



Designation: D4154 – 22

Standard Performance Specification for Men's and Boys' Knitted and Woven Beachwear and Sports Shirt Fabrics¹

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

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D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)³

D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus

D2262 Test Method for Tearing Strength of Woven Fabrics

by the Tongue (Single Rip) Method (Constant-Rate-of-
Traverse Tensile Testing Machine) (Withdrawn 1995)³

D2594 Test Method for Stretch Properties of Knitted Fabrics Having Low Power

D2724 Test Method for Bond Strength of Bonded, Fused, and Laminated Apparel Fabrics

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D7022 Terminology Relating to Apparel (Withdrawn 2022)³

2.2 AATCC Test Methods:⁴

TM8 Colorfastness to Crocking: Crockmeter Method

TM15 Colorfastness to Perspiration

TM16.3 Colorfastness to Light: Xenon-Arc

TM23 Colorfastness to Burnt Gas Fumes

TM61 Colorfastness to Laundering: Accelerated

TM96 Dimensional Changes in Laundering of Woven and Knitted Textiles Except Wool

TM116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

TM124 Smoothness Appearance of Fabrics After Repeated Home Launderings

TM132 Colorfastness to Drycleaning

TM135 Dimensional Changes of Fabrics after Home Laundering

TM172 Colorfastness to Powdered Non-chlorine Bleach in Home Laundering

TM188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

EP1 Gray Scale for Color Change

EP2 Gray Scale for Staining

EP8 AATCC 9-Step Chromatic Transference Scale

M11 A Glossary of AATCC Standard Terminology

¹ This performance 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 AATCC Technical Manual, available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, <http://www.aatcc.org>.

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 performance 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 all terminology related to Apparel, see Terminology **D7022**.

3.1.1 The following terms are relevant to this standard: dimensional change; pressing and finishing.

3.2 For definition of all other textile terms see Terminology **D123**.

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.

3.3 For terms relating to chemical or colorfastness testing, refer to specific AATCC test methods, or the Glossary of AATCC Standard Terminology, or both.

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 men's and boy's beachwear and sport shirts shall conform to the specification requirements in **Table 1**.

5. Significance and Use

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 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 supplier.

TABLE 1 Specification Requirements

NOTE 1—Grade for colorfastness and SA 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	Grade 4 ^A min	Grade 4 ^A min	7.6.1
Shade change after 1 laundering or 1 dry cleaning	Grade 4 ^A min	Grade 4 ^A min	
Laundering: ^E			
Shade change	Grade 4 ^A min	Grade 4 ^A min	7.6.2
Staining	Grade 3 ^B min	Grade 3 ^B min	
Dry cleaning:			
Shade change	Grade 4 ^A min	Grade 4 ^A min	7.6.3
Crocking: ^E			
Dry	Grade 4 ^C min	Grade 4 ^C min	7.6.4
Wet	Grade 3 ^C min	Grade 3 ^C min	
Perspiration: ^E			
Shade Change	Grade 4 ^A min	Grade 4 ^A min	7.6.5
Staining	Grade 3 ^B min	Grade 3 ^B min	
Light (40 AFU) (xenon-arc)	Grade 4 ^A min	Grade 4 ^A min	7.6.6
Sodium Hypochlorite Bleach	Grade 4 ^A , min	Grade 4 ^A , min	7.6.7
Powdered Non-chlorine Bleach	Grade 4 ^A , min	Grade 4 ^A , min	7.6.8
Fabric smoothness appearance (see 7.7.1)	SA 3.5 ^D min	SA 3.5 ^D min	7.7
Flammability	Class 1	Class 1	7.8

^A AATCC Gray Scale for Color Change.

^B AATCC Gray Scale for Staining.

^C AATCC 9-Step Chromatic Transference Scale.

^D For durable-press fabrics only.

^E See **Note 10**.