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Title: Product Specification – 00052 Finish Testing Requirements	Revision: F	Page: 1 of 7

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1.0 General

1.1 Purpose

1.1.1. The purpose of this document is to specify Finish Testing Requirements. Defined herein are the environmental exposure test types and associated performance requirements for each product family & finish combination.

1.2 Abbreviations/Definitions

1.1.2. Abbreviations

ASTM - American Society for Testing and Materials
BHMA - Building Hardware Manufacturers Association
CIE - International Commission on Illumination

2.0 Test Definition


2.1 Test #1: Neutral Salt Spray (1)

- 2.1.1. Target: XX hrs. as defined per specific products
- 2.1.2. Test to be conducted in accordance with ASTM B 117-03 – Standard Method of Salt Spray (Fog) Testing
- 2.1.3. Parts shall withstand exposure time without substrate corrosion exceeding one spot visible to the unaided eye per one square inch and without any spot larger than 1/16 inch in diameter.
- 2.1.4. Staining shall not exceed 5% of the significant surface area and no stain larger than a ¼ inch diameter is allowed.
NOT a CASS Test

2.2 Test #2: UV Exposure

- 2.2.1 Tested in accordance with ASTM G154-05, Standard practice for operating fluorescent light apparatus for UV exposure of non-metallic material except as follows:


2.2.1.1 UVA 340 Lamps (typical irradiance .77 W/m²/nm)

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- 2.2.1.2 Test to exterior grade
- 2.2.1.3 Three test specimens in chamber, one retained outside chamber for comparative control
- 2.2.1.4 Test cycle of 8 hours UV and 4 hours of humidity at 50 degrees C. Start test at beginning of UV cycle and end at conclusion of humidity cycle.
- 2.2.1.5 144 Hours total in chamber.
- 2.2.1.6 Specimens should be mounted as specified in ASTM G 154
- 2.2.1.7 Any cut edges are permitted to be sealed with silicone sealant or vinyl electrical tape.
- 2.2.1.8 Comparative finishes (cycled vs. uncycled) should appear the same when viewed two feet apart and three feet away on the same relative plane (neutral background middle gray to white under CIE illumination D65 daylight bulb in accordance with ASTM D 1729-89)
- 2.2.1.9 Visual failure modes shall be any chipping, flaking, cracking, color loss, or change (from clear to white, yellow or brownish)
- 2.2.1.10 Should pass F Pencil Hardness at the end of test using same method as in Test #5 (Section 2.5)

2.3 Test #3: Humidity

- 2.3.1 Includes 2H pencil hardness and adhesion after humidity
- 2.3.2 240 hours (or as called out) in humidity chamber with conditions described in ASTM D1735-04 followed by a Pencil Hardness Test (must pass 2H (test with #5 below) and adhesion test (must meet adhesion class4/B)
- 2.3.3 Conducted in a chamber having 95% +/- 5% relative humidity @ 100 degrees F +/- 5 degrees.

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- 2.3.4 Parts allowed to stabilize at room temperature for 30 minutes before examining for visible degradation
- 2.3.5 Blistering/Staining shall not be visible to the unaided eye.
- 2.3.6 Within an additional 15 minutes of removal from the chamber, coating shall pass Pencil Harness Test (2H min.) and shall pass the method B Cross-Cut Tape Test (ASTM D 3359-02)

2.4 Test #4: Perspiration

- 2.4.1 Reagent by weight of 5% sodium chloride, 5% acetic acid, 3% butyric acid, 3% valeric acid and 85% distilled water less than one year old and stored at 40 degrees F +/- 5 degrees.
- 2.4.2 Epoxy dam to contain solution over an area ½ and 1 sq. inch with a minimum solution depth of 1/16th inch.
- 2.4.3 Apply reagent, let stand for 15 minutes and wash off with cold water.
- 2.4.4 Shall pass Pencil Hardness Test (2B hardness); this is one cycle. Pencil Harness Test starts in area that was exposed to reagent. Pencil also weighted same as in Test #3 (Section 2.3)

2.5 Test #5: Pencil Hardness

- 2.5.1 Can substitute 500 cycles for Taber abrasion (Note: 156.2 – locks, require 4H pencil on organic coatings)
- 2.5.2 Berol Turquoise pencil lead. Pencil lead hardness defined as required by test for which hardness being checked (typically 3H for organic, 2H after humidity, 2B during perspiration, F after UV).
- 2.5.3 1/8 to ¼ of lead exposed beyond holder
- 2.5.4 Use a 3lb, 10oz. +/- 1oz. weight bearing on pencil

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2.5.5 Failure presented if coating is removed to substrate or near enough to activate Holiday detector alarm (a 27V continuity circuit that alarms if the lead gets close enough to substrate to allow current to flow).

