



Designation: D 4119 – 95

Standard Performance Specification for Men's and Boys' Knitted Dress Shirt Fabrics¹

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1. Scope

1.1 This performance specification covers knitted fabrics comprised of any textile fiber or mixture of fibers, used in men's and boy's dress shirts.

1.2 This performance specification is not applicable to knitted fabrics used for interlinings.

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:

D 123 Terminology Relating to Textiles²

D 2594 Test Methods for Stretch Properties of Knitted Fabrics Having Low Power²

D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics²

D 2905 Practice for Statements on Number of Specimens for Textiles²

D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method³

D 3787 Test Method for Bursting Strength of Knitted Goods—Constant-Rate-of-Traverse (CRT) Ball Burst Test³

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

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 Laundering of Woven and Knit Fabrics

Evaluation Procedure No. 1 Gray Scale For Color Change

Evaluation Procedure No. 2 Gray Scale for Staining

Evaluation Procedure No. 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 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.

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

3.2 Definitions of Terms Specific to This Standard:

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

NOTE 2—No method is available for reproducing on a laboratory level the results of industrial press or finishing treatments, or both, used in the manufacture of garments.⁷

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

¹ This 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*, Vol 07.01.

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

⁴ AATCC Technical Manual, 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.

⁷ The development of a method has been referred to Subcommittee D13.59.

4. Specification Requirements

4.1 The properties of fabrics for men's and boy's knitted dress shirts shall conform to the specification requirements in Table 1.

5. Significance and Use

5.1 Upon 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 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 upon 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 4119 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

methods are discussed in the appropriate sections of the specified 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 Method (See Note 1)

7.1 *Bursting Strength*—Determine the bursting strength, in the standard atmosphere for testing textiles, as directed in Test Method D 3787 using an approved type of constant-rate-of-traverse (CRT) machine equipped with a bursting attachment or Test Method D 3786 using an approved type of diaphragm bursting tester as agreed upon between the purchaser and the seller.

NOTE 3—There is no overall correlation between the results obtained with the CRT machine equipped with a bursting attachment and the diaphragm bursting tester. Consequently, these two bursting testers should not 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 material to be evaluated.

7.2 Dimensional Change:

7.2.1 *Pressing and Finishing During Manufacturing*—Mark specimen(s) as directed in 5.4 of AATCC Method 135. Press and finish specimen(s) as agreed upon between the purchaser and the seller with respect to time cycles, temperature, steam, vacuum, and mechanical pressure of the press head. Measure the specimen(s) and calculate the dimensional change as directed in Sections 4 and 7 of AATCC Method 135 (see Note 2).

7.2.1.1 If no agreement has been made between the purchaser and the seller, press the specimen(s) using a flat-bed steam press and using a cycle as directed in 10.1.4.1 through 10.1.4.5 of Test Methods D 2724.

7.2.2 *Laundering*—Determine the maximum-dimensional change after five launderings as directed in the applicable procedure in AATCC Method 135 (Notes 5 and 6).

7.2.2.1 The wash conditions and drying procedure shall be as specified by the seller.

7.2.2.2 When the dimensional change after five launderings exceeds 3 %, determine the stretch of the fabric after five launderings as directed in Test Methods D 2594 using a 2.2-N (0.5-lbf) load. If the difference between the percent stretch of the laundered fabric and the percent shrinkage due to laundering does not exceed 3 % shrinkage, then the fabric meets the specification requirements in Table 1.

7.2.3 *Drycleaning*—Determine the maximum-dimensional change after three drycleanings as directed in 10.1.1 through 10.1.4 of Test Methods D 2724 (Notes 5 and 6).

TABLE 1 Specification Requirements

NOTE 1—Class in a,b,c and DP 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
<i>Bursting strength (load) (ball burst)</i>	222 N (50 lbf)	7.1
<i>Dimensional change:</i>		
Pressing and finishing	2 % max	7.2.1
After 5 launderings (see 7.2.2.2 if shrinkage exceeds 3%)	3 % max	7.2.2
After 3 drycleanings	3 % max	7.2.3
Growth	3 % max	7.2.4
<i>Colorfastness:</i>		
Burnt gas fumes—2 cycles:		
Shade change, original fabric	Class 4 ^A , min	7.3.1
Shade change after 1 laundering	Class 4 ^A , min	
or		
1 drycleaning		
Laundering:		
Shade change	Class 4 ^A , min	7.3.2
Staining	Class 3 ^B , min	
Drycleaning:		
Shade change	Class 4 ^A , min	7.3.3
Crocking:		
Dry	Class 4 ^C , min	7.3.4
Wet	Class 3 ^C , min	
Perspiration:		
Shade change	Class 4 ^A , min	7.3.5
Staining	Class 3 ^B , min	
Light (20 AATCC FU) (xenon-arc)	Step 4 ^A , min	7.3.6
<i>Fabric appearance (see 7.4.1.1)</i>	DP 3.5 ^D , min	7.4
<i>Flammability</i>	Pass	7.5

^A A AATCC Gray Scale for Color Change.

^B AATCC Gray Scale for Staining.

^C AATCC Chromatic Transference Scale.

^D For durable press fabrics only.