



Standard Guide for Abrasion Resistance of Textile Fabrics (Uniform Abrasion)¹

This standard is issued under the fixed designation D4158; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This guide covers the determination of the resistance to abrasion of a wide range of textile materials using the uniform abrasion testing instrument. Fabrics of all types including carpets, garments and nonwovens may be tested under this method.

NOTE 1—Other procedures for measuring the abrasion resistance of textile fabrics are given in: Test Methods [D3884](#), [D3885](#), [D3886](#), [D4157](#), [D4966](#), and AATCC Test Method 93.

1.1.1 Provisions are provided for testing specimens in dry and wet conditions. Four options for evaluation are included:

- Option 1—Fabric Rupture
- Option 2—Mass Loss
- Option 3—Thickness Loss
- Option 4—Breaking Strength Loss

1.1.2 Provision is provided for testing specimens in the wet state.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as the standard. Within the text, the inch-pound units are shown in parentheses. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

1.3 *This guide 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:²

[D123](#) Terminology Relating to Textiles

¹ This guide 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 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.

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

[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)

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

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

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

[D4966](#) Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)

[D5035](#) Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)

2.2 Other Documents:

AATCC Test Method 93 Abrasion Resistance of Fabrics: Accelerator Method³

3. Terminology

3.1 For all terms 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, rotation.

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

4. Summary of Test

4.1 A specimen is mounted in a holder and abraded uniformly in all directions in the plane and about every point of the surface of the specimen. The settings of the instrument, method of mounting specimens, conditions of test (conditioned or wet), and criteria to be used in evaluating abrasive wear in the test, depend upon the nature of the specimen to be tested and the use to be made of the test results. Abrasion resistance for wear is evaluated by one or more conditions of destruction, a defined surface damage, loss in the mass, strength or thickness of test specimens, or by increased weakness in the

³ Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, <http://www.aatcc.org>.