



Designation: D1424 – 09 (Reapproved 2019)

Standard Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus¹

This standard is issued under the fixed designation D1424; 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 test method covers the determination of the force required to propagate a single-rip tear starting from a cut in a fabric and using a falling-pendulum (Elmendorf-Type) apparatus.

1.2 This test method applies to most fabrics including woven, layered blankets, napped pile, blanket, and air bag fabrics, provided the fabric does not tear in the direction crosswise to the direction of the force application during the test. The fabrics may be untreated, heavily sized, coated, resin-treated, or otherwise treated. Instructions are provided for testing specimens with, or without, wetting.

1.3 This test method is suitable only for the warp direction tests of warp-knit fabrics. It is not suited for the course direction of warp knit fabrics or either direction of most other knitted fabrics.

1.4 The values stated in either SI units or U.S. customary units are to be regarded as standard, but must be used independently of each other. The U.S. customary units may be approximate.

1.5 *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.*

1.6 *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.*

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. Referenced Documents

2.1 ASTM Standards:²

- D123 Terminology Relating to Textiles
- D629 Test Methods for Quantitative Analysis of Textiles
- D1776 Practice for Conditioning and Testing Textiles
- D2261 Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)
- D2904 Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data (Withdrawn 2008)³
- D2906 Practice for Statements on Precision and Bias for Textiles (Withdrawn 2008)³
- D4848 Terminology Related to Force, Deformation and Related Properties of Textiles
- D4850 Terminology Relating to Fabrics and Fabric Test Methods
- D5587 Test Method for Tearing Strength of Fabrics by Trapezoid Procedure

3. Terminology

3.1 For all terminology relating to D13.59, Fabric Test Methods, General, refer to Terminology D4850.

3.2 For all terminology relating to Force, Deformation and Related Properties in Textiles, refer to Terminology D4848.

3.2.1 The following terms are relevant to this standard: cross-machine direction, CD, length of tear, machine direction, MD, tearing energy, tearing force, tear resistance, tearing strength, fabric.

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

4. Summary of Test Method

4.1 A slit is centrally precut in a test specimen held between two clamps and the specimen is torn through a fixed distance.

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