



# Standard Specification for Woven and Warp Knitted Comforter Fabrics<sup>1</sup>

This standard is issued under the fixed designation D 4769; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers woven and warp knitted comforter fabrics, composed of any textile fiber, or mixture of fibers.

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

1.3 The following safety hazards caveat pertains only to the test methods described in this specification: *This standard may involve hazardous materials, operations, and equipment. 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 Textiles<sup>2</sup>
- D 1424 Test Method for Tear Resistance of Woven Fabrics by Falling-Pendulum (Elmendorf) Apparatus<sup>2</sup>
- D 1682 Test Methods for Breaking Load and Elongation of Textile Fabrics<sup>2</sup>
- D 2261 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single-Rip) Method (Constant-Rate-of-Extension Tensile Testing Machine)<sup>2</sup>
- D 2262 Test Method for Tearing Strength of Woven Fabrics by the Tongue (Single-Rip) Method (Constant-Rate-of-Traversal Tensile Testing Machine)<sup>2</sup>
- D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics<sup>2</sup>
- D 2905 Practice for Statements on Number of Specimens for Textiles<sup>2</sup>
- D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method<sup>3</sup>
- D 3787 Test Method for Bursting Strength of Knitted

Goods—Constant-Rate-of-Traversal (CRT) Ball Burst Test<sup>3</sup>

### 2.2 AATCC Methods:<sup>4</sup>

- 8 Colorfastness to Crocking: AATCC Crockmeter Method
- 16A Colorfastness to Light: Carbon-Arc-Lamp, Continuous Light
- 16E Colorfastness to Light: Water-Cooled Xenon-Arc Lamp, Continuous 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 Durable Press Woven or Knit Fabrics
- AATCC Evaluation Procedure 1 Gray Scale for Color Change
- AATCC Evaluation Procedure 2 Gray Scale for Staining
- AATCC Evaluation Procedure 3 Chromatic Color Transference Scale

NOTE 1—References to test methods in this standard 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 *comforter, n*—a bed covering assembly, consisting of an insulating filler secured between two layers of fabric, used primarily to reduce heat loss.

3.1.2 *fill leakage, n*—in *comforters*, either partial or total penetration of the stuffing material through the outer or face fabric.

3.1.3 For definitions of other textile terms used in this specification, refer to Terminology D 123, and the Technical Manual of the American Association of Textile Chemists and Colorists.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 07.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 07.02.

<sup>4</sup> Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

4. Specification Requirements

4.1 The properties of woven comforter fabrics shall conform to the specification requirements in Table 1.

5. Significance and Use

5.1 Upon mutual agreement between the purchaser and seller, fabrics intended for this end use should meet all 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 seller.

5.2.1 If any of the requirements in Table 1 are modified by mutual agreement between purchaser and seller, any reference to the specification shall state that: "This fabric meets ASTM Specification D 4769, except for the following characteristic(s)."

5.3 Where no prepurchase agreement has been reached between the purchaser and seller, and in case of controversy, the requirements listed in Table 1 are intended to be used as a guide only. As stated 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 agree-

TABLE 1 Specification Requirements

NOTE 1—Class in A, B, and C, and D.P. rating is based on a numerical scale of 5 for no color change, color transfer, or wrinkle, to 1 for severe color change, color transfer, or wrinkle.

Characteristic	Woven Fabrics	Warp Knit Fabrics	Section
Breaking Strength (Load)	133 N (30 lbf) min	NA	7.2
Bursting Strength (Motor-Driven Diaphragm Tester)	NA	35 psi (155 kPa)	7.2
Tear Strength	6.7 N (1.5 lbf) min	NA	7.3
Dimensional Change:			
Laundering	3 % max	5 % max	7.4.1
Drycleaning	3 % max	5 % max	7.4.2
Fabric Appearance	D.P. 3.5 min	D.P. 3.5 min	7.5
Colorfastness:			
Burnt Gas Fumes-2 cycles	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.1
Shade Change After One Laundering or One Drycleaning	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.1
Laundering:			
Shade Change	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.2
Staining	Class 3 <sup>B</sup> min	Class 3 <sup>B</sup> min	7.6.2
Drycleaning:			
Shade Change	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.3
Crocking:			
Dry	Class 4 <sup>C</sup> min	Class 4 <sup>C</sup> min	7.6.4
Wet	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	7.6.4
Light (20 AATCC SFU)	Class 4 <sup>A</sup> min	Class 4 <sup>A</sup> min	7.6.5
Flammability	Pass	Pass	7.7
Fill Leakage	...	...	7.8

<sup>A</sup> AATCC Gray Scale For Color Change.  
<sup>B</sup> AATCC Gray Scale For Staining.  
<sup>C</sup> AATCC Chromatic Transference Scale.

ment, 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-finish" 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 D 2905 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 (See Note 1)

7.1 Breaking Strength (Load)—Determine the dry breaking strength of woven fabrics, in the standard atmosphere for testing textiles, as directed in Test Method D 1682, using a constant-rate-of-traverse (CRT) tensile testing machine, with the speed of the pulling jaw at 305 ± 13 mm (12 ± 0.5 in.)/min.

