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Standard Classification of Wallcovering by Durability Characteristics¹

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1. Scope

1.1 This classification covers the classification of wallcovering by durability characteristics, that is, according to its serviceability in use, recognizing that certain wallcovering is designed primarily for decorative effect, while other wallcovering is also designed to achieve a high degree of serviceability.

1.2 The values stated in inch-pound units are to be regarded as the standard. The metric values given in parentheses are provided for information only.

1.3 *The flammability test in this classification should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment that takes into account all of the factors that are pertinent to an assessment of the fire hazard of a particular end use.*

1.4 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- D 685 Practice for Conditioning Paper and Paper Products for Testing
- D 751 Test Methods for Coated Fabrics
- D 1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
- D 2486 Test Method for Scrub Resistance of Wall Paints

¹ This classification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.15 on Wallcoverings.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E 84 Test Method for Surface Burning Characteristics of Building Materials

G 21 Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

2.2 Federal Standards:

Fed. Std. No. 191 Textile Test Methods³

Fed. Spec. CCCW-408C Wallcoverings and Vinyl Coated³

2.3 Other Documents:

NFPA 101 Life Safety Code⁴

NFPA 255 Test of Surface Burning Characteristics of Building Materials⁴

UL 723 Test for Surface Burning Characteristics of Building Materials⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *abrasion resistance*—the ability to withstand mechanical action such as rubbing, scraping, or scrubbing that may progressively tend to remove material from the surface of a wallcovering.

3.1.2 *blocking resistance*—the ability to resist adhesion or sticking between two surfaces of a wallcovering that touch under uniform loading and temperature conditions for a specified time.

3.1.3 *breaking strength*—the ability of a wallcovering to withstand a pulling force in the plane of the web.

3.1.4 *coating adhesion*—a measure of the strength of the bond between the surface coating and the backing or substrate of a wallcovering.

3.1.5 *cold cracking resistance*—the ability to resist cracking of the coated or decorative surface when a wallcovering is folded during exposure to low temperatures.

3.1.6 *colorfastness*—the ability to resist change or loss of color resulting from exposure to light.

3.1.7 *croaking resistance*—the ability to resist transfer of color from a wallcovering surface when rubbed.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, ATTN: NPODS.

⁴ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.

⁵ Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.

3.1.8 *flammability*—a measure of the ability of a wallcovering to resist the propagation of flame and the development of smoke under prescribed test conditions. (See 1.2.)

3.1.9 *heat aging resistance*—the ability to resist deterioration of the coated or decorative surface when a wallcovering is exposed to elevated temperatures over an extended period.

3.1.10 *mildew-resistant wallcovering*—a wallcovering that has been treated to deter the growth of fungi (mildew) on the decorative surface.

3.1.11 *peelable wallcovering*—a wallcovering from which the decorative surface may be dry-peeled from the substrate, leaving a continuous layer of the substrate on the wall, when the wallcovering has been installed and peeled in accordance with the manufacturer’s instructions.

3.1.12 *scrubbability*—the ability of a wallcovering to withstand scrubbing with a brush and a prescribed detergent solution.

3.1.13 *shrinkability*—the change in the dimension of the wallcovering after wetting it and drying it.

3.1.14 *stain resistance*—the ability of a wallcovering to show no appreciable change in appearance after application and removal of specified reagents.

3.1.15 *strippable wallcovering*—a wallcovering that can be dry-stripped from the wall after having been installed and stripped in accordance with the manufacturer’s instructions, leaving a minimum of product residue on the wall and without damage to the wall surface.

3.1.16 *tear strength*—the ability of a wallcovering to resist the propagation of an existing tear.

3.1.17 *wallcovering*—a flexible product designed to cover walls and ceilings for decorative or functional purposes, or both.

3.1.18 *washability*—the ability of a wallcovering to withstand occasional sponging with a prescribed detergent solution.

4. Significance and Use

4.1 This classification provides criteria by which wallcovering of appropriate durability characteristics can be chosen for particular residential and commercial decorating applications.

