



Standard Performance Specification for Seamless Knit Garments Including Intimates and Swimwear¹

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1. Scope

1.1 This specification covers the evaluation of specific performance characteristics of importance in seamless knit garments, including camisoles, panties, slips, girdles and swimwear.

1.2 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

D629 Test Methods for Quantitative Analysis of Textiles

D1230 Test Method for Flammability of Apparel Textiles³

D2905 Practice for Statements on Number of Specimens for Textiles³

D3107 Test Methods for Stretch Properties of Fabrics Woven from Stretch Yarns

D3136 Terminology Relating to Care Labeling for Apparel, Textile, Home Furnishing, and Leather Products

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

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

20 Fiber Analysis: Qualitative

20 A Fiber Analysis: Quantitative

61 Colorfastness to Laundering, Home and Commercial: Accelerated

106 Colorfastness to Water: Sea

107 Colorfastness to Water

116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method

132 Colorfastness to Drycleaning

150 Dimensional Changes in Automatic Home Laundering of Garments

158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method

162 Colorfastness to Water: Chlorinated Pool

172 Colorfastness to Non-Chlorine Bleach in Home Laundering

179 Skewness Change in Fabric and Garment Twist Resulting from Automatic Home Laundering

188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering

Evaluation Procedure 1 Gray Scale for Color Change

Evaluation Procedure 2 Gray Scale for Staining

Evaluation Procedure 8 9-Step Chromatic Transference Scale

Glossary for AATCC Standard Terminology

AATCC-ASTM TS-001 Quick Methods for Colorfastness to Chlorine and Non-Chlorine Bleach

NOTE 1—AATCC-ASTM TS-001 contains quick test methods for color change from chlorine and non-chlorine bleach. The methods have not been validated for verified. In case of dispute use AATCC 172 and/or 188 for bleach test results.

2.3 Federal Standards:⁵

16 CFR 1610 Flammable Fabrics Act

NOTE 2—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 all terminology related to Apparel see Terminology D7022.

⁵ Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

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 Withdrawn. 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.

3.2 The following terms are relevant to this standard: camisole, girdle, intimates, panties, seamless knit garment, slip, swimwear.

3.3 For definitions of all other textile terms see Terminology **D123**.

4. Significance and Use

4.1 Upon mutual agreement between the purchaser and the supplier, seamless knit garments intended for this end use should meet all of the requirements listed in **Table 1** of this specification.

4.2 It is recognized that, for purposes of fashion or aesthetics, the ultimate consumer of articles made from these fabrics may find acceptable products that do not conform to all of the requirements listed in **Table 1**. Therefore, one or more of the requirements in **Table 1** may be modified by mutual agreement between the purchaser and the supplier.

4.2.1 In such cases, any references to the specifications should specify that: “This product meets ASTM specifications XXXX except for the following characteristic(s).”

4.3 Where no pre-purchase agreement has been reached between the purchaser and supplier, and in case of controversy, the requirements listed in **Table 1** are intended to be used as a guide only. As noted in 4.2, ultimate consumer demands dictate varying performance parameters for a particular product.

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

5. Sampling

5.1 *Acceptance Testing Lot*—Unless agreed otherwise, consider as a lot for acceptance testing all material of a single item as a single shipment.

5.2 *Lot Samples and Laboratory Samples*—For acceptance testing, take lot samples and laboratory samples as directed by each of the applicable test methods.

5.3 *Specimens*—Take the number of specimens directed in each of the applicable test methods. Perform the tests on the product as it reaches the consumer. Any “partially finished” or “post-finish” fabrics should be processed in accordance with the fabric manufacturer’s instructions.

5.3.1 If the applicable test method does not specify the number of specimens, use the procedures in Practice **D2905** to determine the number of specimens per laboratory sample unit.

5.3.2 Use a reliable estimate of the variability of individual observations on similar materials in the user’s laboratory, a 95% probability level, and an allowable difference of 5% of units and the average for the laboratory sampling unit.

