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Standard Performance Specification for Men's and Women's Dress and Vocational Career Apparel Fabrics[1]

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1. Scope

1.1 This specification covers the performance requirements for woven fabrics for men's and women's dress and vocational career apparel.

1.2 This specification is not applicable to career apparel fabrics 3.1.1.2that do not patently fit the categories in 3.1.1.1 and 3.1.2. Performance specifications for such fabrics should be as agreed to between the purchaser and the seller. This specification is not applicable to overcoat or topcoat uniform fabrics.

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

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:*

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[1] This specification is under the jurisdiction of ASTM Committee D~~-~~13 on Textiles and is the direct responsibility of Subcommittee D13.5~~6~~1 on ~~Performance Standards for Textile Fabrics.~~ Apparel.

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D 123 Terminology Relating to Textiles[2]
D 434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam[2]
D 1424 Test Method for Tear ~~Resistance~~ Strength of ~~Woven~~ Fabrics by Falling-Pendulum Type (Elmendorf) Apparatus[2]
D 2261 Test Method for Tearing Strength of ~~Woven~~ Fabrics by the Tongue (Single-Rip) ~~Method~~ Procedure (Constant-Rate-of-Extension Testing Machine)[2]
D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single-Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine)[3]
D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics[2]
D 2905 Practice for Statements on Number of Specimens for Textiles[2]
D 5034 Test Method for Breaking ~~Force~~ Strength and Elongation of Textile Fabrics (Grab Test)[4]
2.2 *AATCC Test Methods:*[5]
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 Change in Automatic Home Laundering of Woven or Knit Fabrics
172 Colorfastness to Non-chlorine Bleach in Home Laundering
188 Colorfastness to Chlorine Bleach in Home Laundering
Evaluation Procedure 1 AATCC Gray Scale for Color Change
Evaluation Procedure 2 AATCC Gray Scale for Staining
Evaluation Procedure 3 AATCC Chromatic Transference Scale
2.3 *Federal Standard:*[6]
16 CFR, Chapter II-Consumer Product Safety Commission Subchapter D-Flammable Fabrics Act Regulations
2.4 *Military Standard:*[7]
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 *Definitions:*

3.1.1 *career apparel, n.*—garments, usually of a specified design, for on-the-job wear by business or professional employees.

3.1.1.1 *career dress apparel, n.*—career apparel which is not generally subject to abusive wear and for which appearance is a more important attribute than durability.

(*1*) *Discussion*—Fabrics for career dress apparel are usually categorized as heavyweight, mediumweight, or lightweight. The uses of these fabrics vary with weight as follows:

Category	Mass (Weight)	Typical End-Uses
I—Heavy-weight	200 g/m^2(6.0 oz/yd^2) and above	Pants, suits, blazer, waiter-type jackets, vests, coveralls, etc.
II—Medium-weight	150 g/m^2(4.5 oz/yd^2) and above, but less than 200 g/m^2 (6.0 oz/yd^2)	Pants, jackets, dresses, shirts and blouses, gowns, smocks, lab coats, etc.
III—Light-weight	Below 150 g/m^2(4.5 oz/yd^2)	Tops (shirts, blouses) and dresses

3.1.1.2 *career vocational apparel, n.*— career apparel which is generally subject to abusive wear and for which durability is a more important attribute than appearance.

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[2] *Annual Book of ASTM Standards*, Vol 07.01.
[3] Discontinued; see *1994 Annual Book of ASTM Standards*, Vol 07.0~~2~~1.
[4] ~~AATCC Technical Manual, available from the American Association~~
[4] *Annual Book of ~~Textile Chemists and Colorists, P. O. Box 12215 Research Triangle Park, NC 27709.~~ ASTM Standards*, Vol 07.02.
[5] AATCC Technical Manual, available from ~~Superintendent~~ the American Association of ~~Documents, Government Printing Office, Washington, DC 20402.~~ Textile Chemists and Colorists, P. O. Box 12215 Research Triangle Park, NC 27709.
[6] Available from ~~Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.~~ Superintendent of Documents, Government Printing Office, Washington, DC 20402.
[7] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

(*1*) *Discussion*—Fabrics for career dress apparel are usually categorized as heavyweight, mediumweight, or lightweight. The uses of these fabrics vary with weight as follows:

Category	Mass (Weight)	Typical End-Uses
I— Heavy-weight	270 g/m^2(8.0 oz/yd^2) and above	Pants, jackets, lab coats, cover-alls, etc.
II—Medium-weight	150 g/m^2(4.5 oz/yd^2) and above, but less than 270 g/m^2 (8.0 oz/yd^2)	Shirts, smocks, aprons, lab coats, nurses dresses, etc.
III—Light-weight	Below 150 g/m^2(4.5 oz/yd^2)	Light duty shirts, blouses, dresses, smocks, etc.