5. Basis of Classification

5.1 Wallcovering is classified based on its durability in tests for:

- Abrasion resistance
- Blocking resistance
- Breaking strength
- Coating adhesion
- Cold cracking resistance
- Colorfastness
- Crocking resistance
- Heat aging resistance
- Maximum Flame Spread
- Maximum Shrinkage
- Maximum Smoke Development
- Scrubbability
- Stain resistance
- Tear resistance
- Washability

Wallcovering shall be classified in accordance with the performance criteria listed in Table 1 when tested in accordance with the appropriate test methods in Section 7.

5.1.1 *Category I, Decorative Only*—Wallcovering manufactured for decorative purposes that can be hung without damage in accordance with the manufacturer’s instructions.

5.1.2 *Category II, Decorative with Medium Serviceability*—Wallcovering primarily decorative but more washable and colorfast than Category I wallcovering.

5.1.3 *Category III, Decorative with High Serviceability*—Wallcovering manufactured for medium use, where abrasion resistance, stain resistance, scrubbability, and increased colorfastness are necessary. Category III wallcovering must also meet breaking strength and crocking resistance criteria.

5.1.4 *Category IV, Type I Commercial Serviceability*—Wallcovering manufactured for use where higher abrasion

TABLE 1 Classification Criteria

Property	Section Reference	Category I Decorative Only	Category II Decorative with Medium Serviceability	Category III Decorative with High Serviceability	Category IV Type I Commercial Serviceability	Category V Type II Commercial Serviceability	Category VI Type III Commercial Serviceability
Minimum colorfastness	7.3		23 h	46 h	200 h	200 h	200 h
Minimum washability	7.4		100 cycles	100 cycles	100 cycles	100 cycles	100 cycles
Minimum scrubbability	7.7			50 cycles	200 cycles	300 cycles	500 cycles
Minimum abrasion resistance	7.8				200 cycles (220 grit)	300 cycles (220 grit)	1000 cycles (220 grit)
Minimum breaking strength	7.9				40 lb	50 lb	100 lb
MD (machine direction)					30 lb	55 lb	95 lb
CMD (cross machine direction)							
Minimum crocking resistance	7.6			good	good	good	good
Minimum stain resistance	7.5			Reagents 1 to 9	Reagents 1 to 9	Reagents 1 to 12	Reagents 1 to 12
Minimum tear resistance	7.10				12	25	50
Maximum blocking resistance	7.11				2	2	2
Minimum coating adhesion	7.12				2 lb/in	3 lb/in.	3 lb/in.
Minimum cold cracking resistance	7.13				no change	no change	no change
Minimum heat aging resistance	7.14				pass	pass	pass
Maximum flame spread	7.15		25	25	25	25	25
Maximum smoke development	7.15		50	50	50	50	50
Maximum shrinkage	7.19						
MD (machine direction)					2	2	2
CMD (cross machine direction)					1	1	1.5

resistance, stain resistance, and scrubbability are necessary in heavy consumer and light commercial use. Category IV wallcovering must also meet crocking resistance, tear resistance, blocking resistance, cold cracking resistance, heat aging resistance, and breaking strength criteria. Wallcovering meets Type I performance as defined by Fed. Spec. CCCW-408C.

5.1.5 *Category V, Type II Commercial Serviceability*—Wallcovering manufactured for use where better wearing qualities are required and exposure to wear is greater than normal. Category V wallcovering must meet high abrasion resistance, stain resistance, and colorfastness criteria, in addition to higher crocking resistance, tear resistance, and breaking strength criteria than Categories I to IV. Blocking resistance, cold cracking resistance, coating adhesion, and heat aging resistance tests also apply. Wallcovering meets Type II performance as defined by Fed. Spec. CCCW-408C.

5.1.6 *Category VI, Type III Commercial Serviceability*—Wallcovering manufactured for use in heavy traffic areas. Category VI wallcovering must meet highest abrasion resistance, stain resistance, tear resistance, colorfastness, crocking resistance, and breaking strength criteria. Blocking resistance, coating adhesion, cold cracking resistance, and heat aging resistance tests also apply. Wallcovering meets Type III performance as defined by Fed. Spec. CCCW-408C.

