

## TEST REPORT

Mechanical & Hardgoods Laboratory

Report No. : HL60131D/2016

Page : 1 of 4

Date : Feb. 23, 2017

### Element 119

Reynolds Bridge Rd, Thomaston, CT 06787 USA

The following merchandise was submitted and identified by the applicant as:

Product Description: System X Ceramic Coating

Style/Item No.: Diamond

Manufacturer/Vendor: Element 119

Country of Origin: US

We have tested the submitted sample(s) as requested and the following results were obtained:

Test Requested:

1. Hardness by pencil
2. Alkali resistance
3. Salt solution resistance

Test Method and Result: --- See following sheet(s) ---

Date of Receipt: Jun. 07, 2016

Testing Period: Jun. 07, 2016 ~ Jun. 22, 2016

Signed for and on behalf of  
SGS Taiwan Ltd.

*Jackson Chen*

Jackson Chen  
Team Leader



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### 1. Hardness by pencil

#### Test Method:

Refer to JIS K5400(1990) Testing Methods for paints

(Gouge Hardness and Scratch Hardness)

Weight: 1000 g

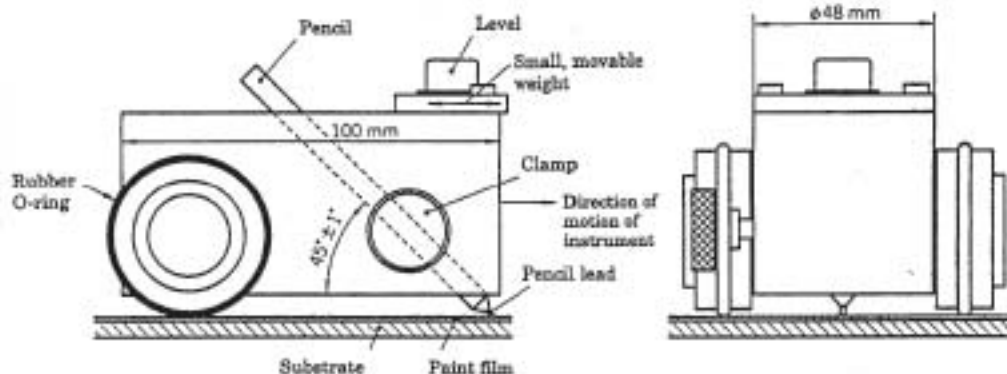
The variety of pencil hardness :

6B - 5B - 4B - 3B - 2B - B - HB - F - H - 2H - 3H - 4H - 5H - 6H - 7H - 8H - 9H

Soft ←-----> Hard

#### Test Equipment :

Name	Brand	Model
Pencil	MITSU-BISHI	uni



#### Lab Environmental Conditions:

Ambient temperature :  $(23 \pm 2) ^\circ\text{C}$

Relative humidity :  $(65 \pm 5) \%RH$

#### Test Results:

Sample	Result
System X Pro	9H, No scratch.



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### 2. Alkali Resistance

#### Lab Environmental Conditions :

Ambient temperature : (23±2) °C  
Relative humidity : (65±5) %RH

#### Test Method :

JIS K5400(1990) Testing Methods for Paints

#### Test Condition :

Test Procedure : Immersion  
Test reagent : 5% Na<sub>2</sub>CO<sub>3</sub>  
Test Temperature : 23 °C  
Test time : 24 hours

#### Test Result :

Sample	Test Result(s)
System X Pro	There is no abnormality even immersed in alkali.

### 3. Salt Solution Resistance

#### Lab Environmental Conditions :

Ambient temperature : (23±2)°C  
Relative humidity : (50±5)%RH

#### Test Method :

JIS K5400 (1990) Testing Methods for Paints

#### Test Condition :

Test Procedure : Immersion  
Test reagent : 3% NaCl  
Test Temperature : 23°C  
Test time : 96 hours

#### Test Result :

Sample	Test Result(s)
System X Pro	There is no abnormality, even immersed in sodium chloride solution.


