



Designation: D5433 – 12

# Standard Performance Specification for Towel Products for Institutional and Household Use<sup>1</sup>

This standard is issued under the fixed designation D5433; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This specification covers the evaluation of specific performance characteristics of importance in woven and knitted kitchen towel, dishcloth, crash towel, huck towel, washcloth, hand towel, bath towel, and bath sheet products for use in institutional and household environments.

1.2 This specification may be used by mutual agreement between the purchaser and the supplier to establish purchasing specification requirements.

1.3 The requirements in **Tables 1 and 2** apply to the length and width directions for those properties where fabric direction is pertinent.

1.4 This specification is not applicable for coated and laminated products, nonwoven products, or terry fabrics used for apparel.

1.5 *This standard does not purport to address all of the safety problems, 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:*<sup>2</sup>

**D123 Terminology Relating to Textiles**

**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)**

**D2905 Practice for Statements on Number of Specimens for Textiles (Withdrawn 2008)**<sup>3</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.63 on Home Furnishings.

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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

**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**

**D4772 Test Method for Surface Water Absorption of Terry Fabrics (Water Flow)**

**D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)**

**D6797 Test Method for Bursting Strength of Fabrics Constant-Rate-of-Extension (CRE) Ball Burst Test**

**D7023 Terminology Relating to Home Furnishings**

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

**8 Colorfastness to Crocking: Crockmeter Method**

**16 Option 3 Colorfastness to Light: Xenon-Arc Lamp, Continuous Light**

**61 Colorfastness to Laundering: Accelerated**

**88B Smoothness Appearance of Seams in Fabrics after Repeated Home Laundering**

**135 Dimensional Changes of Fabrics after Home Laundering**

**96 Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool**

**116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method**

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

**Evaluation Procedure 1 Gray Scale for Color Change**

**Evaluation Procedure 2 Gray Scale for Staining**

**Evaluation Procedure 8 AATCC 9-Step Chromatic Transference Scale**

NOTE 1—Reference to test methods in this specification give only the pertinent part of the designation of ASTM, AATCC, or other test methods. The current edition of each test method shall prevail.

## 3. Terminology

3.1 For definitions of terms relating to Home Furnishings, D13.63, refer to Terminology **D7023**.

3.1.1 The following terms are relevant to this standard: bath sheet, bath towel, crash towel, fingertip towel, huck towel, terry towel, towel.

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

**TABLE 1 Woven or Knitted Terry Fabric Specification Requirements**

	Terry Requirements			Section
	Kitchen Towels	Dishcloths	Bath, Hand, Washcloths, Bath Sheets	
Breaking Strength (CRE)				7.1
Length	178 N (40 lbf) min	220 N (50 lbf) min	178 N (40 lbf) min	
Width	133 N (30 lbf) min	178 N (40 lbf) min	133 N (30 lbf) min	
Bursting Strength (knits only)				
Diaphragm	222 N (50 lbf) min	222 N (50 lbf) min	222 N (50 lbf) min	7.1.3
Dimensional Change:				7.1.4
Length	10 % max	10 % max	10 % max	
Width	5 % max	5 % max	4 % max	
Skew	5 % max	5 % max	5 % max	7.1.5
Colorfastness: <sup>A</sup>				
Laundering:				7.1.6.1
Shade Change	Grade 4 <sup>B</sup> min	Grade 4 <sup>B</sup> min	Grade 4 <sup>B</sup> min	
Staining	Grade 3 <sup>C</sup> min	Grade 3 <sup>C</sup> min	Grade 3 <sup>C</sup> min	
Crocking:				7.1.6.2
Dry	Grade 4 <sup>D</sup> min	Grade 4 <sup>D</sup> min	Grade 4 <sup>D</sup> min	
Wet	Grade 3 <sup>D</sup> min	Grade 3 <sup>D</sup> min	Grade 3 <sup>D</sup> min	
Light (20 AATCC AFU)	Grade 4 <sup>B</sup> min	Grade 4 <sup>B</sup> min	Grade 4 <sup>B</sup> min	7.1.6.3
Absorbency	Pass	Pass	Pass	7.1.7
Laundered Appearance	Acceptable	Acceptable	Acceptable	7.2.1

<sup>A</sup> Class for color change and color transfer is based on a numerical scale of 5 for negligible or no color change or color transfer to 1 for severe color change or color transfer. The numerical rating in Table 1 or higher is acceptable.

<sup>B</sup> AATCC Gray Scale for Color Change.

<sup>C</sup> AATCC Gray Scale for Staining.

<sup>D</sup> AATCC 9-Step Chromatic Transference Scale.

**TABLE 2 Non Terry Fabric Requirements**

	Dishcloths	Huck & Crash Towels	Section
Breaking Strength (CRE)			7.1
Length	220 N (50 lbf) min	178 N (40 lbf) min	
Width	178 N (40 lbf) min	133 N (30 lbf) min	
Bursting Strength (knits only)			
Diaphragm	222 N (50 lbf) min	222 N (50 lbf) min	7.1.3
Dimensional Change:			7.1.4
Length	10 % max	10 % max	
Width	5 % max	5 % max	
Skew	5 % Acceptable	5 % Acceptable	7.1.5
Colorfastness: <sup>A</sup>			
Laundering:			7.1.6.1
Shade Change	Grade 4 <sup>B</sup> min	Grade 4 <sup>B</sup> min	
Staining	Grade 3 <sup>C</sup> min	Grade 3 <sup>C</sup> min	
Crocking:			7.1.6.2
Dry	Grade 4 <sup>D</sup> min	Grade 4 <sup>D</sup> min	
Wet	Grade 3 <sup>D</sup> min	Grade 3 <sup>D</sup> min	
Light (20 AATCC FU)	Step 4 <sup>B</sup> min	Step 4 <sup>B</sup> min	7.1.6.3
Absorbency	Pass	Pass	7.1.7
Laundered Appearance	Acceptable	Acceptable	7.2.1

<sup>A</sup> Class for color change and color transfer is based on a numerical scale of 5 for negligible or no color change or color transfer to 1 for severe color change or color transfer. The numerical rating in Table 1 or higher is acceptable.

<sup>B</sup> AATCC Gray Scale for Color Change.

<sup>C</sup> AATCC Gray Scale for Staining.

<sup>D</sup> AATCC 9-Step Chromatic Transference Scale.

3.2 For all other terminology related to textiles, refer to Terminology **D123**.

#### 4. Specification Requirements

4.1 *Product*—The properties to be evaluated and the acceptance criteria assigned to these areas shall be set by mutual agreement between the purchaser and the supplier.

4.2 *Fabrics*—The properties of fabrics for institutional and household kitchen towels, dishcloths, huck towels, crash towels, washcloths, hand towels, bath towels, and bath sheets shall conform to the specification requirements in **Tables 1 and 2**.