconds.

Average Burn Length may not exceed 8 inches.

Average Dripping may not exceed 5 seconds after falling.

Additional Comments/Observations:

PASSED: XXX

FAIL:

Tested by: *May Colston*

Date: 3/6/24

This test data only represents the material and lot number listed above.

Aearo Technologies LLC • a 3M company

Figure 28 FAA DER – tested vertical burn test results for 9143FR Lot # 22300214T bonded to 0.020 inch thick 7075-T6 aluminum



***Statement of Compliance with Federal Aviation
Flammability Requirements***

Date Tested: 3/6/24

Material: 9143FR Lot #: 22300214T

Bonded to 7075-T6 Aluminum

The above material has been tested and complies with the flammability requirements of:

FAR 25.853(a) Appendix F Part I (a) (1) (i)

FAR 25.853(a) Appendix F Part I (a) (1) (ii)

Tested by: *Mary Colston*

Aearo Technologies LLC • a 3M company

Figure 29 FAA DER Statement of Compliance to Federal Aviation Flammability Requirements



Vertical Flammability Test Results - 12 Second Test

FAR 25.853(a) Appendix F Part 1 (a) (1) (ii)

Material: 9143FR

Lot #: 23023119

Bonded to 7075-T6 Aluminum

Conditioning Room: Date In: 3/5/24

Time In: 8:00 am

Date Out: 3/6/24

Time Out: 2:00 pm

Coupon Number	Flame Time (Seconds)	Burn Length (Inches)	Drippings (Seconds)
06-844106-4a	1.7	1.7	0
06-844106-4b	1.7	1.6	0
06-844106-4c	1	1.8	0
AVERAGE:	1.5	1.7	0

Vertical 12 Second Burn Test Requirements:

Average Self-Extinguish times may not exceed 15 seconds.

Average Burn Length may not exceed 8 inches.

Average Dripping may not exceed 5 seconds after falling.

Additional Comments/Observations:

PASSED: XXX

FAIL:

Tested by:

Date: 3/6/24

This test data only represents the material and lot number listed above.

Aearo Technologies LLC • a 3M company

Figure 30 FAA DER – tested vertical burn test results for 9143FR Lot # 23023119 bonded to 0.020 inch thick 7075-T6 aluminum



***Statement of Compliance with Federal Aviation
Flammability Requirements***

Date Tested: 3/6/24

Material: 9143FR Lot #: 23023119

Bonded to 7075-T6 Aluminum

The above material has been tested and complies with the flammability requirements of:

- FAR 25.853(a) Appendix F Part I (a) (1) (i)
- FAR 25.853(a) Appendix F Part I (a) (1) (ii)

Tested by: *Mary Colston*

Aearo Technologies LLC • a 3M company

Figure 31 FAA DER Statement of Compliance to Federal Aviation Flammability Requirements

7.6 Horizontal Burn Flame Resistance

15 Second horizontal burn resistance was completed on 3 inch wide converted rolls for each lot of 9143FR. The average results as tested per TM-06-120624 (Reference 5) are provided in the following table. Individual measurements are provided in Section 9. Note: “SE/O” means the material ignites on either surface, but the flame extinguishes itself before reaching the first scribed line (no calculation is required).

Sample ID	Lot Number	Avg Burn Length (in)	Avg Burn Time after Flame Removal (s)	Burn Rate (in/min)	Comments
rema040423-174	22300214T	0.2	3.6	N/A	SE/O
rema040423-175	23023119	0.3	5.4	N/A	SE/O
rema040423-176	23023219	0.3	4.1	N/A	SE/O

Horizontal burn flame resistance testing of 9143FR was also completed at Aearo Technologies LLC, a 3M company (Indianapolis, IN). Aearo Technologies is recognized by the FAA as a laboratory actively using fire test procedures (Reference 16). 9143FR was tested according to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal (Reference 15). Testing was completed in a free-standing configuration. An image of the test report is provided below in Figure 32. (Note, this test report is for informational use only and installation approval is the responsibility of the design approval holder or the aircraft owner/operator).

Note - The Aearo Technologies and 3M test results in this technical report are for informational use only and installation approval is the responsibility of the aircraft owner/operator. The data provided are specific to the lot tested on the date specified and cannot be relied upon for future customer installation approvals.



Analytical Report

Report Number:	7331	Date Completed:	30-OCT-2023
Requested By:	Ryan Marx	Notebook Reference:	AEARO23-1077
Distribution:	Zhiming Luo, Ryan Marx, MBC		

Subject: Flammability Testing of 9143FR to FAR Horizontal Flame Test

A request was made to evaluate 3 different lots of 9143FR for the FAR Horizontal Flame test. Testing was done as per FAR 25.853(a) Appendix F Part 1 (a) (1) (iv) with the film side facing the flame.

Lot Number	After Flame Time (sec)	Burn Length (in)	Burn Rate (in/min)
Specification			< 4
22300214T	3.7	< 1.5	NA/SE
	3.4	< 1.5	NA/SE
	6.5	< 1.5	NA/SE
	Average: 4.5	<1.5	NA/SE(*)
PASS			
23023119	4.8	< 1.5	NA/SE
	7.2	< 1.5	NA/SE
	5.7	< 1.5	NA/SE
	Average: 5.9	<1.5	NA/SE(*)
PASS			
2314504	6.9	< 1.5	NA/SE
	3.6	< 1.5	NA/SE
	4.2	< 1.5	NA/SE
	Average: 4.9	<1.5	NA/SE(*)
PASS			

(*): Material self-extinguished before reaching the 1.5" timing zone for burn rate calculation. Materials that self-extinguish before this point are considered to pass the test.

Results reported above indicated that all 3 lots passed the FAR 15 Second Horizontal Flame Test.

Tested by: Mary Colston

This test data only represents the material and lot number listed above.

Figure 32 Horizontal burn test results completed at an FAA recognized flammability test laboratory to 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal

7.7 Water Vapor Transmission Rate

Water Vapor Transmission Rate was measured by Ametek Mocon (Minneapolis, MN). The average results are shown in the table below and the results report from Ametek Mocon is shown in Figures 33 and 34. Individual measurements are provided in Section 9.

