Designation: D 4233 – 95

Standard Performance Specification for Women's and Girls' Knitted and Woven Brassiere Fabrics[1]

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1. Scope

1.1 This performance specification covers woven and knitted fabrics comprised of any fiber or mixture of fibers used in women's and girls' brassieres.

1.2 This performance specification is not applicable to knitted or woven brassiere fabrics containing elastomeric yarns, to knitted lace fabrics, and to fabrics used for interlinings.

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

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

D 434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam[2]

D 1424 Test Method for Tear Resistance of Woven Fabrics by Falling-Pendulum (Elmendorf) Apparatus[2]

D 1682 Test Methods for Breaking Load and Elongation of Textile Fabrics[2]

D 2261 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Extension Tensile Testing Machine)[2]

D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Traverse Tensile Testing Machine)[2]

D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method[3]

D 3787 Test Method for Bursting Strength of Knitted Goods—Constant-Rate-of-Traverse (CRT) Ball Burst Test[3]

2.2 *AATCC 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 Washing, Domestic, and Laundering, Commercial: Accelerated

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

124 Appearance of Durable Press Fabrics after Repeated Home Launderings

132 Colorfastness to Drycleaning

135 Dimensional Changes in Automatic Home Laundering of Durable Press Woven or Knit Fabrics

Evaluation Procedure 1 Gray Scale for Color Change

Evaluation Procedure 2 Gray Scale for Staining

Evaluation Procedure 3 AATCC Chromatic Transference Scale

2.3 *Federal Standard:*[5]

16 CFR, Chapter II-Consumer Product Safety Commission Subchapter D-Flammable Fabrics Act Regulations

2.4 *Military Standard:*[6]

MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes

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 editions of each test method cited shall prevail.

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of textile terms used in this specification refer to the individual ASTM and AATCC test methods and to Terminology D 123.

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

4. Specification Requirements

4.1 The properties of knitted and woven fabrics for women's and girls' brassieres shall conform to the specification requirements in Table 1.

5. Significance and Use

5.1 Upon mutual agreement between the purchaser and the seller, fabrics intended for this end use should meet all the requirements listed in Table 1 of this specification.

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[1] This performance specification is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.56 on Performance Standards for Textile Fabrics.

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[2] *Annual Book of ASTM Standards*, Vols 07.01.

[3] *Annual Book of ASTM Standards*, Vol 07.02.

[4] Available from the 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.

[6] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

TABLE 1 Specification Requirements[A]

Characteristic	Requirements		Section
	Knit	Woven	
Breaking strength (load) (CRT)[B]	...	40 lbf (178 N), min	7.1
Bursting strength (ball burst)[B]	50 lbf (222N), min	...	7.2
Tongue-tear strength[B]	...	1.5 lbf (6.7 N), min	7.3
Yarn slippage	...	¼ in. (6 mm) separation at 30 lbf (133 N), min	7.4
Dimensional Change:			
Laundering	5 % max	2 % max (no change)	7.5.1
Colorfastness:			
Burnt gas fumes—2 cycles			7.6.1
Shade change, original fabric	Class 4[C], min	Class 4[C], min	
Shade change, after one laundering	Class 4[C], min	Class 4[C], min	
Laundering			7.6.2
Shade change	Class 4[C], min	Class 4[C], min	
Staining	Class 3[D], min	Class 3[D], min	
Crocking			7.6.3
Dry	Class 4[E], min	Class 4[E], min	
Wet	Class 3[E], min	Class 3[E], min	
Perspiration			7.6.4
Shade change	Class 4[C], min	Class 4[C], min	
Staining	Class 3[D], min	Class 3[D], min	
Light (10AATCC FU)[B] (xenon-arc)	Step 4[C], min	Step 4[C], min	7.6.5
Flammability	pass	pass	7.7

[A] Class in colorfastness is based on a numerical scale of 5 for negligible color change or color transfer to 1 for very severe color change or color transfer.
[B] There is more than one standard that can be used to measure breaking.
[C] AATCC Gray Scale for Color Change.
[D] AATCC Gray Scale for Staining.
[E] AATCC Chromatic Transference Scale.

