



Designation: D 4117 – 95a

## Standard Performance Specification for Women's and Girls' Woven Robe, Negligee, Nightgown, Pajama, Slip, and Lingerie Fabrics<sup>1</sup>

This standard is issued under the fixed designation D 4117; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This performance specification covers woven fabrics comprised of any textile fiber or mixture of fibers used in women's and girls' robes, negligees, nightgowns, pajamas, slips, or lingerie.

1.2 These requirements apply to the length and width directions for those properties where each fabric direction is pertinent.

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:

- D 123 Terminology Relating to Textiles<sup>2</sup>
  - D 434 Test Method for Resistance of Slippage of Yarns in Woven Fabrics Using a Standard Seam<sup>2</sup>
  - D 1336 Test Method for Distortion of Yarn in Woven Fabrics<sup>2</sup>
  - D 1424 Test Method for Tear Resistance of Woven Fabrics by Falling-Pendulum (Elmendorf) Apparatus<sup>2</sup>
  - D 2261 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Extension Tensile Testing Machine)<sup>2</sup>
  - D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine)<sup>2</sup>
  - D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics<sup>2</sup>
  - D 5034 Test Method for Breaking Force and Elongation of Textile Fabrics (Grab Test)<sup>3</sup>
- #### 2.2 AATCC Test Methods:<sup>4</sup>
- 8 Colorfastness to Crocking: AATCC Crockmeter Method

- 15 Colorfastness to Perspiration
  - 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 Fabrics after Repeated Home Launderings
  - 132 Colorfastness to Drycleaning
  - 135 Dimensional Changes in Automatic Home Laundering of Woven or Knit Fabrics
  - Evaluation Procedure No. 1 Gray Scale for Color Change
  - Evaluation Procedure No. 2 Gray Scale for Staining
  - Evaluation Procedure No. 3 AATCC Chromatic Transference Scale.
- #### 2.3 Federal Standard:<sup>5</sup>
- 16 CFR, Chapter II—Consumer Product Safety Commission Subchapter D—Flammable Fabrics Act Regulations
- #### 2.4 Military Standard:<sup>6</sup>
- MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes

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 Definition:

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

3.1.1.1 *Discussion*—There is no clear distinction between sheer fabrics and nonsheer fabrics. The purchaser and seller should agree in advance as to which category a fabric should be classified.

3.2 For definitions of other textile terms used in this specification, refer to the individual ASTM and AATCC methods and to Terminology D 123.

3.3 Definitions found in a dictionary of common terms are suitable for this specification.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 07.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 07.02.

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

<sup>5</sup> Available from Superintendent of Documents, Government Printing Office, Washington, DC 20407.

<sup>6</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

**TABLE 1 Specification Requirements**

NOTE 1—Class in colorfastness is based on a numerical scale of 5 for negligible color change or color transfer to 1 for very severe color change or color transfer.

Characteristic	Requirements		Section
	Sheer Fabrics	Non-Sheer Fabrics	
<i>Breaking strength (load)(CRT)<sup>A</sup></i>	67 N (15 lbf), min	8.9 N (20 lbf), min	7.1
<i>Yarn slippage</i>	6 mm (¼ in.) separation at 44 N (10 lbf), min	6 mm (¼ in.) separation at 67 N (15 lbf), min	7.2
<i>Tongue-tear strength<sup>A</sup></i>	4.4 N (1 lbf), min	6.7 N (1.5 lbf), min	7.3
<i>Yarn distortion:</i>			7.4
Satin	2.5 mm (0.1 in.), max at 4.4 N (1 lbf) load	2.5 mm (0.1 in.), max at 4.4 N (1 lbf) load	
All other	1 mm (0.05 in.) max at 4.4 N (1 lbf) load	1 mm (0.05 in.), max at 4.4 N (1 lbf) load	
<i>Dimensional change:</i>			
Laundering	2.5%, max	2.5 %, max	7.5.1
Drycleaning	2.0 %, max	2.0 %, max	7.5.2
<i>Colorfastness:</i>			
Burnt gas fumes—2 cycles:			7.6.1
Shade change, original fabric	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , mn	
Shade change, after one laundering or one drycleaning	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Laundering:			7.6.2
Shade change	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Staining	Class 3 <sup>C</sup> , min	Class 3 <sup>C</sup> , min	
Drycleaning:			7.6.3
Shade change	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Crocking:			7.6.4
Dry	Class 4 <sup>D</sup> , min	Class 4 <sup>D</sup> , min	
Wet	Class 3 <sup>D</sup> , min	Class 3 <sup>D</sup> , min	
Perspiration:			7.6.5
Shade change	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Staining	Class 3 <sup>C</sup> , min	Class 3 <sup>C</sup> , min	
Light (10 AATCC FU)(xenon-arc)	Step 4 <sup>B</sup> , min	Step 4 <sup>B</sup> , min	7.6.6
Fabric appearance (see 7.7.1.1)	DP 3.5, min	DP 3.5, min	7.7
<i>Flammability</i>	pass	pass	7.8

<sup>A</sup> There is more than one method that can be used to measure breaking strength (load), tear strength, and lightfastness. These methods cannot be used interchangeably since there may be no overall correlation between them (see Note 2, Note 4, and Note 7).

<sup>B</sup> AATCC Gray Scale for Color Change.

<sup>C</sup> AATCC Gray Scale for Staining.

<sup>D</sup> AATCC Chromatic Transference Scale.

#### 4. Specification Requirements

4.1 The properties of woven fabrics for women's and girls' robes, negligees, nightgowns, pajama, slips, and lingerie shall conform to the specification requirements in Table 1.

