



Standard Guide for Standard Test Methods and Practices for Evaluating Pile Yarn Floor Covering¹

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1. Scope

1.1 This guide provides users with an index of procedures in the form of test methods, practices, and related documents that are currently used in industry for determination of properties of pile yarn floor covering. This guide is not considered as all-inclusive for testing procedures related to pile yarn floor covering.

1.1.1 It is the responsibility of the user to choose from this guide those procedures that provide test information on properties of interest for pile yarn floor covering that relate to its physical and esthetic properties and performance.

1.1.2 Procedures for particular properties appear in the following sections:

Property	Section
Surface Appearance Change	8.1-8.31, 8.35
Antimicrobial	8.5
Binding Sites	8.6
Backing Characteristics	8.7
Colorfastness to Light, Crocking, Ozone, Water, and Oxides of Nitrogen	8.8-8.12
Carpets, Cleaning	8.13 and 8.14
Conditioning	7
Delamination Resistance	8.15
Fiber Analysis	8.16
Flammability	8.17-8.20
Pile Thickness	8.21
Mass per Unit Area	8.22
Soiling	8.23-8.25
Stain Resistance	8.26
Static	8.27
Tuft Bind	8.28
Tuft Height	8.29
Tuft Element Length	8.30
Durability	8.32
Edge Ravel	8.33
Dimensional Stability	8.34
Fluorine Content	8.36
Colorfastness to Sodium	8.37

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

¹ This guide is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.21 on Pile Floor Coverings.

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1.2.1 Some of the listed procedures may cite other units as standard. In this event, language of the procedure is controlling.

1.3 *This standard does not purport to address all of the safety concerns, 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

- D123 Terminology Relating to Textiles
- D629 Test Methods for Quantitative Analysis of Textiles
- D1335 Test Method for Tuft Bind of Pile Yarn Floor Coverings
- D1776 Practice for Conditioning and Testing Textiles
- D2646 Test Methods for Backing Fabric Characteristics of Pile Yarn Floor Coverings
- D2859 Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
- D3936 Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering
- D5251 Practice for the Operation of the Tetrapod Walker Drum Tester
- D5252 Practice for the Operation of the Hexapod Tumble Drum Tester
- D5417 Practice for Operation of the Vettermann Drum Tester
- D5684 Terminology Relating to Pile Floor Coverings
- D5793 Test Method for Binding Sites per Unit Length or Width of Pile Yarn Floor Coverings
- D5823 Test Method for Tuft Height of Pile Floor Coverings
- D5848 Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
- D6119 Practice for Creating Surface Appearance Changes in Pile Yarn Floor Covering from Foot Traffic
- D6283 Test Method for Tuft Element Length of Uncoated Pile Yarn Floor Coverings

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.

- D6540** Test Method for Accelerated Soiling of Pile Yarn Floor Covering
- D6859** Test Method for Pile Thickness of Finished Level Pile Yarn Floor Coverings
- D6962** Practice for Operation of a Roller Chair Tester for Pile Yarn Floor Coverings
- D7241** Test Method for Pile Thickness of Finished Multi-level Pile Yarn Floor Covering
- D7267** Test Method for Edge Ravel Resistance of Finished Loop Pile, Pile Yarn Floor Covering
- D7330** Test Method for Assessment of Surface Appearance Change in Pile Floor Coverings Using Standard Reference Scales
- D7570** Test Method for Evaluation of Dimensional Stability of Pile Yarn Floor Covering
- E122** Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
- E648** Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- E662** Test Method for Specific Optical Density of Smoke Generated by Solid Materials

2.2 AATCC Test Methods:³

- 16** Colorfastness to Light
- 20** Fiber Analysis: Qualitative
- 20A** Fiber Analysis: Quantitative
- 107** Colorfastness to Water
- 121** Carpet Soiling: Visual Rating Method
- 122** Carpet Soiling: Service Soiling Method
- 129** Colorfastness to Ozone in the Atmosphere Under High Humidities
- 134** Electrostatic Propensity of Carpets
- 138** Cleaning: Washing of Textile Floor Coverings
- 164** Colorfastness to Oxides of Nitrogen in the Atmosphere Under High Humidities
- 165** Colorfastness to Crocking: Carpets Crockmeter Method
- 171** Carpets: Cleaning of; Hot Water Extraction Method
- 174** Antimicrobial Activity Assessment of Carpets
- 175** Stain Resistance: Pile Floor Coverings
- 189** Fluorine Content of Carpet Fibers
- 196** Colorfastness to Sodium Hypochlorite of a Textile Floor Covering

2.3 Federal Regulations:⁴

- Title 16, Chapter II, Part 1630 and 1631** Standard for the Surface Flammability of Carpets and Rugs (FF 1-70)

3. Terminology

3.1 For definitions of terms relating to Pile Floor Coverings, D13.21, refer to Terminology **D5684**.

3.1.1 The following terms are relevant to this standard: backing, backing fabric, binding sites, carpet, change in surface appearance, durability, finished, finished pile yarn floor cover-

ing, floor covering, pile, pile yarn floor covering, resistance to delamination, soiling, textile floor covering, total mass, tuft bind, tuft element, tuft height, tufted fabric.

3.2 For all other terminology related to textiles, refer to Terminology **D123**.

4. Significance and Use

4.1 This guide is useful to select test methods and or practices that are commonly used in industry for evaluating pile yarn floor covering. Refer to the particular test method or practice cited for the property of interest for significance and use statements.

5. Sampling

5.1 Sampling Units:

5.1.1 *Uncoated Floor Covering*—The basic sampling unit of uncoated floor covering is a production roll.

5.1.2 *Coated Floor Covering*—The basic sampling unit of coated floor covering is a shipping roll. The number of shipping rolls obtained from each production roll ranges from one to over ten.