3.2 For definitions of other textile terms used in this specification, refer 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 woven fabrics for men's and women's career apparel shall conform to the specification requirements in Table 1.

5. Significance and Use

5.1 Upon mutual agreement between the purchaser and the supplier, woven fabrics intended for this end use should meet all

TABLE 1 Specification Requirements

NOTE 1—Class in colorfastness and durable press requirements are based on a numerical scale of 5 for negligible color change, color transfer, or durable press rating, and to 1 for very severe color change, color transfer, or durable press rating.

Characteristics	Career Dress Apparel Fabric Requirements	Career Vocational Apparel Fabric Requirements	Section
Breaking strength (load) (CRT):			
Category I	267 N (60 lbf), min	312 N (70 lbf), min	7.1
Category II	178 N (40 lbf), min	222 N (50 lbf), min	
Category III	156 N (35 lbf), min	178 N (40 lbf), min	
Yarn slippage, 6-mm, (¼-in.) separation:			
Category I	111 N (25 lbf), min	111 N (25 lbf), min	7.2
Category II	89 N (20 lbf), min	89 N (20 lbf), min	
Category III	67 N (15 lbf), min	67 N (15 lbf), min	
Tongue tear strength:			
Category I	20 N (4.5 lbf), min	27 N (6.0 lbf), min	7.3
Category II	16 N (3.5 lbf), min	18 N (4.0 lbf), min	
Category III	11 N (2.5 lbf), min	11 N (2.5 lbf), min	
Dimensional stability:			
Pressing and finishing	2 % shrink, 0.5 % gain, max	2 % shrink, 0.5 % gain, max	7.4.1
After 5 washes	2.5 % max	2.5 % max	7.4.2
After 3 drycleanings	2.5 % max	2.5 % max	7.4.3
Fabric Appearance (see 7.5.1.1):			
Category I	D.P., 3.5 min	D.P., 3.0 min	7.5
Category II	D.P., 3.5 min	D.P., 3.0 min	
Category III	D.P., 3.0 min	D.P., 3.0 min	
Flammability	pass	pass	7.6
Colorfastness to:			
Laundering			
Shade change	Class 4, min[A]	Class 4, min[A]	7.7.1
Staining	Class 3, min[B]	Class 3, min[B]	
Drycleaning			
Shade change	Class 4, min[A]	Class 4, min[A]	7.7.2
Crocking			
Dry	Class 4, min[C]	Class 4, min[C]	7.7.3
Wet	Class 3, min[C]	Class 3, min[C]	
Burnt gas fumes—2 cycles			
Shade change, original fabric	Class 4, min[A]	Class 4, min[A]	7.7.4
Shade change, after one laundering or one drycleaning	Class 4, min[A]	Class 4, min[A]	
Light (xenon-arc)			
Outdoor (40 AATCC FU)	Step 4, min[A]	Step 4, min[A]	7.7.5
Indoor (20 AATCC FU)	Step 4, min[A]	Step 4, min[A]	
Perspiration			
Shade change	Class 4, min[A]	Class 4, min[A]	7.7.6
Staining	Class 3, min[B]	Class 3, min[B]	
Ozone—2 cycles	Class 4[A]	Class 4[A]	7.7.7
Chlorine Bleach	Class 4[A], min	Class 4[A], min	7.7.8
Non-chlorine Bleach	Class 4[A], min	Class 4[A], min	7.7.9

[A] AATCC Gray Scale for Color Change.
[B] AATCC Gray Scale for Staining.
[C] AATCC Chromatic Transference Scale.

of the requirements listed in Table 1 of this specification.

5.2 It is recognized that where more critical requirements call for higher performance levels, 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. One or more of the requirements may be modifed by mutual 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 4232 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 test 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 and 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 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, the use of a constant-rate-of-extension (CRE) testing machine is permitted. The crosshead speed should be as agreed 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 machine will prevail.

