



Designation: **D7019–14 D7019–20**

Standard Performance Specification for Brassiere, Slip, Lingerie and Underwear Fabrics¹

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 (ϵ) 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 and health practices, 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: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[D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam](#) (Withdrawn 2003)³

[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:⁴

[8TM8 Colorfastness to Crocking: AATCC-Crockmeter Method](#)

[15TM15 Colorfastness to Perspiration](#)

[16TM16.3 Colorfastness to Light](#)

[23TM23 Colorfastness to Burnt Gas Fumes](#)

[61TM61 Colorfastness to Laundering, Home and Commercial: Laundering: Accelerated](#)

[116TM116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method](#)

[124TM124 Smoothness Appearance of Fabrics after Repeated Home Launderings](#)

[132TM132 Colorfastness to Drycleaning](#)

[135TM135 Dimensional Changes of Fabrics after Home Laundering](#)

[158TM158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method](#)

[172TM172 Colorfastness to Powdered Non-Chlorine Bleach in Home Laundering](#)

[188TM188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering](#)

¹ 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 2014 as D7019-05(2010); D7019-14. DOI: 10.1520/D7019-14.10.1520/D7019-20.

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, P.O. Box 12215, Research Triangle Park, NC 27709.

2.3 Federal Standard:⁵

16 CFR 1610 - Flammable Fabrics Act Regulations

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.

4. Significance and Use

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

TABLE 1 Specification Requirements

| Characteristic | Minimum Requirements | | Section |
|---|----------------------|--|---------|
| | Sheer | Non-Sheer | |
| Breaking strength (CRE) ^A | 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) Brassieres - 133 N (30 lbf) | 5.3 |
| Yarn distortion at 4.4 N (1 lbf) load | | | 5.4 |
| 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 ^B | | | 5.7.2 |
| Shade change | | Grade 4 | |
| Shade Change | | Grade 4 | |
| Staining | | Grade 3 | |
| Drycleaning | | Grade 3 | 5.7.3 |
| Shade change | | Grade 4 | |
| 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 |
| Burnt Gas Fumes—2 cycles: | | | 5.7.1 |
| Shade change, original fabric | | Grade 4 | |
| Shade Change, original fabric | | Grade 4 | |
| Shade change, after one cleaning | | Grade 4 | |
| Shade Change, after one cleaning | | Grade 4 | |
| Crocking: ^B | | | 5.7.5 |
| Dry | | Grade 4 | |
| Wet | | Grade 3 | |
| Perspiration: ^B | | | 5.7.6 |
| Shade change | | Grade 4 | |
| Shade Change | | Grade 4 | |
| Staining | | Grade 3 | |
| Light (10 AFU) (xenon-arc) | | Grade 4 | 5.7.7 |
| Fabric appearance | | SA 3-5 | 5.8 |
| Fabric Appearance | | SA 3.5 | 5.8 |
| Flammability | | Class I | 5.9 |

^AThere 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**).

^BSee **Note 5**.

⁵ Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

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**.

5.5 *Bursting Strength* (knit fabrics only)—Determine the bursting strength of knit fabrics as directed in Test Method **D3786**.

NOTE 4—If preferred, a constant-rate-of-extension (CRE) tensile testing machine may be used. Since there is no overall correlation between the results obtained with the CRE machine equipped with a bursting attachment (Test Method **D3787**) and the diaphragm bursting tester Test Method **D3786**, these two bursting testers cannot be used interchangeably. In case of controversy, the diaphragm bursting tester machine (Test Method **D3786**) shall prevail.

5.6 *Dimensional Change:*

5.6.1 *Laundering*—Determine the dimensional change after laundering as directed in the applicable procedure in AATCC Method ~~135~~-**TM135**.

5.6.2 *Drycleaning*—Determine the dimensional change after drycleaning as directed in AATCC ~~Test Method 158~~-**TM158**.

5.7 *Colorfastness:*

5.7.1 *Laundering*—Determine the colorfastness to laundering as directed in the applicable procedure of AATCC Method ~~61~~-**TM61**.

NOTE 5—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.

5.7.2 *Drycleaning*—Determine the colorfastness to drycleaning as directed in AATCC ~~Test Method 132~~-**TM132**.

NOTE 6—Launderable fabrics are expected normally to be drycleaned, except where all or part of the fabric will not withstand drycleaning. 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. If a fabric would be harmed by ALL methods of care except for drycleaning, it should be considered Dryclean only.

5.7.3 *Bleaching*—When testing with bleach is indicated, test as directed in AATCC ~~Test Method 172~~-**TM172** for sodium hypochlorite bleach, or AATCC ~~Test Method 188~~-**TM188** for non-chlorine bleach, as appropriate.

5.7.4 *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 Method 23. Washing or drycleaning conditions shall be as for dimensional change testing.

5.7.5 *Crocking*—Determine colorfastness to dry and wet crocking as directed in AATCC ~~Method 8~~-**TM8** for solid shades and AATCC ~~Method 116~~-**TM116** for prints or as agreed upon between the purchaser and the supplier (see **Note 5**).

5.7.6 *Perspiration*—Determine colorfastness to perspiration as directed in AATCC ~~Method 15~~-**TM15** (see **Note 6**).

5.7.7 *Light*—Determine colorfastness to light as directed in AATCC ~~Method 16~~-**TM16.3, Option 3**.

NOTE 7—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Method 16, 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 E shall prevail.

5.8 *Fabric Appearance*—Determine the fabric smoothness appearance (SA) as directed in AATCC ~~Method 124~~-**TM124** after the applicable laundering or dry cleaning procedure.

5.8.1 For fabrics not intended for use in durable press garments, determine the smoothness appearance after pressing as specified in 10.2.5 of AATCC ~~Test Method 135~~-**AATCC TM135**.