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 by mutual agreement between the purchaser and the seller.

5.2.1 In such cases, any references to the specification shall specify that: "This fabric meets ASTM Specification D 4233 except for the following characteristic(s)."

5.3 Where no prepurchase agreement has been reached between the purchaser and the seller, 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.

5.4 The uses and significance of particular properties and test methods are discussed in the appropriate sections of the specified test 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 MIL-STD-105D.

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 Methods (See Note 1)

7.1 *Breaking Strength* (load) (woven fabrics only)—Determine the dry-breaking strength (load) in the standard atmosphere for testing textiles, as directed in the grab test procedure of Test Methods D 1682 using a constant-rate-of-traverse (CRT) tensile testing machine with the speed of the pulling jaw at 12 ± 0.5 in. (305 ± 13 mm)/min.)

NOTE 2—If preferred a constant-rate-of-extension (CRE) tensile testing machine may be used. The crosshead speed should be as agreed between the purchaser and the seller. There may be no overall correlation between the results obtained with the CRT machine and the CRE machine. Consequently, these two breaking load testers cannot be used interchangeably. In case of controversy, the CRT method shall prevail.

7.2 *Bursting Strength* (knit fabrics only)—Determine the bursting strength of knit fabrics as directed in Test Method D 3786 or Test Method D 3787 as agreed between the purchaser and the seller.

NOTE 3—Care should be taken to subtract the tare diaphragm pressure from the gross pressure to obtain actual bursting strength of fabric when using the diaphragm bursting tester. Calibrate the equipment according to manufacturer's instruction before use. Since there is no overall correlation between the results obtained with the CRT machine equipped with a bursting attachment and the diaphragm bursting tester, these two bursting testers cannot be used interchangeably. In case of controversy, the CRT machine equipped with a bursting attachment method shall prevail.

NOTE 4—The precision of the ball burst method using the CRT machine equipped with a bursting attachment and the precision of the diaphragm bursting tester method are being established by Subcommittee D13.59. The methods are accordingly not recommended for acceptance testing unless preceded by an interlaboratory check test in the laboratory of the purchaser and the laboratory of the seller using randomized replicate specimens of the type of material to be evaluated.

7.3 *Tear Strength* (woven fabrics only)—Determine the tear strength as directed in Test Method D 1424.

NOTE 5—If preferred, use of Test Method D 2262 or Test Method D 2261 is permitted with existing requirements as given in this standard. There may be no overall correlation between the results obtained with the tongue tear machines and with the Elmendorf machine. Consequently, these three testers cannot be used interchangeably. In case of controversy, Test Method D 1424 shall prevail.

7.4 *Resistance to Yarn Slippage* (woven fabrics only)—Determine the resistance to yarn slippage as directed in Test Method D 434.

NOTE 6—The precision of Test Method D 434 is being established, and it may not be suitable for fabrics with a low number of warp (ends) and filling (picks) counts (see 5.2).

7.5 *Dimensional Change*:

7.5.1 *Laundering*—Determine the maximum dimensional change after five launderings, or as agreed between the purchaser and the seller, as directed in the applicable procedure in AATCC Method 135.

7.5.1.1 The wash conditions and drying procedures shall be as specified by the seller.

7.6 *Colorfastness*:

7.6.1 *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 Method 23 after 1 cycle.

NOTE 7—Washing conditions shall be the same as those used in 7.5.1.1.

7.6.2 *Laundering*—Determine the colorfastness to laundering as directed in the applicable procedure of AATCC Method 61. The test conditions shall be as specified by the seller.

7.6.3 *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 between the purchaser and the seller.

7.6.4 *Perspiration*—Determine colorfastness to perspiration as directed in AATCC Method 15.

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

NOTE 8—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.

7.7 *Flammability*—The flammability requirements shall be as agreed between the purchaser and the seller, provided they meet or exceed those of Part 1610 of the Flammable Fabrics Act Regulations.

8. Keywords

8.1 underwear