



Designation: ~~D6567 – 14~~ D6567 – 17

Standard Test Method for Measuring the Light Penetration of a Turf Reinforcement Mat (TRM) Rolled Erosion Control Product (RECP)¹

This standard is issued under the fixed designation D6567; 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 measuring the amount of incandescent light that penetrates through a Turf Reinforcement Mat-rolled erosion control product.

1.2 This test method does not provide light penetration values for TRMRECPs under variable normal sun and soil conditions. This test method determines nominal light penetration.

1.3 This test method is not to be used to determine a percent ground cover value for RECPs, as the amount of light penetration may include light passing through translucent material or reflecting off surfaces.

1.4 The values stated as a percentage are to be regarded as the standard. The values provided in foot-candles are for information only.

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.*

1.6 *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

[D123 Terminology Relating to Textiles](#)

~~D1776 Practice for Conditioning and Testing Textiles~~

[D4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control Products \(RECPs\) for Testing](#)

[D4439 Terminology for Geosynthetics](#)

[E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

3. Terminology

3.1 *Definitions:*

3.1.1 *light penetration, n*—the ~~percentage~~percent of incandescent light that is measurable through a geosynthetic material from a ~~static light source~~light incident on the front surface of a material that is emitted from the back surface of the material.

3.1.2 ~~turf reinforcement mat (TRM), n~~—~~a long term non-degradable rolled erosion control product composed of a UV-stabilized, non-degradable, synthetic fibers, nettings or filaments, or all of these, processed into three-dimensional reinforcement matrices.~~

3.2 For definitions of other textile terms used in this test method, refer to Terminology [D123](#).

3.3 For definitions of other terms relating to geotextiles and geomembranes used in this test method, refer to Terminology [D4439](#).

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.

Current edition approved ~~May 1, 2014~~ July 1, 2017. Published ~~June 2014~~ July 2017. Originally approved in 2000. Last previous edition approved in 2014 as ~~D6567 – 00~~ [D6567 – 14](#) (2014). DOI: [10.1520/D6567-14](#)-10.1520/D6567-17.

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.

4. Summary of Test Method

4.1 The nominal light penetration of TRMs/RECPs is determined by observing the foot-candles on the light meter through a determined open area versus the amount of foot-candles on the light meter once the TRM is placed over the determined open area. The meter reading in foot candles with and without placement of the specimen in a determined location between the light source and the meter.

5. Significance and Use

5.1 Light penetration may be used to control the quality of many TRMs/RECPs. Light penetration is not indicative of field performance and therefore is not recommended for specifications. It has not been proven to relate to field performance for all materials.

5.2 The light penetration of TRMs/RECPs may vary considerably depending on the composite materials used in the matrix of the mat or due to inconsistency within a given mat. To minimize variation, specific sample size and procedures are indicated in this test method to help ensure comparable results.

5.3 This test method may be used to determine the effect of different composite materials and make-up of TRMs/RECPs on the penetration of light.

5.4 This test method may be used for acceptance testing of commercial shipments of TRMs/RECPs, but caution is advised since information on between laboratory precision is incomplete. Comparative tests as directed in 5.4.1 may be advisable.

5.4.1 In case of a dispute arising from differences in reported test results 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 a 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 specimens that are as homogeneous as possible and that are formed from a lot of material of the type in question. The test specimens should 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 begun. If bias is found, either its cause must be corrected, or the purchaser and supplier must agree to the light of the upon the known bias.

NOTE 1—The light penetration has no definitive relationship to the amount of ground cover provided by a RECP, as the amount of light penetration may include light passing through translucent elements or light deflecting off of elements of the RECP structure. Thus, this test method is not intended to be used to determine a percent ground cover value for RECPs.

NOTE 2—The user should be aware that the makeup and possible movement of the composite materials, and the like, may affect the TRMs/RECPs following the time when they are rolled up on rolls shipped, shipped, and stored.

