



Designation: D 6818 – 02

Standard Test Method for Ultimate Tensile Properties of Turf Reinforcement Mats¹

This standard is issued under the fixed designation D 6818; 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 strip test procedures for determining the tensile properties of Turf Reinforcement Mats (TRM).

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are provided for information purposes only.

1.3 This standard does not apply to TRM's made of composite materials where the component providing the reinforcement cannot be tested for tensile strength with the procedure herein described. In this case, the established ASTM testing method, which is most appropriate for that material, shall be used instead.

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 76 Specification for Tensile Testing Machines for Textile²

D 123 Terminology Relating to Textiles²

D 1776 Practice for Conditioning Textiles for Testing²

D 4439 Terminology for Geosynthetics³

D 5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Force)⁴

3. Terminology

3.1 Definitions:

3.1.1 *breaking load, n*—the maximum force applied to a specimen in a tensile test carried to rupture.

3.1.1.1 *Discussion*—Materials that are brittle usually rupture at the maximum force. Materials that are ductile usually experience a maximum force before rupturing.

3.1.2 *constant rate of extension (CRE) tensile testing machine*—a testing machine in which the rate of increase of specimen length is uniform with time.

3.1.3 *elongation, n*—the ratio of the extension of a material to the length of the material prior to stretching. (Compare *extension*.)

3.1.4 *extension, n*—the change in length of a material due to stretching. (Compare *elongation*.)

3.1.5 *rupture, v*—the act of bursting.

3.1.6 *strip test, n*—in TRM testing, a tensile test in which the full width of the specimen is gripped in the clamps.

3.1.7 *tensile test, n*—in geosynthetics, a test in which a geosynthetic material is stretched in one direction to determine the force - elongation characteristics, the breaking force, or the breaking elongation.

4. Summary of Test Method

4.1 A test specimen is clamped in a tensile testing machine and a force applied to the specimen until it breaks. Values for the breaking force and elongation of the test specimen are obtained from machine scales, dials, autographic recording charts, or a computer interfaced with the testing machine. Also, points along the stress/strain curve can be reported.

5. Significance and Use

5.1 The strip test in this test method is considered satisfactory for acceptance testing of commercial shipments of Turf Reinforcement Mats since the method has been used extensively in the trade for acceptance testing.

5.1.1 In case of disagreement arising from differences in reported test values when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimen which are as homogeneous as possible and are from a lot of material of the type in question. The test specimen should then be randomly assigned in equal numbers to each laboratory for testing. The average results from the two laboratories should be compared using Student's t-test for unpaired data and an acceptable probability level chosen by the two parties before testing is begun. If bias is found, either its cause must be found

¹ This test method is under the jurisdiction of ASTM Committee D35 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 07.01.

³ *Annual Book of ASTM Standards*, Vol 04.13.

⁴ *Annual Book of ASTM Standards*, Vol 07.02