Proposed revision of A156.18-2012

AMERICAN NATIONAL STANDARD

FOR

MATERIALS AND FINISHES

SPONSOR

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.

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Revision B August 6, 2018
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AMERICAN NATIONAL STANDARD

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FOREWORD (Not a part of ANSI/BHMA A156.18)

The general classification of builders hardware includes a wide variety of items which are divided into several categories. To recognize this diversity, a sectional classification system has been established. Each Standard is the result of the collective efforts of members of the Builders Hardware Manufacturers Association, Inc. who manufacture the products included in each Section. The total product standards effort is, therefore, a collection of Section Standards, each covering a specific category of items.

In BHMA Standards, performance tests and, where it has been necessary, material and dimensional requirements have been established to ensure safety, security, and stability to which the public is entitled. There are no restrictions on design except for those dimensional requirements imposed for the reasons given above. It is also required that some hardware items fit certain specified cutout dimensions.

This Standard on materials and finishes contains a description of types of finishes and divides them into categories. A numbering system has been established which identifies base material and finish.

Performance test methods for finishes are included. Requirements and exemptions concerning appearance are contained in this Standard.

The BHMA recognizes that new finishes, methods and materials will be developed. With this in mind, the Association plans to update, correct and revise this Standard on a regular basis.

Only finishes produced by three or more manufacturers are listed and are numbered starting with 600. Numbers 001 through 599 are reserved for individual manufacturers to use, as they desire for their own unique finishes.

The finish test methods, code numbers and finish descriptions contained in this Standard are intended to apply to the builders hardware industry. However, the Standard is suitable for use in other industries.

TABLE OF CONTENTS

1. SCOPE

1.1 This Standard establishes test and performance requirements for organic and inorganic finishes applied to architectural hardware. Tests called out in the standard include salt spray, UV, perspiration, hardness, and humidity. Performance requirements are listed in Section 6 based on the different ANSI/BHMA A156 standards. This standard also includes criteria for viewing comparative finishes to the BHMA match plates, code numbers for finishes on various base materials, and establishes five categories of finishes.

1.2 Tests described in this Standard are performed under laboratory conditions. In actual usage, results vary because of installation, maintenance and environmental conditions.

1.3 **Performance Requirements** Are established based on the different ANSI/BHMA A156 requirements as listed in Section 6. Finish requirements can be different depending on the product type and standard. Finishes can be tested and listed to multiple standard finish requirements.

1.4 Related products are covered in additional BHMA Publications:
A156.1-2016 for Butts and Hinges
A156.2-2017 for Bored and Preassembled Locks and Latches
A156.3-2014 for Exit Devices
A156.4-2013 for Door Controls – Closers
A156.6-2015 for Architectural Door Trim
A156.8-2015 for Door Controls – Overhead Stops and Holders
A156.9-2015 for Cabinet Hardware
A156.11-2010 for Cabinet Locks
A156.12-2018 for Interconnected Locks and Latches
A156.13-2017 for Mortise Locks and Latches
A156.14-2013 for Sliding and Folding Door Hardware
A156.15-2015 for EM Release Device Closer Holder
A156.16-2013 for Auxiliary Hardware
A156.17-2014 for Self Closing Hinges and Pivots
A156.20-2012 for Straps and Tee Hinges
A156.23-2017 for Electromagnetic Locks
A156.26-2017 for Continuous Hinges
A156.29-2012 for Exit Locks and Alarms for Exit Devices
A156.31-2013 for Electric Strike and Frame Mounted Actuators
A156.36-2016 for Auxiliary Locks
A156.37-2014 for Multipoint Locks
A156.39-2015 Residential Locksets and Latches
A156.40-2015 Residential Deadbolts

2. DEFINITIONS

2.1 **Blackened** A surface treated to be light absorbing, and darkened.

2.2 **Bright** A reflective mirror like surface.

2.3 **Coating** ~~Coating is~~ The application, of organic or inorganic materials to, or the conversion of the surface of the base material or substrate, for the changing of appearance, or for protection or both. The topcoat when applied establishes the type of coating for test purposes. When the top coat is transparent, it is often referred to as a clear coat.

2.3.1 **Organic Coating** Coatings with a material containing carbon compounds, excepting cyanides and carbonates, and including mixtures of organic and inorganic materials.

2.3.2 **Inorganic Coating** Coating with metallic or other non-carbonaceous materials or conversion of the surface to an oxide.

2.3.2.1 **Plating** Coating with a metallic deposit by chemical, electro-chemical, mechanical or electro-mechanical means.

2.3.2.2 **Oxidizing** Coating by conversion of the surface of the base material to an oxide by addition of oxygen or removal of hydrogen.

2.3.2.2.1 **Anodizing (aluminum)** Coating by electro-chemical process which converts the surface (aluminum) metal to (aluminum) oxide due to reactions at the anode in an acidic solution.

2.3.3 **Vacuum Applied Coating** Electrochemical or electrophysical (PVD or physical vapor deposition) deposition, operated in a vacuum to deposit an adherent, dense, thin film coating.

2.4 **Corrosion** The result of breakdown or eating away of the base material or substrate, not to be confused with staining. Corrosion of brass or bronze material can be green, brown or pink; corrosion of steel or stainless steel material is red rust, corrosion of aluminum or zinc base material is white.

2.6 **Finish Matching** Equivalent in color, texture, and appearance.

2.7 **Relieved** To set off by contrast through the partial removal of finish, creating a brushed, satin, or antique effect.

2.8 **Satin** A smooth dull finish with or without a directional pattern.

2.9 **Significant Surfaces** Surfaces of a product that are visible or exposed after the product are installed.

2.10 **Stain** Any obvious color change other than corrosion, which cannot be removed by rinsing with water.

2.11 **Substrate** The surface to which a coating is applied; may be a coating or the base material.

2.12 **Unstable Finish** A finish that intentionally lacks sufficient protection to ensure consistent color, texture, and appearance for the intended period of use.

3. FINISH TEST METHODS AND CRITERIA

3.1 These test methods do not predict the performance life of the finishes in actual use but are used as a quality control method to ensure consistent finish quality. Consult Section 6 of this standard for the applicable ~~BHMA Product Standards for~~ minimum exposure times and other values.

3.1.1 **Exempt Surfaces** Surfaces on which a controlled deposit ordinarily cannot be obtained, such as holes, edges, recesses, bases of angles, and similar areas, are exempt from the requirements for significant surfaces.

3.1.2 **Exempt Finishes** Category B and equivalent finishes 607 (634, 683), 613 (640, 703, 704), 717, 718, 719, 720, 721, 722, ~~727~~, 728 are not subject to testing but may be listed in the certified products directory to represent the manufacturer's product line.

3.1.3 **Test Specimens** Actual product components shall be used except where otherwise specified. Components without surfaces which are compatible with the prescribed test methods, shall use a finished flat test panel using substrate of the same base material of the actual product or component. The flat panels shall have a minimum exposed area of 2.50 x 3.75 in (64 x 95 mm) and shall be 0.020 to .25 in (0.5 to 6.4 mm) thick. A painted or powder coated finish in several different colors, where each color is composed of all the same materials except for variations in tints, is considered to be one finish type for test purposes.

3.2 **Salt Spray Test** This test shall be conducted in accordance with ASTM B 117-16 Standard Method of Salt Spray (Fog) Testing. Parts shall withstand exposure for the time specified in Section 6 ~~in the applicable ANSI/BHMA A156 Series Standard~~ without base material or substrate corrosion or blistering exceeding one spot visible to the unaided eye per one square inch (25.4 square mm) of significant surface and without any spot larger than 1/16 in (1.6 mm) in diameter. The spread of corrosion on significant surfaces that originate from holes, edges, recesses, and bases of angles, shall not exceed 1/16 in. (1.6mm). Staining shall not exceed 5% of the significant surface area of the component under test and without any spot larger than 1/4 in. (6.4 mm) in diameter.

3.3 **Humidity Test** This test shall be conducted in a chamber with conditions as described in ASTM D1735-14, except with ~~that this test shall be conducted in a chamber having~~ a 95% ± 5% relative humidity. The parts shall be allowed to stabilize at room temperature for 30 minutes before they are examined. Blistering or staining of the part shall not be visible to the unaided eye. Within an additional 15 minutes, the organic coating shall pass a pencil hardness test (see 3.4) as specified in Section 6 ~~the applicable ANSI/BHMA A156 Series Standard~~ and shall pass ASTM D 3359-17 Method for Measuring Adhesion by Tape Test using Method B Cross-Cut Tape Test with Intertape 51596 or Elcometer 99.

3.4 **Pencil Hardness Test**

3.4.1. Using a Hardness Test Fixture similar to the one shown in Figure 1, test the organic coating hardness with the applicable Berol Turquoise pencil lead of the hardness specified in Section 6. The pencil lead shall be exposed beyond the tip of the holder 1/8 to 1/4 in (3.2 to 6.4 mm). In accordance with 3.4.2, abrade the end of the lead flat and perpendicular to its axis with the means provided in the Hardness Test Fixture. Place a 3 lb. 10 oz ± 1 oz (1644 g ± 28.3 g) load on the pencil lead during test. The test part shall be grounded to the movable portion of the test fixture table. Push the organic coated surface of the test part across the lead for ¼ to ½ in. (6.4 to 12.7 mm). Failure occurs if the coating is removed to the substrate, or near enough to the substrate, to activate the holiday detector alarm on the fixture.