5.2 *Lot Sample*—In quality acceptance and quality control situations, take a lot sample as directed in Practice **E122** when statistical knowledge of the product variability and test method precision is available and a decision has been made on the maximum deviation that can be tolerated between the estimate to be made from the lot sample and the result that would be obtained by measuring every sampling unit of the lot. Otherwise the number of sampling units is a lot sample and the use of the test results obtained from the individual test samples shall be in accordance with the manufacturer's Quality Control program or with the specification agreed upon between purchaser and the supplier.

5.3 *Laboratory Sampling Unit*—A laboratory sampling unit shall consist of full width section of floor covering cut from one end of each roll in the lot sample and shall be at least 100 mm (4 in.) longer than the specimens required for the test being conducted. For coated pile yarn floor covering exclude the seam end of a production roll.

5.4 *Test Specimens*—From each laboratory sampling unit, take as many test specimens as directed by the procedure being used that will yield a standard test result.

6. Calibration

6.1 Many of the test methods cited herein require the use of properly calibrated testing equipment. All testing systems should be verified before use. Refer to the individual test methods for specific information on the preparation, calibration, and verification of apparatus.

7. Conditioning

7.1 Condition the test specimens in the specific atmosphere detailed in the method of interest. If a conditioning procedure is not specified, bring the test specimens to moisture equilibrium in the standard atmosphere for testing textiles as directed in Practice **D1776**.

³ Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, <http://www.aatcc.org>.

⁴ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

8. Test Methods and Practices

8.1 Create surface appearance changes in pile yarn floor coverings as directed in Practice **D6119**.

8.2 Produce changes in appearance due to changes in surface structure by mechanical action of the Vettermann Drum as directed in Practice **D5417**.

8.3 Produce changes in appearance due to changes in surface structure by mechanical action of the Hexapod Drum as directed in Practice **D5252**.

8.4 Produce changes in appearance due to changes in surface structure by mechanical action of the Tetrapod Drum as directed in Practice **D5251**.

8.5 Assess the antimicrobial activity of new carpet materials as directed in AATCC **174**.

8.6 Determine the number of binding sites per unit length or width of pile yarn floor covering as directed in Test Method **D5793**.

8.7 Determine the fabric backing characteristics of pile yarn floor coverings as directed in Test Methods **D2646**.

8.8 Determine the colorfastness to light as directed in AATCC **16**.

8.9 Determine the colorfastness to crocking as directed in AATCC **165**.

8.10 Determine the colorfastness to ozone in the atmosphere under high humidity as directed in AATCC **129**.

8.11 Determine colorfastness to water as directed in AATCC **107**.

8.12 Determine the colorfastness to oxides of nitrogen in the atmosphere under high humidity as directed in AATCC **164**.

8.13 Carpets: Cleaning of, Hot water extraction method as directed in AATCC **171**.

8.14 Simulate changes that occur in cleaning; Washing of textile floor coverings as directed in AATCC **138**.

8.15 Determine the resistance to delamination as directed in Test Method **D3936**, and the visual assessment of delamination of the secondary back as directed in Practice **D6962**.

8.16 Perform fiber analysis as directed in Test Method **D629**, and or AATCC **20** and **20A**.

8.17 Determine the ignition characteristics of finished textile floor covering as directed in Test Method **D2859**.

8.18 Determine the ignition characteristics of finished textile floor coverings as directed in the Code of Federal Regulations, **Title 16, Chapter II, Part 1630** and **1631**.

8.19 Determine the optical density of smoke generated by solid materials as directed in Test Method **E662**.

8.20 Measure the critical radiant flux of horizontally mounted floor covering systems exposed to a flaming ignition source as directed in Test Method **E648**.

8.21 Determine the pile thickness of pile yarn floor coverings as directed in Test Method **D6859** and Test Method **D7241**.

8.22 Determine the mass per unit area of pile yarn floor coverings as directed in Test Method **D5848**.

8.23 Determine the soiling propensity of pile yarn floor covering as directed in Test Method **D6540**.

8.24 Evaluate the surface soiling of carpets and rugs as directed in AATCC **121**.

8.25 Evaluate the degree of cleanness of pile yarn floor coverings exposed normal foot traffic as directed in AATCC **122**.

8.26 Determine the resistance to staining as directed in AATCC **175**.

8.27 Determine the static generating propensity of carpets as directed in AATCC **134**.

8.28 Measure the tuft bind of pile yarn floor covering as directed in Test Method **D1335**.

8.29 Determine the tuft height of pile yarn floor coverings as directed in Test Methods **D5823**.

8.30 Determine the tuft element length of uncoated pile yarn floor coverings as directed in Test Method **D6283**.

8.31 Produce changes in appearance due to changes in surface structure by mechanical action of the Roller Chair Tester as directed in Practice **D6962**.

8.32 Determine the durability of pile yarn floor covering as directed in Practice **D6962**.

8.33 Determine the edge ravel of pile yarn floor coverings as directed in Test Method **D7267**.

8.34 Determine the dimensional stability of pile floor coverings as directed in Test Method **D7570**.

8.35 Determine the surface appearance change of pile floor coverings as directed in Test Method **D7330**.

8.36 Determine the fluorine of carpet fiber as directed in Test Method AATCC **189**.

8.37 Determine the colorfastness to sodium hypochlorite as directed in Test Method AATCC **196**.

9. Keywords

9.1 antimicrobial; appearance change; backing characteristics; binding sites; carpet; colorfastness; delamination; dimensional stability; durability; fiber analysis; flammability; fluorine content; mass per unit area; pile thickness; pile yarn floor covering; soiling; stain resistance; static; tuft bind; tuft element length; tuft height

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