



Standard Test Method for Determining the Short-Term Compression Behavior of Turf Reinforcement Mats (TRMs)¹

This standard is issued under the fixed designation D 6454; 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 The test method establishes the procedures for evaluation of the deformations of a turf reinforcement mat (TRM) under short-term compressive loading. This test method is strictly an index test method to be used to verify the compressive strength consistency of a given manufactured geosynthetic. Results from this test method should not be considered as an indication of actual or long-term performance of the TRM in field applications.

1.2 Since these TRMs experience multidirectional compressive loadings in the field, this test method will not show actual field performance and should not be used for this specific objective. The evaluation of the results also should recognize that the determination of the short term single plane compressive behavior of geosynthetics does not reflect the installed performance of TRMs and, therefore, should not be used as the only method of product or performance specification.

1.3 The values in SI units are to be regarded as the standard. The values stated in inch-pound units are provided in parentheses for information only.

1.4 *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 4354 Practice for Sampling of Geosynthetics for Testing²
- D 4439 Terminology for Geotextiles²
- D 4716 Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head²
- D 5199 Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes²

3. Terminology

3.1 Definitions:

3.1.1 *compressive deformation, [L], n*—the decrease in

gage length produced in the test specimen by a compressive load.

3.1.2 *compressive strain, [nd], n*—the ratio of compressive deformation to the gage length of the test specimen.

3.1.3 *gage length, [L], n*—in compression testing, the measured thickness of the test specimen under specified compressional force, expressed in units of length prior to compressive loading.

D 5199

3.1.4 *geosynthetic, n*—a planar product manufactured from polymeric material used with foundation, soil, rock, earth, or any other geotechnical engineering related material as an integral part of a man-made project, structure, or system.

D 4439

3.1.5 *index test, n*—a test procedure which may contain a known bias but which may be used to establish an order for a set of specimens with respect to the property of interest.

D 4439

3.1.6 *yield point, n*—the first point on the load-deformation curve at which an increase in deformation occurs without a corresponding increase in load.

3.1.6.1 *Discussion*—Some geosynthetics do not exhibit an exact yield point. The tested TRM may exhibit a less steep slope at yield. In addition, it should be stated that the yield point also may be the ultimate strength of the TRM.

3.1.7 For definitions of terms relating to geotextiles, refer to Terminology D 4439.

4. Summary of Test Method

4.1 Specimens are mounted between parallel plates in a load frame. Compressive loads are applied at a constant rate of crosshead movement. The deformations are recorded as a function of load. The compressive stress and strain are evaluated and plotted. The compressive yield point is evaluated from the stress/strain relationship for those materials that exhibit a detectable compressive yield point.

5. Significance and Use

5.1 The compression behavior test for TRMs is intended to be an index test. It is anticipated that the results of the compression behavior test will be used to evaluate product. The results of the analyses also may be used to compare the relative compressive yield points of materials that exhibit a detectable compressive yield point. It is anticipated that this test will be used for quality control testing to evaluate

¹ This test method is under the jurisdiction of ASTM Committee D-35 on Geosynthetics and is the direct responsibility of Subcommittee D35.05 on Geosynthetic Erosion Control.

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² *Annual Book of ASTM Standards*, Vol. 04.09.