3.4.2 Abrade the lead with #400 grit sandpaper and finish with light pressure to minimize grooves in the abraded surface. The circular edge shall be sharp, not serrate, when inspected with 5X magnification after each abrading. Repeat the abrading as required until the inspected edge is sharp. By rotating the lead holder after each test either 180 or 120 degrees ± 1 degree, three tests maximum shall be performed per abrading.

3.4.3 In lieu of the BHMA Hardness Test Fixture a similar fixture is permitted to be used. The following details are required.

a) lead holder firmly held at 45 degrees ± 1 degree to test surface
b) Weight and lead holder "float" vertically on a miniature slide
c) Table moves on linear ball bearings
d) Lead abrading means is provided for 90^0 dressing
e) The BHMA Holiday Detector alarm circuit of Figure 2

3.5 **Perspiration Test** This test shall be conducted using a reagent made up by weight of 5% sodium chloride, 5% acetic acid, 3% butyric acid, 3% valeric acid and 84% distilled water. The reagent must be less than one year old and stored at 40 degree F ± 5 degrees F (4 degrees C ± 3 degrees C). A dam of epoxy or similar adhered material, shall be used to contain the solution over an area between ½ and 1 square in. (323 and 645 square mm) with a minimum solution depth of 1/16 in. (1.6 mm). Apply the reagent; let stand for 15 minutes and wash off with cold water. The coating shall then pass a pencil hardness test in accordance with 3.4 using a pencil lead of 2B hardness. This constitutes one cycle. Repeat within the test area (avoiding the same line), the number of cycles specified in Section 6. ~~the applicable ANSI/BHMA A156 Series Standard.~~

3.6 **Ultraviolet Light and Condensation Test** This test shall be conducted in accordance with ASTM G154-16 Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials except as follows. For all products, use UVA-340 lamps with a typical irradiance: 0.77 $W/m^2/nm$. The test cycles and duration are ~~shall be~~ specified in Section 6. ~~the applicable ANSI/BHMA A156 Series Standards.~~ Three test specimens shall be tested for each finish and one additional specimen shall be retained for comparison at the end of the test. For organic coatings used on multiple base materials, testing of only one material is required. The retained specimen shall be stored in a controlled environment and protected from UV exposure. Start the test at the beginning of a UV cycle and end it at the conclusion of a condensation cycle. Test specimens shall be the actual product or component. Refer to 3.1.2 when finished product or component cannot be adopted to the UV test equipment. The test specimen shall be mounted as specified in ASTM G 154. Any of the cut edges of the panels are permitted to be sealed with silicone sealant or vinyl electrical tape. At the conclusion of the test, the retained panel and the tested panels shall be viewed in accordance with 4.3.3 and shall appear the same. Visual failure modes shall be any chipping, flaking, cracking, color loss, or change (from clear to white, yellow or brownish). At the completion of the Ultra Violet Light and Condensation Test, the panel shall pass F pencil hardness when tested in accordance with 3.4.

3.7 **Taber Abrasion Test** This Test shall be conducted in accordance with ASTM D4060-14 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser. A uniform thickness of the coating to be tested shall be applied to a .060 in. (1.5 mm) minimum thick coupon using the manufacturer's normal coating materials and processes. The coating thickness of specimen shall reflect the average coating thickness of the manufacturer's products. The wheel shall be a CS-10 calabrase with a 1000 gram load. Reface the wheel every 500 cycles. Failure constitutes wearing through the coating to the coupon prior to completing the number of cycles specified in Section 6. ~~the applicable ANSI/BHMA A156 Series Standard.~~ Detection shall be by a BHMA Holiday Detector (see Figure 2) or by visual inspection when the conductivity test is not applicable with non-conducting substrates nor with conductive coatings.

4. MATERIALS, CATEGORIES, AND FINISHES

4.1 **Materials** Except for the generic classifications of materials shown, there shall be no restrictions other than those specified in the applicable ANSI/BHMA A156 Series Standard and so long as good commercial practices are observed. The following identification numerals are used and often appear as the first numeral in the product type numbers used in individual ANSI/BHMA A156 Series Standards and identify the predominant material from which the product is made:

0	Optional material	5	Stainless steel
1	Cast, forged or extruded brass or bronze	6	Malleable iron
2	Sheet, coil or strip brass or bronze	7	Cast iron
3	Cast, forged or extruded aluminum	8	Steel
4	Sheet, coil or strip aluminum	9	Zinc alloy

Note: All reference in this document to "bronze" shall exclude the nickel silver alloy known as "white bronze".

4.2 **Categories** BHMA code numbers for finishes fall into one of five categories defined as follows:

A. Category A finishes are those that shall match BHMA match plates and are applied to the base material or are the base material defined by the description in 5.2 when viewed according to the formula in 4.3.3. Nominal reference values for color measuring equipment using the L*a*b* scale are listed in the appendix.

B. Category B finishes are those that are unstable and are applied to the base material or are the base material defined by the description in 5.2. These finishes shall be compatible with the BHMA match plates, but these finishes cannot and do not match from one alloy or form of material to the next and from one manufacturer to the next. See A4.3.

C. Category C includes ornamental finishes that are applied to the base material defined by the description of 5.2. The material is blackened or oxidized then relieved or highlighted.

D. Category D finishes are functional protective finishes and appearance is not a factor.

E. Category E finishes shall be equivalent in appearance when compared with the corresponding Category A, B or C finishes. They shall be viewed using the method specified in 4.3.3.

4.2.1 BHMA provides certain Category A and Category B match plates including 605, 606, 607, 611, 612 (694), 613 (695), 618, 619, 622 (693), 625, 626, 627 (628), 629, and 630. Contact individual manufacturers for other finish samples. Category B finish match plates shall be kept fresh and shall be considered so if not held over six months and are kept in the original container and the viewing surface not touched.

4.3 **Finishes**

4.3.1 There are separate numbers for finishes as they are applied to each separate base material except when brass or bronze is permitted to be used interchangeably without affecting the final finish, and with some painted finishes which apply to several base materials. When a manufacturer designates a finish code i.e. 605 it does not necessarily denote that all significant surface trim is made from that base material. The customer is encouraged to consult with the manufacturer to determine specific materials used in each component.

4.3.2 All BHMA product types as described in the ANSI/BHMA A156 Series Standards are not available in all finishes. Consult individual manufacturers' catalogs.

4.3.3 **Test Methods for Finish Matching**

4.3.3.1 Comparative finishes shall appear the same when viewed two feet apart and three feet away, on the same relative plane.

4.3.3.2 Viewing Conditions. Place the specimen on a neutral background (middle gray to white) and illuminate it with natural or artificial daylight in 4.3.3.3.

4.3.3.3 Light Source. The artificial daylight source shall approximate the color and spectral quality of average daylight as represented by CIE illuminant D65 (as shown in appendix A) in accordance with ASTM D 1729-96 (2009).

5. FINISH NOMENCLATURE AND CODE NUMBERS

5.1 **Finish Nomenclature** Finishes shall be specified using the categories listed in 4.2. A finish designation with a letter suffix E indicates the finish code that the BHMA match plate is derived from. Example: 605 means that all the significant surfaces are produced from the same base material (brass) that the match plate is derived from. However 605E means that the finish is to be compared to the 605 match plate for appearance only regardless of the base material or finish process used.

5.2 **Tables of Finish Descriptions and Equivalents**

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
	Primed for Painting			
600	Primed for painting	Steel	D	USP
674	Primed for painting	Zinc	D	USP
715	Primed for painting	Aluminum	D	USP
	Bright Japanned			
601	Bright Japanned	Steel	D	US1B
	Zinc Plated			
603	Zinc plated	Steel	D	US2G
604	Zinc plated and dichromate sealed	Steel	D	
663	Zinc plated with clear chromate seal	Steel	D	
	Bright Brass			
605	Bright Brass, clear coated	Brass	A	US3
632	Bright brass plated, clear coated	Steel	E	US3
666	Bright brass plated, clear coated	Aluminum	E	US3
677	Bright brass plated, clear coated	Zinc	E	US3
697	Bright brass plated, clear coated	Plastic	E	US3
707	Bright brass anodized	Aluminum	E	US3
716	Bright gold anodized	Aluminum	E	US3
721	Bright brass uncoated	Architectural Bronze	B	US3
723	Bright brass appearance vacuum applied	Brass/Bronze	E	US3
724	Bright brass appearance vacuum applied	300 Series Stainless Steel	E	US3
729	Bright brass appearance vacuum applied	Zinc	E	US3
	Satin Brass			
606	Satin brass, clear coated	Brass	A	US4
633	Satin brass plated, clear coated	Steel	E	US4
667	Satin brass plated, clear coated	Aluminum	E	US4
678	Satin brass plated, clear coated	Zinc	E	US4
696	Satin brass painted	Any	E	US4
688	Satin aluminum, gold anodized	Aluminum	E	US4
698	Satin brass plated, clear coated	Plastic	E	US4
720	Mill finish brass uncoated	Architectural Bronze	B	US4
728	Satin brass uncoated	Architectural Bronze	B	US4
730	Satin brass appearance vacuum applied	Brass/Bronze	E	US4

