



Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets¹

This standard is issued under the fixed designation D 6475; 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 can be used as an index test to determine the mass per unit area of all erosion control blankets (ECBs).

1.2 This test method requires several hours for proper drying of the specimen in an oven at high temperature.

1.3 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D 6026.

1.3.1 The method used to specify collection, calculation, or recording of data in this standard is not directly related to the accuracy to which the data can be applied in design or in other uses, or both. Application of the results obtained using this standard is beyond its scope.

1.4 The values stated in SI units shall be regarded as standard. The values stated in parentheses are provided 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.*

2. Referenced Documents

2.1 ASTM Standards:

- D 123 Terminology Relating to Geotextiles²
- D 653 Terminology Relating to Soil, Rock, and Contained Fluids³
- D 1776 Practice for Conditioning Textiles for Testing²
- D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction³
- D 4354 Practice for Sampling Geosynthetics for Testing⁴
- D 4439 Terminology for Geosynthetics⁴
- D 5261 Test Method for Measuring Mass per Unit Area of Geotextiles⁴
- D 6026 Practice for Using Significant Digits in Calculating

and Reporting Geotechnical Test Data⁵

E 145 Specification for Gravity-Convection and Forced-Ventilation Ovens⁶

2.2 *Erosion Control Technology Council Standard:*⁷

Technical Guidance Manual, Terminology and Index Testing Procedures for Rolled Erosion Control Products

3. Terminology

3.1 Definitions:

3.1.1 *erosion control blanket, ECB, n*—a degradable material, composed primarily of processed natural organic materials, manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment, and protection of vegetation.

3.1.2 *erosion control net, ECN, n*—a planar woven natural fiber or extruded geosynthetic mesh used as a component in the manufacture of ECBs.

3.1.3 *index test, n*—a test procedure that may be used to establish an order for a set of specimens with respect to the property of interest.

3.1.4 *lot, n*—a unit of production, or a group of other units or packages, taken for sampling or statistical examination, having one or more common properties and being readily separable from other similar units.

3.1.5 *natural, adj*—describes a class of various genera of fibers, of animal or vegetable origin.

3.1.6 *polymer, n*—a chemical compound or mixture of compounds formed by polymerization and consisting essentially of repeating structural units.

3.1.7 *sample, n*—a portion of material that is taken for testing or recording purposes and used in the laboratory as a source of individual specimens.

3.1.8 *temporary degradable, n*—an erosion control blanket composed of biologically, photochemically, or otherwise degradable materials that temporarily reduce soil erosion and enhances the establishment of vegetation.

4. Summary of Test Method

4.1 The mass per unit area of an ECB is determined by weighing test specimens of known dimensions cut from various locations over the full width of the laboratory sample.

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.25 on Erosion and Sediment Control.

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² *Annual Book of ASTM Standards*, Vol 07.01.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ *Annual Book of ASTM Standards*, Vol 04.13.

⁵ *Annual Book of ASTM Standards*, Vol 04.09.

⁶ *Annual Book of ASTM Standards*, Vol 14.02.

⁷ Available from ISO Case Postale 56, CH-1211, Geneva 20, Switzerland.

The measured weight is then used to calculate the mass per unit area of the specimen, and these values are averaged to obtain the mean mass per unit area of the laboratory sample.

5. Significance and Use

5.1 This test method is used to determine if the ECB meets specifications for mass per unit area. This measurement allows for a simple control of the delivered material by a comparison of the mass per unit area of the delivered material and the specified mass per unit area.

5.2 The procedure in this test method may be used for acceptance testing of commercial shipments, but caution is advised since information about between-laboratory precision is incomplete.

5.3 Testing under this standard shall conform to the requirements of Practice D 3740

6. Apparatus

6.1 *Balance*, weighing device, calibrated, capable of weighing to an accuracy of 0.1 g.

6.2 *Drying Oven*, thermostatically controlled, preferably of the forced-draft type, meeting the requirements of Specification E 145 and capable of maintaining a uniform temperature of $50 \pm 5^\circ\text{C}$ throughout the drying chamber.

6.3 *Specimen Trays*, made of material resistant to corrosion and change in mass upon repeated heating, cooling, exposure to materials of varying pH, and cleaning.

6.4 *Container Handling Apparatus*, gloves, tongs, or suitable holder for moving and handling hot trays after drying.

7. Sampling

7.1 *Lot Sample*—Divide the test specimens into lots and for the lot to be tested, take the lot samples in accordance with Practice D 4354.

7.2 *Laboratory Sample*—Consider the units in the lot sample as the units in the laboratory sample. For the laboratory sample, take a full-width swatch of sufficient length along the selvage so that the requirements of 7.2.3 can be met.

7.2.1 The laboratory sample should be free from imperfections and characteristics not representative of the material sampled.

7.2.2 As most ECBs are constructed from several component materials, sampling of the bulk product must be performed so as to maintain the structural integrity of the product. This is true not only for generating a test sample, but also for the generation of individual test specimens from the sample for testing. Careless handling of materials may result in loss of component fibers, yarns, netting, or stitching, or a combination thereof, and a bias of test results. Note any loss of material components observed during sample and test specimen preparation. Report the mass of lost components in the final report.

