



Designation: D7019 – 20

# Standard Performance Specification for Brassiere, Slip, Lingerie and Underwear Fabrics <sup>1</sup>

This standard is issued under the fixed designation D7019; 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 fabrics used in brassieres underwear, slips, and lingerie.

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

1.3 The following safety hazards caveat pertains only to the test methods described in this performance 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.*

1.4 *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- D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)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>
- D1336 Test Method for Distortion of Yarn in Woven Fabrics
- 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)

- 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
- 2.2 AATCC Test Methods:<sup>4</sup>
  - TM8 Colorfastness to Crocking: Crockmeter Method
  - TM15 Colorfastness to Perspiration
  - TM16.3 Colorfastness to Light
  - TM23 Colorfastness to Burnt Gas Fumes
  - TM61 Colorfastness to Laundering: Accelerated
  - TM116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method
  - TM124 Smoothness Appearance of Fabrics after Repeated Home Laundering
  - TM132 Colorfastness to Drycleaning
  - TM135 Dimensional Changes of Fabrics after Home Laundering
  - TM158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method
  - TM172 Colorfastness to Powdered Non-Chlorine Bleach in Home Laundering
  - TM188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering
- 2.3 Federal Standard:<sup>5</sup>
  - 16 CFR 1610 - Flammable Fabrics Act Regulations

<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.

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<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.

NOTE 1—Reference to test methods in this 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 specification refer to Terminologies D123 and D7022. For terms relating to chemical and colorfastness testing refer to specific AATCC test methods.

3.2 Definitions found in a dictionary of common usage are suitable for this specification.

<sup>4</sup> Available from 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 20402.

#### 4. Significance and Use

4.1 Fabrics intended for this end-use should meet all of the requirements listed in **Table 1**.

4.2 It should be recognized that fabric can be produced utilizing an almost infinite number of combinations of construction variables (e.g., 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.

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**)

5.1 **Breaking Strength** (woven fabrics only)—Determine the dry-breaking strength as directed in the grab test procedure of

Test Method **D5034** using a constant-rate-of-extension (CRE) tensile testing machine.

**NOTE 2**—If preferred a constant-rate-of-traverse (CRT) tensile testing machine may be used. There may be no overall correlation between the results obtained with the CRT machine and the CRE machine. Consequently, these two testers cannot be used interchangeably. In case of controversy, the CRE method, Test Method **D5034**, shall prevail.

5.2 **Tearing Resistance** (woven fabrics only)—Determine the tear resistance as directed in Test Method **D1424**.

**NOTE 3**—If preferred, use of the tensile testing machine is permitted as directed in Test Method **D2261**. There may be no overall correlation between the results obtained with the Elmendorf machine (Test Method **D1424**) and with the tongue tear machines (Test Method **D2261**). Consequently, these two testers cannot be used interchangeably. In case of controversy, Test Method **D1424** shall prevail.

5.3 **Resistance to Yarn Slippage** (woven fabrics only)—Determine the resistance to yarn slippage as directed in Test Method **D434**.

5.4 **Yarn Distortion** (woven fabrics only)—Determine the yarn distortion as directed in Test Method **D1336**.

**TABLE 1 Specification Requirements**

Characteristic	Minimum Requirements		Section
	Sheer	Non-Sheer	
Breaking strength (CRE) <sup>A</sup>	67 N (15 lbf)	111 N (25 lbf)	5.1
Tearing strength	4.4 N (1 lbf)	6.7 N (1.5 lbf)	5.2
Resistance to Yarn slippage 6 mm (¼ in.) separation,	45 N (10 lbf)	67 N (15 lbf)	5.3
Yarn distortion		Brassieres - 133 N (30 lbf)	5.4
at 4.4 N (1 lbf) load			
Satins		2.5 mm (0.1 in.), max	
All other		1 mm (0.05 in.), max	
Bursting strength	133 N (30 lbf)	222 N (50 lbf)	5.5
Dimensional Change - Woven			
Laundering		3 %, max	5.6.1
Drycleaning		2 %, max	5.6.2
Dimensional Change – Knit			
Laundering		5 % max	5.6.1
Drycleaning		5 % max	5.6.2
Colorfastness:			
Laundering <sup>B</sup>			5.7.2
Shade Change		Grade 4	
Staining		Grade 3	
Drycleaning			5.7.3
Shade Change		Grade 4	
Staining		Grade 3	
Sodium Hypochlorite Bleach			5.7.4
Shade Change		Grade 4	
Non-Chlorine Bleach			5.7.4
Shade Change		Grade 4	
Burnt Gas Fumes—2 cycles:			5.7.1
Shade Change, original fabric		Grade 4	
Shade Change, after one cleaning		Grade 4	
Crocking: <sup>B</sup>			5.7.5
Dry		Grade 4	
Wet		Grade 3	
Perspiration: <sup>B</sup>			5.7.6
Shade Change		Grade 4	
Staining		Grade 3	
Light (10 AFU) (xenon-arc)		Grade 4	5.7.7
Fabric Appearance		SA 3.5	5.8
Flammability		Class I	5.9

<sup>A</sup> There is more than one method that can be used to measure breaking strength, tearing strength, bursting strength and lightfastness. These methods cannot be used interchangeably since there may be no overall correlation between them (see **Note 2**, **Note 3**, **Note 4**, and **Note 6**).

<sup>B</sup> See **Note 5**.