



Designation: D 4110 – 02

Standard Performance Specification for Men's and Boys' Knitted Bathrobe, Dressing Gown, and Pajama Fabrics¹

This standard is issued under the fixed designation D 4110; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This performance specification covers knitted fabrics for men's and boys' bathrobes, dressing gowns, and pajamas.

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

1.3 The following precautionary caveat pertains only to the test methods portion, Section 7, of this specification. *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:²

D 123 Terminology Relating to Textiles

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

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

2.2 AATCC Methods:³

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 Woven or Knit Fabrics

172 Colorfastness to Non-chlorine Bleach in Home Laundering

188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

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:⁴

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

2.4 Military Standard:⁵

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 edition of each test method cited shall prevail.

3. Terminology

3.1 Definitions:

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

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

¹ 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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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 Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

⁴ Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

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

4. Specification Requirements

4.1 The properties of knitted fabrics for bathrobes, dressing gowns, and pajamas shall conform to the specification requirements in Table 1.

5. Significance and Use

5.1 Upon agreement between the purchaser and the seller, knitted 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 4110 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.

TABLE 1 Specification Requirements

NOTE 1—Class for color change, color transfer, 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
Bursting strength(load)(ball burst)	222 N (50 lbf), min	7.1
Dimensional change:		
Pressing and finishing	2 % max	7.2.1
After five launderings	5 % max	7.2.2
After three drycleanings	2 % max	7.2.3
Growth	3 % max	7.2.4
Colorfastness:		
Burnt gas fumes—2 cycles:		7.3.1
Shade change, original fabric	Class 4 ^A min	
Shade change after one laundering or one drycleaning	Class 4 ^A min	
Sodium Hypochlorite Bleach	Class 4 ^A min	7.3.7
Non-Chlorine Bleach	Class 4 ^A min	7.3.8
Laundering:		7.3.2
Shade change	Class 4 ^A min	
Staining	Class 3 ^B min	
Drycleaning:		7.3.3
Shade change	Class 4 ^A min	
Crocking:		7.3.4
Wet	Class 4 ^C min	
Dry	Class 3 ^C min	
Perspiration:		7.3.5
Shade change	Class 4 ^A min	
Staining	Class 3 ^B min	
Light (20 AATCC FU) (x-non-arc)	Step 4 ^A min	7.3.6
Fabric appearance (see 7.4.1.1)	DP 3.5 ^D min	7.4
Flammability	pass	7.5

^A AATCC Gray Scale for Color Change.

^B AATCC Gray Scale for Staining.

^C AATCC Chromatic Transference Scale.

^D For durable press fabrics only.

5.4 The significance and use of particular properties and 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 *Bursting Strength*—Determine the bursting strength, in the standard atmosphere for testing textiles, as directed in Test Methods D 3786 or D 3787.

NOTE 2—There is no overall correlation between the results obtained when using the constant-rate-of-traverse (CRT) machine equipped with a bursting attachment and the diaphragm-bursting tester. Consequently, these two bursting testers cannot be used interchangeably. In case of controversy, the CRT machine equipped with a bursting-attachment method shall prevail.

NOTE 3—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 D 13.59. 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 Garment Manufacturing*—Mark specimen(s) as directed in 4.5 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 6 and 7 of AATCC Method 135 (see Note 4).

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 according to the cycle in 10.1.4 through 10.1.4.5 of Test Methods D 2724.

NOTE 4—No method is available for reproducing on a laboratory level the results of industrial press or finish treatments, or both, used in the manufacture of knitted bathrobes, dressing gowns, and pajamas.⁶

7.2.2 *Laundering*—Determine the maximum dimensional change after five launderings or as agreed upon between the purchaser and the seller as directed in the applicable procedure in AATCC Test Methods 135 (Notes 5 and 6).

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

7.2.3 *Drycleaning*—Determine the maximum-dimensional change after three drycleanings or as agreed upon between the purchaser and the seller in accordance with 10.1.1 through 10.1.5 of Test Methods D 2724 (Notes 5 and 6).

⁶ The development of a method has been referred to Subcommittee D13.59 on Fabric Test Methods, General.