



Designation: D 4154 – 01

## Standard Performance Specification for Men's and Boys' Knitted and Woven Beachwear and Sports Shirt Fabrics<sup>1</sup>

This standard is issued under the fixed designation D 4154; 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 and woven fabrics comprised of any textile fiber or mixture of fibers used in men's and boy's beachwear and sports shirts.

1.2 This performance specification is not applicable to knitted and woven fabrics used for interlining and swimwear.

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

1.4 *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 434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam
- D 1424 Test Method for Tear Resistance of Fabrics by Falling-Pendulum Type (Elmendorf) Apparatus
- D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant Rate-of-Travel Tensile Testing Machine)<sup>3</sup>
- D 2594 Test Methods 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<sup>4</sup>

D 3787 Test Method for Bursting Strength of Knitted Goods: Constant-Rate-of-Travel (CRT) Ball Burst Test<sup>4</sup>

D 5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

#### 2.2 AATCC Test Methods:<sup>5</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
  - 96 Dimensional Changes in Laundering of Woven and Knitted Textiles Except Wool
  - 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 Launderings of Durable Press Woven of 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>6</sup>
- 16 CFR, Chapter II—Consumer Product Safety Commission Subchapter D—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> Discontinued; see 1994 *Annual Book of ASTM Standards*, Vol 07.01.

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

<sup>5</sup> AATCC Technical Manual, available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

<sup>6</sup> Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

### 2.4 Military Standard:<sup>7</sup>

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

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 Definitions:

3.1.1 *dimensional change, n*— in pressing and finishing of textiles, the change in dimensions of a fabric caused by pressing and finishing during garment manufacture.

in the manufacture of garments.<sup>8</sup>

3.4 Definitions of terms used in a dictionary of common terms are suitable for terms used in this performance specification.

## 4. Specification Requirements

4.1 The properties of fabrics of woven and knitted fabrics for mens's and boy's beachwear and sport shirts shall conform to the specification requirements in Table 1.

## 5. Significance and Use

**TABLE 1 Specification Requirements**

NOTE 1—Class for colorfastness and DP rating is based on a numerical scale of 5 for negligible or no color change, color transfer, or wrinkle to 1 for very severe color change, color transfer, or wrinkle. The numerical rating in Table 1 or a higher numerical rating is acceptable.

Characteristic	Requirements		Section
	Knitted	Woven	
Breaking strength (load) (CRT)	...	111 N (25 lbf), min	7.1
Bursting strength (load) (ball burst)	222 N (50 lbf)	...	7.2
Yarn slippage, 6-mm (¼-in.) separation	...	89 N (20 lbf), min	7.3
Tongue tear strength	...	6.7 N (1.5 lbf), min	7.4
Dimensional Change:			
Pressing and finishing	2 % max	1 % max, pre-finished fabrics	7.5.1
After five launderings (see 7.5.2.2 if shrinkage exceeds 3 %)	3 % max	2 % max, post-finished fabrics	7.5.2
After three dry cleanings	3 % max	3 % max	7.5.3
Growth	3 % max	3 % max	7.5.4
Colorfastness:			
Burnt Gas Fumes—2 Cycles:			
Shade change, original fabric	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.1
Shade change after 1 laundering or 1 dry cleaning	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	
Laundering:			
Shade change	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.2
Staining	Class 3 <sup>B</sup> min	Class 3 <sup>B</sup> min	
Dry cleaning:			
Shade change	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.3
Crocking:			
Dry	Class 4 <sup>C</sup> min	Class 4 <sup>C</sup> min	7.6.4
Wet	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	
Perspiration:			
Shade Change	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.5
Staining	Class 3 <sup>B</sup> min	Class 3 <sup>B</sup> min	
Light (40 AATCC FU) (xenon-arc)	Step 4 <sup>A</sup> min	Step 4 <sup>A</sup> min	7.6.6
Chlorine Bleach	Class 4 <sup>A</sup> , min	Class 4 <sup>A</sup> , min	7.6.7
Non-chlorine Bleach	Class 4 <sup>A</sup> , min	Class 4 <sup>A</sup> , min	7.6.8
Fabric appearance (see 7.7.1.1)	DP 3.5 <sup>D</sup> min	DP 3.5 <sup>D</sup> min	7.7
Flammability	pass	pass	7.8

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

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

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

<sup>D</sup> For durable-press fabrics only.

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

### 3.3 Definitions of Terms Specific to This Standard:

3.3.1 *pressing and finishing*—This term takes into account all of the industrial pressing and finishing treatments used in garment production.

NOTE 2—No standard method is available for reproducing on a laboratory level the results of industrial pressing or finishing treatments used

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

<sup>7</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

<sup>8</sup> The development of a standard method has been referred to Subcommittee D13.59 on Fabric Test Methods, General.