



Designation: D 5735 – 95

Standard Test Method for Tearing Strength on Nonwoven Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)¹

This standard is issued under the fixed designation D 5735; 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 measurement of the tearing strength of nonwoven fabrics by the tongue (single rip) procedure using a recording constant-rate-of-extension (CRE) tensile testing machine.

1.1.1 The CRE-type tensile testing machine has become the preferred test apparatus for determining tongue tearing strength. It is recognized that some constant-rate-of-traverse (CRT) tensile testing machines continue to be used. As a consequence, these test instruments may be used when agreed upon between the purchaser and the supplier. The conditions for the CRT-type tensile tester as used with this test are included in Appendix X1.

1.2 This test method applies to most nonwoven fabrics including those that are treated or untreated, including those heavily sized, coated or resin treated, provided that during the test, the fabric does not tear in the direction crosswise to the direction of the force applied. This test method may not be useful for highloft nonwoven fabrics. If the tear is not substantially lengthwise, the fabric shall be described as untearable in that direction by this test.

1.3 Tongue tear strength as measured in this method is the maximum single-peak force required to continue or propagate a tear started previously in the specimen. The reported value includes the simultaneous force required to shift fibers, break fibers, break fiber bonds and break fiber interlocks in nonwoven fabric. The reported value is not directly related to the force required to initiate or start a tear.

1.4 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 76 Specification for Tensile Testing Machines for Textiles²

D 123 Terminology Relating to Textile Materials²

D 1776 Practice for Conditioning Textiles for Testing²

D 4848 Terminology Relating to Force and Deformation and Properties Textiles³

3. Terminology

3.1 Definitions:

3.1.1 *lengthwise direction, n*—in textiles, the direction in a machine-made fabric parallel to the direction of movement the fabric followed in the manufacturing machine.

3.1.1.1 *Discussion*—For nonwovens, an easily distinguishable pattern for orientation may not be apparent, especially if removed from the roll. Care should be taken to maintain the directionality by clearly marking the direction.

3.1.2 *nonwoven fabric, n*—a textile structure produced by bonding or interlocking of fibers, or both, accomplished by mechanical, chemical, thermal, or solvent means and combination thereof.

3.1.3 *tearing force, n*—the average force required to continue a tear previously started in a fabric.

3.1.3.1 *Discussion*—For nonwovens, the tearing force is recorded as the maximum force required to continue a tear previously started in a fabric. The tearing force may appear as a single peak or a series of peaks on a force-extension curve, depending on the nature of the material. Typically for nonwoven fabrics, if a small decrease in force occurs at a time when the applied force is increasing, it is not considered as a peak unless the indicated force exceeds the force required to break, individually or collectively, the fibers, fiber bonds, or fiber interlocks. Lower shifts corresponding to fiber movement do not qualify as peaks since the fibers, fiber bonds, or fiber interlocks are not broken. The tongue tearing force may be calculated from a single-peak or multiple-peak force-extension curve.

3.1.4 *tearing strength, n*—the force required either to start or to continue or propagate a tear in a fabric under specified conditions.

3.1.5 *widthwise direction, n*—in textiles, the direction in a

¹ This test method is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.64 on Non-Woven Fabric. Current edition approved June 15, 1995. Published September 1995.

² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 07.02.