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Date: 29-Sep-2014

SMI/REF: 1407-943

Product: **ANTIMICROBIAL SHIELD-ZOONO Z-71 FORMULA (Ready to use)**
(Part Code A333)
(received 02-Sep-2014)

Dilution: As received

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British Aerospace
AIRBUS AIMS09-00-002 (Issue 3, July 2011)
EVALUATION OF MAINTENANCE MATERIALS
Toilet Fluids (Disinfectants)

5.3.1 Sandwich Corrosion Test	<u>Conforms</u>
5.3.2 Total Immersion Test	<u>Conforms</u>
5.3.4 Paint Softening Test	<u>Conforms</u>
5.3.6 Polycarbonate Crazing Test	<u>Conforms</u>
5.3.7 Elastomer Degradation Test	<u>Conforms</u>

Respectfully Submitted,



Patricia D. Viani, SMI Inc.

Client: Permagard Pty Ltd Date: 29-Sep-2014
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5.3.1 **Sandwich Corrosion Test:** Testing shall be in accordance with ASTM-F-1110 using:

- aluminium alloy 2024 T3 clad against
- anodised aluminium alloy 2024 T3 unclad and
- anodised aluminium alloy 7075 T6 unclad.

After the test the aluminium alloy specimens shall show a rating less than or equal to 1 or no worse than a control sample prepared with distilled water.

	Aluminium alloy 2024 T3 clad against Anodised alum. 2024 T3 unclad	Aluminium alloy 2024 T3 clad against Anodised alum. 7075 T6 unclad
AS RECEIVED	2024 T3 clad: 1 2024 T3 unclad anodised: 1	2024 T3 clad: 1 7075 T6 unclad anodised: 1
CONTROL	2024 T3 clad: 1 2024 T3 unclad anodised: 1	2024 T3 clad: 1 7075 T6 unclad anodised: 1

Result Conforms

5.3.2 **Total Immersion Test:** Testing shall be in accordance with ASTM-F-483 using:

- aluminium alloys as per 5.3.1. above
- low carbon steel, e.g. AMS 5045, XC18 or equivalent
- cadmium plated steel, e.g. AMS 5045, XC18 (or equivalent), plated in accordance with AMS QQ-P-416 Type I Class 1 (or equivalent)

The immersion time shall be (24 ± 0.5) h. The immersion temperature shall be (23 ± 2)°C.

No significant visual change shall be evident. The max. permitted weight changes are as follows:

Aluminum alloy = **0.02 mg/cm²** maximum.
 Low carbon steel = **0.8 mg/cm²** maximum
 Cadmium plated steel = **0.3 mg/cm²** maximum

ALLOY	WEIGHT CHANGE
	AS RECEIVED
Aluminum alloy 2024-T3 clad	0.02 mg/cm ² /24 hrs
Anodized aluminum alloy 2024-T3 unclad	+ 0.01 mg/cm ² /24 hrs
Anodized aluminum alloy 7075-T6 unclad	0.01 mg/cm ² /24 hrs
Low carbon steel AMS 5045	0.09 mg/cm ² /24 hrs
Cadmium plated steel AMS 5045 plated i.a.w. AMS-QQ-P-416 Type I Class 1	0.17 mg/cm ² /24 hrs

Result Conforms

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5.3.4 **Paint Softening Test:** Maintenance material compatibility shall be tested with Airbus approved paints and/or customer specific systems. Testing shall consist of three specimens for each of the following combinations. The substrate shall be clad aluminium alloy 2024 suitably pre-treated:

- Epoxy primer of polyurethane primer with or without polyurethane topcoat (interior paint scheme according to TN A.007.10050 OR epoxy primer to MIL-PRF-23377 Type I with or without polyurethane topcoat to MIL-PRF-85285 Type I or customer specific system).
- Basic primer plus relevant exterior paint scheme according to TN A.007.10050 OR epoxy primer to MIL-PRF-23377 Type I with polyurethane topcoat to MIL-PRF-85285 Type I OR external paint scheme conforming to AMS 3095 OR customer specific system.

The thickness and drying times of individual coats shall be in accordance with the manufacturer's instruction sheets. Testing shall be in accordance with ISO 1518 "Scratch Test" using the following test sequence: one hour immersion in the maintenance material at an ambient temperature (23 ± 2)°C, rinsing with water immediately after the immersion and drying for 1 hour at room temperature. The material shall not soften the paint coat and the Scratch Test shall have 90% of the original value after the immersion.