6. Apparatus

6.1 Light Penetration Box—See Fig. 1 (length view), and see Fig. 2 (width view).

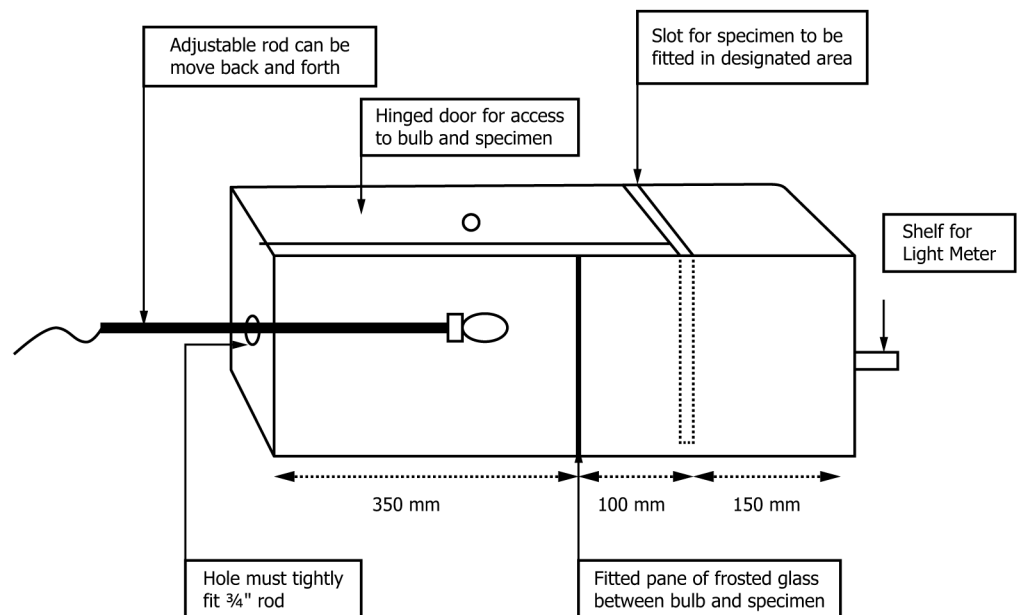


FIG. 1 Light Penetration Box

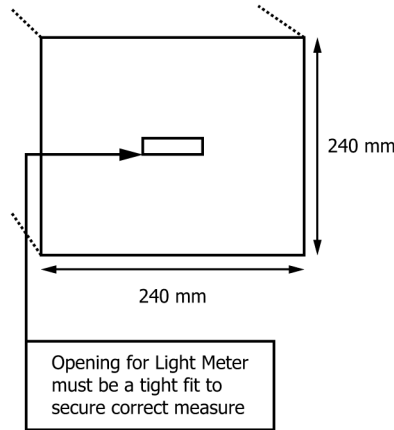


FIG. 2 End View of Box

NOTE 3—The light penetration box shown in Fig. 1 is built from $\frac{3}{4}$ -in.-in. wood.

6.2 *Adjustable Rod with Light Bulb*—See Fig. 3.

6.3 *Light Meter*—The light meter must measure in foot-candles and be capable of measuring determined open area foot-candle reading as well as determined area with dense FRM/RECP material in place. A meter with a digital readout such as Extech Instruments Model 407026 Heavy Duty Light Meter is recommended.³

6.4 *Cutting Dies*—The cutting dies must be capable of cutting specimen dimensions at least 200 mm (8 in.) by at least 250 mm (10 in.).

NOTE 4—Due to possible loss of loose internal components during cutting and handling of many FRMs/RECPs, care should be exercised to minimize these effects.

7. Sampling

7.1 *Sample by Lot*—In the absence of other guidelines, divide the product into lots and sample as specified in take lot samples in accordance with Practice D4354.

7.2 *Laboratory Sample*—For the laboratory sample, take a full width full-width sample of sufficient length along the selvage or edge of roll in the machine direction so that the requirements required size and number of 7.3 through specimens 7.4.2 can be met obtained. Exclude the inner and outer layers or wraps of the roll or any material containing folds, crushed areas, or other distortions not representative of the sampled lot.

7.3 *Test Specimens*—Remove the test specimens from the laboratory sample in a randomly distributed pattern across the width so that each specimen will contain different machine and cross-machine elements with no specimen taken nearer than 100 mm (4 in.) from the selvage or roll edge, roll sides or ends, unless otherwise specified. Cut five 250 by 200 mm (10 by 8 in.) test specimens from the sample. Handle the specimens in a manner to avoid the loss of loose filler and weaving components.

7.4 *Test Specimens*—Test specimens from the sample shall be at least 250 by 200 mm (10 by 8 in.). Handle the specimens in a manner to avoid the loss of loose filler and weaving components.

³ The sole source of supply of the apparatus known to the committee at this time is Extech Instruments Corporation, 9 Townsend West, Nashua, NH 03063. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

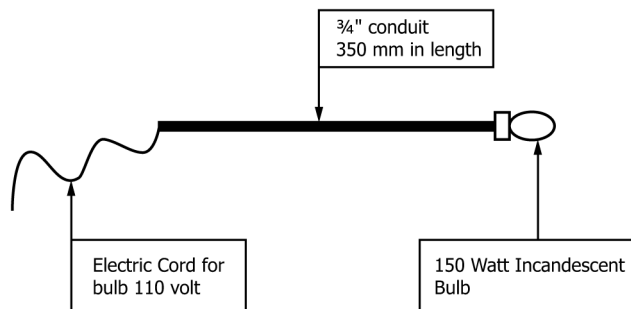


FIG. 3 Adjustable Rod and Bulb