3.0 Performance / Qualification Criteria


Product	Finish Type / Test	Neutral Salt Spray (1)	UV (2)	Humidity (3)	Perspiration (4)	Pencil Hardness (5)
Panic Device Lock fronts, strikes, and coordinators aesthetic components	Organic (Note: Inorganic requires 200)	72 Hours*	Currently Not Tested	Currently Not Tested	Currently Not Tested	Currently Not Tested
Panic Device Aesthetic Components	Organic	200 Hours*	400 Hours*	240 Hours	4 Cycles	3H
Panic Device Aesthetic Components	Inorganic	200 Hours	N/A	N/A	N/A	N/A
Panic Device Anodized Aesthetic	Anodized	200 Hours	400 Hours*	N/A	N/A	N/A
Panic & Trim Internal Components (Note: Not required by BHMA but an internal specification)	Zinc Plated (-79: clear color) also called 479 finish	72 Hours**	N/A	N/A	N/A	N/A
	Zinc Plated (-89: yellow color) also called 604 finish	120 Hours**	N/A	N/A	N/A	N/A
	Zinc Plated (-480: black color) also called 480 finish	120 Hours**	N/A	N/A	N/A	N/A
	Zinc Plated (-80: green color) also called 481 finish	120 Hours**	N/A	N/A	N/A	N/A
Panic Trim/Controls Aesthetic Components	Organic	200 Hours*	400 Hours*	240 Hours	4 Cycles	3H
Panic Trim/Controls Aesthetic Components	Inorganic	200 Hours	N/A	N/A	N/A	N/A
Hospital Latches (HL6) Aesthetic Components	Organic	200 Hours*	144 Hours	240 Hours	4 Cycles	3H

Product	Finish Type / Test	Neutral Salt Spray (1)	UV (2)	Humidity (3)	Perspiration (4)	Pencil Hardness (5)
Hospital Latches (HL6) Aesthetic Components	Inorganic	200 Hours	N/A	N/A	N/A	N/A
Panic Mullions	Organic	96 Hours	144 Hours	240 Hours	4 Cycles	N/A
Panic Mullions	Anodized	200 Hours	144 Hours	N/A	N/A	N/A
Overheads & Stops (arms, end caps, mounting brackets and exposed channels)	All Finishes except – 79 and Clear Organic Coated	48 Hours	N/A	N/A	N/A	N/A
Overheads & Stops (arms, end caps, mounting brackets and exposed channels)	Clear Coated Organic	48 Hours	N/A	48 Hours	N/A	N/A
Electrical Power Transfer (EPT) (Painted Components Only)	Painted	48 Hours*	N/A	*48 Hours (Must then meet class 4, method B adhesion)	N/A	N/A
Power Operators (arms, end caps, mounting brackets and exposed channels)	Anodized	48 Hours*	N/A	48 Hours	N/A	N/A
Power Operators (arms, end caps, mounting brackets and exposed channels)	Organic	48 Hours*	N/A	*48 Hours (Must then meet 2H Pencil & class 4, method B adhesion)	N/A	N/A

* Denotes item where internal requirement exceeds BHMA min.

** Zinc plating to meet the requirements of ASTM B633 Fe/Zn 5 – SC1 Type V (clear) or Type VI (colored). Aesthetic color samples to be approved by engineering per visual standards. This is a non-hex chrome specification callout. Per ASTM spec, hours are to white rust. No sealers allowed that adversely inhibit paint adhesion.

Note: Legacy drawings that call out hexavalent (zinc dichromate or clear hex) are allowed to conform to either spec until drawing updates are completed

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4.0 Approvals and revision record

REVISION CONTROL RECORD

REV LTR	REV DATE	DESCRIPTION OF CHANGE	REV AUTHOR
F	11-18-14	Remastered and Revised for Windchill Publication (Revisions (1-5) prior to F are stored in Compliant Pro)	W. Blanchard

APPROVALS:	
Product Manager: _____	Product Category Leader: _____
Lead Engineer: Loren Mueller	Mechanical COE Manager: Jim Sweney
Quality Manager: Patrick Garrison	Engineering Manager: Ryan Williams