



Standard Test Method for Abrasion Resistance of Textile Fabrics (Inflated Diaphragm Apparatus)¹

This standard is issued under the fixed designation D3886; 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 method² covers the determination of the resistance to abrasion of woven and knitted textile fabrics, both conditioned and wet, using the inflated diaphragm tester. This procedure is not applicable to floor coverings.

NOTE 1—Other procedures for measuring the abrasion resistance of textile fabrics are given in Test Methods [D3884](#), [D3885](#), [D1175](#) and AATCC Test Method 93.

1.2 The values stated in SI units are to be regarded as standard; the values in English units are provided as information only and are not exact equivalents.

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

2. Referenced Documents

2.1 ASTM Standards:³

[D123 Terminology Relating to Textiles](#)

[D1175 Method of Test for Abrasion Resistance of Textile Fabrics \(Oscillatory Cylinder and Uniform Abrasion\); Replaced by D 4157, D 4158 \(Withdrawn 1981\)⁴](#)

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

[D2904 Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data \(Withdrawn 2008\)⁴](#)

[D2906 Practice for Statements on Precision and Bias for](#)

[Textiles \(Withdrawn 2008\)⁴](#)

[D3884 Guide for Abrasion Resistance of Textile Fabrics \(Rotary Platform, Double-Head Method\)](#)

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

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

2.2 AATCC Standard:

[Test Method 93 Abrasion Resistance of Fabrics: Accelerator Method⁵](#)

3. Terminology

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

3.2 The following term is relevant to this standard: abrasion.

3.3 For definitions of all other textile terms see Terminology [D123](#).

4. Summary of Test Method

4.1 A specimen is abraded by rubbing either unidirectionally or multidirectionally against an abradant having specified surface characteristics. A specimen is held in a fixed position and supported by an inflated rubber diaphragm which is held under constant pressure. A specimen is abraded by rubbing either unidirectionally or multidirectionally against an abradant having specified surface characteristics. The resistance to abrasion is determined using Option 1, the number of cycles to wear a hole in the specimen, or Option 2, visual assessment of the specimen surface after a specified number of cycles.

5. Significance and Use

5.1 The measurement of the resistance to abrasion of textile and other materials is very complex. The resistance to abrasion is affected by many factors, such as the inherent mechanical properties of the fibers; the dimensions of the fibers; the structure of the yarns; the construction of the fabrics; and the type, kind, and amount of finishing material added to the fibers, yarns, or fabric.

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 Test Methods, Specific.

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² This test method is based upon the development described by R. G. Stoll, in "Improved Multipurpose Abrasion Test and Its Application for the Wear Resistance of Textiles," *Textile Research Journal*, July 1949, p. 394.

³ 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.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.