7.2 *Yarn Slippage*—Determine the 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 ends and picks per inch.

7.3 *Tearing Strength*—Determine the tearing strength as directed in Test Method D 2262.

NOTE 4—If preferred, the use of either Test Methods D 1424 or D 2261 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 the Elmendorf machine. Consequently, these tear testers cannot be used interchangeably. In case of controversy, Test Method D 2262 shall prevail.

7.4 *Dimensional Change*:

7.4.1 *Pressing and Finishing During Garment Manufacturing*—Mark specimen(s) as directed in 4.4 of AATCC Test Method 135. Press and finish specimen(s) as agreed to by the purchaser and the supplier with respect to time, cycles, temperature, steam, vacuum, and mechanical pressure of the presshead. Measure the specimen(s) and calculate the dimensional change as directed in Sections 6 and 7 of AATCC Test Method 135.

7.4.1.1 If no agreement has been made between the purchaser and the supplier, press the specimen(s) using a flat-bed steam press according to the cycle in 10.1.4.1 through 10.1.4.5 of Test Methods D 2724.

7.4.2 *Laundering*—Determine the maximum dimensional change after 5 launderings as directed in the applicable procedure in AATCC Test Method 135 or as agreed to by buyer and supplier.

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

NOTE 5—Launderable fabrics are expected to be drycleanable except where all or part of the fabric is not drycleanable 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. Goods labeled "Drycleanable" are to be drycleaned only.

NOTE 6—Specimens prepared for 7.4.1 may be used for 7.4.2 and 7.4.3 as desired. When this is done, the dimensional change due to laundering or drycleaning is calculated using Eq 1. The dimensional change to pressing is determined on the fabric as it will reach the user. It is not additive to the dimensional change to laundering or drycleaning of the fabric as it will reach the consumer (see 6.1).

$$\text{Percent Dimensional Change} = 100\,(D_1 - D_2)/D_2 \quad (1)$$

where:

D_1 = measurement after laundering or drycleaning, and

D_2 = measurement after pressing and finishing.

7.4.3 *Dimensional Change in Drycleaning*— Determine the maximum dimensional change after three drycleanings as directed in 10.1.1 through 10.1.5 of Test Methods D 2724, or as agreed to by the purchaser and the supplier.

7.5 *Fabric Appearance*—Determine the fabric appearance as directed in AATCC Test Method 124 after laundering, using the conditions agreed to by the purchaser and the supplier, or as specified in 7.4.2 or 7.4.2.1 for washable fabrics, or after drycleaning as specified in7.4.3 for drycleanable fabrics (see Note 8).

7.5.1 For fabrics not intended for use in “durable press” garments, determine the fabric smoothness after pressing as directed in AATCC Test Method 96.

7.5.1.1 The fabric smoothness (D.P.) rating of such fabrics, and the D.P. rating of drycleaned fabrics, shall have decreased no more than ½ D.P. rating from that of the fabric before it is laundered or drycleaned.

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

7.7 *Colorfastness*:

7.7.1 *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 7).

7.7.2 *Drycleaning*—Determine the colorfastness to drycleaning as directed in AATCC Test Method 132.

7.7.3 *Crocking*—Determine the colorfastness to crocking as directed in AATCC Test Method 8 for solid shades and AATCC Test Method 116, for prints, or as agreed to by the purchaser and the supplier.

7.7.4 *Burnt Gas Fumes*—Determine the colorfastness to burnt gas fumes on the original fabric and after one laundering or drycleaning, in accordance with AATCC Test Method 23.

NOTE 7—Washing conditions shall be the same as those noted in 7.4.2.1. Drycleaning conditions shall be the same as those used in 7.4.3.

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

NOTE 8—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.

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

7.7.7 *Colorfastness to Ozone*—Determine colorfastness to ozone as directed in AATCC Test Method 109.

7.7.8 *Colorfastness to Chlorine Bleach*—Determine colorfastness to light as directed in AATCC Test Method 16.

7.7.9 *Colorfastness to Non-chlorine Bleach*—Determine colorfastness to light as directed in AATCC Test Method 16.

8. Keywords

8.1 career apparel; fabric; performance; specification