



Designation: ~~D7017~~—~~14~~ D7017 – 20

## Standard Performance Specification for Water-Resistant Rainwear and All-Purpose, Water-Repellent Coat Fabrics<sup>1</sup>

This standard is issued under the fixed designation D7017; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This performance specification covers rainwear and all-purpose water-repellent coat outer fabrics composed of any textile fiber or mixture of textile fibers.

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

1.3 These requirements apply to 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, 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:<sup>2</sup>

[D123 Terminology Relating to Textiles](#)

[D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam \(Withdrawn 2003\)<sup>3</sup>](#)

[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 \(Constant-Rate-of-Extension Tensile Testing Machine\)](#)

~~[D2724 Test Method for Bond Strength of Bonded, Fused, and Laminated Apparel Fabrics](#)~~

~~[D3136 Terminology Relating to Care Labeling for Apparel, Textile, Home Furnishing, and Leather Products](#)~~

[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](#)

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

[D7022 Terminology Relating to Apparel](#)

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.61 on Apparel. Current edition approved Feb. 1, 2014; July 1, 2020. Published March 2014; August 2020. Originally approved in 2005. Last previous edition approved in 2012 as D7017-12-14. DOI: 10.1520/D7017-14.10.1520/D7017-20.

<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

## 2.2 AATCC Test Methods:<sup>4</sup>

[8TM8](#) Colorfastness to Crocking: Crockmeter Method  
[15TM15](#) Colorfastness to Perspiration  
[16TM16.3](#) Colorfastness to Light: Xenon-Arc  
[22TM22](#) Water Repellency: Spray Test  
[23TM23](#) Colorfastness to Burnt Gas Fumes  
[35TM35](#) Water Resistance: Rain Test  
[61TM61](#) Colorfastness to Laundering: Accelerated  
[107TM107](#) Colorfastness to Water  
[116TM116](#) Colorfastness to Crocking: Rotary Vertical Crockmeter Method  
[119TM119](#) Color Change Due to Flat Abrasion (Frosting): Screen Wire Method  
[124TM124](#) Smoothness Appearance of Fabrics after Repeated Home Laundering  
[132TM132](#) Colorfastness to Dry Cleaning  
[135TM135](#) Dimensional Changes of Fabrics after Home Laundering  
[158TM158](#) Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method  
[TM172](#) Colorfastness to Powdered Non-chlorine Bleach in Home Laundering  
[188TM188](#) Colorfastness to Sodium Hypochlorite Bleach in Home Laundering  
[EP1](#) AATCC Gray Scale for Color Change  
[EP2](#) AATCC Gray Scale for Staining  
[EP8](#) AATCC 9-Step Chromatic Transference Scale  
[M11](#) A Glossary of AATCC Standard Terminology

## 2.3 Federal Standard:<sup>5</sup>

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

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 edition of each test method cited shall prevail.

## 3. Terminology

3.1 For all terminology related to Apparel, see Terminology [D7022](#).

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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. Significance and Use

4.1 Fabrics intended for rainwear and all-purpose, water-repellent coat end use should meet all of the requirements listed in [Table 1](#) of this specification.

4.2 It should be recognized that fabric can be produced utilizing an almost infinite number of combination of construction variables (for example, type of fibers, percentage of fibers, yarn twist, yarn number, warp and pick count, chemical and mechanical finishes). Additionally, fashion or aesthetics dictate that the ultimate consumer may find acceptable articles made from fabrics that do not conform to all of the requirements in [Table 1](#).

4.2.1 Hence, no single performance specification can possibly apply to all the various fabrics that could be utilized for this end-use.

<sup>4</sup> Available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

<sup>5</sup> Available from Superintendent of Documents, Government Printing Office, Washington, DC.

**TABLE 1 Specification Requirements**

NOTE 1—Grade in colorfastness and DP<sub>SA</sub> requirements is based on a numerical scale of 5 for negligible or no color change, color transfer, or fabric wrinkles/smoothness to 1 for severe color change, color transfer, or fabric wrinkles/smoothness.

Characteristic	Minimum Requirement	Section
Breaking strength (CRE), wovens	178 N (40 lbf)	5.1
Resistance to Yarn slippage – wovens		5.2
6 mm (1/4-in.) separation	111 N (25 lbf)	
Tearing Strength – wovens	13 N (3 lbf)	5.3
Bursting Strength – knits	222 N (50lbf)	5.4
Dimensional change:		
Pressing and finishing	2 % max	5.5.1
After laundering	3 % max	5.5.2
After dry cleaning	2 % max	5.5.3
Colorfastness:		
Laundering: <sup>A</sup>		5.6.1
Shade change	Grade 4	
Staining	Grade 3	
Dry cleaning (shade change)	Grade 4	5.6.2
Burnt gas fumes—2 cycles:		
Shade change, original fabric	Grade 4	5.6.3
Shade change after 1 laundering or 1 dry cleaning	Grade 4	
Crocking: <sup>A</sup>		5.6.4
Dry	Grade 4	
Wet	Grade 3	
Chlorine Bleach		5.6.5
Shade Change	Grade 4	
Non-chlorine Bleach		5.6.6
Shade Change	Grade 4	
Water: <sup>A</sup>		5.6.7
Shade change	Grade 4	
Staining	Grade 4	
Perspiration: <sup>A</sup>		5.6.8
Shade change	Grade 4	
Staining	Grade 3	
Light (20 AATCC Fading Units)	Grade 4	5.6.9
Frosting	Grade 4	5.6.10
Water repellency:		
Smooth-textured fabrics:		
Original	90	5.7
After 5 launderings or 3 dry cleanings	70	
Rough-textured:		
Original	80	5.7
After 5 launderings or 3 dry cleanings	70	
Water resistance (categories based on time for maximum weight increase at following head pressures):		
Shower 600 mm (2 ft) for 30 seconds	1 gram, max	5.8
Shower 600 mm (2 ft) for 30 s	1 g, max	5.8
Rain 600 mm (2 ft) for 2 minutes	1 gram, max	5.8
Rain 600 mm (2 ft) for 2 min	1 g, max	5.8
Storm 915 mm (3 ft) for 5 minutes	1 gram, max	5.8
Storm 900 mm (3 ft) for 5 min	1 g, max	5.8
Fabric appearance	SA 3.5	5.9
Flammability	Class 1	5.10

<sup>A</sup>See Note 6.

4.3 The uses and significance of particular properties and test methods are discussed in the appropriate sections of the specified test methods.

## 5. Test Methods (See Note 1 and Note 1 in Table 1)

5.1 *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 extension (CRE) tensile testing machine. (See Note 2).

NOTE 2—If preferred, the use of a constant-rate-of-traverse (CRT) tensile testing machine is permitted. 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 CRE method (Test Method D5034) shall prevail.