5.2 Wallcovering labeled with a flammability rating shall be tested and classified as a “Class A, B, or C Interior Finish” in accordance with 6-5.1.5 and 6-5.1.6⁶ of NFPA 101, the Life Safety Code.⁷

5.3 Wallcovering described as peelable shall be capable of having the decorative surface removed as a discrete self-supporting film by a dry method defined by the manufacturer, leaving a surface that may be removed in the conventional manner or left on the wall for rehang.

5.4 Wallcovering described as strippable shall be capable of being dry-stripped in accordance with the manufacturer’s instructions without leaving appreciable residue or otherwise damaging the wall.

5.5 Wallcovering described as mildew-resistant shall be protected to resist fungi (mildew) growth on the decorative surface to achieve a rating of 0 or 1 when tested in accordance with Practice G 21.

6. Labeling

6.1 Either of the following statements is suggested for use in representing products as conforming to all requirements of this classification:

6.1.1 “This Category ___ (descriptive phrase) wallcovering conforms to all requirements established in Standard Classification of Wallcovering by Durability Characteristics ASTM F 793. Full responsibility for the conformance of this product to the standard is assumed by (name and address of manufacturer or distributor);” or

6.1.2 “Conforms to ASTM F 793, Category ___ (descriptive phrase) (name and address of manufacturer or distributor).”

⁶ Section 6-5.3.1 of NFPA 101 references NFPA 255, which is essentially identical to Test Method E 84 and UL 723.

⁷ NFPA 101 Life Safety Code Flammability ratings do not supplant flammability ratings specified by local code authorities. See 1.2.

6.2 When specified in the purchase order or contract, a producer’s or supplier’s certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, and inspected in accordance with this specification and has been found to meet the requirements. When specified in the purchase order or contract, a report of the test results shall be furnished.

7. Test Methods

7.1 *General*—The inspection and test procedures contained in this section shall be used to determine the conformance of the product to the requirements of this classification. Each manufacturer who represents a product as conforming to this classification may use statistically based sampling plans that are appropriate for each particular manufacturing process, but shall keep such essential records as are necessary to document with a high degree of assurance the claim that the requirements of this classification have been met.

7.2 *Testing Conditions*—Unless otherwise provided, test specimens under standard conditions as set forth in Method D 685. To determine whether the visual appearance of a test specimen has been appreciably changed by a test, suspend the specimen at eye level in a vertical position, as on the wall, under illumination between 100 to 150 fc (1000 to 1500 lx), and view the specimen from a distance of 4 ft (1.2 m). An appreciable change is one such as discoloration, change in gloss, blistering, softening, swelling, or loss of adhesion that is noticeable when the tested specimen is compared with a sample of the original specimen.

7.3 *Colorfastness*—Test for colorfastness to light in accordance with Fed. Std. No. 191, Method 5660.1. The exposed sample shall show no appreciable change after the prescribed hours of exposure.

7.4 *Washability*—Cut a sample of wallcovering 6½ by 17 in. (165 by 430 mm) with the longer dimension in the cross direction. Choose an area with as many different printed colors as possible. The test shall include each printed color and the ground surface. For routine quality control it is not necessary for the specimen to be “hung.” If the wallcovering is a type that cannot be washed the requisite number of rubs without wrinkling or tearing, the specimen should be hung or mounted on ⅛-in. (3.2-mm) smooth-finish board and allowed to dry 24 h at room temperature with good air circulation.

7.4.1 Place the specimen in a washability machine,⁸ equipped with a cellulose sponge,⁸ mounted on a plated brass holder [weight 1 lb (454 g)]. Distribute 1 tablespoon (15 mL) of detergent solution (Note 1) over the area to be washed. Install the cellulose sponge holder, that has been soaking in detergent solution for at least 15 min, in the machine, set the counter at zero, and turn the switch to start. At the end of the requisite number of cycles, stop the machine, remove the specimen, rinse it under running water, and set it aside for examination after drying (Note 2).

NOTE 1—The detergent solution is made by combining the following

⁸ The Gardner Abrasion Tester, Model M-105-A, equipped with a WG-2000C cellulose sponge and available from BYK Gardner, 2435 Linden Lane, Silver Springs, MD 20910, has been found acceptable for this purpose.