7.2.3 The number of test specimens shall be a minimum of five, cut in square or rectangular configuration using sharp shears, so that they are representative of the entire roll width and with a combined total minimum area of 5000 cm^2 (769 in.^2). Each test specimen shall be equal in area (not less than 1000 cm^2 (153.8 in.^2), in accordance with Test Method D 5261). Cut each test specimen using a jig or template to ensure uniformity of size, with an accuracy of $\pm 0.5\%$ of its area.

7.2.4 Cut specimens from across each third of the roll width. Do not cut specimens from the first or last 3 m (10 ft) of the roll length, or from within 8.8 cm (4 in.) of the edges of the roll.

7.2.5 For test specimens prepared in the field, larger than minimum-sized test specimens will be required to stay within the cutting accuracy of 0.5 %. It is recommended that field cut specimens be cut with an area not less than 1500 cm^2 (230.7 in.^2), so that the integrity of the specimen will be preserved until final specimen sizes can be prepared in the testing laboratory.

7.2.6 Some products vary in physical properties in the transverse or fill direction. For that reason it is appropriate to secure samples from across the roll width.

7.2.7 Procedures found to be successful for cutting test specimens from rolled erosion control products include the use of bags and slip supports to keep all components of degradable specimens together during the sample preparation. The method of specimen cutting should be included with the reported data.

7.2.8 If the structure of the erosion control blanket is such that the specified test specimen size is not representative of the laboratory sample, a larger size shall be agreed upon between the purchaser and the supplier.

7.2.9 All samples must be marked with identification information, including manufacturer's name, style, or product number, unique roll number and date sampled.

7.2.10 Most conformance testing requires the laboratory to sample the material randomly across the roll width. When this is required, a section of material representing the entire roll must be provided. Alternately, cut panels can be used as long as they represent random locations across the width of the roll. Mark each panel for identification.

7.2.11 If samples are to be shipped or transported to the laboratory they should be wrapped in a durable protective covering so as to prevent damage or loss, or both, of component materials. Provide a packing list or chain of custody to indicate where the sample came from and instructions for testing or other handling.

8. Procedure

8.1 Determine and record the mass of the clean and dry specimen tray on a calibrated balance to the nearest 0.1 g. Record this value as *Mc*.

8.2 Select representative test specimens in accordance with Section 7.

8.3 Place the specimen on the specimen tray.

8.4 To prevent mixing of specimens and yielding of incorrect results, number all trays and record the tray numbers on the laboratory data sheets.

8.5 Place the tray with the test specimen in the drying oven. Dry the specimen to a constant mass. Maintain the drying oven at $50 \pm 5^\circ\text{C}$ unless otherwise specified. The time required to obtain constant mass will vary depending on the type of material, size of specimen, moisture content in the as-delivered condition, and other factors. The influence of these factors generally can be established by good judgment, experience with the materials being tested, and the apparatus being used.

8.6 Since the type of materials being tested is lightweight and organic in nature, drying time required to achieve constant mass should be relatively short. Dry for a minimum of 8 h, or

until the change in mass after two successive periods (greater than 1 h) of drying is less than 0.1 %.

8.7 After the specimen has dried to constant mass as prescribed in 8.6, remove the tray from the oven using appropriate safety gloves or tongs. In order that the weight of the dried specimen not be affected as a result of moisture absorption, place the tray on the balance and weigh the specimen within 5 min after removal from the oven.

8.8 Determine the mass of the tray with the dried specimen to the nearest 0.1 g using the same calibrated balance as in 8.1. Record this value as M_t .

9. Calculation

9.1 Calculate the mass of the specimen M_s , in grams, as follows:

$$M_s = M_t - M_c \quad (1)$$

where:

M_t = mass of the dried specimen, g, and

M_c = mass of the specimen tray, g.

9.2 Calculate the mass per unit area of each of the specimens as follows:

$$m = M_s \times 1000/A \quad (2)$$

where:

m = mass per unit area, rounded to the nearest 0.1 g/m², and

A = area of the specimen, cm².

9.3 Repeat this procedure for each test specimen.

9.4 Calculate the average and standard deviation of the mass per unit area results for the specimens tested.

10. Report

10.1 Report the following information:

10.1.1 Type of ECB tested, sampling method used, the test specimen size, shape, and the number of test specimens tested,

10.1.2 The average mass per unit area and standard deviation to three significant figures, and

10.1.3 A statement of any departures from the testing procedures so that the results can be evaluated.

11. Precision and Bias

11.1 *Precision*—Test data on precision is not presented due to the nature of the ECB materials tested by this test method.

11.1.1 Subcommittee D 18.25 is seeking any data from the users of this test method that might be used to make a limited statement on precision.

11.2 *Bias*—There is no accepted reference value for this test method, therefore, bias cannot be determined.

12. Keywords

12.1 ECB; erosion control blanket; mass per unit area; weight

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