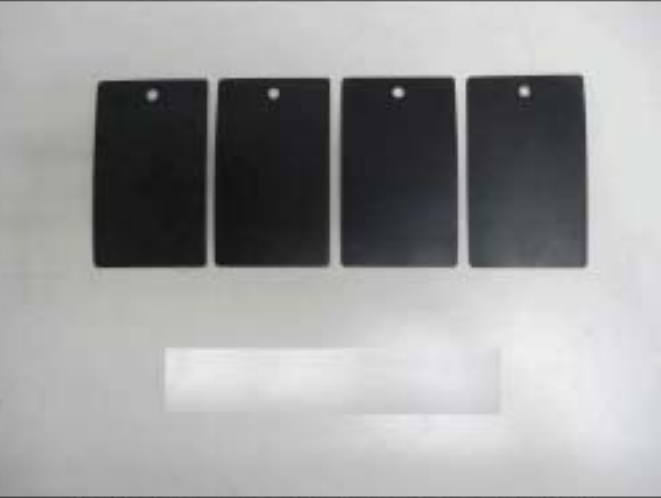
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– Pictures –

	
<p>Photo A : Appearance of the sample (Hardness by pencil)</p>	<p>Photo B : Appearance of the sample(s) (Alkali, Acid, Salt solution resistance)</p>

---End of Report---

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# SMI, Inc.

12219 SW 131 Avenue  
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047  
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Attn: Andrew Zeppa  
Element 119  
133 Clearview  
Harwington, CT 06791

Date: 31-Jul-2015

SMI/REF: 1506-917<sub>R4</sub>  
Report revised for product name change

Product: **SYSTEM X DIAMOND** (received 10-Jun-2015)

Dilution: As received

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

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

Respectfully submitted,



Patricia D. Viani, SMI, Inc.

Client: Element 119  
Product: **SYSTEM X DIAMOND**  
Dilution: As received

Date: 31-Jul-2015  
SMI/REF: 1506-917<sub>R4</sub>  
Report revised for product name change

BOEING D6-17487 REVISION T (Exterior & General)

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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:

a. 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.
- (3) Anodize shall be sealed. (2024-T3 nonclad specimens are neither required nor optional).
- (4) Distilled or deionized water may be used in place of ASTM F1193, Type IV reagent grade water for control specimens.
- (5) The filter paper may be Whatman No. 5 or equivalent in place of Whatman GFA glass fiber paper.

b. 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.

c. 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.

Panels with very light darkening or staining, which have no obvious metal attack or pitting, may be swabbed (cotton-tipped swabs or cotton gauze) with a 0.26 mole/liter sulfuric acid solution and re-examined. If the coloration is substantially removed and there is no evidence of metal attack or pitting, the condition shall not be cause for rejection. (The 0.26 mole/liter sulfuric acid solution can be prepared by adding 1.5 cc of concentrated sulfuric acid (SG = 1.84) to 100 cc of distilled or deionized water.

- (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.



Client: Element 119  
 Product: **SYSTEM X DIAMOND**  
 Dilution: As received  
**BOEING D6-17487 REVISION T (Exterior & General)**

Date: 31-Jul-2015  
 SMI/REF: 1506-917<sub>R4</sub>  
 Report revised for product name change

Sandwich Corrosion Test :continued

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

Result Conforms

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 BAC5882 plus BMS 10-60, Type II enamel in accordance with BAC5845.
  - (2) BMS 10-79, Type III primer applied in accordance with BAC5882, plus BMS 10-100 coating in accordance with BAC5797.
- b. Three specimens conforming to Section 12a.(1) and three specimens conforming to Section 12a(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: 1 pencil hardness change after 24 hour post-exposure dry time.  
Slight staining.**

Result Conforms

Client: Element 119  
Product: **SYSTEM X DIAMOND**  
Dilution: As received

Date: 31-Jul-2015  
SMI/REF: 1506-917<sub>R4</sub>  
Report revised for product name change

BOEING D6-17487 REVISION T (Exterior & General)

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Hydrogen Embrittlement Test:

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