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
731	Satin brass appearance vacuum applied	300 Series SS	E	US4
732	Satin brass appearance vacuum applied	Zinc	E	US4
	Oxidized Satin Brass			
607	Oxidized satin brass, oiled rubbed	Brass	B	
634	Oxidized satin brass plated, oil rubbed	Steel	E	
683	Oxidized satin brass plated, oil rubbed	Zinc	E	
733	Oxidized Satin brass appearance vacuum applied	Brass/Bronze	E	US4
734	Oxidized Satin brass appearance vacuum applied	300 Series SS	E	US4
735	Oxidized Satin brass appearance vacuum applied	Zinc	E	US4
	Oxidized Satin Brass, Relieved			
608	Oxidized satin brass, relieved, clear coated	Brass	C	
635	Oxidized satin brass plated, relieved, clear coated	Steel	E	
651	Oxidized satin brass plated, relieved, clear coated -	Zinc	E	
	Satin Brass, Blackened, Satin Relieved			
609	Satin brass, blackened, satin relieved, clear coated	Brass	C	US5
638	Satin brass plated, blackened, satin relieved, clear coated	Steel	E	US5
752	Satin brass plated, blackened, satin relieved, clear coated	Zinc	E	
	Satin Brass, Blackened, Bright Relieved			
610	Satin brass, blackened, bright relieved, clear coated	Brass	C	US7
636	Satin brass plated, blackened bright relieved, clear coated	Steel	E	US7
	Bright Bronze			
611	Bright bronze, clear coated	Bronze	A	US9
637	Bright bronze plated, clear coated	Steel	E	US9
679	Bright bronze plated, clear coated	Zinc	E	US9
705	Bright bronze plated, clear coated	Aluminum	E	US9
708	Bright bronze anodized	Aluminum	E	US9
726	Bright bronze plated, clear coated	Brass	E	US9
736	Bright bronze appearance vacuum applied	Brass/Bronze	E	US9
737	Bright bronze appearance vacuum applied	300 Series SS	E	US9
738	Bright bronze appearance vacuum applied	Zinc	E	US9
	Satin Bronze			
612	Satin bronze, clear coated	Bronze	A	US10
639	Satin bronze plated, clear coated	Steel	E	US10
668	Satin bronze plated, clear coated	Aluminum	E	US10

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
680	Satin bronze plated, clear coated	Zinc	E	US10
694	Medium bronze painted	Any	A	
699	Satin bronze plated, clear coated	Plastic	E	US10
709	Satin bronze anodized	Aluminum	E	US10
725	Satin bronze plated, clear coated	Brass	E	US10
739	Satin bronze appearance vacuum applied	Brass/Bronze	E	US10
740	Satin bronze appearance vacuum applied	300 Series Stainless Steel	E	US10
741	Satin bronze appearance vacuum applied	Zinc	E	US10
	Dark Oxidized Satin Bronze			
613	Dark oxidized satin bronze, oil rubbed	Bronze	B	US10B
640	Oxidized satin bronze plated over copper plate, oil rubbed	Steel	E	US10B
695	Dark bronze painted	Any	A	
703	Oxidized satin bronze plated, oil rubbed	Aluminum	E	US10B
704	Oxidized satin bronze plated, oil rubbed	Zinc	E	US10B
710	Dark oxidized satin bronze anodized	Aluminum	E	US10B
727	Dark oxidized Satin bronze plated	Brass	E	US10B
742	Dark oxidized Satin bronze appearance vacuum applied	Brass/Bronze	E	US10B
743	Dark oxidized Satin bronze appearance vacuum applied	300 Series Stainless Steel	E	US10B
744	Dark oxidized Satin bronze appearance vacuum applied	Zinc	E	US10B
	Oxidized Satin Bronze, Relieved			
614	Oxidized satin bronze, relieved clear coated	Bronze	C	
615	Oxidized satin bronze, relieved, waxed	Bronze	C	
641	Oxidized satin bronze plated, relieved, clear coated	Steel	E	
642	Oxidized satin bronze plated, relieved, waxed	Steel	E	
	Satin Bronze, Blackened			
616	Satin bronze, blackened, satin relieved, clear coated	Bronze	C	US11
643	Satin bronze plated, blackened satin relieved, clear coated	Steel	E	US11
	Dark Oxidized Satin Bronze, Bright Relieved			
617	Dark oxidized satin bronze, bright relieved, clear coated	Bronze	C	US13
644	Dark oxidized satin bronze plated, bright relieved, clear coated	Steel	E	US13
	Bright Nickel			
618	Bright nickel plated, clear coated	Brass, Bronze	A	US14
645	Bright nickel plated, clear coated	Steel	E	US14
669	Bright nickel plated	Aluminum	E	US14
745	Bright nickel appearance vacuum applied	Brass/Bronze	E	US14

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
746	Bright nickel appearance vacuum applied	300 Series SS	E	US14
747	Bright nickel appearance vacuum applied	Zinc	E	US14
753	Bright Nickel Plated, Clear Coated	Zinc	E	US14
	Satin Nickel			
619	Satin nickel plated, clear coated	Brass, Bronze	A	US15
646	Satin nickel plated, clear coated	Steel	E	US15
670	Satin nickel plated	Aluminum	E	US15
748	Satin nickel appearance vacuum applied	Brass/Bronze	E	US15
749	Satin nickel appearance vacuum applied	300 Series SS	E	US15
750	Satin nickel appearance vacuum applied	Zinc	E	US15
754	Satin Nickel plated, clear coated	Zinc	E	US15
	Satin Nickel Plated, Blackened			
620	Satin nickel plated, blackened, satin relieved, clear coated	Brass, Bronze	C	US15A
647	Satin nickel plated, blackened, satin relieved, clear coated	Steel	E	US15A
755	Satin Nickel plated, blackened, satin relieved, clear coated	Zinc	E	US15A
	Nickel Plated, Blackened, Relieved			
621	Nickel plated, blackened, relieved clear coated	Brass, Bronze	C	US17A
648	Nickel plated, blackened, relieved, clear coated	Steel	E	US17A
	Flat Black Coated			
622	Flat black coated	Brass, Bronze	A	US19
631	Flat black coated	Steel	E	US19
671	Flat black coated	Aluminum	E	US19
676	Flat black coated	Zinc	E	US19
693	Black painted	Any	A	
711	Flat black anodized	Aluminum	E	US19
	Light Oxidized Statuary Bronze			
623	Light oxidized statuary bronze, clear coated	Bronze	C	US20
649	Light oxidized bright (statuary?) bronze plated, clear coated	Steel	E	US20
691	Light bronze painted	Any	E	US20
	Dark Oxidized Statuary Bronze	Bronze	C	US20A
624	Dark oxidized statuary bronze, clear coated	Bronze	C	US20
650	Dark oxidized statuary bronze plated, clear coated	Steel	E	US20A
690	Dark bronze painted	Any	E	US20A
	Bright Chromium			
625	Bright chromium plated over nickel	Brass, Bronze	A	US26
651	Bright chromium plated over nickel	Steel	E	US26
672	Bright chromium plated over nickel	Aluminum	E	US26
681	Bright chromium plated over nickel	Zinc	E	US26
700	Bright chromium plated over nickel	Plastic	E	US26

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
712	Bright chromium anodized	Aluminum	E	US26
717	Bright aluminum uncoated	Aluminum	B	US26
	Satin Chromium			
626	Satin chromium plated over nickel	Brass, Bronze	A	US26D
652	Satin chromium plated over nickel	Steel	E	US26D
682	Satin chromium plated over nickel	Zinc	E	US26D
701	Satin chromium plated over nickel	Plastic	E	US26D
702	Satin chromium plated over nickel	Aluminum	E	US26D
713	Satin chromium anodized	Aluminum	E	US26D
	Satin Aluminum			
627	Satin aluminum, clear coated	Aluminum	A	US27
628	Satin aluminum, clear anodized	Aluminum	A	US28
673	Aluminum clear coated	Aluminum	D	
689	Aluminum painted	Any	E	US28
718	Satin aluminum uncoated	Aluminum	B	US27
719	Mill finish aluminum uncoated	Aluminum	B	US27
	Bright Stainless Steel			
629	Bright stainless steel	Stainless steel 300 series	A	US32
653	Bright stainless steel	Stainless steel 400 series	E	US32
	Satin Stainless Steel			
630	Satin stainless steel	Stainless steel 300 series	A	US32D
654	Satin stainless steel	Stainless steel 400 series	E	US32D
	Other Combinations			
655	Light oxidized satin bronze, bright relieved, clear coated	Bronze	C	US13
656	Light oxidized satin bronze plated, bright relieved, clear coated	Steel	E	US13
657	Dark oxidized copper plated, satin relieved, clear coated	Steel	C	
658	Dark oxidized copper plated, bright relieved, clear coated	Steel	C	
659	Light oxidized copper plated, satin relieved, clear coated	Steel	C	
660	Light oxidized copper plated, bright relieved, clear coated	Steel	C	
661	Oxidized satin copper plated, relieved, clear coated	Steel	C	
662	Satin brass plated, browned satin relieved, clear coated	Steel	C	
664	Cadmium plated with clear chromate seal	Steel	D	
665	Cadmium plated with iridescent dichromate	Steel	D	
675	Dichromate sealed	Zinc	D	

BHMA CODE NUMBER	FINISH DESCRIPTION	BASE MATERIAL	CATEGORY	NEAREST FORMER US EQUIVALENT
684	Black chrome plated, bright	Brass, Bronze	C	
685	Black chrome plated, satin	Brass, Bronze	C	
686	Black chrome plated, bright	Steel	E	
687	Black chrome plated, satin	Steel	E	
692	Tan painted	Any	D	
706	Gold painted	Any	D	
714	White painted	Aluminum	D	
722	Dark oxidized bronze oil rubbed	Architectural Bronze	B	US10A

* Vacuum applied finishes are generally applied over stainless steel base, or a chrome substrate on various base materials

5.3 *Reference Chart of Appearance Equivalent Finish Numbers*
Primary equivalent in parenthesis. See previous table for full descriptions.

BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT	BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT
600	Primed for Painting/ steel	(600)	621	Nickel Plated, Blackened, Relieved/ brass, bronze	(621)
601	Bright Japanned/ steel	(601)	622	Flat Black Coated/ Brass, bronze	(622)
603	Zinc Plated/ Steel	(603)	623	Light Oxidized Statuary bronze/bronze	(623)
604	Zinc Plated/ steel	(603)	624	Dark Oxidized Statuary bronze/bronze	(624)
605	Bright Brass/ brass/brass	(605)	625	Bright Chromium/ brass, bronze	(625)
606	Satin Brass/ brass	(606)	626	Satin Chromium/ brass, bronze	(626)
607	Oxidized Satin/ brass/brass	(607)	627	Satin Aluminum/ aluminum	(627)
608	Oxidized Satin Brass, Relieved/brass	(608)	628	Satin aluminum, clear anodized/aluminum	(627)
609	Satin Brass, Blk'd, Satin Relieved/brass	(609)	629	Bright Stainless Steel/ 300 series ss	(629)
610	Satin Brass, Blk'd, Brite Relieved/brass	(610)	630	Satin Stainless Steel/ 300 series ss	(630)
611	Bright Bronze/ bronze	(611)	631	Flat black coated Steel/steel	(622)
612	Satin Bronze/ bronze	(612)	632	Bright brass plated, clear coated/steel	(605)
613	Dark Oxidized Satin Bronze/bronze	(613)	633	Satin brass plated, clear coated	(606)
614	Oxidized Satin Bronze, Relieved/ bronze	(614)	634	Oxidized satin brass plated, oil rubbed/steel	(607)
615	Oxidized satin bronze, relieved, waxed/bronze	(615)	635	Oxidized satin brass plated, relieved, clear coated/steel	(608)
616	Satin Bronze, Blackened Satin/ bronze	(616)	636	Satin brass plated, blackened bright relieved, clear coated/steel	(610)
617	Dk Oxidized Satin Bronze/bronze	(617)	637	Bright bronze plated, clear coated/steel	(611)
618	Bright Nickel/ Brass, bronze	(618)	638	Satin brass plated, blackened, satin relieved, clear coated/steel	(609)
619	Satin Nickel/ Brass, bronze	(619)	639	Satin bronze plated, clear coated/steel	(612)
620	Satin Nickel Plated,Blackened / brass, bronze	(620)	640	Oxidized satin bronze plated over copper plate, oil rubbed/steel	(613)

BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT	BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT
641	Oxidized satin bronze plated, relieved, clear coated/steel	(614)	659	Light oxidized copper plated, satin relieved, clear coated/steel	(None)
642	Oxidized satin bronze plated, relieved, waxed/steel	(614)	660	Light oxidized copper plated, bright relieved, clear coated/steel	(None)
643	Satin bronze plated, blackened satin relieved, clear coated/ steel	(616)	661	Oxidized satin copper plated, relieved, clear coated/steel	(None)
644	Dk Oxidized Satin Bronze/steel	(617)	662	Satin brass plated, browned satin relieved, clear coated/steel	(None)
645	Bright Nickel/ steel	(618)	663	Zinc plated with clear chromate seal/steel	(603)
646	Satin Nickel/ steel	(619)	664	Cadmium plated with clear chromate seal/steel	(None)
647	Satin nickel plated, blackened, satin relieved, clear coated/steel	(620)	665	Cadmium plated with iridescent dichromate/ steel	(None)
648	Nickel plated, blackened, relieved, clear coated/steel	(621)	666	Bright brass plated, clear coated/aluminum	(605)
649	Light oxidized bright bronze plated, clear coated/steel	(623)	667	Satin brass plated, clear coated/aluminum	(606)
650	Dark oxidized statuary bronze plated, clear coated/steel	(624)	668	Satin bronze plated, clear coated/aluminum	(612)
651	Bright chromium plated over nickel/steel	(625)	669	Bright nickel plated/aluminum	(618)
652	Satin chromium plated over nickel/steel	(626)	670	Satin nickel plated/aluminum	(619)
653	Bright stainless steel plated/400 series ss	(629)	671	Flat black coated/aluminum	(622)
654	Satin stainless steel plated/ 400 series ss	(630)	672	Bright chromium plated over nickel/aluminum	(625)
655	Light oxidized satin bronze, bright relieved, clear coated/bronze	(None)	673	Aluminum clear coated/aluminum	(627)
656	Light oxidized satin bronze plated, bright relieved, clear coated/steel	(None)	674	Primed for painting/zinc	(600)
657	Dark oxidized copper plated, satin relieved, clear coated/steel	(None)	675	Dichromate sealed/zinc	(None)
658	Dark oxidized copper plated, bright relieved, clear coated/steel	(None)	676	Flat black coated/zinc	(622)

BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT	BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT
677	Bright brass plated, clear coated/zinc	(605)	701	Satin Chromium/plastic	(626)
678	Satin brass plated, clear coated/zinc	(606)	702	Satin Chromium/aluminum	(626)
679	Bright bronze plated, clear coated/zinc	(611)	703	Dark Oxidized Satin Bronze/aluminum	(613)
680	Satin bronze plated, clear coated/zinc	(612)	704	Dark Oxidized Satin Bronze/zinc	(613)
681	Bright chromium plated over nickel/zinc	(625)	705	Bright Bronze/aluminum	(611)
682	Satin chromium plated over nickel/zinc	(626)	706	Gold painted/any	(None)
683	Oxidized satin brass plated, oil rubbed/zinc	(607)	707	Bright Brass/aluminum	(605)
684	Black chrome plated, bright/brass, bronze	(None)	708	Bright Bronze/aluminum	(611)
685	Black chrome plated, satin/brass, bronze	(None)	709	Satin Bronze/aluminum	(612)
686	Black chrome plated, bright/steel	(None)	710	Dark Oxidized Satin Bronze/aluminum	(613)
687	Black chrome plated, satin/steel	(None)	711	Flat Black Coated/aluminum	(622)
688	SatinBrass/aluminum	(606)	712	Bright Chromium/aluminum	625)
689	Satin Aluminum/any	(627)	713	Satin Chromium/aluminum	(626)
690	Dark bronze painted/any	(624)	714	White painted/aluminum	(None)
691	Light bronze painted/any	(623)	715	Primed for Painting/aluminum	(600)
692	Tan painted/any	(None)	716	Bright Brass/aluminum	(605)
693	Black painted/any	(622)	717	Bright Chromium/aluminum	(625)
694	Satin Bronze/any	(612)	718	Satin Aluminum/aluminum	(627)
695	Dark Oxidized Satin Bronze/any	(613)	719	Satin Aluminum/aluminum	(627)
696	Satin Brass/any	(606)	720	Satin Brass/architectural bronze	(606)
697	Bright Brass/plastic	(605)	721	Bright Brass/architectural bronze	(605)
698	Satin Brass/plastic	(606)	722	Dark oxidized bronze oil rubbed/architectural bronze	(None)
699	Satin Bronze/plastic	(612)	723	Bright Brass/brass, bronze	(605)
700	Bright Chromium/plastic	(625)	724	Bright Brass/300series ss	(605)

BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT	BHMA CODE NUMBER	FINISH DESCRIPTION/ BASE MATERIAL	PRIMARY EQUIVALENT
725	Satin Bronze/brass	(612)	741	Satin bronze appearance vacuum applied/zinc	(612)
726	Bright Bronze/brass	(611)	742	Dark oxidized Satin bronze appearance vacuum applied/brass, bronze	(613)
727	Dark Oxidized Satin Bronze/brass	(613)	743	Dark oxidized Satin bronze appearance vacuum applied/300 series ss	(613)
728	Satin Brass/architectural bronze	(606)	744	Dark oxidized Satin bronze appearance vacuum applied/zinc	(613)
729	Bright brass appearance vacuum applied/zinc	(605)	745	Bright nickel appearance vacuum applied/brass, bronze	(618)
730	Satin brass appearance vacuum applied//brass, bronze	(606)	746	Bright nickel appearance vacuum applied/300 series ss	(618)
731	Satin brass appearance vacuum applied/300 series ss	(606)	747	Bright nickel appearance vacuum applied/zinc	(618)
732	Satin brass appearance vacuum applied/zinc	(606)	748	Satin nickel appearance vacuum applied/brass, bronze	(619)
733	Oxidized Satin brass appearance vacuum applied/brass, bronze	(607)	749	Satin nickel appearance vacuum applied/300 series ss	(619)
734	Oxidized Satin brass appearance vacuum applied/300 series ss	(607)	750	Satin nickel appearance vacuum applied/zinc	(619)
735	Oxidized Satin brass appearance vacuum applied/zinc	(607)	751	Oxidized satin brass plated, relieved, clear coated - Zinc Substrate	(608)
736	Bright bronze appearance vacuum applied/brass, bronze	(611)	752	Satin brass plated, blackened, satin relieved, clear coated - Zinc Substrate	(609)
737	Bright bronze appearance vacuum applied/300 series ss	(611)	753	Bright Nickel Plated, Clear Coated - Zinc Substrate	(618)
738	Bright bronze appearance vacuum applied/zinc	(611)	754	Satin Nickel plated, clear coated – Zinc Substrate	(619)
739	Satin bronze appearance vacuum applied/brass, bronze	(612)	755	Satin Nickel plated, blackened, satin relieved, clear coated – Zinc Substrate	(620)
740	Satin bronze appearance vacuum applied/300 series ss	(612)			

6. FINISH TEST REQUIREMENTS PER STANDARD

These requirements do not predict the performance life of the finishes in actual use but are used as a quality control method to ensure consistent finish quality. Trim parts (levers, knobs, turns, roses, escutcheons, lock fronts, paddles, and strikes) shall meet the requirement as specified. All exposed, architecturally finished parts are subject to the finish requirements as detailed below. The values given are minimum requirements. Category B finishes as defined by A156.18 shall be excluded from any of the following finish test requirements.

