Designation: D3780 – 14

Standard Performance Specification for Men's and Boys' Woven Dress Suit Fabrics and Woven Sportswear Jacket, Slack, and Trouser Fabrics[1]

This standard is issued under the fixed designation D3780; 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 men's and boys' woven dress suit fabrics and woven sportswear jacket, slack, and trouser fabrics composed of any textile fiber or mixture of textile fibers.

1.2 This performance specification is not applicable to woven fabrics used for interlinings.

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

1.4 The following safety hazards caveat pertains only to the test method described in 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:*[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D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)[3]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Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine) (Withdrawn 1995)[3]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

D2905 Practice for Statements on Number of Specimens for Textiles (Withdrawn 2008)[3]

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

16.3 Colorfastness to Light

23 Colorfastness to Burnt Gas Fumes

61 Colorfastness to Laundering: Accelerated

96 Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

119 Color Change Due to Flat Abrasion (Frosting): Screen Wire 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 1 Gray Scale for Color Change

Evaluation Procedure 2 Gray Scale for Staining

Evaluation Procedure 8 AATCC 9–Step Chromatic Transference Scale

A Glossary of AATCC Standard Terminology

2.3 *Federal Standards:*

16 CFR 1610 Standard for Flammability of Clothing Textiles[5]

[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 the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709; www.aatcc.org.

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

16 CFR, Chapter II—Consumer Product Safety Commission, Subchapter D—Flammable Fabrics Act Regulations[5]

2.4 *Military Standard:*

MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes[6]

NOTE 1—Reference to test methods in this specification gives 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 For all terminology related to Apparel, see Terminology D7022.

3.1.1 The following terms are relevant to this standard: pressing and finishing.

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.

4. Specification Requirements

4.1 The properties of fabrics for men's and boys' woven dress suits and woven sportswear jackets, slacks, and trousers 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 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 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 Specification D3780 except for the following characteristic(s).

[6] 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—Grade in a, b, c, 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. The numerical rating in Table 1 or a higher numerical rating is acceptable.

Characteristic	Requirements		Section
	Suit, Slack, Trouser	Jacket	
Breaking strength (load) (CRT):			7.1
Worsted count yarns	178 N (40 lbf), min	133 N (30 lbf), min	
Cotton count yarns	178 N (40 lbf), min	133 N (30 lbf), min	
Woolen run yarns	133 N (30 lbf), min	111 N (25 lbf), min	
Yarn slippage	6.3-mm (¼-in.) separation at 111 N (25 lbf), min	89 N (20 lbf), min	7.2
Tear strength	11 N (2.5 lbf), min	9 N (2 lbf)	7.3
Dimensional Change:			
Pressing and finishing (in each direction)	2 % max	2 % max	7.4.1
After five launderings (in each direction)	3 % max	3 % max	7.4.2
After three dry cleanings (in each direction)	2 % max	2 % max	7.4.3
Colorfastness:			
Burnt gas fumes—2 cycles:			
Shade change, original fabric	Grade 4[A] min	Grade 4[A] min	7.5.1
Shade change after one laundering or one dry cleaning	Grade 4[A] min	Grade 4[A] min	
Sodium Hypochlorite Bleach	Grade 4[A] min	Grade 4[A] min	7.5.8
Powdered Non-Chlorine Bleach	Grade 4[A] min	Grade 4[A] min	7.5.9
Laundering:[E]			
Shade change	Grade 4[A] min	Grade 4[A] min	7.5.2
Staining	Grade 3[B] min	Grade 3[B] min	
Dry cleaning:			
Shade change	Grade 4[A] min	Grade 4[A] min	7.5.3
Crocking:[E]			
Dry	Grade 4[C] min	Grade 4[C] min	7.5.4
Wet	Grade 3[C] min	Grade 3[C] min	
Perspiration:[E]			
Shade change	Grade 4[A] min	Grade 4[A] min	7.5.5
Staining	Grade 3[B] min	Grade 3[B] min	
Light (40 AATCC FU) (xenon-arc)	Grade 4[A] min	Grade 4[A] min	7.5.6
Frosting	Grade 4[A] min	Grade 4[A] min	7.5.7
Fabric smoothness appearance (See 7.6.1)	SA 3.5[D] min	SA 3.5[D] min	7.6
Flammability	Class 1 or Class 2	Class 1 or Class 2	7.6

[A] AATCC Gray Scale for Color Change.
[B] AATCC Gray Scale for Staining.
[C] AATCC 9-Step Chromatic Transference Scale.
[D] For easy-care fabrics only.
[E] See Note 8.