Sample ID	Mocon ID	Lot Number	Avg WVTR (g/(m ² -day))	
9143FR Lot 22300214T - S1	11415-001	22300214T	7.86	7.56
9143FR Lot 22300214T - S2	11415-002		7.81	
9143FR Lot 22300214T - S3	11415-003		7.01	
9143FR Lot 23023219 - S1	11415-004	23023219	8.20	8.13
9143FR Lot 23023219 - S2	11415-005		8.12	
9143FR Lot 23023219 - S3	11415-006		8.07	

© GOES 340



MOCON Laboratory
 7500 Mendelssohn Ave. N | Minneapolis, MN 55428 | USA



ASTM F1249 Water Vapor Transmission Rate Results Report

MOCON Job Number 486945-1

PO#: 3501658338

3M COMPANY
 Attn: RYAN MARX
 BLDG 280-2W-21, MAPLEWOOD, MN 55144

Test Conditions:

Test Gas	Water Vapor	Test Temperature	38.0 °C	100.4 °F
Test Gas Concentration	100% RH	Carrier Gas	100% N ₂ , Dry	

Test Results:

Sample Identification	MOCON ID	Water Vapor Transmission Rate		Steady State or Test Duration ¹
		Replicate	g/(m ² ·day)	
9143FR LOT22300214T-S1	11415-001	A	7.90	Steady State
		B	7.82	Steady State
9143FR LOT22300214T-S2	11415-002	A	7.86	Steady State
		B	7.75	Steady State
9143FR LOT22300214T-S3	11415-003	A	6.85	Steady State
		B	7.17	Steady State
9143FR LOT23023219-S1	11415-004	A	8.25	Steady State
		B	8.14	Steady State
9143FR LOT23023219-S2	11415-005	A	8.09	Steady State
		B	8.14	Steady State
9143FR LOT23023219-S3	11415-006	A	8.09	Steady State
		B	8.05	Steady State

Note: Above sample(s) was analyzed on a MOCON Permatran-W Water Vapor Permeability Instrument following the testing procedure written within QMS 702-004. The results relate only to the specific items tested.

¹MOCON defines steady state as a value that changes ≤1% over 24hrs or ± the low-end specification of the instrument, whichever is greater. Additionally, if Steady State has not been reached, the result at the maximum contracted test duration will be reported.

This information represents our best judgement based on work done, but the company (MOCON) assumes no liability whatsoever in connection with the use of information or findings contained herein. This report shall not be reproduced except in full without written approval of the company (MOCON). Any deviations from, additions to, or exclusions from the test method shall be noted in the remarks.

End of Report

QMS 702-004-1 Rev B

Page 1 of 2

Printed in U.S.A.

Figure 33 9143FR Water Vapor Transmission Rate Results Report from Ametek Mocon

© GOES 340

mocon
AMETEK

MOCON Laboratory
7500 Mendelssohn Ave. N | Minneapolis, MN 55428 | USA

ASTM F1249 Water Vapor Transmission Rate Results Report

MOCON Job Number 486945-1 PO#: 3501658338

Remarks: None

Sampling: MOCON sampled per our standard procedures.

Date: 3/22/2023

Test Operator: Ling Lei Date: 3/22/23 Authorized by: JAR Date: 3-22-23
Ling Lei Choose an item.

This information represents our best judgement based on work done, but the company (MOCON) assumes no liability whatsoever in connection with the use of information or findings contained herein. This report shall not be reproduced except in full without written approval of the company (MOCON). Any deviations from, additions to, or exclusions from the test method shall be noted in the remarks.
End of Report

QMS 702-004-1 Rev B Page 2 of 2

Libra by U.S.A.

Figure 34 9143FR Water Vapor Transmission Rate Results Report from Ametek Mocon

7.8 90° Peel Adhesion to Epoxy Primer

Peel adhesion to primer was conducted using converted 1 inch rolls of 9143FR. The average results for each lot of 9143FR on AkzoNobel 10P4-2NF Primer after the conditioning described in Section 6.3 are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr112122-846	22300214T	AkzoNobel 10P4-2NF Primer	Room Temperature	22.2	Clean
aegr112122-856			Dry Heat	121.3	Clean
aegr112122-851			Hot/Wet	157.6	Clean
rema020623-989	23023119	AkzoNobel 10P4-2NF Primer	Room Temperature	29.6	Clean
rema020623-004			Dry Heat	180.7	Clean
rema020723-014			Hot/Wet	60.6	Clean
rema020623-990	23023219	AkzoNobel 10P4-2NF Primer	Room Temperature	27.8	Clean
rema020623-005			Dry Heat	188.2	Mostly clean, minor skin residue
rema020723-015			Hot/Wet	101.8	Clean

Representative images of the epoxy-primed panels after removal of the 9143FR after the specified dwell conditions are provided in Figures 35 and 36.

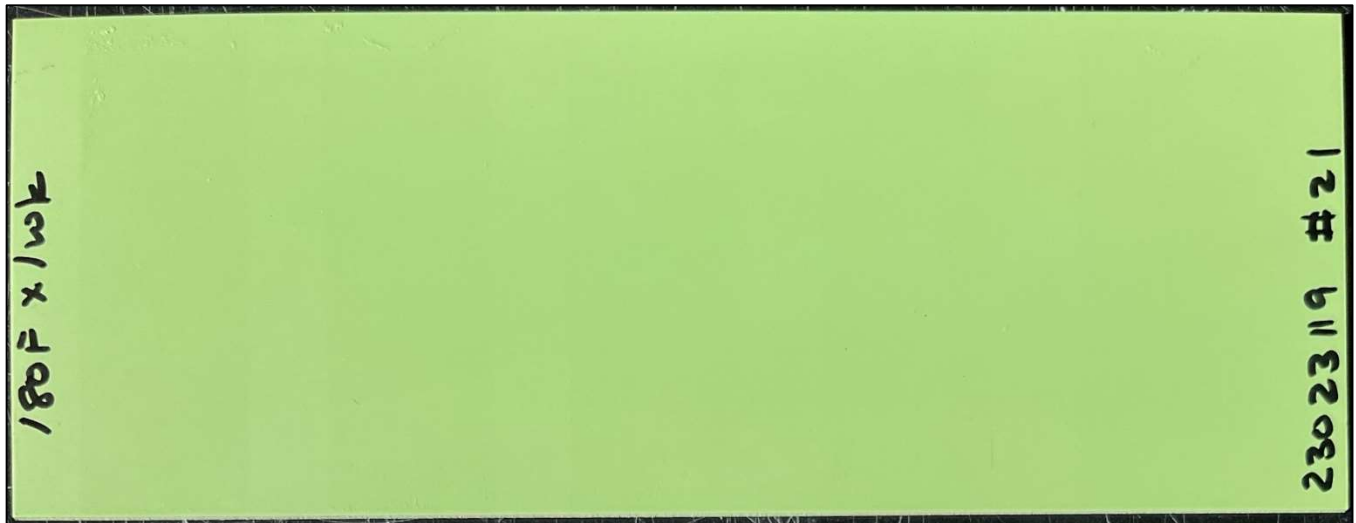


Figure 35 Representative image of epoxy-primed panel after removal of 9143FR after exposure to “Dry Heat” dwell condition (rema020623-004)



Figure 36 Representative image of epoxy-primed panel after removal of 9143FR after exposure to “Hot/Wet” dwell condition (rema020723-014)

7.9 90° Peel Adhesion to Epoxy Topcoat

Peel adhesion to topcoat was conducted using converted 1 inch rolls of 9143FR. The average results for each lot of 9143FR on AkzoNobel 446-22-1000 Topcoat after the conditioning described in section 6.3 are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	LotNumber	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr113022-878	22300214T	AkzoNobel 446-22-1000 Topcoat	Room Temperature	14.2	Clean
aegr113022-877			Dry Heat	118.7	Clean
aegr113022-876			Hot/Wet	23.8	Clean
aegr021523-056	23023219	AkzoNobel 446-22-1000 Topcoat	Room Temperature	19.7	Clean
aegr021523-057			Dry Heat	26.8	Clean
aegr021523-058			Hot/Wet	47.0	Clean

Representative images of the epoxy topcoat test panels after removal of the 9143FR after the specified dwell conditions are provided in Figures 37 and 38.