6.13.2.2 Test Sample Selection: Three parts shall be selected at random for any specific finish requirement. When one part is noticeably poorer than the others tested, this defective part shall be ignored and three more parts shall be selected to be tested and failure of any parts shall then constitute failure of the complete test. PLACE HOLDER

6.1 FINISH GROUP ~~A~~ XYZ

	A156.2	A156.3	A156.6	A156.12	A156.13	A156.29	A156.31	A156.36	A156.37
SALT SPRAY									
ORGANIC/ CLEAR COATINGS	96 HRS.	96 HRS.	96 HRS.	96 HRS.	96 HRS.	96 HRS.	N/A	96 HRS.	96 HRS.
ORGANIC COATINGS LOCK FRONTS AND STRIKES, ~~AND~~ COORDINATORS, AND STAND ALONE EXIT ALARM	24 HRS.	24 HRS.	~~24 HRS.~~	24 HRS.	24 HRS.	24 HRS.	~~24 HRS.~~	24 HRS.	24 HRS.
WITHOUT ORGANIC (INORGANIC) COATING	200 HRS.	200 HRS.	200 HRS.	200 HRS.	200 HRS.	200 HRS.	200 HRS.	200 HRS.	200 HRS.
PAINTED COATINGS	N/A	N/A	24 HRS.	N/A	N/A	N/A	N/A	N/A	N/A
HUMIDITY									
ORGANIC COATINGS/CLEAR COATINGS	240 HRS.	240 HRS.	240 HRS.	240 HRS.	240 HRS.	240 HRS.	48 HRS.	240 HRS.	240 HRS.
ORGANIC COATINGS LOCK FRONTS AND STRIKES, ~~AND~~ COORDINATORS AND STAND ALONE EXIT ALARMS	48 HRS.	48 HRS.	N/A	48 HRS.	48 HRS.	48 HRS.	48 HRS.	48 HRS.	48 HRS.
PAINTED COATINGS	N/A	N/A	48 HRS.	N/A	N/A	N/A	N/A	N/A	N/A
PENCIL HARDNESS	2H	2H	4H	2H	2H	2H	2H	2H	2H
CROSS-CUT TAPE ADHESION	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B	CLASS 4 METHOD B
FINISH HARDNESS									
ORGANIC COATINGS PENCIL HARDNESS. EXEMPT COORDINATORS	4H	3H	4H	4H	4H	3H	4H 2H	4H	4H GR1 & GR2 4B GR3
ORGANIC COATINGS, FRONTS AND STAND-ALONE EXIT ALARMS	N/A	N/A	N/A	N/A	N/A	2H	N/A	N/A	N/A
ORGANIC COATINGS TABER ABRASION. EXEMPT COORDINATORS	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES	500 CYCLES
PERSPIRATION									
ORGANIC / CLEAR COATINGS, ALL PRODUCTS EXCEPT STAND ALONE EXIT ALARMS	4 CYCLES	4 CYCLES	3 CYCLES	4 CYCLES	4 CYCLES	4 CYCLES 2B PENCIL	4 CYCLES	4 CYCLES	4 CYCLES 2B PENCIL
PAINTED COATINGS	N/A	N/A	3 CYCLES	N/A	N/A	N/A	N/A	N/A	N/A
UV/CONDENSATION									
ORGANIC COATINGS EXEMPT	144 HRS	144 HRS	N/A	144 HRS	144 HRS	144 HRS	144 HRS	144 HRS	144 HRS

COORDINATORS									
UVA 340 LAMPS EXEMPT COORDINATORS	YES	YES	N/A	YES	YES	YES	YES	YES	YES
8 HRS. UV AT 60 C AND 4 HRS. CONDENSATION AT 50 C EXEMPT COORDINATORS	YES	YES	N/A	YES	YES	~~YES~~	~~YES~~	YES	DOES NOT SPECIFY
8 HRS. UV AND 4 HRS CONDENSATION AT 50C.	N/A	YES	N/A	N/A	N/A	YES	YES	N/A	N/A
PENCIL HARDNESS. EXEMPT COORDINATORS	F	F	N/A	F	F	F	F	F	F

6.2 FINISH GROUP B

	A156.39	A156.40
SALT SPRAY		
ALL FINISHES	200 GR A 96 GR B 72 GR C HRS.	200 GR A 96 GR B 72 GR C HRS.
~~ORGANIC COATINGS~~ LOCK FRONTS AND STRIKES	24 HRS.	24 HRS.
HUMIDITY		
ORGANIC COATINGS/CLEAR COATINGS	240 GR A 192 GR B 144 GR C HRS.	240 GR A 192 GR B 144 GR C HRS.
ORGANIC COATINGS LOCK FRONTS AND STRIKES	48 HRS. All Grades	48 HRS. All Grades
PENCIL HARDNESS	DOES NOT SPECIFY	DOES NOT SPECIFY
CROSS-CUT TAPE ADHESION	DOES NOT SPECIFY	DOES NOT SPECIFY
FINISH HARDNESS		
ORGANIC COATINGS PENCIL HARDNESS	3H GR A 2H GR B 2H GR C	3H GR A 2H GR B 2H GR C
PERSPIRATION		
ORGANIC COATINGS, ALL PRODUCTS	3 GR A 2 GR B 2 GR C CYCLES	3 GR A 2 GR B 2 GR C CYCLES
UV/CONDENSATION		
ORGANIC COATINGS	288 GR A 144 GR B 96 GR C HRS.	288 GR A 144 GR B 96 GR C HRS.
ORGANIC COATINGS LOCK FRONTS AND STRIKES	24 HRS.	24 HRS.
UVA 340 LAMPS	YES	YES
8 HRS. UV AT 60 C AND 4 HRS. CONDENSATION AT 50 C	YES	YES
PENCIL HARDNESS	F	F

6.3 FINISH GROUP C

	A156.1	A156.17	A156.26
SALT SPRAY			
PAINTED	48 HRS.	48 HRS.	48 HRS.
NON-FERROUS, PLATED OR UNPLATED, COATED OR UNCOATED	72 HRS.	72 HRS.	72 HRS.
FERROUS, MULTIPLE PLATED, COATED OR UNCOATED	24 HRS.	24 HRS.	~~24~~ ~~HRS.~~
FERROUS, SINGLE PLATED, ~~COATED OR~~ UNCOATED	18 HRS.	18 HRS.	~~18~~ ~~HRS.~~
FERROUS, SINGLE PLATED, CLEAR COATED	~~24~~ ~~HRS.~~	18 HRS.	24 HRS.
STAINLESS STEEL	200 HRS.	200 HRS.	200 HRS.

6.4 FINISH GROUP D

	A156.4	A156.15	A156.20	A156.23
SALT SPRAY				
(ALL FINISHES ON OUTSIDE CASE OF LOCKS, MOUNTING HARDWARE, AND ARMATURES) (ALL PRODUCTS PAINTED OR PLATED) (FINISH ON ALL PRODUCTS)	~~25~~ 24 HRS. (NOTE: A156.4 AGREED TO CHANGE TO 24 HRS 9-11-18)	~~24~~ 25 HRS.	24 HRS	24 HRS.
ORGANIC COATINGS LOCK FRONTS AND STRIKES AND COORDINATORS	~~24~~ ~~HRS~~	~~24~~ ~~HRS~~	~~24~~ ~~HRS~~	~~24~~ ~~HRS~~
WITHOUT ORGANIC (INORGANIC) COATING	~~200~~ ~~HRS~~	~~200~~ ~~HRS~~	~~200~~ ~~HRS~~	~~200~~ ~~HRS~~
HUMIDITY				
ORGANIC COATINGS/CLEAR COATINGS	~~48~~ HRS	~~48~~ HRS	~~240~~ ~~HRS~~	~~240~~ ~~HRS~~
ORGANIC COATINGS LOCK FRONTS AND STRIKES AND COORDINATORS AND STAND ALONE EXIT ALARMS	~~48~~ ~~HRS.~~	~~48~~ ~~HRS.~~	N/A	~~48~~ HRS.
PAINTED COATINGS	N/A	N/A	~~48~~ ~~HRS.~~	N/A
PENCIL HARDNESS	2H	2H	~~4H~~	~~2H~~
CROSS-CUT TAPE ADHESION	CLASS 4 METHOD B	CLASS 4 METHOD B	~~CLASS~~ 4 ~~METHOD~~ ~~B~~	~~CLASS~~ 4 ~~METHOD~~ ~~B~~

6.5 FINISH GROUP E

	A156.8	A156.11
SALT SPRAY		
ALL FINISHES ARMS, CAPS, BRACKETS, EXPOSED CHANNELS, STRIKES AND LOCKS	48 GR 1 24 GR 2 12 GR 3 HRS.	48 GR 1 24 GR 2 12 GR 3 HRS.
HUMIDITY		
ALL SURFACES (WHAT IS MEANT BY ALL SURFACES)	N/A	96 GR 1 48 GR 2

