Designation: D4114 – 14

Standard Performance Specification for Woven Flat Lining Fabrics for Women's and Girls' Apparel[1]

This standard is issued under the fixed designation D4114; 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 flat fabrics comprised of any textile fiber or mixture of fibers to be used as linings for women's and girls' apparel.

1.2 This performance specification is not applicable to woven pile, woven fusible, fire-bonded fusible, sliver-knit pile, and sheepskin lining fabrics.

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

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D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)[3]

D1336 Test Method for Distortion of Yarn in Woven Fabrics

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Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine) (Withdrawn 1995)[3]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

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

15 Colorfastness to Perspiration

16.2 Colorfastness to Light: Carbon-Arc

16.3 Colorfastness to Light: Xenon-Arc

23 Colorfastness to Burnt Gas Fumes

61 Colorfastness to Laundering: Accelerated

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

124 Smoothness Appearance of Fabrics After Repeated Home Laundering

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 , 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 performance specification give only the permanent part of the designation of ASTM, AATCC, or

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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.

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

other test methods. The current editions of each test method cited shall prevail.

3. Terminology

3.1 *Definitions:*

3.1.1 For terminology related to apparel see Terminology D7022.

3.1.2 For definitions of textile terms used in this performance specification, refer to the individual ASTM and AATCC methods and to Terminology D123.

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

4. Specification Requirements

4.1 The properties of woven flat fabrics, to be used as linings in women's and girls' apparel, 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 D4114 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 test 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

TABLE 1 Specification Requirements[A]

NOTE 1—Class for color change, color transfer, and SA rating is based on a numerical scale of 5 for negligible or no color change, color transfer, or wrinkle to 1 for severe color change, color transfer, or wrinkle.

Characteristic	Requirements	Section
Breaking strength (load)(CRT)	111 N (25 lbf), min	7.1
Yarn slippage	6.3-mm (¼-in.) separation at 67 N (15 lbf), min	7.2
Tongue-tear strength	6.7 N (1.5 lbf), min	7.3
Yarn distortion		7.4
Satins	2.5 mm (0.10 in.), max	7.4
All other	1 mm (0.05 in.), max	
Dimensional change:		
After five launderings	3 %, max	7.5.1
After three dry cleanings	2% , max	7.5.2
Colorfastness:		
Burnt gas fumes—2 cycles:		7.6.1
Shade change, original fabric	Grade 4[B] , min	
Shade change after one laundering or one dry cleaning	Grade 4[B] , min	
Sodium Hypochlorite Bleach	Grade 4[B] , min	7.6.7
Powdered Non-Chlorine Bleach	Grade 4[B] , min	7.6.8
Laundering:[F]		7.6.2
Shade change	Grade 4[B] , min	
Staining	Grade 3[C] , min	
Dry cleaning:		7.6.3
Shade change	Grade 4[B] , min	
Crocking:[F]		7.6.4
Dry	Grade 4[D] , min	
Wet	Grade 3[D] , min	
Perspiration:[F]		7.6.5
Shade change	Grade 4[B] , min	
Staining	Grade 3[C] , min	
Light (10 AATCC Fading Units)(xenon-arc)	Grade 4[B] , min	7.6.6
Fabric smoothness appearance (see 7.7.1)	SA 3.5[E] , min	7.7
Flammability	pass	7.8

[A] 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 8).
[B] AATCC Gray Scale for Color Change.
[C] AATCC Gray Scale for Staining.
[D] AATCC Chromatic Transference Scale.
[E] For durable-press fabrics only.
[F] See Note 7.

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 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 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 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 *Resistance to Yarn Slippage*—Determine the resistance to yarn slippage as directed in Test Method D434.

NOTE 3—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).

7.3 *Tongue-Tear Strength*—Determine the tongue-tear strength as directed in Test Method D2262.

NOTE 4—If preferred, the use of Test Methods D1424 and 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 *Yarn Distortion*—Determine the yarn distortion as directed in Test Method D1336.

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 procedures shall be as specified by the supplier.

7.5.2 *Dry cleaning*— Determine the maximum dimensional changes after three dry cleanings, or as agreed upon between the purchaser and the supplier, as directed in 10.1.1 through 10.1.5 of Test Methods D2724.

NOTE 5—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 dry-cleaned 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 dry cleaning 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. Dry-cleaning 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, Note 7).

NOTE 7—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 *Dry cleaning*— Determine colorfastness to dry cleaning 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 (Note 7).

7.6.5 *Perspiration*— Determine colorfastness to perspiration as directed in AATCC Test Method 15 (Note 7).

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

NOTE 8—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Test Method 16.2 and 16.3, 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 16.3 Option 3 shall prevail.

7.6.7 *Colorfastness to Sodium Hypochlorite Bleach*—Determine colorfastness to chlorine 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 *Fabric Smoothness Appearance*—Determine the fabric smoothness 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 dry cleaning as specified in 7.5.2 for dry-cleanable fabrics (see Note 5).

7.7.1 The fabric smoothness (SA) rating of such fabrics, and the SA rating of dry-cleaned fabrics, shall have decreased no more than 0.5 SA 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.

7.8.1 When lining fabrics are used for purposes other than linings, (for example, as apparel fabrics), they shall meet or exceed the requirements of the applicable Part (1610, 1615, or 1616) of the Flammable Fabrics Act Regulations.

8. Keywords

8.1 fabric; lining; performance; specification