Figure 37 Representative image of epoxy topcoat panel after removal of 9143FR after exposure to “Dry Heat” dwell condition (aegr021523-057)



Figure 38 Representative image of epoxy topcoat panel after removal of 9143FR after exposure to “Hot/Wet” dwell condition (aegr021523-058)

7.10 90° Peel Adhesion After 130 °F Extended Aging on Epoxy Primer

Peel adhesion to primer after 130 °F extended aging was conducted using converted 1 inch rolls of 9143FR. The average results for 2 lots of 9143FR on AkzoNobel 10P4-2NF Primer are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr011723-907	22300214T	AkzoNobel 10P4-2NF Primer	130 °F x 1 month	63.7	Clean
aegr011723-908			130 °F x 3 months	102.1	Clean
aegr011723-909			130 °F x 6 months	105.2	Clean
aegr022723-093	23023219	AkzoNobel 10P4-2NF Primer	130 °F x 1 month	48.1	Clean
aegr022723-094			130 °F x 3 months	66.2	Clean
aegr022723-095			130 °F x 6 months	90.8	Clean

A representative image of the epoxy-primed test panel after removal of the 9143FR after 3 months at 130 °F is provided in Figure 39.



Figure 39 Representative image of epoxy-primed panel after removal of 9143FR after exposure to 130 °F for 3 months (aegr011723-908)

7.11 90° Peel Adhesion After 130 °F Extended Aging on Epoxy Topcoat

Peel adhesion to topcoat after 130 °F extended aging was conducted using converted 1 inch rolls of 9143FR. The average results for 2 lots of 9143FR on AkzoNobel 446-22-1000 Topcoat are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	LotNumber	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr011723-910	22300214T	AkzoNobel 446-22-1000 Topcoat	130 °F x 1 month	62.1	Clean
aegr011723-911			130 °F x 3 months	100.5	Clean
aegr011723-912			130 °F x 6 months	67.8	Clean
aegr022723-096	23023219	AkzoNobel 446-22-1000 Topcoat	130 °F x 1 month	33.7	Clean
aegr022723-097			130 °F x 3 months	128.0	Clean
aegr022723-098			130 °F x 6 months	185.6	Clean

A representative image of the epoxy topcoat test panel after removal of the 9143FR after 3 months at 130 °F is provided in Figure 40.

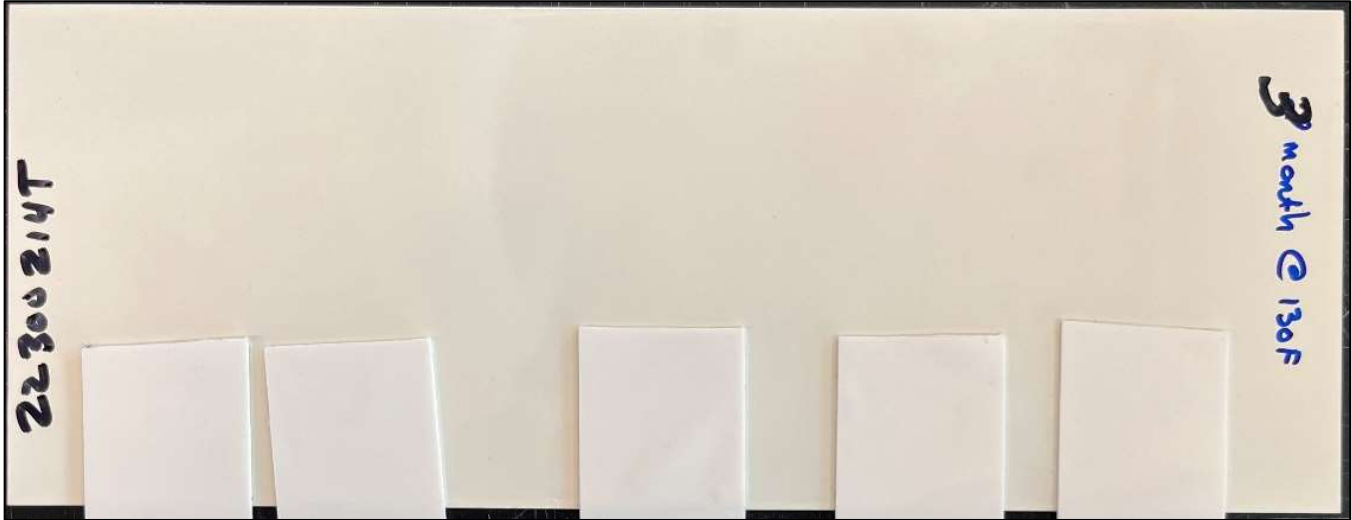


Figure 40 Representative image of epoxy topcoat panel after removal of 9143FR after exposure to 130 °F for 3 months (aegr011723-911)

7.12 90° Peel Adhesion After 160 °F Extended Aging on Epoxy Primer

Peel adhesion to primer after 160 °F extended aging was conducted using converted 1 inch rolls of 9143FR. The average results for 2 lots of 9143FR on AkzoNobel 10P4-2NF Primer are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
rema022723-081	22300214T	AkzoNobel 10P4-2NF Primer	160 °F x 1 wk	54.0	Clean
rema022723-082			160 °F x 2 wk	54.9	Clean
rema022723-083			160 °F x 6 wk	101.8	Clean
rema022723-084			160 °F x 12 wk	106.9	Clean
rema022723-077	23023219	AkzoNobel 10P4-2NF Primer	160 °F x 1 wk	49.1	Clean
rema022723-078			160 °F x 2 wk	57.0	Clean
rema022723-079			160 °F x 6 wk	96.0	Clean
rema022723-080			160 °F x 12 wk	138.3	Clean

A representative image of the epoxy-primed test panel after removal of the 9143FR after 6 weeks at 160 °F is provided in Figure 41.

