



Designation: D4595/D4595M – 24

Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Method¹

This standard is issued under the fixed designation D4595/D4595M; 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 tensile properties of geotextiles using a wide-width specimen tensile method. This test method is applicable to most geotextiles that include woven geotextiles, nonwoven geotextiles, layered fabrics, and knit fabrics that are used for geotextile applications.

1.2 This test method covers the measurement of tensile strength and elongation of geotextiles and includes directions for the calculation of initial modulus, offset modulus, secant modulus, and breaking toughness.

1.3 Procedures for measuring the tensile properties of both conditioned and wet geotextiles by the wide-width method are included.

1.4 The basic distinction between this test method and other methods for measuring strip tensile properties is the width of the specimen. Some fabrics used in geotextile applications have a tendency to contract (neck down) under a force in the gage length area. The greater width of the specimen specified in this test method minimizes the contraction effect of those fabrics and provides a closer relationship to expected geotextile behavior in the field and a standard comparison.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. 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 standard.

1.6 *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.*

1.7 *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

D76/D76M Specification for Tensile Testing Machines for Textiles

D579/D579M Practice for Greige Woven Glass Fabrics

D1776/D1776M Practice for Conditioning and Testing Textiles

D2905 Practice for Statements on Number of Specimens for Textiles (Withdrawn 2008)³

D4439 Terminology for Geosynthetics

D4873/D4873M Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

D8102 Practice for Manufacturing Quality Control of Geotextiles

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *breaking toughness, T , (FL^{-1}) , Jm^{-2} , n —for geotextiles*, the actual work-to-break per unit surface area of material.

3.1.1.1 *Discussion*—Breaking toughness is proportional to the area under the force-elongation curve from the origin to the breaking point (see also work-to-break). Breaking toughness is calculated from work-to-break, gage length, and width of a specimen.

3.1.2 *corresponding force, F_c , n* —the force associated with a specific elongation on the force-per-unit-width strain curve. (Syn. load at specified elongation, LASE.)

3.2 For terminology of other terms used in this test method, refer to Terminology D4439.

4. Summary of Test Method

4.1 A relatively wide specimen is gripped across its entire width in the clamps of a constant rate of extension (CRE) type

¹ This test method is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.01 on Mechanical Properties.

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