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Date: 26-Mar-2012

SMI/REF: 1201-215

Product: **TOUGHGUARD "STEP 2 PAINT PROTECTION SYSTEM"**
(received 02-Feb-2012 / 23-Feb-2012)

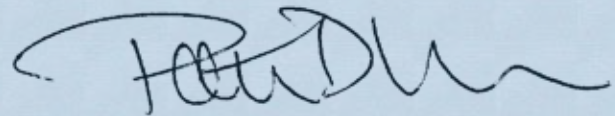
Dilution: As received

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BOEING D6-17487 REVISION R
*Exterior and General Cleaners and Liquid Waxes,
Polishes and Polishing Compounds*

Sandwich Corrosion Test	<u>Conforms</u>
Acrylic Crazeing Test	<u>Conforms</u>
Paint Softening Test	<u>Conforms</u>
Hydrogen Embrittlement Test	<u>Conforms</u>

Respectfully submitted,



Patricia D. Viani, SMI, Inc.

Client:	HR Toughguard, LLC	Date:	26-Mar-2012
Product:	TOUGHGUARD "STEP 2 PAINT PROTECTION SYSTEM"		
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Sandwich Corrosion Test : Specimen preparation, testing, and interpretation shall be in accordance with ASTM F1110 using the following materials and with the following exceptions:

1. Reagents and materials exception:
 - (1). Clad 7075-T6 aluminum alloy in accordance with QQ-A-250/13 (AMS 4049 or AMS-QQ-A-250/13 optional) (2024-T3 Alclad specimens are neither required nor optional.)
 - (2) Bare 7075-T6 aluminum alloy in accordance with QQ-A-250/12 (AMS 4045 or AMS-Q-A-250/12 optional) anodized in accordance with BAC 5019 or MIL-A-8625, Type I. Anodize shall be sealed. (2024-T3 nonclad specimens are neither required nor optional).
 - (3) Distilled or deionized water may be used in place of ASTM F1193, Type IV reagent grade water for control specimens.
 - (4) The filter paper may be Whatman No. 5 or equivalent in place of Whatman GFA glass fiber paper.
2. Procedure exceptions:
 - (1) The filter paper strips shall be 1 by 3 inches and shall be placed in the center of the sandwiched specimens.
 - (2) Each sandwich specimen shall be held together with waterproof tape, with no more than 1 piece of tape (maximum width 0.75 inch) on each of two opposite edges.
3. Interpretation of result exceptions:
 - (1) Leaching or lightening of the chromate sealed anodize coating shall not be cause for rejection.
 - (2) Deposits or residues from the material being tested that are not products of corrosion of the test panel surface shall not be cause for rejection.
 - (3) Special procedure for evaluation of fire extinguishing foams and liquids.
 - (4) Panels shall have a rating of 1 (no more than 5 percent of the surface area shall be corroded) or better in accordance with ASTM F 1110. The preferred method of determining the corroded area is by using image analysis. Other means approved by the purchaser may be substituted.
 - (5) Any corrosion in excess of that shown by the control group shall be cause for rejection.

	Bare 7075-T6 (AMS 4045) Anodized per BAC 5019 (Type 3 chromate seal)	Clad 7075-T6 Aluminum (AMS 4049)
PRODUCT	1	1
Control	1	1

Result Conforms

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Acrylic Crazing Test:

The material being tested shall not craze, crack, or etch acrylic test specimens when tested in accordance with ASTM F 484 using Type C (stretched acrylic plastic in accordance with MIL-P-25690) stressed to an outer fiber stress of 4500 psi.

Type C (MIL-P-25690): No crazing, cracking, or etching

Result Conforms

Paint Softening Test Procedure:

- a. Testing shall be in accordance with ASTM F502 using the following coating systems.
- (1) BMS 10-79, Type II primer applied in accordance with BAC 5882 plus BMS 10-60, Type II enamel in accordance with BAC 5845.
 - (2) BMS 10-79, Type III primer applied in accordance with BAC 5882, plus BMS 10-100 coating in accordance with BAC 5795.
- b. Three specimens conforming to Section 13a.(1) and three specimens conforming to Section 13a(2) shall be used for each test condition.
- c. The material being tested shall not produce a decrease in film hardness greater than two pencils, or any discoloration or staining.

NOTE: Slight darkening of the BMS 10-100 surface is acceptable.

As received:

**Paint system 1: 0 pencil hardness change after 24 hour post-exposure dry time.
No discoloration or staining.**

**Paint system 2: 0 pencil hardness change after 24 hour post-exposure dry time.
No discoloration or staining.**

Result Conforms

Hydrogen Embrittlement Test:

Hydrogen Embrittlement testing shall be in accordance with ASTM F 519-93, using cadmium plated Type 1a, 1c, or 2a specimens. All requirements of ASTM F519-93 for specimens, preparation, testing, and reporting shall apply. Type 1a specimens shall meet the requirements of D6-4307.

Specimens: Type 1c, cadmium plated per MIL-STD-870.

(45% load, 150 hours, notched immersed for the duration, room temp.)

**As received: #1: No failure occurred within 150 hours.
#2: No failure occurred within 150 hours.
#3: No failure occurred within 150 hours.
#4: No failure occurred within 150 hours.**

Result Conforms