



Designation: D4966 – 22

Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)¹

This standard is issued under the fixed designation D4966; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of the abrasion resistance of textile fabrics using the Martindale abrasion tester. The method is generally applicable to knit, woven, and nonwoven fabrics; however, material thickness may limit suitability for testing due to specimen holder capacity.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—For other current test methods of testing the abrasion resistance of textiles refer to Test Methods [D3884](#), [D3885](#), [D3886](#), [D4157](#), [D4158](#), and AATCC TM93.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[D123 Terminology Relating to Textiles](#)

[D1776 Practice for Conditioning and Testing Textiles](#)

[D3884 Guide for Abrasion Resistance of Textile Fabrics \(Rotary Platform Abrader Method\)](#)

[D3885 Test Method for Abrasion Resistance of Textile Fabrics \(Flexing and Abrasion Method\)](#)

[D3886 Test Method for Abrasion Resistance of Textile Fabrics \(Inflated Diaphragm Apparatus\)](#)

[D4157 Test Method for Abrasion Resistance of Textile Fabrics \(Oscillatory Cylinder Method\)](#)

[D4158 Guide for Abrasion Resistance of Textile Fabrics \(Uniform Abrasion\)](#)

[D4850 Terminology Relating to Fabrics and Fabric Test Methods](#)

2.2 AATCC Methods and Procedures:

[EP1 Evaluation Procedure for Gray Scale for Color Change](#)³

[TM93 Test Method for Abrasion Resistance of Fabrics: Accelerator Method](#)³

3. Terminology

3.1 For all terminology relating to D13.60, Fabric Test Methods, Specific, refer to Terminology [D4850](#).

3.1.1 The following terms are relevant to this standard: *abrasion, abrasion cycle, Lissajous figure, movement.*

3.2 For all other terms related to textiles, refer to Terminology [D123](#).

3.3 *abrasion cycle, n*—in abrasion testing, one or more movements of the abrasant across a material surface, or movement of the material across the abrasant, which permits a return to its starting position.

3.3.1 *Discussion*—The abrasion cycle is dependent on the programmed motions of the abrasion machine and the test standard used. It may consist of one back-and-forth unidirectional movement such as for the flexing and abrasion test method; a circular movement such as for the rotary platform test method, or a combination of both such as for the inflated diaphragm test method. For the oscillatory cylinder abrasion method, an abrasion cycle consists of one double-rub.

3.4 *Lissajous figure, n*—any of an infinite variety of curves formed by combining two mutually perpendicular simple harmonic motions, commonly exhibited by the oscilloscope, and used in studying frequency, amplitude, and phase relations of harmonic variables.

¹ This test method is under the jurisdiction of ASTM Committee [D13](#) on Textiles and is the direct responsibility of Subcommittee [D13.60](#) on Fabric Physical Test Methods B.

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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 Available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.