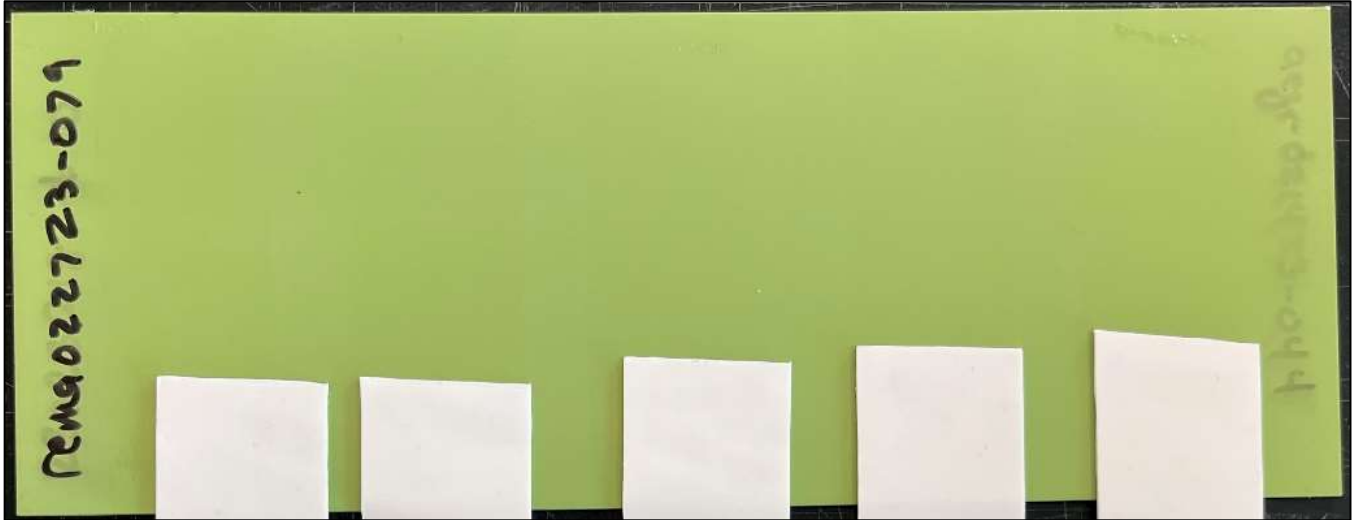


Figure 41 Representative image of epoxy-primed panel after removal of 9143FR after exposure to 160 °F for 6 weeks (rema022723-079)

7.13 90° Peel Adhesion After 160 °F Extended Aging on Epoxy Topcoat

Peel adhesion to topcoat after 160 °F extended aging was conducted using converted 1 inch rolls of 9143FR. The average results for 2 lots of 9143FR on AkzoNobel 446-22-1000 Topcoat are provided in the table below. Individual measurements are provided in Section 9.

Sample ID	LotNumber	Substrate	Dwell Condition	Avg 90° Peel Adhesion (oz/in)	Failure mode
rema022723-089	22300214T	AkzoNobel 446-22-1000 Topcoat	160 °F x 1 wk	97.2	Clean
rema022723-090			160 °F x 2 wk	65.8	Clean
rema022723-091			160 °F x 6 wk	109.1	Clean
rema022723-092			160 °F x 12 wk	94.7	Clean
rema022723-085	23023219	AkzoNobel 446-22-1000 Topcoat	160 °F x 1 wk	52.9	Clean
rema022723-086			160 °F x 2 wk	131.9	Clean
rema022723-087			160 °F x 6 wk	129.2	Clean
rema022723-088			160 °F x 12 wk	121.3	Clean

A representative image of the epoxy topcoat test panel after removal of the 9143FR after 6 weeks at 160 °F is provided in Figure 42.

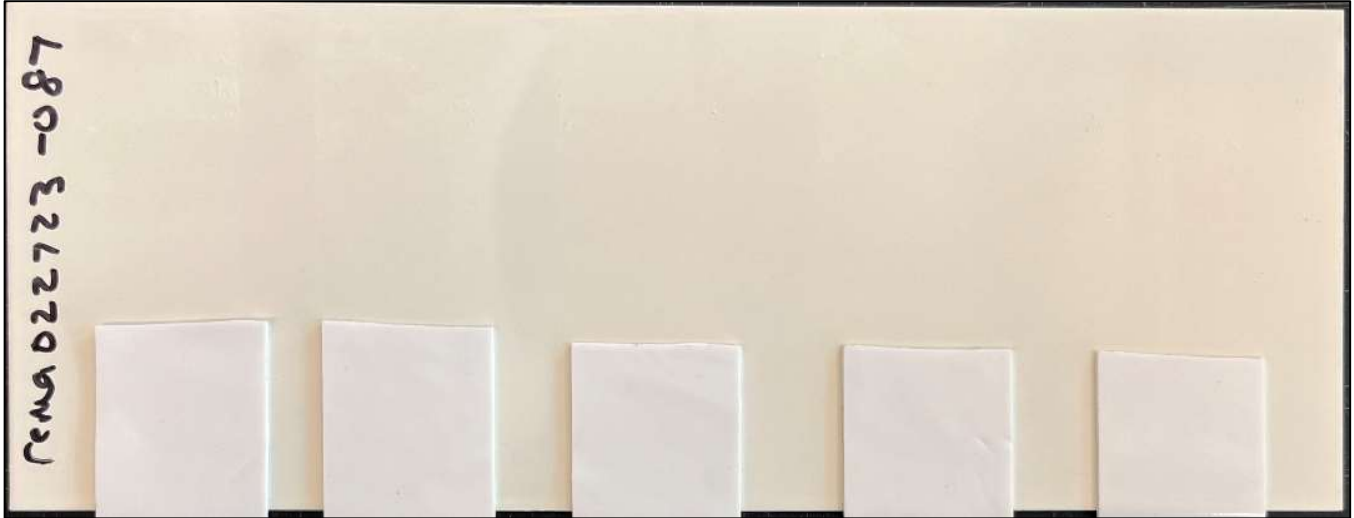


Figure 42 Representative image of epoxy-primed panel after removal of 9143FR after exposure to 160 °F for 6 weeks (rema022723-087)

7.14 Removal After Aging in Simulated Floor Construction

9143FR Lot number 22300214T was used determine clean removability after aging in a simulated floor construction. Photos of the construction after removal for the oven (prior to disassembly), during disassembly, and after 9143FR removal are shown in Figures 43 through 45.