NOTE 2—If preferred, the use of a constant-rate-of-extension (CRE) tensile testing machine is permitted. The cross head speed should be as agreed between the purchaser and the seller. There may be no overall correlation between the results obtained with the CRT and CRE machines. Consequently, these two testers cannot be used interchangeably. In case of controversy, the CRT method shall prevail.

7.2 Bursting Strength—Determine the bursting strength of warp knit fabrics in the standard atmosphere for testing textiles, as directed in Test Method D 3786, or Test Method D 3787 as agreed between the purchaser and 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 cannot be used interchangeably. In case of controversy, the motor-driven diaphragm tester method (Test Method D 3786) shall prevail.

NOTE 4—The precision of the bursting strength testers has not been established. The methods are accordingly not recommended for acceptance testing unless preceded by an interlaboratory check in the laboratories of the purchaser and seller, using randomized replicate specimens of the material to be evaluated.

7.3 Tear Strength—Determine the tear strength of woven fabrics as directed in Test Method D 1424.

NOTE 5—If preferred, the use of Test Methods D 2261, or 2262 is permitted, with existing requirements as given in this specification. There may be no overall correlation between the results obtained with the tongue tear testers, and the Elmendorf tester. Consequently, these three testers cannot be used interchangeably. In case of controversy, Test Method D 1424 shall prevail.

7.4 Dimensional Change:

7.4.1 Laundering—Determine the maximum dimensional change after five launderings as directed in AATCC

Method 135, using the wash conditions and drying procedures specified by the seller.

7.4.2 *Drycleaning*—Determine the maximum dimensional change after three drycleanings as directed in Test Methods D 2724, or as agreed between the purchaser and seller.

NOTE 6—Do not flat bed press the test specimens after drycleaning, as directed in Test Methods D 2724, as the fabric in its end use should not be pressed.

7.5 *Fabric Appearance*—Determine the fabric appearance as directed in AATCC Method 124, after laundering as specified in 7.4.1, for washable fabrics, or drycleaning as specified in 7.4.2 for drycleanable fabrics (Note 6).

7.6 *Colorfastness*:

7.6.1 *Burnt Gas Fumes*—Determine the colorfastness to burnt gas fumes on the original fabric, and after one laundering or one drycleaning, as directed in AATCC Method 23.

NOTE 7—Washing conditions shall be the same as those used in 7.4.1. Drycleaning conditions shall be the same as those used in 7.4.2.

7.6.2 *Laundering*—For washable items, determine the colorfastness to laundering as directed in AATCC Method 61. The test conditions shall be as specified by the seller.

7.6.3 *Drycleaning*—For drycleanable items, determine the colorfastness to drycleaning as directed in AATCC Method 132.

7.6.4 *Crocking*—Determine the colorfastness to dry and wet crocking as directed in AATCC Method 8 or AATCC Method 116, or as agreed to by the purchaser and seller. In case of controversy, AATCC Method 8 shall prevail.

7.6.5 *Light*—Determine the colorfastness to light as directed in AATCC Method 16A or AATCC Method 16E.

NOTE 8—There is a distinct difference in spectral distribution between the xenon fading lamp apparatus and the enclosed carbon-arc (not sunshine carbon arc). Consequently, these two fading lamp apparatus cannot be used interchangeably. In case of controversy, AATCC Method 16E shall prevail.

7.7 *Flammability*—The flammability requirements shall be as agreed to between the purchaser and seller, except when regulated by applicable Government mandatory standards.

7.8 *Fill Leakage*—No acceptable standard method is yet available for the determination of this fabric property. Depending on the type of fill used during the manufacture of the comforter, and the cover factor of face and back fabrics, varied degrees of fill leakage may occur, and this property can only be evaluated on the assembled comforter. Hence, the degree of permissible fill leakage should be agreed upon by the purchaser and seller.

## 8. Keywords

8.1 comforter; specification; woven and warp knitted fabrics

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