



Standard Performance Specification for Brassiere, Slip, Lingerie and Underwear Fabrics ¹

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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, and determine the applicability of regulatory limitations prior to use.*

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- D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)³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

- 8 Colorfastness to Crocking: AATCC Crockmeter Method
- 15 Colorfastness to Perspiration
- 16 Colorfastness to Light
- 23 Colorfastness to Burnt Gas Fumes
- 61 Colorfastness to Laundering, Home and Commercial: Accelerated
- 116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method
- 124 Appearance of Fabrics after Repeated Home Launderings
- 132 Colorfastness to Drycleaning
- 135 Dimensional Changes of Fabrics after Home Laundering
- 158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method
- 172 Colorfastness to Non-Chlorine Bleach in Home Laundering
- 188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

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.

¹ 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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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.

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

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)	5.3
Yarn distortion		Brassierres - 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 ^B			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: ^B			5.7.5
Dry		Grade 4	
Wet		Grade 3	
Perspiration: ^B			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

^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](#).

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.

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

5.7 Colorfastness:

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

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.

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 for sodium hypochlo-

rite bleach, or AATCC Test Method 188 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 for solid shades and AATCC Method 116 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 (see **Note 6**).

5.7.7 *Light*—Determine colorfastness to light as directed in AATCC Method 16.

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 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.

5.9 *Flammability*—The flammability test and requirements shall meet or exceed the Flammable Fabrics Act mandatory standards as specified in 16 CFR 1610.

6. Keywords

6.1 brassiere; lingerie; slip; underwear

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