#### 5. Significance and Use

5.1 Upon agreement between the purchaser and the supplier, fabrics intended for this end use should meet all of the requirements listed in Table 1 of this specification.

5.2 It is recognized that for purposes of fashion or aesthetics the ultimate consumer of articles made from these fabrics may find acceptable fabrics that do not conform to all of the requirements in Table 1. Therefore, one or more of the requirements listed in Table 1 may be modified upon agreement between the purchaser and the supplier.

5.2.1 In such cases, any references to the specification shall specify that: "This fabric meets ASTM Specification D 4117 except for the following characteristic(s)."

5.3 Where no prepurchase agreement has been reached between the purchaser and the supplier, and in case of controversy, the requirements listed in Table 1 are intended to be used as a guide only. As noted in 5.2, ultimate consumer demands dictate varying performance parameters for any particular style of fabric.

5.4 The uses and significance of particular properties and

methods are discussed in the appropriate sections of the specified methods.

#### 6. Sampling

6.1 *Lot Sample*—As a lot sample for acceptance testing, take at random the number of rolls as directed in an applicable specification or other agreement between the purchaser and the supplier, such as an agreement to use MIL-STD-105D.

6.2 *Laboratory Sample*—From each roll or piece in the lot sample, cut two laboratory samples the full width of the fabric and at least 375 mm (15 in.) along the selvage.

#### 7. Test Methods (See Note 1)

7.1 *Breaking Force*—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  $300 \pm 10$  mm ( $12 \pm 0.5$  in.)/min.

NOTE 2—If preferred, the use of a constant-rate-of-extension (CRE) tensile-testing machine is permitted. 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 the CRE machine. Consequently, these two breaking-load testers cannot be used interchangeably. In case of controversy, the CRT method shall prevail.

7.2 *Resistance to Yarn Slippage*—Determine the resistance

to yarn slippage as directed in Test Method D 434.

NOTE 3—The precision of Test Method D 434 is being established, and it may not be suitable for fabrics with a low number of warp (ends) and filling (picks) counts (see 5.2).

7.3 *Tongue-Tear Strength*—Determine the tongue-tear strength as directed in Test Method D 2262.

NOTE 4—If preferred, use of Test Methods D 1424 and D 2261 is permitted with existing requirements as given in this specification. There may be no overall correlation between the results obtained with the tongue-tear machines and the Elmendorf machine. Consequently, these three tear testers cannot be used interchangeably. In case of controversy, Method D 2262 shall prevail.

7.4 *Yarn Distortion*—Determine the yarn distortion as directed in Test Method D 1336.

#### 7.5 *Dimensional Change:*

7.5.1 *Laundering*—Determine the maximum-dimensional change after five launderings or as agreed upon between the purchaser and the supplier as directed in the applicable procedure in AATCC Test Method 135 (Note 5).

7.5.1.1 The wash conditions and drying procedure shall be as specified by the supplier.

7.5.2 *Drycleaning*—Determine the maximum-dimensional changes after three drycleanings or as agreed upon between the purchaser and the supplier, as directed in 10.1.1 through 10.1.5 of Test Methods D 2724.

NOTE 5—Launderable fabrics are expected to the 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 that is soluble in the solvent, or the fiber could be degraded by the solvent, which would be the case with poly(vinyl chloride) fiber. “Drycleanable” goods are to be drycleaned only.

#### 7.6 *Colorfastness:*

7.6.1 *Burnt Gas Fumes*—Determine the colorfastness to burnt gas fumes on the original fabric and after one laundering or one drycleaning as directed in AATCC Test Method 23 after 2 cycles.

NOTE 6—Washing conditions shall be the same as those used in 7.5.1.1. Drycleaning conditions shall be the same as those used in 7.5.2.

7.6.2 *Laundering*—Determine the colorfastness to laundering as directed in the applicable procedure of AATCC Test Method 61. The test conditions shall be as specified by the supplier (Note 5).

7.6.3 *Drycleaning*—Determine colorfastness to drycleaning as directed in AATCC Test Method 132 (Note 5).

7.6.4 *Crocking*—Determine colorfastness to dry and wet 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 the supplier.

7.6.5 *Perspiration*—Determine colorfastness to perspiration as directed in AATCC Test Method 15.

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

NOTE 7—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.

7.7 *Fabric Appearance*—Determine the fabric appearance as directed in AATCC Test Method 124 after laundering using the wash-and-wear cycle or the normal cycle as agreed upon between the purchaser and the supplier as specified in 7.5.1.1 for washable fabrics or after drycleaning as specified in 7.5.2 for drycleanable fabrics (see Note 5).

7.7.1 For fabrics not intended for use in durable press garments determine the fabric smoothness after pressing as specified in 10.2.5 of Test Methods D 2724.

7.7.1.1 The fabric smoothness or durable press (DP) rating of such fabrics, and the DP rating of dry-cleaned fabrics, shall have decreased no more than ½ (DP) rating from that of the fabric before it is laundered or drycleaned.

7.8 *Flammability*—The flammability requirements shall be as agreed upon between the purchaser and the supplier, provided they meet or exceed those of Part 1610 of the Flammable Fabrics Act Regulations.

7.8.1 When the fabrics covered in this performance specification are used or intended to be used to make children’s sleepwear garments, they must meet or exceed the requirements set forth in Part 1615 (sizes 0 through 6X) or Part 1616 (sizes 7 through 14) of the Flammable Fabrics Act Regulations.

## 8. Keywords

8.1 bathrobe; fabric; pajama; performance; specification; underwear

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