Designation: D7021 – 14

Standard Performance Specification for Bathrobe, Dressing Gown, Negligee, Nightgown, and Pajama Fabrics[1]

This standard is issued under the fixed designation D7021; 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 fabrics used in bathrobes, dressing gowns, negligee, nightgown, and pajamas.

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

1.3 The following safety hazards caveat pertains only to the test methods described in this performance 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 (See Note 1)

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D434 Test Method for Resistance to Slippage of Yarns in Woven Fabrics Using a Standard Seam (Withdrawn 2003)[3]

D1336 Test Method for Distortion of Yarn in Woven Fabrics

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

D2261 Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)

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

2.2 *AATCC Test 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 Laundering, Home and Commercial: Accelerated

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

124 Smoothness Appearance of Fabrics after Repeated Home Launderings

132 Colorfastness to Drycleaning

135 Dimensional Changes of Fabrics after Home Laundering

158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method

172 Colorfastness to Non-Chlorine Bleach in Home Laundering

188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

2.3 *Federal Standards:*[5]

16 CFR 1610 Standard for Flammability of Clothing Textiles

16 CFR 1615 Standard for the Flammability of Children's Sleepwear: Sizes 0 Through 6X

16 CFR 1616 Standard for the Flammability of Children's Sleepwear: Sizes 7 through 14

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 For definitions of textile terms used in this specification refer to Terminologies D123 and D7022. For terms relating to chemical and colorfastness testing refer to specific AATCC test methods.

[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] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from 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.

3.2 Definitions found in a dictionary of common usage are suitable for this specification.

4. Significance and Use

4.1 Fabrics intended for this end-use should meet all of the requirements listed in Table 1.

4.2 It should be recognized that fabric can be produced utilizing an almost infinite number of combination of construction variables (e.g., type of fibers, percentage of fibers, yarn twist, yarn number, warp and pick count, chemical and mechanical finishes). Additionally, fashion or aesthetics dictate that the ultimate consumer may find acceptable articles made from fabrics that do not conform to all of the requirements in Table 1.

4.2.1 Hence, no single performance specification can possibly apply to all the various fabrics that could be utilized for this end-use.

4.3 The uses and significance of particular properties and test methods are discussed in the appropriate sections of the specified test methods.

5. Test Methods (See Note 1)

5.1 *Breaking Strength* (woven fabrics only)—Determine the breaking force (load), as directed in the grab test procedure of Test Method D5034 using a constant-rate-of-extension (CRE) tensile testing machine.

NOTE 2—If preferred a constant-rate-of-traverse (CRT) tensile testing machine may be used. There may be no overall correlation between the results obtained with the CRT machine and the CRE machine. Consequently, these two breaking force testers can not be used interchangeably. In case of controversy, the CRE method, Test Method D5034, shall prevail.

5.2 *Tearing Strength* (woven fabrics only)—Determine the tearing resistance as directed in Test Method D1424.

TABLE 1 Specification Requirements

Characteristic	Minimum Requirements		Section
	Sheer Fabrics	Non-Sheer Fabrics	
Breaking strength (CRE)[A]	67 N (15 lbf)	89 N (20 lbf)	5.1
Tearing strength (CRE)[A]	4.4 N (1 lbf)	6.7 N (1.5 lbf)	5.2
Yarn distortion:			
Satins		2.5 mm (0.1 in.), max at 4.4 N (1 lbf) load	
All other		1 mm (0.05 in.), max at 4.4 N (1 lbf) load	
Resistance to Yarn slippage[A]			5.4
(6 mm (¼ in.) separation)	44 N (10 lbf)	67 N (15 lbf)	
Bursting strength, Knit[A]	133 N (30 lbf)	222 N (50 lbf)	5.5
Dimensional Change - Woven			
Laundering	3 %, max		5.6.1
Drycleaning	2 %, max		5.6.2
Dimensional Change – Knit			
Laundering	5 % max		5.6.1
Drycleaning	5 % max		5.6.2
Colorfastness:			
Laundering:[B]			5.7.1
Shade change	Grade 4		
Staining	Grade 3		
Drycleaning:			5.7.2
Shade change	Grade 4		
Sodium Hypochlorite Bleach			5.7.3
Shade Change	Grade 4		
Non-Chlorine Bleach			5.7.3
Shade Change	Grade 4		
Burnt gas fumes—2 cycles:			5.7.4
Shade change, original fabric	Grade 4		
Shade change, after one laundering or one drycleaning	Grade 4		
Crocking:[B]			5.7.5
Dry	Grade 4		
Wet	Grade 3		
Perspiration:[B]			5.7.6
Shade change	Grade 4		
Staining	Grade 3		
Light (10 AFU) (xenon-arc)	Grade 4		5.7.7
Fabric appearance	SA 3.5		5.8
Flammability			5.9
16 CFR 1610	Class I		
16 CFR 1615, 1616	Pass		

[A]There is more than one method that can be used to measure breaking strength, tearing strength, bursting strength, and lightfastness. These methods cannot be used interchangeably since there may be no overall correlation between them (see Note 2, Note 3, Note 4, and Note 5).
[B]See Note 6.