		24 GR 3 HRS.
CLEAR COATINGS ARMS, CAPS, BRACKETS, EXPOSED CHANNELS	48 GR 1 48 GR 2 N/A GR 3 HRS.	N/A
PENCIL HARDNESS	2H GR 1 2H GR 2 N/A GR 3	DOES NOT SPECIFY
CROSS-CUT TAPE ADHESION	CLASS 4 METHOD B GR 1 & 2 N/A GR3	DOES NOT SPECIFY
FINISH HARDNESS		
ORGANIC COATINGS PENCIL HARDNESS	N/A	4H ALL GRADES IS THIS IN CORRECT LOCATION

6.6 FINISH GROUP F (DID NOT HAVE A FINISH GROUP NUMBER, CALLED IT "F")

	A156.9	A156.14	A156.16
SALT SPRAY			
CLEAR COATED OVER BASE MATERIAL, PLATED SURFACES AND CLEAR COAT OVER PLATED	CLASS A 16 CLASS B 12 CLASS C 8 HRS.	N/A	N/A
PAINTED ZINC AND CHROME PLATED SURFACES	CLASS A 48 CLASS B 24 CLASS C 12 HRS.	N/A	N/A
STEEL , CAST ZINC, AND CAST ALUMINUM BASE MATERIALS, ALL FINISHES, ALL PRODUCTS EXCEPT REPLACEMENT CASEMENT WINDOW CONTROLS	N/A	N/A	24 GR 1 12 GR 2 6 GR 3 HRS.
STEEL , CAST ZINC, AND CAST ALUMINUM BASE MATERIALS, ALL FINISHES, REPLACEMENT CASEMENT WINDOW CONTROLS	N/A	N/A	400 GR 1 240 GR 2 120 GR 3 HRS.
BRASS, BRONZE, STAINLESS STEEL, AND ALUMINUM OTHER THAN CAST BASE MATERIALS	N/A	N/A	96 GR 1 72 GR 2 48 GR 3 HRS.
ALL FINISHES DEPICTED IN 8.17.2, 8.3, 8.4, 8.5, 8.6, AND D0821, D0831, D0841 AS SHOWN IN 8.11	N/A	24 HRS.	N/A
ALL FINISHES DEPICTED IN 8.7, 8.8, 8.9, 8.10, 8.6, AND D8771, AS SHOWN IN 8.11	N/A	12 HRS.	N/A
HUMIDITY			
STEEL , CAST ZINC, AND CAST ALUMINUM BASE MATERIALS, ALL FINISHES, ALL PRODUCTS EXCEPT REPLACEMENT CASEMENT WINDOW CONTROLS	N/A	N/A	120 GR 1 96 GR 2 60 GR 3 HRS.
STEEL , CAST ZINC, AND CAST ALUMINUM BASE MATERIALS,	N/A	N/A	960 GR 1 480 GR 2

ALL FINISHES, REPLACEMENT CASEMENT WINDOW CONTROLS			**240 GR 3 HRS.**
BRASS, BRONZE, STAINLESS STEEL, AND ALUMINUM OTHER THAN CAST BASE MATERIALS	**N/A**	**N/A**	**240 GR 1** **180 GR 2** **120 GR 3 HRS.**
ALL SURFACES (WHAT IS MEANT BY ALL SURFACES)	**CLASS A 96** **CLASS B 48** **CLASS C 24 HRS.**	**N/A**	**N/A**
PENCIL HARDNESS	**DOES NOT SPECIFY**	**N/A**	**2H**
CROSS-CUT TAPE ADHESION	**CLASS 4 METHOD** B	N/A	**CLASS 4 METHOD** B
PERSPIRATION			
ALL FINISHES, APPLICABLE ONLY TO ACCESSORY ITEMS D0781, D1791, D2801, D0821, D0841 AS SHOWN IN 8.11	**N/A**	**1 CYCLE ALL GRADES**	**N/A**

6.1 ANSI/BHMA A156.1

6.1.1 Finish Test Parts. The parts for finish testing shall be selected at random and shall be three pieces. When one part is noticeably poorer than the others tested, this defective part shall be ignored as an isolated defective part.

Requirements.

Salt Spray Exposure Hours - All Grades	
Painted material	48 Hours
Non-Ferrous material - plated or unplated, coated or uncoated	72 Hours
Ferrous material – multiple plated, coated or uncoated	24 Hours
Ferrous material – single plated, coated or uncoated	18 Hours
Stainless steel	200 Hours

6.2 ANSI/BHMA A156.2

6.2.1 **Neutral Salt Spray Test Requirements** - Requirements All Grades

Organic Coatings	96 Hours
Organic Coatings on Lock Fronts and Strikes	24 Hours
Materials without Organic Coatings	200 Hours

6.2.2 **Humidity Test** - Requirements All Grades

Organic Coatings	240 Hours
Organic Coatings on Lock Fronts and Strikes	48 Hours

6.2.3 **Finish Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness – All Material with Organic Coatings	4H
Taber Test – All Material with Organic Coatings	500 Cycles

6.2.4 **Perspiration Test** - Requirements All Grades

All Material with Organic Coatings	4 Cycles

6.2.5 **Ultra Violet Light and Condensation Test** - Test cycle 8 hours UV at 60 C and 4 hours condensation at 50 degrees C. Requirements All Grades

Organic Coatings	144 Hours

6.3 ANSI/BHMA A156.3

6.3.1 **Salt Spray Test Requirements** - Requirements All Grades

Organic Coatings	96 Hours
Organic Coatings on Lock Fronts and Strikes	24 Hours
Materials without Organic Coatings	200 Hours

6.3.2 **Humidity Test** - Requirements All Grades

Organic Coatings	240 Hours
Organic Coatings on Lock Fronts and Strikes	48 Hours

6.3.3 **Finish Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness – All Material with Organic Coatings	3H
Taber Test – All Material with Organic Coatings	500 Cycles

6.3.4 **Perspiration Test** - Requirements All Grades

All Material with Organic Coatings	4 Cycles

6.3.5 **Ultra Violet Light and Condensation Test** - Test cycle 8 hours UV at 60 C and 4 hours condensation at 50 degrees C. Requirements All Grades

Organic Coatings	144 Hours

6.4 ANSI/BHMA A156.4

6.4.1 **Salt Spray Test Requirements** - Requirements All Grades

All Products Painted or Plated	25 Hours

6.4.2 **Humidity Test** - Requirements All Grades

Organic Coatings/Clear Coatings – Grade 1 & 2	48 Hours

6.5 ANSI/BHMA A156.6

6.5.1 **Salt Spray Test Requirements** - Requirements All Grades

Materials with Painted	24 Hours
Materials with Clear Coatings	96 Hours
All Other Materials	200 Hours

6.5.2 **Humidity Test** - Requirements All Grades

Materials with Painted Coatings	48 Hours – Adhesion: Classification 4. Method B, 4H
Materials with Clear Coatings	240 Hours – Adhesion: Classification 4. Method B, 4H

6.5.3 **Finish Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Materials with Clear Coatings and Materials with Painted Coatings	Pencil Hardness: 4H
Materials with Clear Coatings and Materials with Painted Coatings	Taber: 500 Cycles

6.5.4 **Perspiration Test** - Requirements All Grades

Material with Clear Coatings and Materials with Painted Coatings	3 Cycles

6.6 ANSI/BHMA A156.8

Tests shall be conducted on arms, end caps, mounting brackets, and exposed channels only.

6.6.1 **Salt Spray Test Requirements**

Grade 1	48 Hours
Grade 2	24 Hours
Grade 3	12 Hours

6.6.2 **Humidity Test** - Requirements – For clear coatings only

Grade 1	48 Hours – Adhesion: Classification 4. Method B, Pencil Hardness: 2H
Grade 2	48 Hours – Adhesion: Classification 4. Method B, Pencil Hardness: 2H
Grade 3	N/A

6.7 ANSI/BHMA A156.9

Unless otherwise specified, the following are the minimum performance requirements for finishes applied to cabinet hardware, excluding fasteners:

6.7.1 **Test Samples Selection.** Three parts shall be selected at random for any specific finish requirement. When one part is noticeably poorer than the others tested, this defective part shall be ignored and three more parts shall be selected to be tested and failure of any parts shall then constitute failure of the complete test.

6.7.2 **Class A Products.** High wear items. All pulls, knobs and exposed catches.

6.7.3 **Class B Products.** Low wear or non-decorative items or both. All butt, flush, and semiconcealed hinges, shelf rests, standards and brackets, fixed and rotating shelves and trays, drawers and drawer slides and backplates.

6.7.4 **Class C Products.** Low wear or concealed items or both. All concealed, invisible and pivot (knife) hinges, magnetic and mechanical catches.

6.7.5 **Salt Spray Test.** The parts shall be suspended in the test chamber as specified in ASTM B117 except the angular positioning noted is not a requirement. However, care shall be taken to ensure that the test solution does not puddle on the part under test. Nylon monofilament cord is permitted to be used to suspend the parts. The parts shall not be mounted on wood boards or other materials that allow the test solution to run off the support and contact the test part.

6.7.6 **Significant Surfaces.** The following shall not be considered a breakdown of a significant surface: a. Superficial corrosion or staining b. Localized softening, staining, blistering, loss of adhesion or corrosion of the base metal if caused by breakdown of a non-significant surface or if occurring at the points(s) where the salt spray or humidity solution collects and concentrates before dripping off the part.

6.7.7 **Non-Significant Surfaces.** Surfaces on which a controlled deposit ordinarily cannot be obtained such as holes, screw countersinks, mating hinge curls recesses, bases of angles, sheared sheet metal edges and areas not normally visible when the part is installed are exempted from the requirements for significant surfaces.