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

6. Sampling

6.1 *Acceptance Testing Lot*—Unless there is prior agreement, consider as a lot for acceptance testing all material of a single item received as a single shipment.

6.2 *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.

6.3 *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.

6.4 *Test Specimens*—Take the number of specimens directed in each of the applicable test methods. Perform the tests on the fabric as it will reach the customer. Any "partially finished" or "post-finished" fabrics should be processed in accordance with the fabric manufacturer's instructions.

6.5 If the applicable test method does not specify the number of specimens, use the procedures in Practice D2905 to determine the number of specimens per laboratory sampling unit. Use (*1*) a reliable estimate of the variability of individual observations on similar materials in the user's laboratory, (*2*) a 95 % probability level, and (*3*) an allowable difference of 5 % of the average between the test results on laboratory sampling units and the average for the laboratory sampling unit. The average for a laboratory sampling unit is the average that would be obtained by applying the test method to all of the potential specimens from that laboratory sampling unit.

7. Test Method (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 has not been established, and it may not be suitable for fabrics with low yarn counts.

7.3 *Tear Strength*—Determine the tear strength as directed in Test Method D1424.

NOTE 4—If preferred, use of Test Methods D2261 or D2262 is permitted with existing requirements as given in this specification. There may be no overall correlation between the results obtained with the tongue tear machine and with the Elmendorf machine. Consequently, these two tongue tear testers cannot be used interchangeably. In case of controversy, Test Method D1424 shall prevail.

7.4 *Dimensional Change:*

7.4.1 *Pressing and Finishing During Manufacturing*—Mark specimen(s) as directed in Section 4 of AATCC Test Method 135. Press and finish specimen(s) as agreed upon between the purchaser and the supplier with respect to time cycles, temperature, steam, vacuum, and mechanical pressure of the press head. Measure the specimen(s) and calculate the dimensional change as directed in Section 5 of AATCC Test Method 135 (see Note 5).

NOTE 5—No standard test method is available for reproducing on a laboratory level the results of industrial press or finish treatments, or both, used in the manufacture of woven outerwear garments.[7]

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 as follows:

(1) Five seconds steam with head up.

(2) Five seconds dry hot press with head down 293 to 303°F (145 to 151°C) at the press.

(3) Five seconds vacuum, steam off, head down.

(4) Five seconds vacuum, steam off, head up.

7.4.2 *Laundering*—Determine the maximum dimensional change after five launderings as directed in the applicable procedure in AATCC Test Method 135 (Note 6).

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

7.4.3 *Dry Cleaning*—Determine the maximum dimensional change after three dry cleanings as directed in Test Methods D2724.

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, subtract the pressing and finishing dimensional change from the total dimensional change to obtain that portion due to laundering or dry cleaning. The dimensional change to pressing and finishing is determined on the fabric as it will reach the user.

7.5 *Colorfastness:*

7.5.1 *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.

NOTE 7—Washing conditions shall be the same as those used in 7.4.2.1. Dry-cleaning conditions shall be the same as those used in 7.4.3.

7.5.2 *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 8—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] The development of a standard test method has been referred to Subcommittee D13.59 on Fabric Test Methods, General.

7.5.3 *Dry Cleaning*—Determine colorfastness to dry cleaning as directed in AATCC Test Method 132.

7.5.4 *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 (see Note 8).

7.5.5 *Perspiration*—Determine colorfastness to perspiration as directed in AATCC Test Method 15 (see Note 8).

7.5.6 *Light*—Determine colorfastness to light as directed in AATCC Test Method 16.3.

NOTE 9—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Test Method 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 Option 3 shall prevail.

7.5.7 *Flat Abrasion (Frosting)*—Determine the color change due to flat abrasion (frosting) as directed in AATCC Test Method 119.

7.5.8 *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.

7.5.9 *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.

7.6 *Fabric Smoothness 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 seller as specified in 7.4.2.1 for washable fabrics or after dry cleaning as specified in 7.4.3 for dry-cleanable fabrics.

7.6.1 The fabric smoothness appearance (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 dry-cleaned.

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 Fabric Act Regulations.

8. Keywords

8.1 dress suits; fabrics; performance; specification; sportswear; trousers