



**Designation: D4156-01 Designation: D 4156 – 01 (Reapproved 2008)**

## Standard Performance Specification for Women's and Girls' Knitted Sportswear Fabrics<sup>1</sup>

This standard is issued under the fixed designation D 4156; 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 knitted fabrics comprised of any textile fiber or mixture of fibers, used in women's and girl's sportswear.

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

1.3 *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:<sup>2</sup>

D 123 Terminology Relating to Textiles

D 2594 Test Methods/Method for Stretch Properties of Knitted Fabrics Having Low Power

D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics

~~D 2905 Practice for Statements on Number of Specimens for Textiles~~

~~D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method~~ Test Method for Bursting Strength of Textile Fabrics Diaphragm Bursting Strength Tester Method

D 3787 Test Method for Bursting Strength of Knitted Goods: Textiles Constant-Rate-of-Transpose (CRT); (CRT) Ball Burst Test

#### 2.2 AATCC Methods:<sup>3</sup>

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 1978 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

172 Colorfastness to Non-chlorine Bleach in Home Laundering

188 Colorfastness to Chlorine Bleach in Home Laundering

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:<sup>4</sup>

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

#### 2.4 Military Standard:<sup>5</sup>

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

<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 May 10, 2001. Published July 2001. Originally published as D4156-82. Last previous edition D4156-95.

<sup>2</sup> This performance 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 Aug. 1, 2008. Published October 2008. Originally approved in 1982. Last previous edition approved in 2001 as D 4156 – 01.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Discontinued; see 1997 *Annual Book of ASTM Standards*, Vol 07.02.

<sup>5</sup> Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, <http://www.aatcc.org>.

<sup>6</sup> Available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

<sup>7</sup> Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

<sup>8</sup> Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

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 *sheer, n*—a fabric that is transparently thin or diaphanous.

3.1.1.1 *Discussion*—There is no clear distinction between sheer fabrics and nonsheer fabrics. The purchaser and the seller should agree in advance as to which category a fabric is to be classified.

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

### 4. Specification Requirements

4.1 The properties of knitted fabrics for women’s and girls’ sportswear 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 of the requirements listed in Table 1 of this performance specification.

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 4156 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.

<sup>5</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

**TABLE 1 Specification Requirements**

NOTE 1—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.

Characteristic	Requirements		Section
	Sheer Fabric	Nonsheer Fabrics	
Bursting strength (ball burst) <sup>A</sup>	133 N (30 lbf), min	222 N (50 lbf), min	7.1
Dimensional change:			
Pressing and finishing	2 % max	2 % max	7.2.1
Laundering (see 7.2.2.2)	3 % max	3 % max	7.2.2
Drycleaning	3 % max	3 % max	7.2.3
Colorfastness:			
Burnt gas fumes, 2 cycles:			7.3.1
Shade change, original	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Shade change, after laundering or one drycleaning	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Laundering:			7.3.2
Shade change	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Staining	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	
Drycleaning:			7.3.3
Shade change	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Crocking:			7.3.4
Dry	Class 4 <sup>D</sup> min	Class 4 <sup>D</sup> min	
Wet	Class 3 <sup>D</sup> min	Class 3 <sup>D</sup> min	
Perspiration			7.3.5
Shade change	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Staining	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	
Light (40AATCC FU) (xenon-arc)	Step 4 <sup>B</sup> min	Step 4 <sup>B</sup> min	7.3.6
Chlorine Bleach	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	7.3.7
Non-chlorine Bleach	Class 4 <sup>B</sup> , min	Class 4 <sup>B</sup> , min	7.3.8
Fabric appearance (see 7.4.1.1)	DP 3.5 min	DP 3.5 min	7.4
Flammability	pass	pass	7.5

<sup>A</sup> There is more than one standard method that can be used to measure bursting strength, and lightfastness. These methods cannot be used interchangeably since there may be no overall correlation between them (see Note 2, Note 3, and Note 8).

<sup>B</sup> AATCC Gray Scale for Color Change.

<sup>C</sup> AATCC Gray Scale for Staining.

<sup>D</sup> AATCC Chromatic Transference Scale.