Designation: D3597 – 02 (Reapproved 2008)

Standard Performance Specification for Woven Upholstery Fabrics—Plain, Tufted, or Flocked[1]

This standard is issued under the fixed designation D3597; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This performance specification covers the performance requirements for plain, tufted, or flocked woven upholstery fabrics as used in the manufacture of new indoor furniture. These requirements apply to both the warp and filling directions for those factors where each fabric direction is pertinent.

1.2 This performance specification is not applicable to fabrics used in porch, deck, or lawn furniture; nor for knitted fabrics, bonded or laminated fabrics, or surface-coated fabrics (such as vinyls and urethanes).

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

D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam[3] [3]

D1175 Discontinued 1982; Method of Test for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder and Uniform Abrasion); Replaced by D 4157, D 4158[3]

D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus [3]

D2262 NO TITLE

D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

2.2 *AATCC Test Methods:*[4]

8 AATCC Colorfastness to Crocking: Crockmeter Method

16 Colorfastness to Light

23 Colorfastness to Burnt Gas Fumes

107 Colorfastness to Water

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method[4]

129 Colorfastness to Ozone in the Atmosphere Under High Humidities

Gray Scale for Color Change, Evaluation Procedure 1

Chromatic Transference Scale, AATCC Evaluation Procedure 8 AATCC 9–Step Chromatic Transference Scale

Specifications Standards Test Procedures for Upholstered Furniture Fabrics [5]

Guides for the Household Furniture Industry [6]

2.3 *Federal Standard:*

16CFR, Chapter II-Consumer Product Safety Commission, Subchapter D-Flammable Fabrics Act Regulation[7]

2.4 *Military Standard:*

ASQ/ANSI Z1.4 Sampling Procedures and Tables for Inspection by Attributes[8]

NOTE 1—Reference to test methods in this standard give only the permanent part of the designation of ASTM, AATCC, or other test methods. The current editions of each test method cited shall prevail.

3. Terminology

3.1 For definitions of textile terms used in this performance specification, refer to Terminology D123. Definitions found in a dictionary of common terms are suitable for terms used in this performance specification.

4. Significance and Use

4.1 Fabrics intended for this end-use should meet all of the requirements listed in Table 1.

4.2 It should be recognized that fabrics can be produced utilizing an almost infinite number of combinations of construction variables (e.g., type of fibers, percentage of fibers, yarn twist, yarn number, warp and pick count, chemical and

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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.

[3] Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

[4] AATCC Technical Manual, available from the American Association of Textile Chemists and Colorists, P. O. Box 12215, Research Triangle Park, NC 27709.

[5] Issued in 1969 by the National Association of Furniture Manufacturers and the National Retail Furniture Association. Available from Home Furniture Manufacturers Assn., P. O. Box HP-7, High Point, NC 27261.

[6] Available from the Bureau of Consumer Protection, Federal Trade Commission, Washington, DC 20580.

[7] Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

[8] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

TABLE 1 Specification Requirements

Characteristics	Requirements	Section
Breaking strength (load)	222 N (50 lbf), min	6.1
Tongue tear strength	27 N (6 lbf), min	6.2
Resistance to yarn slippage	111 N (25 lbf), min	6.3
Surface abrasion[A]		
Light-duty	3000 cycles (double rubs), min	6.4
Medium-duty	9000 cycles (double rubs), min	6.4
Heavy-duty	15,000 cycles (double rubs), min	6.4
Dimensional change:		
Warp or filling	5.0% shrinkage, max to 2.0% gain, max	6.5
Colorfastness to:[B]		
Water,[C] Color Change	grade 4,[D] min	6.6
Solvent,[C] Color Change	grade4,[D] min	6.7
Burnt gas fumes-2 cycles	grade 4,[D] min	6.8
Crocking:		
Dry	grade 4,[E] min	6.9
Wet	grade 3,[E] min	6.9
Light-40 AATCC Fading Units	grade 4,[D] min	6.10
Ozone 1 cycle	grade 4,[D] min	6.11
Retention of hand, character, and appearance	no significant change	6.12
Durability of back coating	no significant change	6.13
Flammability	pass	6.14
FTC Requirements	pass	6.15

[A] For guideline purposes see 6.4.1.
[B] Class in the colorfastness requirements is based on a numerical scale of 5 for negligible for no colorchange or color transfer to 1 for very severe color change or color transfer.
[C] For guidelines purposes—See Section 6.6.2.
[D] AATCC Gray Scale for Color Change.
[E] AATCC Chromatic Transference Scale.

mechanical finished). Additionally, fashion or aesthetics dictate that the ultimate consumer may find acceptable articles made from fabrics that do not conform to all of the requirements in Table 1.

4.2.1 Hence, no single performance specification can possibly apply to all the various fabrics that could be utilized for this end-use.

4.3 The uses and significance of particular properties and test methods are discussed in the appropriate section of the specified test methods.

5. Specification Requirements

5.1 The properties of woven upholstery fabrics (plain, tufted, or flocked) shall conform to the specification requirements in Table 1.

6. Test Methods (See Note 1)

6.1 *Breaking Strength*—Determine the dry breaking force in the standard atmosphere for testing textiles, as directed in Test Method D5034, using a constant rate of extension (CRE) tensile testing machine.

6.2 *Tear Strength*—Determine the tear strength in accordance with Test Method D2262.

NOTE 2—If preferred, use of Test Method D1424 is permitted with existing requirements as given in this standard. However, in case of controversy, Test Method D2262 shall prevail.

6.3 *Resistance to Yarn Slippage*:

6.3.1 Determine the resistance to yarn slippage in accordance with Test Method D434. Regardless of the disclaimer found in 1.2 of Test Method D434, this procedure is applicable with the following modifications.

6.3.2 Sew the seam using a minimum of seven and a maximum of eight stitches per inch (320 stitches per metre).

6.3.3 Use a chrome or nickel plated needle, 0.063 in. (1.60 mm) in diameter.[9]

6.3.4 Use a No. 24-4 hard finish "Z" twist white cotton sewing thread[10] as the needle thread. Use either hard or soft finish No. 24-4 "Z" twist white cotton sewing thread for the bobbin thread.

6.4 *Surface Abrasion*:

6.4.1 Determine the surface abrasion in accordance with Test Method D1175, using the Oscillatory Cylinder Method with the following modifications.

6.4.2 Use a clean wire screen abradant, stainless steel, 50 by 70 mesh (210 by 297 µm), backed by a 14-mesh (1.4 by 1.4 mm) to an 18-mesh (1.0 by 1.0 mm) screen.

6.4.3 The tension of the specimen shall be 4 lbf (18 N) and the compression force shall be 3 lbf (13 N).

6.4.4 Test at least two specimens in the warp direction, and at least two in the filling direction.

6.4.5 At the end of 3000 cycles (double rubs) examine the specimens for loose threads and wear (slight discoloration from the stainless steel screen on light colored fabrics is disregarded). If no noticeable change is apparent, continue the test for another 6000 cycles (a total of 9000 cycles). Examine the specimen again. If no noticeable change is apparent, continue the test for another 6000 cycles (a total of 15,000 cycles).

NOTE 3—Loss of pigment and frosting are considered in evaluating wear. However, other changes in surface appearance or disturbance of the surface character without significant abrasive wear should be disregarded.

6.4.6 Classify fabrics that show no noticeable wear after 3000 cycles but show appreciable wear at 9000 cycles as

[9] Singer No. 23 needle, or its equivalent has been found satisfactory for this method.
[10] Source, most suppliers of upholstery sewing thread.