



Designation: D5433 – 00

# 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 reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 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<sup>2</sup>
- D629 Test Methods for Quantitative Analysis of Textiles<sup>2</sup>
- D1230 Test Method for Flammability of Apparel Textiles<sup>2</sup>
- D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus<sup>2</sup>
- D2261 Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)<sup>3</sup>
- D2262 NO TITLE<sup>2</sup>
- D2905 Practice for Statements on Number of Specimens for Textiles<sup>4 2</sup>
- D3136 Terminology Relating to Care Labeling for Apparel,

- Textile, Home Furnishing, and Leather Products<sup>5</sup>
- D3786 Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method<sup>5</sup>
- D3787 Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test<sup>5</sup>
- D3882 Test Method for Bow and Skew in Woven and Knitted Fabrics<sup>5</sup>
- D3938 Guide for Determining or Confirming Care Instructions for Apparel and Other Textile Products<sup>5</sup>
- D4390 NO TITLE<sup>5</sup>
- D4772 Test Method for Surface Water Absorption of Terry Fabrics (Water Flow)<sup>5</sup>
- D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- 2.2 AATCC Methods:<sup>6</sup>
- 8 Colorfastness to Crocking
- 16A Colorfastness to Light: Carbon Arc Lamp Continuous Light
- 16E Colorfastness to Light: Water Cooled Xenon-Arc Lamp, Continuous Light
- 61 Colorfastness to Washing, Domestic and Laundering Commercial, Accelerated
- 88B Appearance of Seams in Wash and Wear Items After Home Laundering
- 135 Dimensional Changes in Automatic Home Laundering of Woven or Knit Fabrics
- 96 Dimensional Changes in Laundering of Woven and Knitted Fabrics Except Wool
- 97 Non-Cotton Content of Bleached Cotton Textiles
- 116 Colorfastness to Crocking: Rotary Vertical Crockmeter Method
- Evaluation Procedure 1 Gray Scale for Color Change
- Evaluation Procedure 2 Gray Scale for Staining
- Evaluation Procedure 3 AATCC Chromatic Transference Scale

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.63 on Home Furnishings.

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

<sup>3</sup> Discontinued- See 1995 Annual Book of ASTM Standards, Vol 07.01.

<sup>4</sup> Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

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 Definitions:

<sup>5</sup> Annual Book of ASTM Standards, Vol 07.02.

<sup>6</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 Force (CRT)				<b>7.1</b>
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 Force (knits only)				
Diaphragm	222 N (50 lbf) min	222 N (50 lbf) min	222 N (50 lbf) min	<b>7.1.3</b>
Nonfibrous material	3 % max	5 % max	3 % max	<b>7.1.4</b>
Dimensional Change:				<b>7.1.5</b>
Length	10 % max	10 % max	10 % max	
Width	5 % max	5 % max	4 % max	
Bow and Skew	6 % max	6 % max	6 % max	<b>7.1.6</b>
Colorfastness: <sup>A</sup>				
Laundering:				<b>7.1.7.1</b>
Shade Change	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Staining	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	
Crocking:				<b>7.1.7.2</b>
Dry	Class 4 <sup>D</sup> min	Class 4 <sup>D</sup> min	Class 4 <sup>D</sup> min	
Wet	Class 3 <sup>D</sup> min	Class 3 <sup>D</sup> min	Class 3 <sup>D</sup> min	
Light (20 AATCC FU)	Step 4 <sup>B</sup> min	Step 4 <sup>B</sup> min	Step 4 <sup>B</sup> min	<b>7.1.7.3</b>
Absorbency	Pass	Pass	Pass	<b>7.1.8</b>
Flammability	Class I	Class I	Class I	<b>7.1.9</b>
Laundered Appearance	Acceptable	Acceptable	Acceptable	<b>7.2.1</b>

<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 Chromatic Transference Scale.

**TABLE 2 Non Terry Fabric Requirements**

	Dishcloths	Huck & Crash Towels	Section
Breaking Force (CRT)			<b>7.1</b>
Length	220 N (50 lbf) min	178 N (40 lbf) min	
Width	178 N (40 lbf) min	133 N (30 lbf) min	
Bursting Force (knits only)			
Diaphragm	222 N (50 lbf) min	222 N (50 lbf) min	<b>7.1.3</b>
Nonfibrous material	5 % max	5 % max	<b>7.1.4</b>
Dimensional Change:			<b>7.1.5</b>
Length	10 % max	10 % max	
Width	5 % max	5 % max	
Bow and Skew	6 % Acceptable	6 % Acceptable	<b>7.1.6</b>
Colorfastness: <sup>A</sup>			
Laundering:			<b>7.1.7.1</b>
Shade Change	Class 4 <sup>B</sup> min	Class 4 <sup>B</sup> min	
Staining	Class 3 <sup>C</sup> min	Class 3 <sup>C</sup> min	
Crocking:			<b>7.1.7.2</b>
Dry	Class 4 <sup>D</sup> min	Class 4 <sup>D</sup> min	
Wet	Class 3 <sup>D</sup> min	Class 3 <sup>D</sup> min	
Light (20 AATCC FU)	Step 4 <sup>B</sup> min	Step 4 <sup>B</sup> min	<b>7.1.7.3</b>
Absorbency	Pass	Pass	<b>7.1.8</b>
Flammability	Class 1	Class 17.1.9	
Laundered Appearance	Acceptable	Acceptable	<b>7.2.1</b>

<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 Chromatic Transference Scale.

3.1.1 *bath sheet, n*—a textile terry product with end hems or fringes and side hems or selvages that is generally much larger than a bath towel.

3.1.2 *bath towel, n*—a textile terry product with end hems or fringes and side hems or selvages, which is used to dry a person's body after bathing or swimming.

3.1.3 *crash towel, n*—a plain weave nonterry product with hems or selvages which has a rough texture caused by uneven yarns.

3.1.4 *fingertip towel, n*—a textile product with fringes and side hems or selvages which is smaller than a hand towel, generally used as decoration and to dry hands.

3.1.5 *huck towel, n*—a plain weave nonterry foundation product constructed with small warp and filling floats, having hems or selvages, which is used to dry a person's hands and utensils such as glasses, plates, bowls, and flatware.

3.1.6 *terry towel, n*—a textile product with end hems or fringes and side hems or selvages which is made with loop pile