



Designation: **D3996 – 02 (Reapproved 2008) D3996 – 13**

Standard Performance Specification for Knit Swimwear Fabrics¹

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1. Scope

1.1 This performance specification covers circular and warp knitted fabrics for use in knit swimwear, composed of any textile fiber or mixture of textile fibers.

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

1.3 The following precautionary statement 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

[D123 Terminology Relating to Textiles](#)

[D2905 Practice for Statements on Number of Specimens for Textiles \(Withdrawn 2008\)](#)³

[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-Traversal \(CRT\) Ball Burst Test](#)

[D7022 Terminology Relating to Apparel](#)³

2.2 *AATCC Methods:*⁴

[8 Colorfastness to Crocking: AATCC Crockmeter Method](#)

[15 Colorfastness to Perspiration](#)

[16.3 Colorfastness to Light](#)

[23 Colorfastness to Burnt Gas Fumes](#)

[61 Colorfastness to Washing, Domestic, and Laundering, Commercial: Laundering: Accelerated](#)

[106 Colorfastness to Water: Sea](#)

[107 Colorfastness to Water](#)

[116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method](#)

[129 Colorfastness to Ozone in the Atmosphere Under High Humidities](#)

[135 Dimensional Changes in Automatic Home Laundering of Durable Press Woven or Knit Fabrics of Fabrics After Home Laundering](#)

[Evaluation Procedure No. 1 Gray Scale for Color Change](#)

[Evaluation Procedure No. 2 Gray Scale for Staining](#)

[Evaluation Procedure No. 38 AATCC 9-Step Chromatic Transference Scale](#)

[162 Colorfastness to Water Chlorinated Pool](#)

[172 Colorfastness to Powdered Non-Chlorine Bleach in Home Laundering](#)

[188 Colorfastness to Sodium Hypochlorite Bleach in Home Laundering](#)

2.3 *Federal Standard:*⁵

[16 CFR 1610 Standard for Flammability of Clothing Textiles](#)

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

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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 (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, http://www.aatcc.org.

⁵ Available from Superintendent of Documents, Government Printing Office, Washington, DC 20407.

current editions of each test method cited shall prevail.

3. Terminology

3.1 *Definitions:*

3.1.1 ~~swimwear~~—textile garments intended for wear in fresh, chlorinated, or salt water.

3.1 For all terminology related to D13.61, Apparel, see Terminology [D7022](#).

3.1.1 The following terms are relevant to this standard: swimwear.

3.2 For definitions of ~~textile terms used in this specification, refer to the individual ASTM and AATCC test methods and all other textile terms, see Terminology~~ [D123](#).

3.3 For terms relating to chemical or colorfastness testing, refer to specific AATCC methods.

4. Specification Requirements

4.1 The properties of fabrics for knitted swimwear shall conform to the specification requirements in [Table 1](#).

5. Significance and Use

5.1 Upon mutual 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 by mutual 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 D3996 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 significance and use of particular properties and test methods are discussed in the appropriate sections of the specified test methods.

6. Sampling

6.1 *Acceptance Testing Lot*—Unless there is prior agreement consider as a lot for acceptance testing all material of a single item received as a single shipment.

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

6.3 *Test Specimens*—Take the number of specimens directed in each of the applicable test methods. Perform the tests on the fabric as it will reach the customer. Any “partially finished” or “post-finished” fabrics should be processed in accordance with the fabric manufacturer’s instructions.

6.4 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 sampling unit. Use (1) a reliable estimate of the variability of individual observations on similar materials in the user’s laboratory, (2) a 95 % probability level, and (3) an allowable difference of 5 % of the average between the test results on laboratory sampling units and the average for the laboratory sampling unit. The average for a laboratory sampling unit is the average that would be obtained by applying the test method to all of the potential specimens from that laboratory sampling unit.

7. Test Methods

7.1 *Bursting Strength*—Determine the bursting strength, in the standard atmosphere for testing textiles, as directed in Test Method [D3787](#) using an approved type of constant-rate-of-traverse (CRT) machine equipped with a bursting attachment or as directed in Test Method [D3786](#) using an approved type of motor diaphragm-driven bursting tester as agreed upon between the purchaser and the seller.

NOTE 2—Fabrics which include fibers which are known to lose strength when wet, such as rayon, should be tested for wet bursting strength also.

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 cannot be used interchangeably. In case of controversy, Test Method [D3786](#) shall prevail.

NOTE 4—The precision of the burst methods 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:*