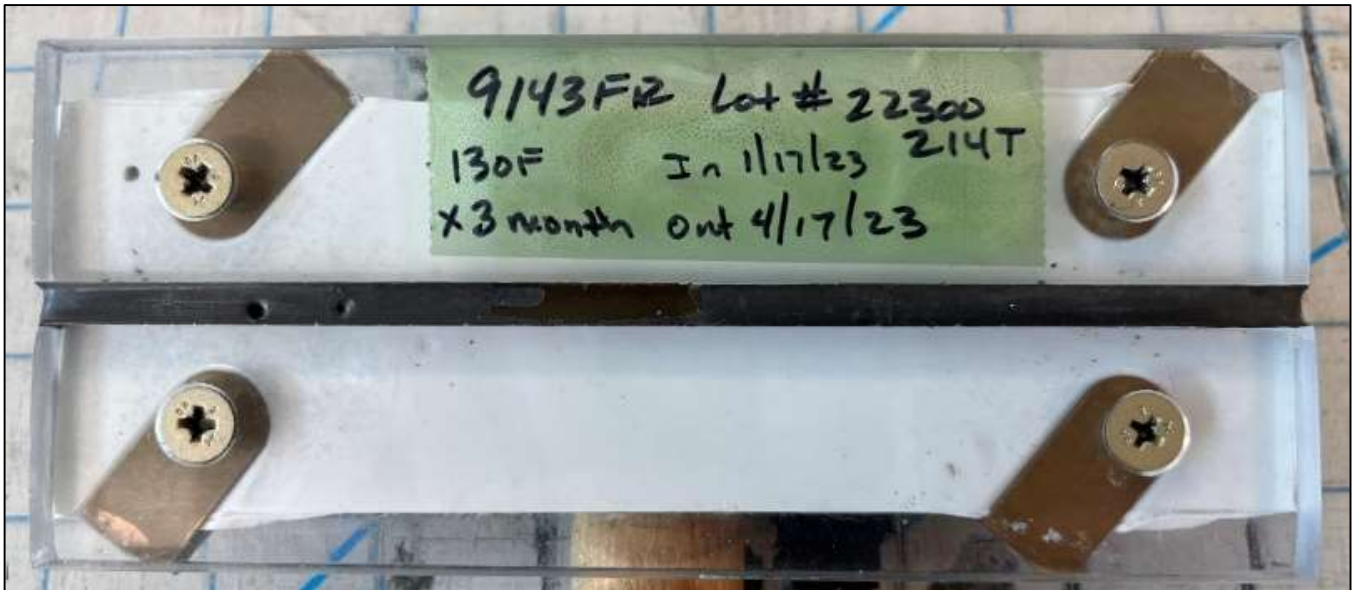


Figure 43 Simulated Floor Construction After Aging



Figure 44 Simulated Floor Construction After Aging with Acrylic Panel Removed



Figure 45 Simulated Floor Construction with 9143FR removed after 3 months aging at 130 °F

7.15 90° Peel Adhesion to Corrosion Inhibiting Compound

Peel adhesion to Ardrox® AV-8 was conducted using converted 1 inch rolls of 9143FR. The average results for each lot of 9143FR on one-hour cured and 24-hour cured Ardrox® AV-8 after the conditioning described in section 6.4 are provided in the tables below. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Ardrox® AV-8 Cure Time Prior to Tape Application	Dwell Conditions	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr120622-893	22300214T	1 hour	Room Temperature	38.6	Clean/stained tape
aegr120622-894			Dry Heat	27.5	CIC off primer, red tape
aegr120622-895			Hot/Wet	32.3	CIC off primer, red tape
aegr021523-059	23023219	1 hour	Room Temperature	29.5	Clean/stained tape
aegr021523-060			Dry Heat	41.1	CIC off primer, red tape
aegr021523-061			Hot/Wet	41.7	CIC off primer, red tape

Sample ID	Lot Number	Ardrox® AV-8 Cure Time Prior to Tape Application	Dwell Conditions	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr120722-904	22300214T	24 hours	Room Temperature	37.7	Clean/stained tape
aegr120722-905			Dry Heat	29.2	CIC off primer, red tape
aegr120722-906			Hot/Wet	37.0	CIC off primer, red tape
aegr021523-062	23023219	24 hours	Room Temperature	21.6	Clean/stained tape
aegr021523-063			Dry Heat	39.8	CIC off primer, red tape
aegr021523-064			Hot/Wet	38.9	CIC off primer, red tape

Representative images of the CIC-coated test panel after removal of the 9143FR and the specified dwell conditions are provided in Figure 46 - 48.

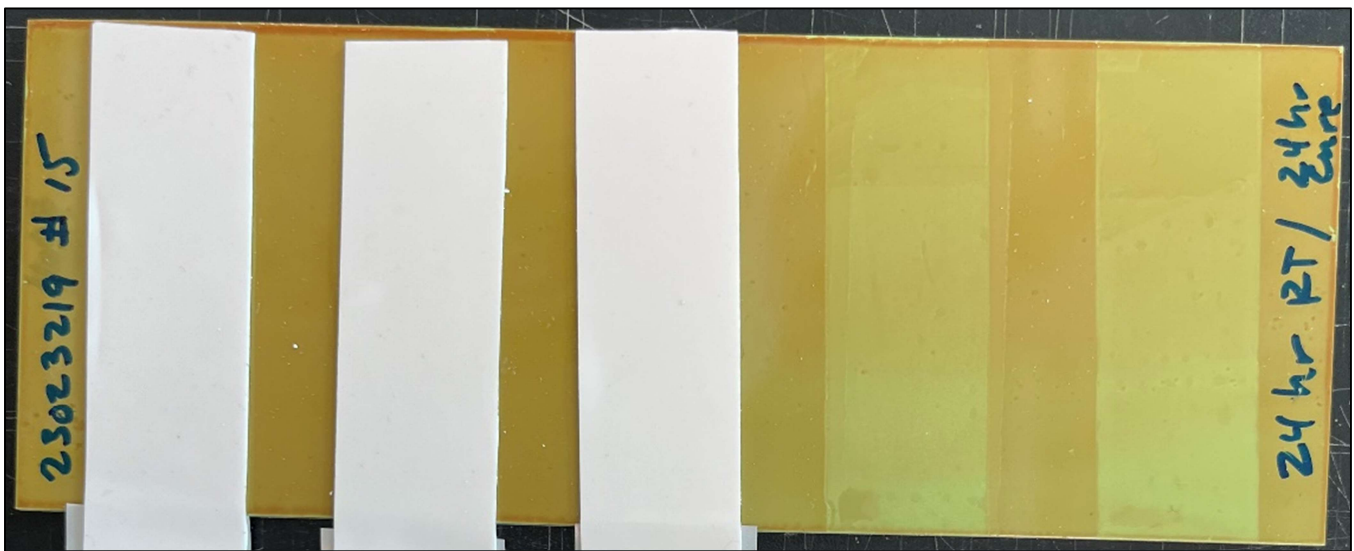


Figure 46 Representative image of CIC-coated panel after removal of 9143FR after exposure to 24 hour dwell at room temperature (aegr021523-062)



Figure 47 Representative image of CIC-coated panel after removal of 9143FR after exposure "Dry Heat" dwell conditions (aegr021523-063)



Figure 48 Representative image of CIC-coated panel after removal of 9143FR after exposure “Hot/Wet” dwell conditions (aegr021523-064)

7.16 One Week Moisture Absorption

The average percent moisture absorbed after one week exposure to 120 °F and 95% relative humidity for each lot of 9143FR is provided in the following table. Individual measurements are provided in Section 9.

Sample ID	Lot Number	Avg % Absorption 1 week
rema111722-841	22300214T	1.48%
rema020623-019	23023119	1.52%
rema020623-020	23023219	1.60%

8.0 Conclusions

Typical results of 3M™ Corrosion Prevention Sealing Tape 9143FR obtained in a variety of applicable tests and configurations were provided. 9143FR Effectively protects aluminum substrates from corrosion in a salt fog environment and when submerged in fluids that may be present in an aircraft cabin. 9143FR Has adequate adhesion to typical interior aircraft coatings and removes cleanly after extended periods of time as accelerated by heat and heat/humidity. 9143FR Self-extinguishes in vertical and horizontal flammability configurations and meets the requirements set forth by 14 CFR 25.853 (a) Appendix F, Part I, (a)(1) (ii): 12 second vertical and 14 CFR 25.853 (a) Appendix F, Part I, (a)(1)(iv): 15 second horizontal.

9.0 Appendix – Individual Test Values

The individual test results used to calculate the averages provided in section 7 are provided in the following sections. Where applicable, the actual test reports and images used for calculating percent corrosion are available upon request.

