



Designation: D 3691 – 95a

Standard Performance Specification for Woven, Lace, and Knit Household Curtain and Drapery Fabrics¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This performance specification covers the requirements for all knit, lace, foam back, stitch-bonded, conventional weights, and sheer woven fabrics to be used in the manufacture of curtains and draperies.

1.2 This performance specification is not applicable to fabrics made of glass.

1.3 For those properties where fabric direction is pertinent, these requirements apply to the length and width directions for woven fabric and to both the wale and course directions for knit fabric.

1.4 *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:

- D 123 Terminology Relating to Textiles²
- D 231 Methods of Testing Tolerances for Knit Goods³
- D 1336 Test Method for Distortion of Yarn in Woven Fabrics²
- D 1424 Test Method for Tear Resistance of Woven Fabrics by Falling-Pendulum (Elemendorf) Apparatus²
- D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine)²
- D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics²
- D 2905 Practice for Statements on Number of Specimens for Textiles²
- D 5034 Test Method for Breaking Force and Elongation of Textile Fabrics (Grab Test)²

¹ This specification is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.56 on Performance Standards for Textile Fabrics.

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² *Annual Book of ASTM Standards*, Vol 07.02.

³ *Discontinued*—See 1979 *Annual Book of ASTM Standards*, Part 32.

2.2 AATCC Test Methods⁴

- 8 Colorfastness to Crocking: AATCC Crockmeter Method
- 16 Colorfastness to Light
- 23 Colorfastness to Burnt Gas Fumes
- 61 Colorfastness to Washing, Domestic, and Laundering, Commercial: Accelerated
- 116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method
- 124 Appearance of Durable Press Fabric After Repeated Home Laundering
- 129 Colorfastness to Ozone in the Atmosphere Under High Humidities
- 132 Colorfastness to Dry Cleaning
- 135 Dimensional Changes in Automatic Home Laundering of Durable Press Woven or Knit Fabric
- Evaluation Procedure 1 Gray Scale for Color Change
- Evaluation Procedure 2 Gray Scale for Staining
- Evaluation Procedure 3 AATCC Chromatic Transference Scale

NOTE 1—Reference to test methods in this specification 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 Definitions:

3.1.1 *sheer, n*—a woven fabric that is transparently thin or diaphanous.

3.2 For definitions of other textile terms used in this specification, refer to Terminology D 123 and to the Technical Manual of the American Association of Textile Chemists and Colorists.⁴

4. Performance Requirements

4.1 The properties of woven, lace, and knit fabrics for curtains and draperies shall conform to the specification requirement in Table 1.

5. Significance and Use

5.1 Woven lace and knit fabrics should meet all of the

⁴ Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

TABLE 1 Performance Requirements

Characteristics	Knit and Lace	Sheer (woven)	Foam Back, Stitch Bonded, and Conventional Weights (woven)	Section
Breaking strength (load), (CRT method), in both directions ^A	...	67 N (15 lbf), min	89 N (20 lbf), min	7.1
Bursting strength (ball burst) ^A	138 kPa (20 lbf/in. ²), min	...	...	7.2
Tear strength (tongue tear), in both directions ^A	...	4.4 N (1 lbf), min	6.7 N (1.5 lbf), min	7.3
Dimensional change:				
After 5 launderings in both directions	3.0 % max	3.0 % max	3.0 % max	7.4.1
After 3 dry cleanings in both directions	3.0 % max	3.0 % max	3.0 % max	7.4.2
Distortion of yarn:				
1-lbf load	...	2.54 mm (0.1 in.), max	...	7.5
2-lbf load	...	...	2.54 mm (0.1 in.), max	
Colorfastness to laundering: ^B				
Alteration in shade	Class 4 ^C min	Class 4 ^C min	Class 4 ^C min	7.6.1
Staining	Class 3 ^D min	Class 3 ^D min	Class 3 ^D min	
Colorfastness to dry cleaning:				
Alteration in shade	Class 4 ^C min	Class 4 ^C min	Class 4 ^C min	7.6.2
Burnt gas fumes, 2 cycles:				
Alteration in shade	Class 4 ^C min	Class 4 ^C min	Class 4 ^C min	7.6.3
After 1 refurbishing	Class 4 ^C min	Class 4 ^C min	Class 4 ^C min	
Crocking:				
Dry	Class 4 ^E min	Class 4 ^E min	Class 4 ^E min	7.6.4
Wet	Class 3 ^E min	Class 3 ^E min	Class 3 ^E min	
Light (60 AATCC FU), xeron ^A	Step 4 ^C min	Step 4 ^C min	Step 4 ^C min	7.6.5
Ozone, 1 cycle	Class 4 ^C min	Class 4 ^C min	Class 4 ^C min	7.6.6
Fabric appearance	DP 3.5 ^F min	DP 3.0 min	DP 3.5 min	7.7
Retention of hand, character, and appearance	pass	pass	pass	7.8
Durability of back coating	pass	pass	pass	7.9
Flammability	pass	pass	pass	7.10
Light degradation ^G	...	...	...	7.11

^A There is more than one standard test method that can be used to measure breaking strength, bursting strength, tear strength, and lightfastness. These test methods cannot be used interchangeably since there may be no overall correlation between them (see Note 2, Note 3, Note 4, Note 5, and Note 9).