The agent being tested shall not produce any blistering, discoloration or staining.

Paint System		Weight required to produce scratch	
		Before exposure	After exposure
AS RECEIVED	Epoxy Primer without topcoat: Primer: MIL-PRF-23377 Type I, Epoxy, High Solids	Pass*	Pass*
	Epoxy primer with polyurethane topcoat: Primer : MIL-PRF-23377 Type I, Epoxy, High Solids Topcoat: MIL-PRF-85285 Type I, Polyurethane, High solids	Pass*	Pass*

* Using a 2,000 gram load (maximum load of the scratch apparatus)

*Conformance ("Pass") if no scratch occurs using a load equal to or greater than 1,800 grams (90% of 2,000 = 1,800), and there is no evidence of blistering, discoloration or staining.

Result _____ *Conforms _____

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5.3.6 Polycarbonate Crazing Test: Material conforming to ASTM-D-3935 or AMS-P-83310 shall be tested in accordance with the method for the determination of stress crazing detailed in ASTM F 484.

Specimens shall be stressed for (30 ± 2) minutes to an outer stress of 21MPa (3000 psi) at a temperature of $(23 \pm 2)^{\circ}\text{C}$.

As received: No evidence of craze, crack, stain or discolor.

Result Conforms

5.3.7 Elastometer Degradation Test: Three test specimens shall be used for each test in accordance with ISO 1817. Take test pieces from Silicon rubber VMQ 50 IRHD, Nitrile rubber NBR 60-70 IRHD, and Fluoro rubber FKM 70-80 IRHD. Immerse the specimens for (71 ± 1) hours at a temperature of $(70 \pm 1)^{\circ}\text{C}$. The changes in properties shall not exceed:

Concentrate:

	Hardness ± 7 IRHD	Tensile Strength - 25 %	Elongation - 25 %	Volume 0/+ 25 %
Silicon Rubber AMS 7273	+ 4	< - 5 %	< - 15 %	< 0.1 %
Nitrile rubber AMS 7271	+ 3	< 20 %	< - 15 %	< 10 %
Fluoro rubber AMS 7276	+ 2	< - 5 %	< - 15 %	< 5 %

Result Conforms

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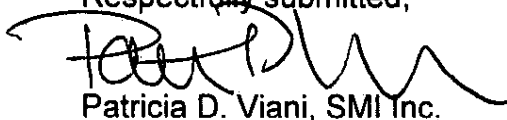
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Boeing D6-7127 Rev P incorporating PDD 6-8 (21 June 12)
CLEANING INTERIORS OF COMMERCIAL
TRANSPORT AIRCRAFT
Category: Disinfectants

11.3.1	Sandwich Corrosion	<u>Conforms</u>
11.3.2	Immersion Corrosion Test	<u>Conforms</u>
11.3.3	Rubber Test	<u>Conforms</u>
11.3.4	Sealant Test	<u>Conforms</u>
11.3.5	Painted Surface Test	<u>Conforms</u>
11.3.6	Tedlar Surface Test	<u>Conforms</u>
11.3.7	Vinyl Surface Test	<u>Conforms</u>
11.3.8	Fabric and Carpet Test	<u>Conforms</u>
11.3.9	Leather and Naugahyde Test	<u>Conforms</u>
11.3.10	Flash Point Test	<u>Informational</u>
11.3.11	Polycarbonate Crazing Test	<u>Conforms</u>

Respectfully submitted,



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11.3.1 Sandwich Corrosion Test: Corrosion in excess of that on the control panel constitutes failure when tested in accordance with Section 12.1.

	Clad 7075-T6 Aluminum (AMS 4049)	Bare 7075-T6 Aluminum (AMS 4045) anodized per Mil-A-8625 Type I
PRODUCT	1	1
Control	1	1

Result Conforms

11.3.2 Immersion Corrosion Test: The average weight change of each test specimen shall not exceed ± 10 mg in a 24 hour immersion period when tested in accordance with Section 12.2.

