



Designation: ~~D6567~~—~~17~~ D6567 – 18

Standard Test Method for Measuring the Light Penetration of a 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 rolled erosion control product.

1.2 This test method does not provide light penetration values for RECPs 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~~footcandles 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~~ safety, health, and health~~environmental~~ 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](#)

[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 percent of light incident on the front surface of a material that is emitted from the back surface of the material.

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](#).

4. Summary of Test Method

4.1 The nominal light penetration of RECPs is determined by the meter reading in ~~foot-candles~~footcandles with and without placement of the specimen in a determined location between the light source and the meter.

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 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.

5. Significance and Use

5.1 Light penetration may be used to control the quality of many RECPs. Light penetration has not been proven to relate to field performance for all materials.

5.2 The light penetration of 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 makeup of RECPs on the penetration of light.

5.4 This test method may be used for acceptance testing of commercial shipments of RECPs. 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 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 RECPs following the time when they are rolled up on rolls, shipped, and stored.

6. Apparatus

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

NOTE 3—The light penetration box shown in Fig. 1 is built from ¾-in. wood.

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

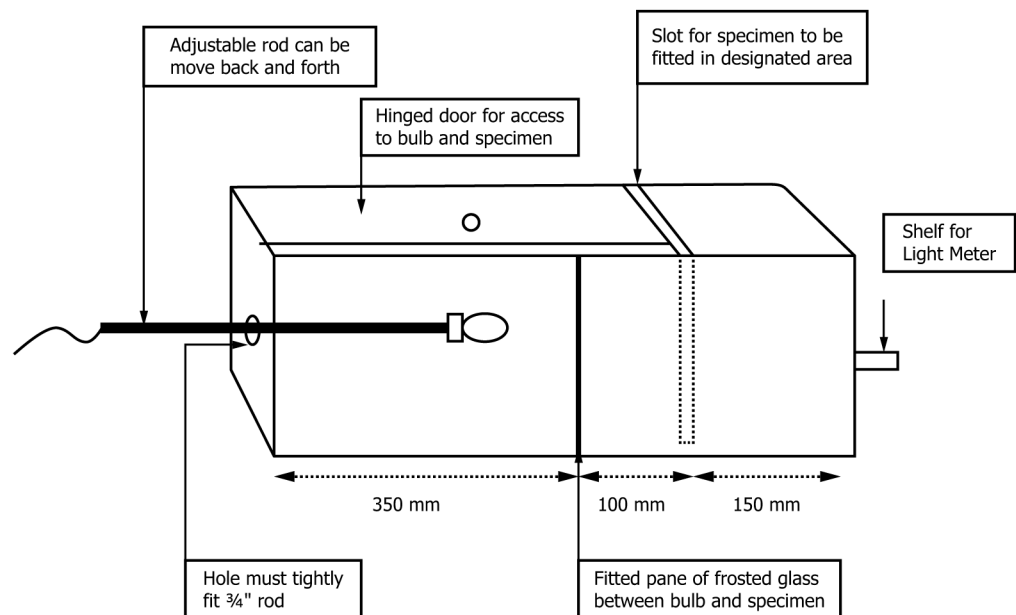


FIG. 1 Light Penetration Box

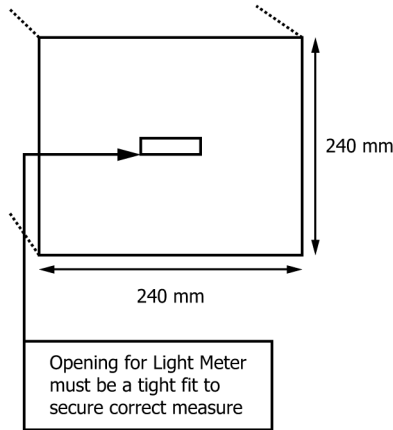


FIG. 2 End View of Box

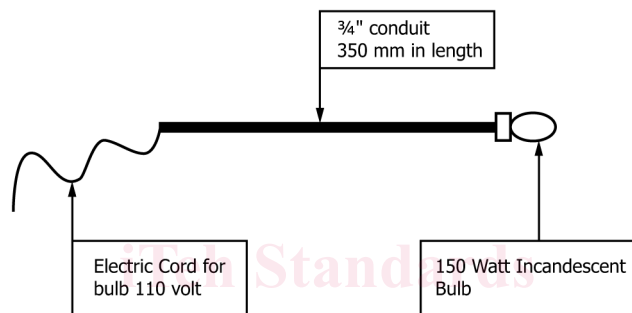


FIG. 3 Adjustable Rod and Bulb

6.3 *Light Meter*—The light meter must measure in foot-candles³ and be capable of measuring determined open area foot-candle reading as well as determined area with dense 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 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 take lot samples in accordance with Practice D4354.

7.2 *Laboratory Sample*—For the laboratory sample, take a full-width sample of sufficient length in the machine direction so that the required size and number of specimens can be 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 Remove test specimens from the laboratory sample so that each specimen will contain different machine and cross-machine elements with no specimen taken nearer than 100 mm (4 in.) from the roll sides or ends, unless otherwise specified.

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.

7.5 *Number of Specimens*—Unless otherwise agreed upon, as when provided in an applicable material specification, take the number of test specimens per laboratory sample as follows:

7.5.1 *Reliable Estimate of v* —When there is a reliable estimate of v based upon extensive part records for similar materials tested in the user's laboratory as directed in this test method, calculate the required number of specimens as follows so that the user may expect at the 95 % probability level that the test result is not more than 5.0 % of the average above or below the average of the sample:

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.