9.1 Thickness

Sample ID	Lot Number	Location	Individual Thickness Measurements (in)					Average Thickness (in)	Overall Average Thickness (in)
aegr110422-790	22300214T	North	0.0434	0.0430	0.0435	0.0439	0.0442	0.0436	0.0427
		North Center	0.0422	0.0433	0.0425	0.0422	0.0417	0.0424	
		Center	0.0420	0.0430	0.0434	0.0427	0.0432	0.0429	

		South Center	0.0426	0.0432	0.0418	0.0429	0.0424	0.0426	
		South	0.0418	0.0420	0.0419	0.0421	0.0420	0.0420	
aegr012623-927	23023119	North	0.0445	0.0447	0.0444	0.0442	0.0442	0.0444	0.0440
		North Center	0.0440	0.0439	0.0437	0.0438	0.0435	0.0438	
		Center	0.0439	0.0441	0.0441	0.0434	0.0444	0.0440	
		South Center	0.0447	0.0443	0.0442	0.0439	0.0444	0.0443	
		South	0.0433	0.0437	0.0439	0.0440	0.0439	0.0438	
aegr012623-928	23023219	North	0.0441	0.0442	0.0444	0.0441	0.0436	0.0441	0.0430
		North Center	0.0431	0.0433	0.0427	0.0423	0.0426	0.0428	
		Center	0.0402	0.0409	0.0411	0.0412	0.0411	0.0409	
		South Center	0.0429	0.0422	0.0424	0.0429	0.0425	0.0426	
		South	0.0444	0.0444	0.0443	0.0451	0.0448	0.0446	

9.2 Areal Weight

Sample ID	Lot Number	Location	Mass of 4 inch x 6 inch (g)	Areal Weight (g/sqin)	Avg Areal Weight (g/sqin)
aegr110422-790	22300214T	North	20.79	0.87	0.85
		North Center	20.24	0.84	
		Center	20.20	0.84	
		South Center	20.30	0.85	
		South	20.09	0.84	
aegr012623-927	23023119	North	21.00	0.88	0.87
		North Center	20.75	0.86	
		Center	20.75	0.86	
		South Center	21.03	0.88	
		South	20.82	0.87	
aegr012623-928	23023219	North	20.93	0.87	0.85
		North Center	20.30	0.85	
		Center	19.30	0.80	
		South Center	20.22	0.84	
		South	21.08	0.88	

9.3 3000 Hour Salt Spray Corrosion Resistance in Simulated Floor Construction

Sample ID	Lot #	Time in Salt Spray Chamber	Corrosion Area (%)	Avg Corrosion Area (%)
rema022723-101	22300214T	125 days	0.00%	0.01%
			0.04%	
			0.00%	
rema022723-102	23023219	125 days	0.00%	0.01%
			0.04%	
			0.00%	

9.4 Accelerated Fluid Immersion

Sample ID	Lot Number	Metal	Liquid	% Corrosion	% Corrosion
rema022723-108	22300214T	Clad 7075-T6	DI Water	0.0%	1.6%
				0.7%	
				4.2%	

rema022723-112	22300214T	Bare 7075-T6	Tap Water	4.3%	5.5%						
				12.1%							
				0.0%							
rema022723-116			22300214T	Bare 7075-T6	Red Wine	41.9%	15.8%				
						5.0%					
						0.7%					
rema022723-120					22300214T	Bare 7075-T6	Coke	0.4%	0.3%		
								0.4%			
								0.2%			
rema022723-124							22300214T	Bare 7075-T6	Synthetic Urine	0.0%	0.1%
										0.4%	
										0.0%	
rema022723-107	22300214T	Bare 7075-T6							DI Water	0.5%	0.2%
										0.0%	
										0.2%	
rema022723-111			22300214T	Bare 7075-T6					Tap Water	0.1%	0.5%
										0.5%	
										1.0%	
rema022723-115					22300214T	Bare 7075-T6			Red Wine	40.7%	43.4%
										39.9%	
										49.6%	
rema022723-119							22300214T	Bare 7075-T6	Coke	2.6%	5.6%
										9.5%	
										4.8%	
rema022723-123	22300214T	Bare 7075-T6							Synthetic Urine	0.2%	0.1%
										0.0%	
										0.0%	
rema022723-110			23023219	Clad 7075-T6					DI Water	0.0%	0.0%
										0.0%	
										0.0%	
rema022723-114					23023219	Clad 7075-T6			Tap Water	0.2%	0.4%
										0.9%	
										0.1%	
rema022723-118							23023219	Clad 7075-T6	Red Wine	0.0%	0.0%
										0.0%	
										0.1%	
rema022723-122	23023219	Clad 7075-T6							Coke	0.0%	0.0%
										0.0%	
										0.0%	
rema022723-126			23023219	Clad 7075-T6					Synthetic Urine	0.0%	0.0%
										0.0%	
										0.0%	
rema022723-109					23023219	Bare 7075-T6			DI Water	0.0%	0.0%
										0.0%	
										0.0%	
rema022723-113							23023219	Bare 7075-T6	Tap Water	0.1%	0.1%

				0.1%			
				0.0%			
rema022723-117			Red Wine	13.3%	15.5%		
				16.8%			
				16.4%			
rema022723-121			Coke	0.1%	0.5%		
				0.9%			
				0.4%			
rema022723-125			Synthetic Urine	0.0%	0.0%		
				0.0%			
				0.0%			
rema040423-160	23023119	Clad 7075-T6	DI Water	0.0%	0.0%		
						0.0%	
						0.0%	
rema040423-161					Tap Water	0.0%	0.0%
						0.0%	
						0.0%	
rema040423-162					Red Wine	0.6%	0.8%
						1.0%	
						0.7%	
rema040423-163					Coke	0.1%	0.1%
						0.1%	
						0.1%	
rema040423-164			Synthetic Urine	0.0%	0.0%		
				0.0%			
				0.0%			
rema040423-155	23023119	Bare 7075-T6	DI Water	0.0%	0.0%		
						0.0%	
						0.0%	
rema040423-156					Tap Water	0.0%	0.0%
						0.0%	
						0.0%	
rema040423-157					Red Wine	10.0%	9.0%
						10.2%	
						7.0%	
rema040423-158					Coke	0.6%	0.0%
						0.0%	
						0.3%	
rema040423-159			Synthetic Urine	0.0%	0.0%		
				0.0%			
				0.0%			

9.5 Vertical Burn Flame Resistance

Sample ID	Lot Number	Extinguish time (s)	Drip time (s)	Burn Length (in)	Avg Extinguish time (s)	Avg Drip time (s)	Avg Burn Length (in)
aegr110322-778	22300214T	1.3	0.0	1.5	3.2	0.0	1.8