NOTE 3—If preferred, use of Test Method D2261 is permitted with existing requirements as given in this standard. There may be no overall correlation between the results obtained with the Elmendorf machine (Test Method D1424) and with the tongue tear method (Test Method D2261). Consequently, these testers cannot be used interchangeably. In case of controversy, Test Method D1424 shall prevail.

5.3 *Yarn Distortion* (woven fabric only)—Determine the yarn distortion as directed in Test Method D1336.

5.4 *Resistance to Yarn Slippage* (woven fabrics only)—Determine the resistance to yarn slippage as directed in Test Method D434.

5.5 *Bursting Strength* (knit fabrics only)—Determine the bursting strength of knit fabrics as directed in Test Method D3786.

NOTE 4—If preferred, a consant-rate-of-extension (CRE) tensile testing machine may be used. Since there is no overall correlation between the results obtained with the CRE machine equipped with a bursting attachment (Test Method D3787) and the diaphragm bursting tester (Test Method D3786), these two bursting testers cannot be used interchangeably. In case of controversy, the diaphragm bursting tester method (Test Method D3786) shall prevail.

5.6 *Dimensional Change:*

5.6.1 *Laundering*—Determine the dimensional change after launderings as directed in the applicable procedure in AATCC Method 135.

5.6.2 *Drycleaning*—Determine the dimensional change after dry cleanings as directed in AATCC Test Method 158.

NOTE 5—Launderable fabrics are expected normally to be drycleaned, except where all or part of the fabric will not withstand drycleaning. For example, the fabric could contain a functional finish soluble in the solvent, or the fiber could be degraded by the solvent, which would be the case with poly (vinyl chloride) fiber. If a fabric would be harmed by ALL methods of care except for drycleaning, it should be considered Dryclean only.

5.7 *Colorfastness:*

5.7.1 *Laundering*—Determine the colorfastness to laundering as directed in the applicable procedure of AATCC Method 61.

NOTE 6—It has been reported that the results for staining, obtained by standard AATCC Test Methods, on fabrics dyed to dark shades that contain a combination of polyester and spandex, or their blends, may not show the full staining propensity of such fabrics in consumer use. It is, therefore, recommended that the staining results obtained by these tests not be used for acceptance testing of such fabrics.

5.7.2 *Drycleaning*—Determine colorfastness to drycleaning as directed in AATCC Method 132.

5.7.3 *Bleaching*—When testing with bleach is indicated, test as directed in AATCC Test Method 172172 for sodium hypochlorite bleach or AATCC Test Method 188 for non-chlorine bleach, as appropriate.

5.7.4 *Burnt Gas Fumes*—Determine the colorfastness to burnt gas fumes on the original fabric and after one laundering or one dry cleaning as directed in AATCC Method 23. Washing or drycleaning conditions shall be as for dimensional change testing.

5.7.5 *Crocking*—Determine colorfastness to dry and wet crocking as directed in AATCC Method 8 for solid shades and AATCC Method 116 for prints (see Note 6).

5.7.6 *Perspiration*—Determine colorfastness to perspiration as directed in AATCC Method 15 (see Note 6).

5.7.7 *Light*—Determine colorfastness to light as directed in AATCC Method 16.

NOTE 7—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Method 16, with no overall correlations between them. Consequently, these machines can not be used interchangeably. In case of controversy, results obtained with the water-cooled xenon-arc machine listed in Option E shall prevail.

5.8 *Fabric Appearance*—Determine the fabric smoothness appearance (SA) as directed in AATCC Method 124 after the applicable laundering or drycleaning procedure.

5.8.1 For fabrics not intended for use in durable press garments, determine the smoothness appearance after pressing as specified in AATCC Test Method 135.

5.9 *Flammability*—The flammability test and requirements shall meet or exceed the applicable Flammable Fabrics Act mandatory standards as specified in 16 CFR 1610 (for adult nightwear), or 16 CFR 1615 or 16 CFR 1616 (for children's nightwear).

6. Keywords

6.1 bathrobe; dressing gown; negligee; nightgown; pajama