



Designation: D6460 – 24

Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion¹

This standard is issued under the fixed designation D6460; 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 the guidelines, requirements and procedures for evaluating the ability of Rolled Erosion Control Products (RECPs) to protect earthen channels from stormwater-induced erosion. Critical elements of this protection are the ability of the RECP to:

1.1.1 Neutralize and absorb the hydraulic force of stormwater, thereby reducing soil particle loosening through “scour” mechanisms;

1.1.2 Slow runoff and encourage sedimentation, thereby reducing soil particle transport downstream;

1.1.3 Absorb shear forces of overland flow;

1.1.4 Trap soil particles beneath; and

1.1.5 Promote the establishment of vegetation.

1.2 This test method utilizes full-scale testing procedures, rather than reduced-scale (bench-scale) simulation, and is patterned after conditions typically found on construction sites prior to and after revegetation work. Further, procedures for evaluation of baseline conditions are provided. Thus, test preparation, test execution, data collection, data analysis and reporting procedures herein are intended to be suitable for testing of bare soil, unvegetated RECP, vegetated soil and vegetated RECP conditions.

1.3 This test method provides a comparative evaluation of an unvegetated RECP to baseline bare soil conditions and a vegetated RECP to a baseline, vegetated condition under controlled and documented conditions.

1.4 The values stated in SI units are to be regarded as standard. The inch-pound units given in parentheses are provided for information purposes 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use. Also, the user must comply with prevalent regulatory codes, such as OSHA (Occupational Health and Safety Administration) guidelines, while using the test method.

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

C136/C136M Test Method for Sieve Analysis of Fine and Coarse Aggregates

D422 Test Method for Particle-Size Analysis of Soils (Withdrawn 2016)³

D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))

D1556/D1556M Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method (Withdrawn 2024)³

D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) (Withdrawn 2007)³

D4318 Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

D4595/D4595M Test Method for Tensile Properties of Geotextiles by the Wide-Width Method

D6475 Test Method for Measuring Mass per Unit Area of Erosion Control Blankets

D6525/D6525M Test Method for Measuring Nominal Thickness of Rolled Erosion Control Products (Withdrawn 2014)³

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock; Subcommittee D18.25 on Erosion and Sediment Control Technology; and is the direct responsibility of Section .02 on Erosion Control Blankets (ECBs).

Current edition approved Feb. 1, 2024. Published March 2024. Originally approved in 1999. Last previous edition approved in 2019 as D6460–19. DOI: 10.1520/D6460-24.

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.

³ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard

- D6526** Test Method for Analysis of Toluene by Capillary Column Gas Chromatography (Withdrawn 2018)³
- D6566** Test Method for Measuring Mass Per Unit Area of Turf Reinforcement Mats
- D6567** Test Method for Measuring the Light Penetration of a Rolled Erosion Control Product (RECP)
- D6818** Test Method for Tensile Properties of Rolled Erosion Control Products
- 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 of Terms Specific to This Standard:

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 synthetic mesh used as a component in the manufacture of ECBs.

3.1.3 *index test*, *n*—a test procedure which may contain a known bias, but which 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*, *n*—a class name of various fibers of animal, mineral or vegetable origin.

3.1.6 *open weave textile (OWT)*, *n*—a temporary degradable ECB composed of natural or polymer yarns woven into a matrix used to provide erosion control and facilitate vegetation establishment.

3.1.7 *point gauge assembly*, *n*—an adjustable, calibrated rack assembly mounted to a manually controlled pinion used to determine the distance from a surface to a plane of reference. Typically, a point gauge assembly is mounted to a data acquisition cart traversing a hydraulic testing flume and measures the relative distance from a surface within the flume to the zero mark of the pinion housing. The rack is graduated and adjustable to accommodate variable offsets. Distance can be recorded manually or electronically.

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

3.1.9 *rolled erosion control product (RECP)*, *n*—a temporary degradable or long-term non-degradable material manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment and protection of vegetation.

3.1.10 *sample*, *n*—a portion of material which is taken for testing or documentation and used in the laboratory as a source of individual specimens.

3.1.11 *shear stress*, *n*—the force of flowing water applied to the surface of a channel in Newtons per square meter (pounds per square foot); also, commonly referred to as “tractive force.”

3.1.12 *temporary degradable*, *adj*—composed of biologically, photochemically or otherwise degradable materials that temporarily reduces soil erosion and enhances the establishment of vegetation.

3.1.13 *turf reinforcement mat (TRM)*, *n*—in erosion control, a non-degradable geosynthetic or geocomposite processed into a matrix sufficient to increase the stability threshold of otherwise unreinforced established vegetation.

3.1.13.1 *Discussion*—Products in this category may incorporate ancillary degradable components to enhance the germination and establishment of vegetation.

4. Summary of Test Method

4.1 The performance of an RECP in reducing stormwater-induced erosion is determined by subjecting the material to simulated stormwater flow in a controlled and documented environment in reference to identical testing on baseline conditions.

4.2 Key elements of the testing process include:

- 4.2.1 Calibration of the stormwater simulation and measurement equipment;
- 4.2.2 Preparation of the test channel;
- 4.2.3 Documentation of the RECP to be tested (if applicable);
- 4.2.4 Installation of the RECP (if applicable);
- 4.2.5 Establishment of vegetative stand (if applicable);
- 4.2.6 Execution of the test;
- 4.2.7 Collection of hydraulic, topographical, and associated data;
- 4.2.8 Analysis of the resultant data; and
- 4.2.9 Reporting.

5. Significance and Use

5.1 This test method evaluates RECPs and their means of installation to:

- 5.1.1 Reduce soil loss and sediment concentrations in stormwater runoff under conditions of varying channel conditions and soil type;
- 5.1.2 Function within a composite system acting as vegetative reinforcement; and
- 5.1.3 Improve water quality exiting the area disturbed by earthwork activity by minimizing mobilization of in-situ particles within the streambed.

5.2 This test method models and examines conditions typically found on construction sites involving earthwork activities, including: highways and roads; airports; residential, commercial and industrial developments; pipelines, mines, and landfills; golf courses; etc.

5.3 This test method is a performance test, but can be used for quality control to determine product conformance to project specifications. Caution is advised since information regarding laboratory specific precision is incomplete. For project specific conformance, unique project-specific conditions should be taken into consideration.