6.7.8 **Salt Spray Test Requirements**	Product Class - Hours		
	A	B	C
Clear coated over base metal, plated surfaces, and clear coated over plated surfaces	16	12	8
Materials with Clear Coatings and Materials with Painted Coatings	48	24	12

6.7.9 **Humidity Test** - Adhesion classification 4, Method B.	Product Class - Hours		
	A	B	C
All Surfaces	96	48	24

6.8 ANSI/BHMA A156.11

6.8.1 All the finish tests in this section apply to both locks and strikes.

6.8.2 **Salt Spray Requirements**

Grade 1	48 Hours
Grade 2	24 Hours
Grade 3	12 Hours

6.8.3 **Humidity Requirements**

Grade 1	48 Hours
Grade 2	24 Hours
Grade 3	12 Hours

6.8.4 **Pencil Hardness Requirements**

Grade 1	4H
Grade 2	4H
Grade 3	4H

6.9 ANSI/BHMA A156.12 – SAME AS 6.2

6.10 ANSI/BHMA A156.13 – SAME AS 6.2

6.11 ANSI/BHMA A156.14

6.11.1 **Acceptability of Finish** A finish sample shall be considered acceptable if it meets or exceeds the performance **requirements.**

6.11.2 **Salt Spray Test Requirements** - Requirements All Grades

Types depicted in 8.7, 8.8, 8.9, 8.10, and D8771 as shown in 8.11	12 Hours
Types depicted in 8.17.2, 8.3, 8.4, 8.5, 8.6, and D0821, D0831, D0841 as shown in 8.11	24 Hours

6.11.3 **Perspiration Test** - Requirements All Grades

Applicable only to accessory items D0781, D1791, D2801, D0821, D0831, D0841 as shown in 8.11	1 Cycle

6.12 ANSI/BHMA A156.15

6.12.1 Covers, arms, and housings shall be subjected to the test.

6.12.2 **Salt Spray Test Requirements**

25 Hours

6.12.3 **Humidity Test** – Clear coatings – Pencil Hardness: 2H and Adhesion: Classification 4 Method B

48 Hours

6.13 ANSI/BHMA A156.16

6.13.1 **Exemptions:** The following shall not be considered a breakdown of a significant surface:

Localized softening, staining, blistering, loss of adhesion or corrosion of the base metal caused by the breakdown of a non-significant surface or if occurring at the point or points where the salt spray or humidity solutions collect and concentrate before dripping off the part. Corrosion of sheared edges of precoated material.

6.13.2 **Pass - Fail Criteria:**

6.13.2.1 Acceptability: A finish sample shall be considered acceptable if it meets or exceeds the performance requirements.

6.13.2.2 Test Sample Selection: Three parts shall be selected at random for any specific finish requirement. When one part is noticeably poorer than the others tested, this defective part shall be ignored and three more parts shall be selected to be tested and failure of any parts shall then constitute failure of the complete test.

6.13.3 **Salt Spray Test Requirements**	Grades - Hours		
	1	2	3
Steel, Cast Zinc, and Cast Aluminum Base Materials. All products except Replacement Casement Window Controls	24	12	6
Replacement Casement Window Controls	480	240	120
Brass, Bronze, Stainless Steel, and Aluminum other than Cast Base Materials	96	72	48

6.13.4 **Humidity Test** - Adhesion: Classification 4, Method B, Pencil hardness shall be 2H	Grades - Hours		
	1	2	3
Steel, Cast Zinc, and Cast Aluminum Base Materials. All products except Replacement Casement Window Controls	120	96	60
Replacement Casement Window Controls	960	480	240
Brass, Bronze, Stainless Steel, and Aluminum other than Cast Base Materials	240	180	120

6.14 ANSI/BHMA A156.17 – SAME AS 6.1 EXCEPT

6.14.1 Three specimens for each finish test to be conducted.

6.15 ANSI/BHMA A156.20

6.15.1 **Application.** This test applies to all products treated by plating or painting.

6.15.2 **Salt Spray Test.** Finishes shall withstand exposure for 24 hours.

6.16 ANSI/BHMA A156.23

6.16.1 Electromagnetic locks shall be tested unlocked with the lock and the armature separated.

6.16.2 **Test Specimens.** Additional parts are also required for the Appearance Finish tests as described.

6.16.3 **Appearance Finish Tests.** One armature and one outside lock body shall be tested for each finish being tested. Failure of any part shall constitute a failure of that finish.

6.16.4 **Salt Spray Test Requirements**

All finishes on the outside case of locks, mounting hardware, and armatures:	24 Hours

6.16.5 **Humidity Test Requirements**

Organic coatings on outside case of locks, mounting hardware, and armatures:	48 Hours

6.17 ANSI/BHMA A156.26

6.17.1 Select at random, three specimens for salt spray testing using 4 in (102 mm) long sections of three different continuous hinges.

6.17.2 **Salt Spray Test** Requirements - All Grades

Clear Coatings on Single Plated Ferrous Material	24 Hours
Painted material	48 Hours
Non-Ferrous material – plated or unplated, coated or uncoated	72 Hours
Stainless steel	200 Hours

6.18 ANSI/BHMA A156.29

6.18.1 **Samples** Finish Test two per finish. Finish tests are for all grades.

6.18.2 **Salt Spray Test** Requirements

Organic coatings except lock fronts and stand-alone exit alarms	96 Hours
Organic coatings on fronts and stand-alone exit alarms	24 Hours
In organic coatings or base material	200 Hours

6.18.3 **Humidity Test** – Organic Coating Only – Adhesion: Classification 4 Method B; Pencil Hardness 2H

Fronts and stand-alone exit alarms	48 Hours
All other parts	240 Hours

6.18.4 **Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness - Fronts and stand-alone exit alarms – Organic Coatings only	2H
Pencil Hardness – All Other Parts – Organic Coatings only	3H
Taber Test – All Material with Organic Coatings	500 Cycles

6.18.5 **Perspiration Test** – Test does not apply to Stand-Alone Exit Alarms

All Organic Coatings Only	4 Cycles, Pencil Hardness 2B

6.18.6 **Ultra Violet Light and Condensation Test** - Test cycle 8 hours UV and 4 hours humidity at 50 degrees C; test to exterior grade using UVA 340 lamps

Organic Coatings Only	144 Hours

6.19 ANSI/BHMA A156.31

6.19.1 All exposed, architecturally finished parts are subject to the finish requirements as detailed below. Finish tests are for all grades.

6.19.2 **Salt Spray Test** Requirements

Organic Coatings	24 Hours
Inorganic Coatings or Base Material	200 Hours

6.19.3 **Humidity Test** – Adhesion Classification 4, Method B; Pencil hardness: 2H

Organic Coatings Only	48 Hours

6.19.4 **Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness – Organic Coatings Only	2H
Taber Test – Organic Coatings Only	500 Cycles

6.19.5 **Perspiration Test**

Applicable Organic Coatings Only	4 Cycles

6.19.6 **Ultra Violet Light and Condensation Test** - Test cycle 8 hours UV and 4 hours condensation at 50 degrees C, test to exterior grade using UVA 340 lamps

Organic Coatings Only	144 Hours

6.20 ANSI/BHMA A156.36 – SAME AS 6.2

6.21 ANSI/BHMA A156.37

6.21.1 **Salt Spray Test Requirements** - Requirements All Grades

Organic coatings on roses, escutcheons, knobs, levers, turns, grips, thumbpieces and cylinder guards	96 Hours
Organic Coatings on Lock Fronts and Strikes	24 Hours
Materials without Organic Coatings	200 Hours

6.21.2 **Humidity Test** - Requirements All Grades - Use Classification 4, Method B; Pencil Hardness 2H

Organic coatings on roses, escutcheons, knobs, levers, turns, grips, thumbpieces and cylinder guards	240 Hours
Organic Coatings on Lock Fronts and Strikes	48 Hours

6.21.3 **Finish Hardness Test** - Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness – All Material with Organic Coatings	Grades 1 & 2: 4H; Grade 3: 4B
Taber Test – All Material with Organic Coatings	500 Cycles

6.21.4 **Perspiration Test** - Requirements All Grades

All Material with Organic Coatings	4 Cycles

6.21.5 **Ultra Violet Light and Condensation Test** – Use UVA 340 lamps

All Grades and Coatings	144 Hours

6.22 ANSI/BHMA A156.39

6.22.1 Subject one sample to test for each test. All plastic trims and covers with metallic finish coatings covering electronics shall be tested for visual color match only.

6.22.2 **Neutral Salt Spray Test Requirements**	Grades - Hours		
	A	B	C
Conduct on all Finishes	200	96	72
Conduct on all finishes except lock fronts and strikes	24	24	24

6.22.3 **Humidity Test**	Grades - Hours		
	A	B	C
Conduct on Organic Finishes Only	240	192	144
Conduct on Organic Finishes Only Except Lock Fronts and Strikes	48	48	48

6.22.4 **Pencil Hardness Test**	Grades		
	A	B	C
Conduct on Organic Finishes Only	3H	2H	2H

6.22.5 **Perspiration Test**	Grades - Cycles		
	A	B	C
Conduct on Organic Finishes Only	3	2	2

6.22.6 **Ultra Violet Light and Condensation Test** - Test cycle 8 hours UV at 60 C and 4 hours condensation at 50 degrees C.	Grades - Hours		
	A	B	C
Conduct on Organic Finishes Only	288	144	96
Conduct on Organic Finishes Only Except Lock Fronts and Strikes	24	24	24

6.23 ANSI/BHMA A156.40 – SAME AS 6.22

APPENDIX A USERS GUIDE

(NOT A PART OF ANSI/BHMA A156.18)

A-1 FINISHING PROCESSES

A1.1 Blackened is a darkened surface usually produced by chemical or applied means.

