



Designation: D4118 – 23

Standard Performance Specification for Woven Coverall, Dungaree, Overall, and Shop-Coat Fabrics¹

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1. Scope

1.1 This performance specification covers woven fabrics, composed of any textile fiber or mixture of textile fibers, to be used in the manufacture of coveralls, dungarees, overalls and shop coats.

1.2 This performance specification recognizes two levels of wearing severity relative to performance requirements for these fabrics.

1.3 This performance specification is not applicable to woven fabrics intended for use in the manufacture of industrial-protective clothing.

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

1.5 *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.*

1.6 *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](#)

[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Strength of Woven Fabrics by the Tongue \(Single Rip\) Method \(Constant-Rate-of- Traverse Tensile Testing Machine\) \(Withdrawn 1995\)](#)³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 Method for Bond Strength of Bonded, Fused, and Laminated Apparel Fabrics](#)

[D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics \(Grab Test\)](#)

[D7022 Terminology Relating to Apparel \(Withdrawn 2022\)](#)³

2.2 *AATCC Test 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 of Woven and Knitted Textiles Except Wool](#)

[TM116 Colorfastness to Crocking: Rotary Vertical Crockmeter](#)

[TM124 Smoothness Appearance of Fabrics After Repeated Home Laundering](#)

[TM132 Colorfastness to Drycleaning](#)

[TM135 Dimensional Changes of Fabrics after Home Laundering](#)

[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.](#)

2.3 *Federal Standard:*⁵

[CFR 1610 Standard for Flammability of Clothing Textiles](#)

2.4 *ANSI Standard:*⁶

[ANSI/ASQ Z1.4 Sampling Procedure and Tables for Inspection by Attributes](#)

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 AATCC Technical Manual, 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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

NOTE 1—Reference to test methods in this performance specification 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 For definitions of textile terms used in this performance specification, refer to the individual ASTM and AATCC methods and to Terminology D123.

3.2 The following terms are relevant to this standard: Type I apparel; Type II apparel.

3.3 For terminology related to apparel, see Terminology D7022.

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

4. Specification Requirements

4.1 The properties of fabrics for coverall, dungaree, overall, and shop coats 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 D4118 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.

TABLE 1 Specification Requirements

NOTE 1—Grade for colorfastness and SA rating is based on a numerical scale of 5 for negligible or no color change, color transfer, or wrinkle to 1 for very severe color change, color transfer, or wrinkle. The numerical rating in Table 1 or a higher numerical rating is acceptable.

Characteristic	Requirements	Section
<i>Breaking strength (load) (CRT):</i>		
Type I	222 N (50 lbf), min	7.1
Type II	178 N (40 lbf), min	
<i>Tongue-tear strength :</i>		7.2
Type I	11 N (2.5 lbf), min	
Type II	9 N (2.0 lbf), min	
<i>Dimensional change</i>		
Pressing and Finishing (DP fabrics)	2 % max	7.3.1
Laundering (DP fabrics)	2.5 % max	7.3.2
Laundering (non-DP fabrics)	3.0 % max	7.3.2.1
Drycleaning	2.5 % max	7.3.3
<i>Colorfastness:</i>		
Burnt gas fumes—2 cycles:		7.4.1
Shade change, original fabric	Grade 4 ^A , min	
Shade change, after 1 laundering or drycleaning	Grade 4 ^A , min	
Laundering: ^D		7.4.2
Shade change	Grade 4 ^A , min	
Staining	Grade 3 ^B , min	
Crocking: ^D		7.4.3
Dry	Grade 4 ^C , min	
Wet	Grade 3 ^C , min	
Perspiration: ^D		7.4.4
Shade change	Grade 4 ^A , min	
Staining	Grade 3 ^B , min	
Light (20 AFUs)	Step 4 ^A , min	7.4.5
Drycleaning		
Shade change	Grade 4 ^A , min	7.4.6
Sodium Hypochlorite Bleach	Grade 4 ^A , min	7.4.7
Non-chlorine Powdered Bleach	Grade 4 ^A , min	7.4.8
<i>Fabric smoothness appearance (see 7.5.1)</i>	SA 3.5 min	7.5
<i>Flammability</i>	Class 1	7.6

^A AATCC Gray Scale for Color change.

^B AATCC Gray Scale for Staining.

^C AATCC 9-Step Chromatic Transference Scale.

^D See Note 7.

5.4 The uses and significance 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 ANSI/ASQ Z1.4.

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 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 and the CRE machines. Consequently, these two machines may not be used interchangeably. In case of controversy, the CRT machine shall prevail.

7.2 *Tearing Strength*—Determine the tearing strength as directed in Test Method D2262.

NOTE 3—If preferred, the use of Test Method 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 methods and the Elmendorf method. Consequently, these three methods cannot be used interchangeably. In case of controversy, Test Method D2262 shall prevail.

7.3 Dimensional Change:

7.3.1 *Pressing and Finishing During Garment Manufacturing*⁷—Mark specimen(s) as directed in AATCC TM135. 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 AATCC TM135.

7.3.2 *Laundering*—Determine the maximum-dimensional change after 5 launderings as directed in the applicable procedure in AATCC TM135 or as agreed upon between the purchaser and the supplier.

7.3.2.1 Non-durable press fabrics shall be ironed before measuring as directed in AATCC TM96.

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

NOTE 4—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.

NOTE 5—Specimens prepared for 7.3.1 may be used for 7.3.2 or 7.3.3

as desired. When this is done, the dimensional change due to laundering or drycleaning is calculated using Eq 1. The dimensional change to pressing and finishing 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 = the measurement after laundering and drycleaning, and

D_2 = the measurement after pressing and finishing.

7.3.3 *Drycleaning*—Determine the maximum-dimensional change after three drycleanings as directed in 10.1.1 through 10.1.5 of Test Methods D2724.

7.4 Colorfastness:

7.4.1 *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 TM23.

NOTE 6—Washing conditions shall be the same as those used in 7.3.2.2.

7.4.2 *Laundering*—Determine the colorfastness to laundering as directed in the applicable procedure to AATCC TM61. The test conditions shall be as specified by the supplier (Note 5).

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.

7.4.3 *Crocking*—Determine colorfastness to dry and wet crocking as directed in AATCC TM8 for solid shades and AATCC TM116 for prints, or as agreed upon between the purchaser and the supplier (Note 7).

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

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

7.4.6 *Drycleaning*—Determine colorfastness to drycleaning as directed in AATCC TM132.

7.4.7 *Colorfastness to Sodium Hypochlorite Bleach*—Determine colorfastness to chlorine bleach as directed in AATCC TM188. The test conditions shall be as specified by the seller.

7.4.8 *Colorfastness to Powdered Non-chlorine Bleach*—Determine colorfastness to non-chlorine bleach as directed in AATCC TM172. The test conditions shall be as specified by the seller.

7.5 *Fabric Smoothness Appearance*—Determine the fabric 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 supplier as specified in 7.3.2.2 or drycleaning as specified in 7.3.3 for dry-cleanable fabrics (Note 5).

7.5.1 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 drycleaned.

⁷ The development of a method has been referred to Subcommittee D13.59 on Fabric Test Methods, General.