



# Standard Performance Specification for Women's and Girls' Knitted and Woven Dress Glove Fabrics<sup>1</sup>

This standard is issued under the fixed designation D 4115; 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 woven and knitted fabrics comprised of any textile fiber or mixture of fibers to be used in women's and girls' dress gloves.

1.2 This performance specification is not applicable to fabrics used for interlinings and industrial-protective clothing.

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

1.4 The following precautionary statement pertains only to the test methods portion, Section 7, of this specification. *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 to Slippage of Yarns in Woven Fabrics Using a Standard Seam<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-Traversal Tensile Testing Machine)<sup>2</sup>

D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics<sup>2</sup>

D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method<sup>3</sup>

D 3787 Test Method for Bursting Strength of Knitted

Goods—Constant-Rate-of-Traversal (CRT) Ball Burst Test<sup>3</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

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

172 Colorfastness to Non-chlorine Bleach in Home Laundering

188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

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 edition of each test method cited shall prevail.

## 3. Terminology

### 3.1 Definitions:

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.61 on Apparel.

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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 20402.

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

3.1.1 *dress glove*—a covering for the hand, often extending part way up the arm, worn primarily for formal or dress-type occasions.

3.2 For definitions of 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 terms used in this specification.

#### 4. Specification Requirements

4.1 The properties of knitted and woven fabrics for women's and girls' dress gloves 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 4115 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 significance and use 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* (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  $300 \pm 10$  mm ( $12 \pm 0.5$  in.)/min.

NOTE 2—If preferred, the use of a constant-rate-of-extension (CRE) tensile-testing machine may be used. The crosshead speed should be as

**TABLE 1 Specification Requirements**

NOTE 1—Class in color change and color transfer 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
	Knit	Woven	
<i>Breaking strength (load)(CRT)</i> <sup>A</sup>	...	222 N (50 lbf), min	7.1
<i>Bursting strength (ball burst)</i> <sup>A</sup>	323 N (75 lbf), min	...	7.2
<i>Tongue-tear strength</i> <sup>A</sup>	...	11 N (2.5 lbf), min	7.3
<i>Yarn slippage</i>	...	6.3 mm (¼ in.) separation @ 111 N (25 lbf), min	7.4
<i>Dimensional change:</i>			
Laundering	5 %, max	3 %, max	7.5.1
Drycleaning	5 %, max	3 %, max	7.5.2
<i>Colorfastness:</i>			
Burnt gas fumes—1 cycle:			7.6.1
Shade change, original fabric	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Shade change, after one laundering or one drycleaning	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	
Sodium Hypochlorite Bleach	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	7.6.7
Non-Chlorine Bleach	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	7.6.8
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 (20 AATCC FU)(xenon-arc)	Step 4 <sup>B</sup> , min	Step 4 <sup>B</sup> , min	7.6.6
<i>Flammability</i>	Pass	Pass	7.7

<sup>A</sup> There is more than one method that can be used to measure breaking strength (load), bursting strength, tear strength, and lightfastness. These methods cannot be used interchangeably since there may be no overall correlation between them (see Notes 2-5 and Note 9).

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

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

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



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 Test Methods D 3786 or D 3787 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 manufacturer's instructions 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 Methods D 1424 or 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 with the Elmendorf machine. Consequently, these three tear testers cannot be used interchangeably. In case of controversy, Test Method D 2262 shall prevail.

**7.4 Resistance to Yarn Slippage (woven fabrics only)**—Determine the resistance to yarn slippage as directed in Test Method D 434.

**NOTE 6**—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).

#### 7.5 Dimensional Change:

**7.5.1 Laundering**—Determine the maximum dimensional change after five launderings, or as agreed upon between the purchaser and the seller, as directed in the applicable procedure in AATCC Test Method 135.

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

**7.5.2 Drycleaning**—Determine the maximum dimensional change after three drycleanings or as agreed upon between the purchaser and the seller as directed in 10.1.1 through 10.1.5 of

Test Methods D 2724.

**NOTE 7**—Launderable fabrics are expected 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 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. "Dry-cleanable" 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 1 cycle.

**NOTE 8**—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 (Note 7).

**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 seller (Note 7).

**7.6.3 Drycleaning**—Determine the colorfastness to drycleaning as directed in AATCC Test Method 132 (Note 7).

**7.6.4 Crocking**—Determine the 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 the 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.

**7.6.7 Colorfastness to Sodium Hypochlorite Bleach**—Determine colorfastness to sodium hypochlorite bleach as directed in AATCC Test Method 188.

**7.6.8 Colorfastness to Non-chlorine Bleach**—Determine colorfastness to non-chlorine bleach as directed in AATCC Test Method 172.

**7.7 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 (see 2.3).

## 8. Keywords

8.1 fabric; glove; performance; specification

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