^B Class in colorfastness and DP rating is based on a numerical scale of 5.0 for negligible color change, color transfer, or wrinkling to 1.0 for very severe color change, color transfer, or wrinkling. The numerical rating in Table 1 or higher is acceptable.

^C AATCC Gray Scale for Color Change.

^D AATCC Gray Scale for Staining.

^E AATCC Chromatic Transference Scale.

^F For durable-press fabrics only.

^G The development of a standard method has been referred to the American Association of Textile Chemists and Colorists.

requirements in Table 1 to be suitable for use in the manufacture of curtains and draperies.

5.2 It is recognized that for purposes of fashion or aesthetics, the ultimate consumer of articles made from these fabrics may find acceptable some fabrics that do not conform to all of the requirements in Table 1. For example, the fabric could be dyed in shades that do not meet the requirement in Table 1 for colorfastness to light, yet be acceptable to the ultimate consumer because the shade is fashionable. In such cases, one or more of the requirements may be modified by mutual agreement between the purchaser and the supplier.

5.2.1 If any of the requirements in Table 1 are modified by mutual agreement between the purchaser and the supplier, any reference to the specification shall specify that: "This fabric meets ASTM Specification D 3691 except for the following characteristic(s)."

5.3 The uses and significance of particular properties are discussed in the appropriate sections of the specific methods.

6. Sampling

6.1 Tests shall be performed on the fabric as it will reach the user.

6.2 Unless otherwise agreed upon, as when specified in an applicable material specification, take the number of specimens

specified in each of the applicable test methods.

6.2.1 If there has been no prior agreement and the test method does not specify the number of specimens, use the procedures in Practice D 2905 to determine the number of specimens, such that the user may expect at the 95 % probability level that the test result is not more than 5 % of the average above or below the true average (that is, a theoretical average from an infinite number of observations) when using a reliable estimate of variability of individual observations on similar materials in the user's laboratory under conditions of single-operator precision.

7. Test Methods (Note 1)

7.1 *Breaking Force* (Woven Fabrics Only)—Determine the dry breaking force in the standard atmosphere for testing textiles, as directed in Test Method D 5034, using a constant rate of traverse (CRT) tensile testing machine with the speed of the pulling clamp at 300 ± 10 mm (12 ± 0.5 in.)/min.

NOTE 2—If preferred a constant-rate-of-extension (CRE) tensile testing machine may be used. The crosshead speed should be as agreed upon between the purchaser and the supplier. There may be no overall correlation between the results obtained with the CRT machine and with the CRE machine. Consequently, these two breaking load testers cannot be

used interchangeably. In case of controversy, the CRT method shall prevail.

7.2 Bursting Strength (Knit Fabrics Only)—Determine the bursting strength of knit fabrics as directed in Methods D 231 using an approved type of CRT machine equipped with a bursting attachment or an approved type of diaphragm bursting tester as agreed upon between the purchaser and the supplier.

NOTE 3—Care should be taken to subtract the tare diaphragm pressure from the gross pressure to obtain actual bursting strength of fabric when using the diaphragm bursting tester. Calibrate the equipment according to the manufacturer's instruction before use. Since there is no overall correlation between the results obtained with the CRT machine equipped with a bursting attachment and the diaphragm bursting tester, these two bursting testers cannot be used interchangeably. In case of controversy, the CRT machine equipped with a bursting attachment method shall prevail.

NOTE 4—The precision of the ball burst method using the CRT machine equipped with a bursting attachment and the precision of the diaphragm bursting tester method are being established by Subcommittee D13.59. The methods are accordingly not recommended for acceptance testing unless preceded by an interlaboratory check test in the laboratory of the purchaser and the laboratory of the supplier using randomized replicate specimens of the type of material to be evaluated.

7.3 Tongue Tear Strength (Woven Fabrics Only)—Determine the tear strength as directed in Test Method D 2262.

NOTE 5—If preferred, use of Test Method D 1424 is permitted with existing requirements as given in this specification. There may be no overall correlation between the results obtained with the tongue tear machine and with the Elmendorf machine. Consequently, these two tongue tear testers cannot be used interchangeably. In case of controversy, Test Method D 2262 shall prevail.