6. Specification Requirements

6.1 The properties of seamless knit garments shall conform to the specification requirements of **Table 1**.

7. Test Methods (See **Note 1**)

7.1 *Bursting Strength*—Determine bursting strength of knit fabrics as directed in Test Method **D3786** (preferred method) or Test Method **D3787**

NOTE 3—The precision of the bursting strength testers has not been established and the results are not interchangeable. The methods are accordingly not recommended for acceptance testing unless preceded by an interlaboratory check in the laboratories of the purchaser and the supplier, using randomized replicate specimens of the material to be evaluated.

7.2 *Colorfastness to Laundering*—Determine the colorfastness to laundering as directed in AATCC Test Method **61** or as otherwise agreed upon between purchaser and the supplier.

TABLE 1 Specification Requirements

Characteristic	Requirements		Section
Bursting Strength	<5 oz	30 lb/sq in	
Colorfastness			
Laundering	Color Change	4.0 Min	7.2
Drycleaning	Staining	3.0 Min	
Crocking	Color change	4.0 Min	7.3
Dry	Staining	3.0 Min	
Wet	Dry	4.0 Min	7.4
Wet	Wet	3.0 Min	
Light Swimwear 40 AFU's		Grade 3.5 Min	7.5
Intimates 20 AFU's		Grade 3.5 Min	
Perspiration	Color change	4.5 Min	7.6
Water	Staining	3.5 Min	
Sea Water (Swimwear only)	Color change	4.5 Min	7.7
Chlorinated Pool Water (Swimwear only)	Staining	3.5 Min	
Bleach	Color change	4.0 Min	7.8
Chlorine		4.0 Min	7.9
Non-Chlorine		Grade 4 Min	7.10
Dimensional Change		Grade 4 Min	
Laundering — Each direction		±5.0% Max	7.11
Drycleaning- Each direction		±3.0% Max	
Stretch		Record Actual	7.12
Flammability		Class 1	7.13
Garment Twist		5 % max	7.14
Fiber Content		±3.0% Max	7.15
	Blends	±0.0% Max	
	100% Fibers		

7.3 Colorfastness to Drycleaning—For drycleanable fabrics, determine the colorfastness to laundering as directed in AATCC Test Method **132** or as otherwise agreed upon between purchaser and the supplier.

7.4 Colorfastness to Crocking—Determine the colorfastness to crocking as directed in AATCC Test Method **8** for shades and AATCC Test Method **116** for prints or as otherwise agreed upon between purchaser and the supplier.

7.5 Colorfastness to Light—Determine the colorfastness to light as directed in AATCC Test Method **16**, Option 3.

NOTE 4—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Test Method **16**, with no overall correlations between them. Consequently, these machines cannot be used interchangeably. In case of controversy, results obtained with the Water Cooled Xenon Arc machine listed in Option E shall prevail.

7.6 Colorfastness to Perspiration—Determine the colorfastness to perspiration as directed in AATCC Test Method **15**.

7.7 Colorfastness to Water—Determine the colorfastness to water as directed in AATCC Test Method **107**.

7.8 Colorfastness to Sea Water—For swimwear, determine the colorfastness to sea water as directed in AATCC Method **106**.

7.9 Colorfastness to Chlorinated Pool Water—For swimwear, determine the colorfastness to chlorinated pool water as directed in AATCC Method **162**.

7.10 Colorfastness to Chlorine and Non-Chlorine Bleach—Determine the colorfastness to bleach as directed in AATCC/ASTM TS-001 or AATCC Test Methods **172** and **188**. (See **Note 1**.)

7.11 Dimensional Change—Determine the dimensional change following the permanently attached care label instructions or as directed in AATCC Test Method **150** for laundering or AATCC Test Method **158** for drycleaning.

7.11.1 If there is no attached care label, the refurbishing conditions shall be as specified by the supplier when using the AATCC Test Method **150** for laundering or AATCC Test Method **158** for drycleaning.

7.12 Stretch—Determine the amount of stretch as directed in Test Method **D3107**.

7.13 Flammability—The flammability requirements shall be as agreed upon between the purchaser and the supplier except when regulated by applicable government mandatory standards. If flammability is to be tested, Test Method **D1230** can be used as the method of evaluation.

7.14 Garment Twist—Determine twist as directed in AATCC **179**.

7.15 Fiber Content—Determine fiber content as directed in AATCC **20**, **20A**, or Test Method **D629**.

8. Keywords

8.1 performance specification; seamless knit garments

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