	PRODUCT (Loss per 1"x2" panel)	RESULT
Clad 2024-T3 Aluminum (QQ-A-250/5)	1.9 mg	PASS
Bare 2024-T3 Aluminum (QQ-A-250/4) alodined per MIL-C-5541	0.8 mg	PASS
Bare 2024-T3 Aluminum (QQ-A-250/4) anodized per MIL-A-8625 Ty I	0.4 mg	PASS
Bare 7178-T6 Aluminum (QQ-A-250/14) anodized per MIL-A-8625 Ty I	1.8 mg	PASS

Result Conforms

11.3.3 Rubber Test: Changes in properties shall not exceed the following, when tested in accordance with Section 12.3:

PROPERTY	MAX. CHANGE ALLOWED	PRODUCT
Tensile Strength	25 % loss	< 15%
Elongation	25 % loss	< 15%
Volume	$\pm 15\%$ change	< 1%

24 hour immersion at room temperature.

Result Conforms

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11.3.4 Sealant Test: The sealant shall not lift at the edges or lose adhesion when tested in accordance with Section 12.4.

Sealant: BMS 5-95

PRODUCT: Sealant did not lift at the edges or lose adhesion.

Result Conforms

11.3.5 Painted Surface Test: When tested in accordance with Section 12.5 and Section 7c., the following is required:

- a. Paint film hardness shall not decrease more than 2 pencil hardnesses.
- b. Greater than minimal color change or staining constitutes test failure.

Application method: paragraph 12.5.2(b)

**PRODUCT: Paint film hardness: 0 pencil hardness change
Color change: none**

Result Conforms

11.3.6 Tedlar Surface Test: When tested in accordance with Section 12.6 and Section 7c., the following is required:

- a. Scratching of exposed specimens constitutes test failure.
- b. Greater than minimal color change or staining constitutes test failure.

Application method: paragraph 12.6.2(b)

PRODUCT: No scratching, color change, or staining of specimens.

Result Conforms

11.3.7 Vinyl Surface Test: When tested in accordance with Section 12.7 and Section 7c., the following is required:

- a. Cracking, or brittleness of exposed specimens constitutes test failure.
- b. Greater than minimal color change or staining constitutes test failure.

Application method: paragraph 12.7.2(b)

PRODUCT: No scratching, color change, or staining of specimens.

Result Conforms

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11.3.8 Fabric and Carpet Test: When tested in accordance with Section 12.8 and Section 7c., the following is required:

Application method: paragraph 12.8.2(b)

Upholstery:

- a. Greater than minimal color change or staining constitutes test failure.
No color change or staining

Result Conforms

- b. Flammability: maximum values:

PROPERTY	MAXIMUM VALUE	PRODUCT
Extinguishing Time	15 seconds	8 seconds
Burn Length	8 inches	7 inches
Drip Extinguish Time	5 seconds	4 seconds

Result Conforms

Carpet:

- a. Greater than minimal color change or staining constitutes test failure.
No color change or staining

Result Conforms

- b. Flammability: maximum values:

PROPERTY	MAXIMUM VALUE	PRODUCT
Extinguishing Time	15 seconds	< 3 seconds
Burn Length	8 inches	4 inches
Drip Extinguish Time	5 seconds	< 3 seconds

Result Conforms

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11.3.9 Leather and Naugahyde Test: When tested in accordance with Section 12.9 and Section 7c., the following is required:

Application method: paragraph 12.9.2(b)

Leather:

- a. *Scratching or brittleness of exposed specimen constitutes test failure.
No scratching or brittleness of exposed specimen.*
- b. *Greater than minimal color change or staining constitutes test failure.
No color change or staining.*

Result Conforms

Naugahyde:

- a. *Scratching or brittleness of exposed specimen constitutes test failure.
No scratching or brittleness of exposed specimen.*
- b. *Greater than minimal color change or staining constitutes test failure.
No color change or staining.*

Result Conforms

11.3.10 Flash Point Test: All cleaning candidates having a flash point shall be approved by Fire Protection Engineering before they can be evaluated for use.

PRODUCT: No flash point observed to IBP 212⁰F.

Result Informational

11.3.11 Polycarbonate Crazing Test: Any cracking or crazing of the polycarbonate sheet constitutes failure, when tested in accordance with Section 12.11.
 (Strain = 0.008; 10 minute exposure)

LEXAN 9600: PRODUCT: No cracking or crazing

BMS8-400 BAC 70913: PRODUCT: No cracking or crazing

Result Conforms