7.4 Dimensional Change:

7.4.1 Laundering—Determine the dimensional change after five launderings as directed in Test II B of AATCC Test Method 135 unless otherwise agreed upon between the purchaser and the supplier.

NOTE 6—Launderable fabrics are expected normally to be dry-cleanable, except where all or part of the fabric is not dry-cleanable and is so labeled. For example, the fabric could contain a functional finish soluble in the solvent, or the fiber could be degraded by the solvent, which would be the case with poly(vinyl chloride) fiber. "Dry-cleanable" goods are to be dry-cleaned only.

7.4.1.1 Mark the test specimens in sets of three 18-in. (460-mm) gage distance in both the length and width directions.

7.4.1.2 Proceed as outlined in AATCC Test Method 135.

NOTE 7—Nondurable-press items can be flat-bed pressed after tumble drying to eliminate wrinkles before measuring.

7.4.2 Dry Cleaning—Determine the dimensional change after three dry cleanings as directed in 10.1.1 to 10.1.4 of Test Methods D 2724 (Note 6).

7.4.2.1 Mark test specimens in sets of three 18-in. (460-mm) gage distance in both the length and width directions.

7.4.2.2 Proceed as outlined in 10.1.1 to 10.1.4 of Test Methods D 2724.

7.5 Distortion of Yarn (Woven Fabrics Only)—Determine the distortion of yarn as directed in Test Method D 1336 using a 1-lbf (4.4-N) load for sheer fabrics and a 2-lbf (8.9-N) load for all other woven fabrics.

7.6 Colorfastness:

7.6.1 Laundering—Determine the colorfastness to laundering as directed in Test II A of AATCC Test Method 61 unless otherwise agreed upon between the purchaser and the seller (Note 6).

7.6.1.1 In this test method, use Multifiber Test Fabric No. 10⁵ and evaluate only cotton, polyester, and self-fiber.

7.6.2 Dry Cleaning—Determine the colorfastness to dry cleaning as directed in AATCC Test Method 132 (Note 6).

7.6.3 Burnt Gas Fumes—Determine the colorfastness to burnt gas fumes after 2 cycles on the original fabric as directed in AATCC Test Method 23. Repeat test for 2 cycles on another specimen after one laundering or one dry cleaning.

NOTE 8—Laundering conditions shall be the same as those in 7.4.1 and dry-cleaning conditions shall be the same as those in 7.4.2.

7.6.4 Crocking—Determine the colorfastness to wet and dry crocking as directed in AATCC Test Method 8 for solid shades and AATCC Test Method 116 for prints, or as agreed upon between the purchaser and supplier.

7.6.5 Light—Determine colorfastness to light as directed in AATCC Test Method 16.

NOTE 9—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Test Method 16, with no overall correlations between them. Consequently, these machines cannot be used interchangeably. In case of controversy, results obtained with the water-cooled xenon-arc machine listed in Option E shall prevail.

NOTE 10—Standardization of the xenon-arc lamp to 60 AATCC FU can be done by using three L4 Blue Wool Lightfastness Standards.

7.6.6 Ozone Fading—Determine the colorfastness to ozone fading after one cycle as directed in AATCC Test Method 129.

7.7 Fabric Appearance—Determine the appearance of durable-press fabric after five launderings as directed in Test II B of AATCC Test Method 124 unless otherwise agreed upon between the purchaser and the supplier.

7.8 Retention of Hand, Character, and Appearance—Fabric tested in accordance with 7.4.1 and 7.4.2 shall not change more in hand, character, or appearance than in the limitation set by prior agreement between the purchaser and the seller.

7.9 Durability of Back Coating—A fabric shall exhibit no evidence of cracking or peeling of back coating when subjected to tests in accordance with 7.4.1 and 7.4.2.

7.10 Flammability—The flammability requirements shall be as agreed upon between the purchaser and the seller, except when regulated by applicable Government mandatory standards.

NOTE 11—The technical need for an ASTM test method for determining the flammability of the types of fabric addressed by this specification has been referred to Subcommittee D13.52 on Flammability and will be incorporated here should a test method become available.

7.11 Resistance to Light Degradation—No standard method is available for the determination of light degradation of curtain and drapery fabrics.⁶

8. Keywords

8.1 drapery; durability; fabric; lace fabric; performance; specification

⁵ Available from Testfabrics, Inc., P.O. Box 118, Middlesex, NJ 08846.

⁶ The development of a standard method has been referred to the American Association of Textile Chemists and Colorists.

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