Designation: D8122 – 21

Standard Test Method for Determining Mass per Unit Area of Geohazard Nettings[1]

This standard is issued under the fixed designation D8122; 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 is an index test to determine the mass per unit area of geohazard nettings. The mass per unit area is a characteristic of a geohazard netting that contributes to its ability to stabilize and control the movement of loose rocks. There are many different types of geohazard nettings which necessitates a single standard by which all geohazard nettings may be measured.

1.2 *Units*—The values stated in SI units are to be regarded as standard. The values given in parentheses are provided for information only and are not considered standard. Reporting of test results in units other than SI shall not be regarded as nonconformance with this standard.

1.2.1 It is common practice in the engineering/construction profession to concurrently use pounds to represent both a unit of mass (lbm) and of force (lbf). This practice implicitly combines two separate systems of units; the absolute and the gravitational systems. It is scientifically undesirable to combine the use of two separate sets of inch-pound units within a single standard. As stated, this standard includes the gravitational system of inch-pound units and does not use/present the slug unit of mass. However, the use of balances and scales recording pounds of mass (lbm) or recording density in lbm/ft^3 shall not be regarded as nonconformance with this standard.

1.2.2 The terms density and unit weight are often used interchangeably. Density is mass per unit volume, whereas, unit weight is force per unit volume. In this standard, density is given only in SI units. After the density has been determined, the unit weight is calculated in SI or inch-pound units, or both.

1.3 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this test method.

1.3.1 The procedures used to specify how data are collected/recorded and calculated in the standard are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user's objectives; and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of these test methods to consider significant digits used in analysis methods for engineering data.

1.4 *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.*

1.5 *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]

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

D4230 Test Method for Measuring Humidity with Cooled-Surface Condensation (Dew-Point) Hygrometer

D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing

D6026 Practice for Using Significant Digits and Data Records in Geotechnical Data

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of common technical terms used in this standard, refer to Terminology D653.

3.2 *Definitions of Terms Specific to This Standard:*

[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 Technology.

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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.

3.2.1 *geohazard netting, n—in geohazard mitigation*, a material made typically from steel wire, or wire ropes, or both, interwoven or connected in such a manner to create a continuous interlaced flexible structure usually used in rockfall, slope stabilization, avalanche, and debris flow applications and includes ring nets, wire mesh, wire nets and wire mesh composites.

3.2.2 *ring net, n—in geohazard mitigation*, a geohazard netting consisting of interlocking steel rings connected to multiple adjoining rings.

3.2.3 *selvage, n—in geohazard mitigation*, a secured junction or edge treatment produced on geohazard netting during manufacture.

3.2.4 *wire mesh, n—in geohazard mitigation*, a geohazard netting consisting of single steel wires forming a regular pattern.

3.2.5 *wire net, n—in geohazard mitigation*, a geohazard netting consisting of multiple steel wire ropes, or strands, or both forming a uniform grid pattern.

3.2.6 *wire mesh composite, n—in geohazard mitigation*, a geohazard netting consisting of a combination of wire mesh, wire nets, or ring nets.

4. Summary of Test Method

4.1 The mass per unit area of geohazard netting (including but not limited to ring net, wire net and wire mesh) is determined by measuring the mass for each test specimen of known dimensions, cut from equally spaced distances over the full width of the laboratory sample. The calculated values are then averaged to obtain the mean mass per unit area of the laboratory sample.

5. Significance and Use

5.1 Using a geohazard netting as a medium to retain rock particles necessitates compatibility between it and the adjacent rock. This test method measures the mass per unit area of a geohazard netting which is often specified by design engineers as an indicator of a geohazard netting's ability to stabilize and control the movement of loose rocks. Knowing a geohazard netting's mass per unit area is also important in analyzing the anchoring required to support the mesh at the top of a soil or rock slope.

5.2 This test method may also be used for quality control during the manufacturing process and quality assurance that material meets project or material specifications.

NOTE 1—The quality of the result produced by this standard is dependent on the competence of the personnel performing it, and the suitability of the equipment and facilities used. Agencies that meet the criteria of Practice D3740 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with Practice D3740 does not in itself assure reliable results. Reliable results depend on many factors; Practice D3740 provides a means of evaluating some of those factors.

6. Apparatus

6.1 *Thermometric Device*—A thermometric device capable of measuring the temperature range within which the test is being performed readable to 0.5°C or better and having an accuracy of at least ±0.5°.

6.2 *Hygrometer*—An instrument used to measure humidity in accordance with ASTM D4230–20.

6.3 *Balance*—Balance shall be calibrated and conform to the requirements of Specification D4753 with a readability without estimation of 1 g.

6.4 *Cutter*—Cutting tools shall be able to cut the netting as per manufacturer's recommendation.

7. Sampling and Test Specimens

7.1 Cut a laboratory sample of sufficient width and length along the selvage to provide a minimum of 10 m^2. Cut each sample to make sure full mesh openings.

7.2 The laboratory sample should be free from imperfections or other areas not representative of the material.

7.3 From the sample, cut a minimum of five specimens, representative of the entire roll width of material provided, with each test specimen being rectangular and equal in area not less than 1.0 by 1.0 m (3.28 by 3.28 ft).

7.3.1 Cut each test specimen such that the edge of the test specimen is at least one tenth the specimen's width away from any selvage.

7.3.2 Verify and record the dimensions (that is, length and width) of each test specimen by hanging the sample in a direction representing the full aperture length and width of the netting as recommended by the manufacturer (see Fig. 1). In some cases, stretching the netting by hand may be required.

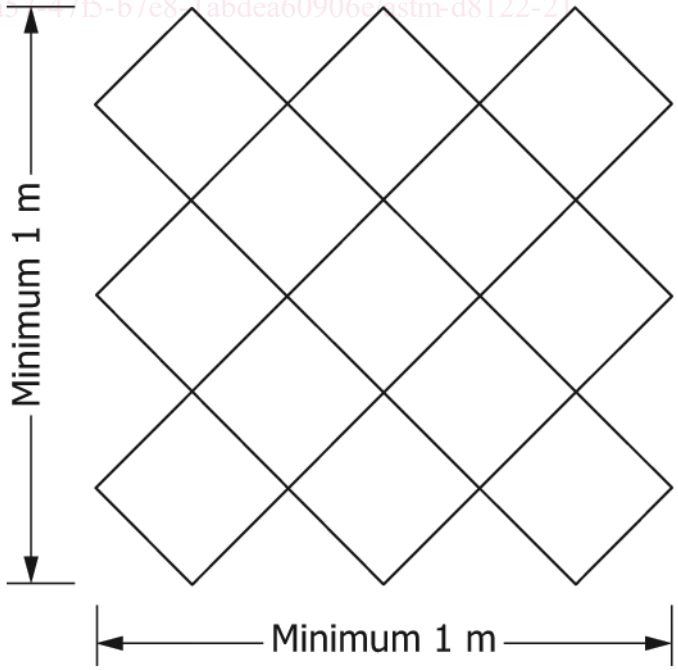

FIG. 1 Example of Geohazard Netting with Full Aperture Length and Width