		5.3	0.0	1.8			
		1.5	0.0	1.5			
		1.7	0.0	1.5			
		0.0	0.0	1.5			
		10.8	0.0	2.3			
		1.8	0.0	1.5			
		2.9	0.0	2.0			
		4.0	0.0	2.3			
		2.6	0.0	1.8			
aegr012623-922	23023119	1.5	0.0	1.8	1.7	0.0	1.6
		1.4	0.0	2.0			
		1.6	0.0	1.5			
		2.4	0.0	1.5			
		1.8	0.0	1.8			
		1.4	0.0	1.5			
		1.7	0.0	1.5			
		1.5	0.0	1.5			
		1.7	0.0	1.5			
aegr012623-923	23023219	3.5	0.0	2.0	2.5	0.0	1.6
		3.1	0.0	2.0			
		3.1	0.0	1.0			
		0.0	0.0	1.0			
		5.8	0.0	2.0			
		2.9	0.0	1.8			
		0.0	0.0	1.5			
		1.0	0.0	1.8			
		3.4	0.0	1.8			

9.6 Horizontal Burn Flame Resistance

Sample ID	Lot Number	Burn Length (in)	Burn Time after Flame Removal (s)	Burn Rate (in/min)	Avg Burn Length (in)	Avg Burn Time after Flame Removal (s)	Burn Rate (in/min)	Comments
rema040423-174	22300214T	0.2	4.2	N/A	0.2	3.6	N/A	SE/O
		0.2	3.2	N/A				
		0.2	2.9	N/A				
		0.3	4.1	N/A				
		0.3	3.9	N/A				
rema040423-175	23023119	0.4	3.2	N/A	0.3	5.4	N/A	SE/O
		0.4	3.3	N/A				
		0.2	9.3	N/A				
		0.3	7.9	N/A				
		0.3	3.4	N/A				
rema040423-176	23023219	0.3	4.3	N/A	0.3	4.1	N/A	SE/O
		0.3	4.5	N/A				
		0.3	4.1	N/A				
		0.3	5.0	N/A				

		0.3	2.6	N/A			
--	--	-----	-----	-----	--	--	--

9.7 Water Vapor Transmission Rate

Sample ID	Mocon ID	Lot Number	Replicate	WVTR (g/(m ² -day))	Avg WVTR (g/(m ² -day))	
9143FR Lot 22300214T - S1	11415-001	22300214T	A	7.90	7.86	7.56
			B	7.82		
9143FR Lot 22300214T - S2	11415-002		A	7.86	7.81	
			B	7.75		
9143FR Lot 22300214T - S3	11415-003		A	6.85	7.01	
			B	7.17		
9143FR Lot 23023219 - S1	11415-004	23023219	A	8.25	8.20	8.13
			B	8.14		
9143FR Lot 23023219 - S2	11415-005		A	8.09	8.12	
			B	8.14		
9143FR Lot 23023219 - S3	11415-006		A	8.09	8.07	
			B	8.05		

9.8 90° Peel Adhesion to Epoxy Primer

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode				
aegr112122-846	22300214T	AkzoNobel 10P4-2NF Primer	Room Temperature	22.3	22.2	Clean				
				21.8						
				22.6						
				21.9						
				22.2						
aegr112122-856			22300214T	AkzoNobel 10P4-2NF Primer	Dry Heat	115.7	121.3	Clean		
						126.7				
						124.5				
						124.8				
aegr112122-851					22300214T	AkzoNobel 10P4-2NF Primer	Hot/Wet	114.9	157.6	Clean
	177.8									
	128.0									
	170.9									
	138.2									
rema020623-989	23023119	AkzoNobel 10P4-2NF Primer					Room Temperature	173.3	29.6	Clean
			29.7							
			29.3							
			29.4							
			27.3							
rema020623-004			23023119	AkzoNobel 10P4-2NF Primer	Dry Heat	32.2	180.7	Clean		
						221.8				
						183.7				
						174.9				
rema020723-014					23023119	AkzoNobel 10P4-2NF Primer	Hot/Wet	163.0	60.6	Clean
	159.9									
	67.1									
	68.0									
								60.3		

				53.8		
				53.8		
rema020623-990	23023219	AkzoNobel 10P4-2NF Primer	Room Temperature	27.2	27.8	Clean
				27.7		
				27.8		
				28.6		
				27.5		
rema020623-005	23023219	AkzoNobel 10P4-2NF Primer	Dry Heat	217.5	188.2	Mostly clean, minor skin residue
				168.4		
				190.4		
				168.6		
				196.0		
rema020723-015	23023219	AkzoNobel 10P4-2NF Primer	Hot/Wet	98.7	101.8	Clean
				99.1		
				94.3		
				96.8		
				120.3		

9.9 90° Peel Adhesion to Epoxy Topcoat

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr113022-878	22300214T	AkzoNobel 446-22- 1000 Topcoat	Room Temperature	14.4	14.2	Clean
				14.2		
				14.0		
				14.0		
				14.4		
aegr113022-877	22300214T	AkzoNobel 446-22- 1000 Topcoat	Dry Heat	117.1	118.7	Clean
				118.7		
				117.9		
				130.8		
				108.8		
aegr113022-876	22300214T	AkzoNobel 446-22- 1000 Topcoat	Hot/Wet	24.7	23.8	Clean
				24.0		
				23.3		
				22.9		
				24.1		
aegr021523-056	23023219	AkzoNobel 446-22- 1000 Topcoat	Room Temperature	18.8	19.7	Clean
				19.4		
				18.7		
				21.6		
				19.9		
aegr021523-057	23023219	AkzoNobel 446-22- 1000 Topcoat	Dry Heat	26.6	47.0	Clean
				28.6		
				27.0		
				25.9		
				26.2		
aegr021523-058	23023219	AkzoNobel 446-22- 1000 Topcoat	Hot/Wet	47.8	26.8	Clean

				60.1		
				45.1		
				39.9		
				42.3		

9.10 90° Peel Adhesion After 130 °F Extended Aging on Epoxy Primer

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode	
aegr011723-907	22300214T	AkzoNobel 10P4-2NF Primer	130 °F x 1 month	65.3	63.7	Clean	
60.3							
62.4							
66.0							
64.5							
aegr011723-908	22300214T	AkzoNobel 10P4-2NF Primer	130 °F x 3 months	99.9	102.1	Clean	
98.2							
102.1							
113.0							
aegr011723-909	22300214T	AkzoNobel 10P4-2NF Primer	130 °F x 6 months	97.5	105.2	Clean	
107.7							
101.6							
93.5							
aegr011723-909	22300214T	AkzoNobel 10P4-2NF Primer	130 °F x 6 months	107.6	105.2	Clean	
115.5							
57.6				48.1			Clean
53.0							
48.4							
39.8							
aegr022723-093	23023219	AkzoNobel 10P4-2NF Primer	130 °F x 1 month	41.7	66.2	Clean	
61.0							
61.7							
69.6							
aegr022723-094	23023219	AkzoNobel 10P4-2NF Primer	130 °F x 3 months	66.9	90.8	Clean	
71.9							
89.1							
90.3							
aegr022723-095	23023219	AkzoNobel 10P4-2NF Primer	130 °F x 6 months	96.5	90.8	Clean	
91.6							
86.5							
86.5							

9.11 90° Peel Adhesion After 130 °F Extended Aging on Epoxy Topcoat

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr011723-910	22300214T	AkzoNobel 446-22-1000 Topcoat	130 °F x 1 month	54.0	62.1	Clean
59.7						
66.3						
53.4						

