Designation: D4115 – 14

Standard Performance Specification for Women's and Girls' Knitted and Woven Dress Glove Fabrics[1]

This standard is issued under the fixed designation D4115; 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 precautinary statement pertains only to the test methods portion, Section 7, of this performance 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:*[2]

D123 Terminology Relating to Textiles

D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)[3]

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

D2261 Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)

D2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine) (Withdrawn 1995)[3]

D2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics

D3786 Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method

D3787 Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test

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

D7022 Terminology Relating to Apparel

2.2 *AATCC Test Methods:*[4]

8 Colorfastness to Crocking: Crockmeter Method

16.3 Colorfastness to Light: Xenon-Arc

23 Colorfastness to Burnt Gas Fumes

61 Colorfastness to Laundering, Commercial: Accelerated

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

132 Colorfastness to Drycleaning

135 Dimensional Changes of Fabrics after Home Laundering

172 Colorfastness to Powdered 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. 8 AATCC 9-Step Chromatic Transference Scale.

A Glossary of AATCC Standard Terminology

2.3 *Federal Standard:*[5]

16 CFR 1610 Standard for Flammability of Clothing Textiles

[1] This performance 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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[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] The last approved version of this historical standard is referenced on www.astm.org.

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

[5] Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

16 CFR, Chapter II—Consumer Product Safety Commission Subchapter D—Flammable Fabrics Act Regulations

2.4 *Military Standard:*[6]

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 currrent edition of each test method cited shall prevail.

3. Terminology

3.1 For all terminology related to Apparel, see Terminology D7022.

3.1.1 The following terms are relevant to this standard: dress glove.

3.2 For definitions of all other textile terms see Terminology D123.

3.3 For terms relating to chemical or colorfastness testing, refer to specific AATCC test methods, or the glossary of AATCC Standard Terminology, or both.

3.4 Definitions found in a dictionary of common terms are suitable for terms used in this performance specification.

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

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 performance 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 D4115 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

TABLE 1 Specification Requirements

NOTE 1—Grade 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	
Breaking strength (load)(CRT) [A]	...	222 N (50 lbf), min	7.1
Bursting strength (ball burst)[A]	323 N (75 lbf), min	...	7.2
Tongue-tear strength [A]	...	11 N (2.5 lbf), min	7.3
Yarn slippage	...	6.3 mm (¼ in.) separation @ 111 N (25 lbf), min	7.4
Dimensional change:			
Laundering	5 %, max	3 %, max	7.5.1
Drycleaning	5 %, max	3 %, max	7.5.2
Colorfastness:			
Burnt gas fumes—1 cycle:			7.6.1
Shade change, original fabric	Grade 4[B], min	Grade 4[B], min	
Shade change, after one laundering or one drycleaning	Grade 4[B], min	Grade 4[B], min	
Sodium Hypochlorite Bleach	Grade 4[B], min	Grade 4[B], min	7.6.7
Powdered Non-Chlorine Bleach	Grade 4[B], min	Grade 4[B], min	7.6.8
Laundering:			7.6.2
Shade change	Grade 4[B], min	Grade 4[B], min	
Staining	Grade 3[C], min	Grade 3[C], min	
Drycleaning:			7.6.3
Shade change	Grade 4[B], min	Grade 4[B], min	
Crocking:			7.6.4
Dry	Grade 4[D], min	Grade 4[D], min	
Wet	Grade 3[D], min	Grade 3[D], min	
Perspiration:[E]			7.6.5
Shade change	Grade 4[B], min	Grade 4[B], min	
Staining	Grade 3[C], min	Grade 3[C], min	
Light (20 AATCC Fading Units)(xenon-arc)	Grade 4[B], min	Grade 4[B], min	7.6.6
Flammability	Pass	Pass	7.7

[A] 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).
[B] AATCC Gray Scale for Color Change.
[C] AATCC Gray Scale for Staining.
[D] AATCC 9-Step Chromatic Transference Scale.
[E] See Note 9.

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 D5034, 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, the use of 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 Test Methods D3786 or D3787 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 D2262.

NOTE 5—If preferred, use of Test Methods D1424 or D2261 is permitted with existing requirements as given in this performance 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 D2262 shall prevail.

7.4 *Resistance to Yarn Slippage* (woven fabrics only)—Determine the resistance to yarn slippage as directed in Test Method D434.

NOTE 6—The precision of Test Method D434 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 D2724.

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).

NOTE 9—It has been reported that the results for staining, obtained by standard AATCC Test Methods, on fabrics dyed to dark shades that contain a combination of polyester and spandex, or their blends, may not show the full staining propensity of such fabrics in consumer use. It is, therefore, recommended that the staining results obtained by these tests not be used for acceptance testing of such fabrics.

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 (see Note 9).

7.6.5 *Perspiration*— Determine colorfastness to perspiration as directed in AATCC Test Method 15 (see Note 9).

7.6.6 *Light*—Determine the colorfastness to light as directed in AATCC Test Method 16.3 Option 3.

7.6.7 *Colorfastness to Sodium Hypochlorite Bleach*—Determine colorfastness to sodium hypochlorite bleach as directed in AATCC Test Method 188. The test conditions shall be as specified by the seller.

7.6.8 *Colorfastness to Powdered Non-chlorine Bleach*—Determine colorfastness to non-chlorine bleach as directed in AATCC Test Method 172. The test conditions shall be as specified by the seller.

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 dress gloves; knitted fabric; performance; specification; woven fabric