



Designation: D3995 – 23

Standard Performance Specification for Knitted Career Apparel Fabrics: Dress and Vocational¹

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1. Scope

1.1 This performance specification covers the minimum performance requirements for knitted fabrics for dress and vocational career apparel composed of any textile fiber or mixtures of textile fibers.

1.2 This performance specification is not applicable to career apparel fabrics such as those used in protective clothing, that do not patently fit the categories Career Apparel or Career Apparel, Dress (see Terminology **D7022** for these terms). Minimum performance specifications for such fabrics should be as agreed between the purchaser and the seller.

1.3 These requirements apply to the length and width directions for those factors 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D123 Terminology Relating to Textiles

D2724 Test Method for Bond Strength of Bonded, Fused, and Laminated Apparel Fabrics

D2905 Practice for Statements on Number of Specimens for Textiles (Withdrawn 2008)³

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

D6797 Test Method for Bursting Strength of Fabrics Constant-Rate-of-Extension (CRE) Ball Burst Test

D7022 Terminology Relating to Apparel (Withdrawn 2022)³

2.2 *AATCC Methods:*⁴

TM8 Colorfastness to Crocking: Crockmeter

TM15 Colorfastness to Perspiration

TM16.3 Colorfastness to Light: Xenon-Arc

TM23 Colorfastness to Burnt Gas Fumes

TM61 Colorfastness to Laundering: Accelerated

TM96 Dimensional Changes in Commercial Laundering

TM116 Colorfastness to Crocking, Rotary Vertical Crockmeter

TM124 Smoothness Appearance of Fabrics After Home Laundering

TM132 Colorfastness to Drycleaning

TM135 Dimensional Changes of Fabrics After Home Laundering

TM158 Dimensional Changes on Dry Cleaning in Perchloroethylene: Machine Method

TM172 Colorfastness to Powdered Non-Chlorine Bleach in Home Laundering

TM188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

EP1 Gray Scale for Color Change

EP2 Gray Scale for Staining

EP8 AATCC 9-Step Chromatic Transference Scale

M11 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.

NOTE 1—The specific dated editions of ASTM test methods that prevail in this standard are referenced in Section 7 on Test Methods.

3. Terminology

3.1 For all terminology related to Apparel see Terminology D7022.

3.1.1 The following terms are relevant to this standard: career apparel, career apparel, dress, career apparel, vocational, dimensional change in pressing and finishing, 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 M11 A Glossary of AATCC Standard Terminology, or both.

4. Specification Requirements

4.1 The properties of knitted fabric for men’s and women’s career apparel shall conform to the specification requirement in Table 1.

5. Significance and Use

5.1 Upon mutual agreement between the purchaser and the seller, 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 seller.

5.2.1 In such cases, any references to the specification shall specify that: “This fabric meets ASTM Specification D3995 except for the following characteristic(s).”

5.3 Where no pre-purchase agreement has been reached between the purchaser and the seller, 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 Tests shall be performed on the fabric as it will reach the consumer. Any “partially finished” or “post-finished” fabrics or those which will be pleated, creased, steamed, or pressed during manufacturing should be processed in accordance with the fabric manufacturer’s instructions before tests are made.

TABLE 1 Specification Requirements

NOTE 1—The grades of colorfastness and SA rating are based on a numerical scale of 5 for negligible or no color change, color transfer, or no wrinkle to 1 for very severe color change, color transfer, or smoothness.

Characteristics	Requirements		Section
	Career Dress Apparel	Career Vocational Apparel	
Bursting strength (ball burst)	60 lbf (267 N) min	60 lbf (267 N) min	7.1
Dimensional stability (each direction):			
Pressing and finishing	2 % max shrinkage, 0 % growth	2 % max shrink, 0 % growth	7.2.1
After 5 washes	3 % max	3 % max	7.2.2
After 3 drycleanings	3 % max	3 % max	7.2.4
Fabric smoothness	Grade 4, SA, min	Grade 3, SA, min	7.3
Flammability	Class 1	Class 1	7.4
Colorfastness:			
Laundering: ^D			7.5.1
Color change	Grade 4, min ^A	Grade 4, min ^A	
Staining	Grade 3 or 4, min, ^B	Grade 3 or 4, min ^B	
Sodium Hypochlorite Bleach	Grade 4, min ^A	Grade 4, min ^A	7.5.8
Powdered Non-Chlorine Bleach	Grade 4, min ^A	Grade 4, min ^A	7.5.9
Drycleaning:			7.5.3
Color change	Grade 4, min, ^A	Grade 4, min ^A	
Crocking: ^D			7.5.4
Dry	Grade 4, min ^C	Grade 4, min ^C	
Wet	Grade 3, min ^C	Grade 3, min ^C	
Burnt Gas Fumes—1 cycle:			7.5.5
Shade change, original fabric and after 1 laundering or 1 drycleaning	Grade 4, min	Grade 4, min ^A	
Light: (xenon-arc)			7.5.6
Outdoor (40 AFUs)	Grade 4, min ^A	Grade 4, min ^A	
Indoor (20 AFUs)	Grade 4, min ^A	Grade 4, min ^A	
Perspiration: ^D			7.5.7
Color change	Grade 4, min ^A	Grade 4, min ^A	
Staining	Grade 3, min ^B	Grade 3, min ^B	

^A AATCC Gray Scale for Color Change.