				76.9		
aegr011723-911			130 °F x 3 months	93.4	100.5	Clean
				100.2		
				107.7		
				97.8		
				103.3		
aegr011723-912			130 °F x 6 months	77.0	67.8	Clean
				63.1		
				64.3		
				60.8		
				73.8		
rema022723-096			130 °F x 1 month	29.1	33.7	Clean
				36.7		
				34.7		
				34.8		
				33.4		
rema022723-097	23023219	AkzoNobel 446-22-1000 Topcoat	130 °F x 3 months	109.1	128.0	Clean
				128.6		
				138.0		
				133.6		
				130.6		
rema022723-098			130 °F x 6 months	201.6	185.6	Clean
				174.7		
				177.7		
				184.7		
				189.3		

9.12 90° Peel Adhesion After 160 °F Extended Aging on Epoxy Primer

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode
rema022723-081			160 °F x 1 wk	57.2	54.0	Clean
				51.7		
				48.7		
				53.5		
				58.8		
rema022723-082	22300214T	AkzoNobel 10P4-2NF Primer	160 °F x 2 wk	75.1	54.9	Clean
				61.6		
				46.3		
				46.0		
				45.3		
rema022723-083			160 °F x 6 wk	109.7	101.8	Clean
				105.3		
				103.8		
				95.9		
				94.2		
rema022723-084			160 °F x 12 wk	110.5	106.9	Clean
				101.8		

				108.9		
				112.0		
				101.5		
rema022723-077	23023219	AkzoNobel 10P4-2NF Primer	160 °F x 1 wk	53.2	49.1	Clean
				46.6		
				49.0		
				45.7		
				50.7		
rema022723-078			160 °F x 2 wk	61.3	57.0	Clean
				54.3		
				52.4		
				57.4		
rema022723-079			160 °F x 6 wk	142.4	96.0	Clean
				18.7		
				128.4		
				90.5		
rema022723-080			160 °F x 12 wk	100.0	138.3	Clean
				154.9		
				120.1		
	130.4					
				132.2		
				153.8		

9.13 90° Peel Adhesion After 160 °F Extended Aging on Epoxy Topcoat

Sample ID	Lot Number	Substrate	Dwell Condition	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode
rema022723-089	22300214T	AkzoNobel 446- 22-1000 Topcoat	160 °F x 1 wk	112.5	97.2	Clean
				110.0		
				101.7		
				75.4		
				86.4		
rema022723-090			160 °F x 2 wk	93.0	65.8	Clean
				60.0		
				69.9		
				56.1		
rema022723-091			160 °F x 6 wk	49.9	109.1	Clean
				106.6		
				97.7		
				113.7		
rema022723-092			160 °F x 12 wk	117.3	94.7	Clean
				110.4		
				95.7		
	100.1					
				100.1		
				96.1		

				81.4		
rema022723-085			160 °F x 1 wk	53.7	52.9	Clean
				63.0		
				49.6		
				47.1		
				51.3		
rema022723-086	23023219	AkzoNobel 446-22-1000 Topcoat	160 °F x 2 wk	121.4	131.9	Clean
				150.5		
				158.6		
				113.1		
				115.8		
rema022723-087			160 °F x 6 wk	120.3	129.2	Clean
				99.6		
				154.1		
				131.0		
				141.2		
rema022723-088			160 °F x 12 wk	102.5	121.3	Clean
				115.4		
				138.1		
				132.8		
				117.7		

9.14 90° Peel Adhesion to Corrosion Inhibiting Compound

Sample ID	Lot Number	Ardrox® AV-8 Cure Time Prior to Tape Application	Dwell Conditions	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode
aegr120622-893			Room Temperature	35.7	38.6	Clean/stained tape
				39.7		
				39.4		
				38.9		
				39.4		
aegr120622-894	22300214T	1 hour	Dry Heat	29.7	27.5	CIC off primer, red tape
				28.2		
				28.0		
				26.5		
				25.0		
aegr120622-895			Hot/Wet	33.2	32.3	CIC off primer, red tape
				32.8		
				33.4		
				31.4		
				30.9		
aegr021523-059	23023219	1 hour	Room Temperature	29.1	29.5	Clean/stained tape
				29.5		
				29.1		
				29.6		
				30.3		
aegr021523-060			Dry Heat	37.3	41.1	

				39.4		CIC off primer, red tape
				41.8		
				43.4		
				43.5		
aegr021523-061			Hot/Wet	43.5	41.7	CIC off primer, red tape
				42.7		
				41.5		
				40.3		
				40.6		

Sample ID	Lot Number	Ardrox® AV-8 Cure Time Prior to Tape Application	Dwell Conditions	90° Peel Adhesion (oz/in)	Avg 90° Peel Adhesion (oz/in)	Failure mode	
aegr120722-904	22300214T	24 hours	Room Temperature	33.7	37.7	Clean/stained tape	
				38.4			
				38.7			
				38.8			
				38.9			
aegr120722-905				Dry Heat	29.6	29.2	CIC off primer, red tape
			30.3				
			30.4				
			28.1				
					27.4		
aegr120722-906				Hot/Wet	43.4	37.0	CIC off primer, red tape
			42.0				
			34.4				
			28.8				
			36.4				
aegr021523-062			23023219	24 hours	Room Temperature	20.6	21.6
	22.9						
	21.7						
	20.4						
	22.6						
aegr021523-063		Dry Heat			41.8	39.8	CIC off primer, red tape
	45.6						
	41.4						
	37.7						
					32.3		
aegr021523-064		Hot/Wet			38.1	38.9	CIC off primer, red tape
	42.3						
	39.6						
	38.9						
	35.8						

9.15 One Week Moisture Absorption

Sample ID	Lot Number	Mass of Clad 7075 T6 (g)	Initial mass of taped panel (g)	Final mass of taped panel @ 1 wk (g)	% Absorption 1 wk	Avg % Absorption 1 week
rema111722-841	22300214T	68.77	79.11	79.25	1.35%	1.48%
		68.91	79.12	79.27	1.47%	
		69.13	79.69	79.86	1.61%	
rema020623-019	23023119	69.09	79.40	79.57	1.65%	1.52%
		68.81	78.95	79.10	1.48%	
		69.12	79.51	79.66	1.44%	
rema020623-020	23023219	69.14	79.23	79.40	1.68%	1.60%
		68.86	79.35	79.52	1.62%	
		69.13	79.25	79.40	1.48%	

Authorization to Use

Ensure products meet all applicable specifications, standards, and maintenance manual requirements for the platform being worked on and validate all aircraft approvals against current technical documentation.

**This product is manufactured under a 3M Quality Management System registered to the AS9100 standard.*

Technical Information: Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

Product Selection and Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability: Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.



**Automotive & Aerospace Solutions
Division**
3M Center
St. Paul, MN 55144-1000
Phone 1-800-328-1684
Web www.3M.com/aerospace

3M is a trademark of 3M Company.
All other trademarks are the property
of their respective owners.

© 3M 2024. All rights reserved.