Designation: D5970/D5970M – 16

Standard Test Method for Deterioration of Geotextiles from Outdoor Exposure[1]

This standard is issued under the fixed designation D5970/D5970M; 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 evaluating the deterioration in tensile strength and strain after outdoor exposure.

1.2 The deterioration is assessed as a reduction in strength and strain at failure from the unexposed geotextile.

1.3 The specific location of the light and weather exposure is made on the basis of a site specific decision between the parties involved.

1.4 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 non-conformance with the standard.

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:*[2]

D4439 Terminology for Geosynthetics

D5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)

G7/G7M Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials

G113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

3. Terminology

3.1 For definitions of terms related to geosynthetics, refer to Terminology D4439.

3.2 For definitions of terms related to weathering, refer to Terminology G113.

3.3 *Definitions:*

3.3.1 *ultraviolet degradation*—the photochemical change induced by exposure to ultraviolet radiation that results in deterioration of the performance characteristics of the polymeric structure.

3.3.2 *weathering degradation*—the change induced by exposure to outdoor conditions, that results in deterioration of the performance characteristics of the polymeric structure.

4. Summary of Test Method

4.1 Geotextile coupons are attached to a test frame oriented 45° from the horizontal and facing the equator at designated location for exposure times of 1, 2, 4, 8, 12, and 18 months. Exposure shall begin so as to ensure that material is exposed during the maximum intensity of ultraviolet light of the year. Unless otherwise specified, the test should be initiated in May in the northern hemisphere, and in November in the southern hemisphere.

4.1.1 Unexposed coupons, or 'file specimens' according to Terminology G113, shall be retained for testing.

4.2 After each exposure time the appropriate coupons are brought into a laboratory for strength determination. The results of these tests are compared to the strength determined for the unexposed coupons. The user may be interested in exposure times other than specified in this test method. These times should be noted in reporting the results.

4.3 The results are presented in the form of various plots.

4.4 Additional recommendations may be found in Practice G7/G7M and Terminology G113.

5. Significance and Use

5.1 Outdoor exposure tests at one location may not be applicable to a project site at another location. This test method evaluates geotextiles under site specific atmospheric conditions over an 18-month period. A degradation curve as per 10.8, based on strength, elongation, or modulus, or all of these, may be developed for the geotextile being evaluated.

5.2 This test method can be used for comparative testing of the degradation of geotextiles.

[1] This test method is under the jurisdiction of ASTM Committee D35 on Geosynthetics and is the direct responsibility of Subcommittee D35.02 on Endurance 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.