A1.2 Bright is a reflective finish generally produced mechanically or chemically.

A1.3 Satin is a surface usually with a limited reflectivity produced mechanically with a fine scratch pattern, which is straight, concentric, spiral or random. It is also produced electro-chemically with a non-reflective surface. A grit size of 150 to 220 is typically used to obtain patterns similar to the BHMA matchplates although results vary by material and process.

A1.4 Oxidizing is chemically changing the color of the base material in shades ranging from dark to light.

A1.5 Relieving or highlighting is mechanically removing oxide or blackening from portions, usually raised, of a patterned or textured surface thereby providing a two toned effect.

A1.6 **Organic Coating Examples** Coatings such as polyester, acrylic, lacquer, epoxy, or enamel in which the principal ingredients are derived from some compound of carbon (excluding carbides).

A1.7 Powder coatings are considered a type of paint.

A-2 VIEWING FORMULA

A2.1 Variations in surface appearance of hardware products occur because of equipment used, the alloys being finished or the processes performed in the finishing operations. For this reason, side by side comparison testing is not realistic and the viewing formula given in 4.3.3 is used.

A-3 Alternate Test method for Finish Matching. The following method is a more precise technique which is being developed by BHMA for comparing finish match. Since it is in the development stage the absolute values and tolerances may be different when adopted into the standard.

A3.1 Spectrophotometer/Colorimeter Test. Spectrophotometers and Colorimeters (hereafter referred to as measuring equipment) can be used to determine finish match to the BHMA match plate when the match test is conducted using the following guidelines.

a) Illumination. A light source representing CIE illuminate D65 should be used for all measurements
b) Observer Angle. The measuring equipment should be set for a 10 degree observer angle.
c) Specular Components. If the measuring equipment can have the specular component included or excluded, the equipment should be set to include the specular component.
d) Aperture Size. The match plate and sample to be measured shall be sized such that it completely fills the measuring equipment's viewing aperture.
e) Measurement Scale. The measuring equipment must be capable of measuring the CIE L*a*b* method.
f) Averaging. If capable, the measuring equipment should be set to take several readings and average their value. For surfaces that are not Bright (satin, relieved, etc.), the average should include readings where the samples have been rotated 90 degrees (both match plate and comparison sample).

g) Other Settings. Other settings required by the measuring equipment should be set in accordance with the manufacturer's recommendations. These settings must be documented for each test. Procedures. Since actual procedures may vary dependent upon the measuring equipment being used, the actual measuring procedure/process must be documented for each test. All tests conducted on similar type finishes should be conducted in a consistent manner. Deviations must be documented.

i) Nominal Reference Values

Finish	L*	a*	b*
605	84.0	-1.0	37.2
606	77.8	-0.2	32.3
611	81.0	8.9	28.3
612	75.6	9.3	27.7
618	77.5	0.7	7.0
619	70.0	0.8	7.0
625	84.0	-1.1	-1.0
626	78.0	-1.1	-0.2
628	85.2	-0.6	0.7
629	77.5	0.7	6.0
630	74.0	0.5	5.1

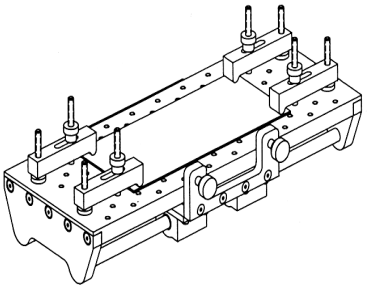
A-4

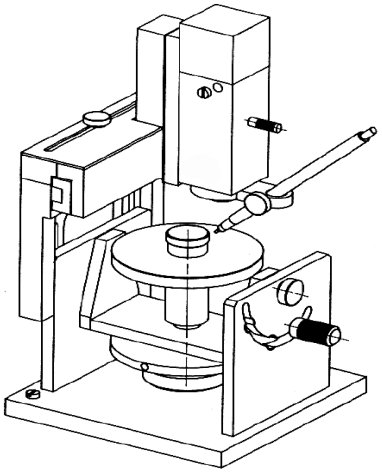
A4.1 Unused proposals for US "de-emphasis":
The use of nearest former US designations of finishes is anathema to the proper use of ANSI finish code numbers contained in this Standard. While discouraging the use of these former US designations, the committee responsible for this standard continued for several decades to print a column of "nearest former US equivalent" for each ANSI/BHMA finish code numbers. This practice is discontinued with this revision. The committee determined that printing such a column has in fact served to encourage the continued use of the US numbers in the jargon of a small segment of our industry.

A4.2 The "E" designation is loosely comparable to the former US numbers; that is, neither the base material, nor process is specified. For the most predictable performance, specify Category A finishes; specifying finish soley by US number is not recommended.

A4.3 Further information on visual matching of BHMA 613 oil rubbed bronze finish:
As stated in the standard "These finishes shall be compatible with the BHMA match plates, but these finishes cannot and do not match from one alloy or form of material to the next and from one manufacturer to the next. When choosing oil rubbed bronze and other Category B finishes, it should be realized that there are at least three variables that effect color matching. First, depending on the substrate, type of hardware part, even ambient conditions i.e. humidity, the finish may look slightly different within the same manufacturer's line. Second, the oxidation and oil rub process can vary by manufacturer to attain their intended appearance. And third, the finish, by nature, changes over time as it is exposed to environmental conditions and wear.

It is these inherent variations which ultimately result in the desirable aesthetic of oil rubbed bronze; if matching colors are desired, an alternative finish should be selected.





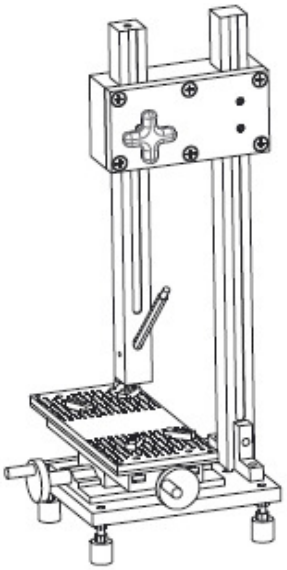
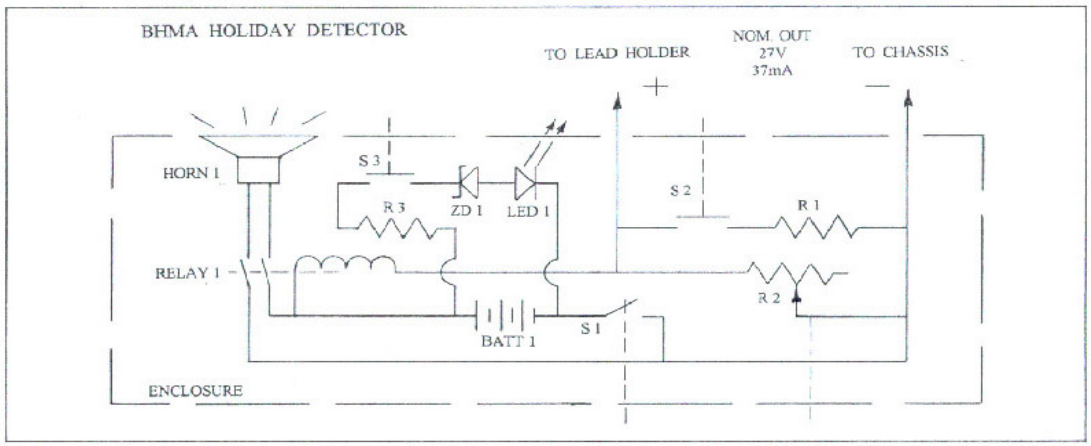


FIGURE 1
PENCIL HARDNESS TEST FIXTURES



SYMBOL	LABEL ON ENCLOSURE	DESCRIPTION	MFR. & PART NO.
BATT 1		Power – 27VDC	3 x 9 Volt Alkaline Battery
HORN 1		Failure Alarm	1.5 – 30v Buzzer, Mallory PK21N30W
RELAY 1		Horn Relay 24VDC DPDT	P & B R10E1Y2V700
S 1	"ON - OFF"	SPST Maintained Switch	Carlingswitch Rocker RA911-VB-B1-V
S 2	"PUSH & HOLD TO ADJUST"	SPST-NO Momentary Switch	SPST-NO Pushbutton Grayhill 30-3
S 3	"BATTERY TEST"	Do.	Do.
R 1		Calibration Resistance	3.01K Ohms ±1% ¼ w Philips SFR55 Resistor
R 2	"ADJUST TO ALARM THRESHOLD"	Potentiometer	5K Ohms ½ w Clarostat 308N
R 3		Current Limiter	1300 Ohms ±5% ½ w Resistor
ZD 1		Low Battery Test Zener Diode	25v ±5% ½ w Philips 1N5253B
LED 1	"BATTERY OK"	5mm Super Bright Diffused LED T-1 ¾ 20ma	Microlamp MLED-3500D13/E
ENCLOSURE		3" x 3" x 6" or 2 ½" x 3 ½" x 8"	Hammond 1411M or Hammond 1454K

NOTES: 1. All components may be replaced by equivalents.
2. Battery supply voltage of 25 to 27 and 3.01K ohms ±1% calibration resistance are mandatory.

FIGURE 2

BHMA HOLIDAY DETECTOR