^B AATCC Gray Scale for Staining.

^C AATCC 9-Step Chromatic Transference Scale.

^D See Note 6.

6.2 Unless otherwise agreed upon, as when specified in an applicable material specification, take the number of specimens directed in each of the applicable test methods.

6.2.1 If there has been no prior agreement and the test method does not specify the number of specimens, use the procedures in Practice **D2905** to determine the number of specimens, such that the user may expect at the 95 % probability level that the test result is no more than 5 % of the average above or below the lot average (that is, the average that would be obtained by applying this method to the entire lot) using a reliable estimate of variability of individual observations on similar materials in the user's laboratory under conditions of single-operator precision.

7. Test Methods (Note 1 and Table 1's Note 1)

7.1 *Bursting Strength*—Determine the bursting strength as directed in Test Methods **D3787**, **D3786**, or **D6797** (see Note 2 and Note 3).

NOTE 2—There is no overall correlation between the results obtained with the CRT and CRE machine equipped with a bursting attachment and the diaphragm bursting tester. Consequently, these three bursting testers cannot be used interchangeably. In case of controversy, Method **D3787** shall prevail.

NOTE 3—The precision of the ball burst method using the CRT and CRE machine equipped with a bursting attachment and the precision of the diaphragm bursting tester method are unknown. 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 seller using randomized replicate specimens of the material to be evaluated.

7.2 Dimensional Change:

7.2.1 *Pressing and Finishing During Garment Manufacturing*—Where applicable mark the specimen(s) as directed in AATCC TM135. Press and finish specimen(s) as agreed by the purchaser and the seller with respect to time, cycles, temperature, steam, vacuum, and mechanical pressure of the press head or using procedure in AATCC TM158. Measure the specimen(s) and calculate the dimensional change as directed in AATCC TM135.

7.2.1.1 If no agreement has been made between the purchaser and the seller, press the specimen(s) using a flat-bed steam press according to the cycle in AATCC TM158.

7.2.2 *Home Laundering*—Determine the maximum dimensional change after five launderings as directed in the applicable procedure in AATCC TM135 or as agreed upon between the purchaser and the seller.

7.2.2.1 The wash conditions and drying procedure shall be as agreed upon between the purchaser and the seller (see Notes 4 and 5).

7.2.3 *Institutional Laundering*—The wash conditions and drying procedure shall be as agreed upon between the purchaser and the seller.

7.2.4 *Drycleaning*—Determine the maximum dimensional change after three drycleanings as directed in AATCC TM158 (see Notes 4 and 5).

NOTE 4—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, which would be the case

with poly(vinyl) chloride fiber. “Drycleanable” goods are to be drycleaned only.

NOTE 5—Specimens prepared for 7.2.1 may be used for 7.2.2, 7.2.3, and 7.2.4 as desired. When this is done, the dimensional change due to laundering or drycleaning is calculated using Eq 1, due to laundering. The dimensional change to pressing and finishing will have occurred in the fabric before it reaches the user. Therefore, it should not be included as a part of the dimensional change to laundering or drycleaning of the fabric as it will reach the consumer (see 6.1).

$$\% \text{ dimensional change} = 100 (D_2 - D_1)/D_2 \quad (1)$$

where:

D_1 = measurement after laundering or drycleaning, and
 D_2 = measurement after pressing and finishing.

7.3 *Fabric Smoothness Appearance*—Determine the fabric smoothness appearance, as directed in AATCC TM124, after laundering using the wash-and-wear cycle, or the normal cycle as agreed upon between the purchaser and the seller, as specified in 7.2.2 or 7.2.3 for washable fabrics or after drycleaning as specified in 7.2.4 for drycleanable fabrics.

7.3.1 For washable fabrics not intended for use in “durable press” garments determine the fabric smoothness after pressing as specified in Section 5.12 of AATCC TM96.

7.3.1.1 The fabric smoothness durable press (SA) rating of such fabrics, and the SA rating of drycleaned fabrics, shall have decreased no more than 1/2 SA rating from that of the fabric before it is laundered or drycleaned.

7.4 *Flammability*—The flammability requirements shall be as agreed upon between the purchaser and the seller provided they meet or exceed those of 16 CFR 1610 Standard for Flammability of Clothing Textiles.

7.5 Colorfastness:

7.5.1 *Home Laundering*—Determine the colorfastness to laundering of home laundered fabrics as directed in AATCC TM61.

NOTE 6—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.

7.5.2 *Institutional Laundering*—Determine the colorfastness to laundering of institutional laundered fabrics as agreed upon between the purchaser and the seller.

7.5.3 *Drycleaning*—Determine the colorfastness to drycleaning as directed in AATCC TM132 (Table 1's Note 1).

7.5.4 *Crocking*—Determine the colorfastness to dry and wet crocking as directed in AATCC TM8 for solid shades or AATCC TM116 for prints or as agreed upon between the purchaser and the seller (see Note 6).

7.5.5 *Burnt Gas Fumes*—Determine the colorfastness to burnt gas fumes on the original fabric and after one laundering as in 7.2.2 or 7.2.3 or after one dry cleaning as in 7.2.4 as directed in AATCC TM23.

7.5.6 *Light*—Determine colorfastness to light as directed in AATCC TM16.3, Option 3.

7.5.7 *Perspiration*—Determine the colorfastness to perspiration as directed in AATCC TM15 (see Note 6).