Designation: ~~D7367 – 19~~ D7367 – 19$^{\varepsilon 1}$

Standard Test Method for Determining Water Holding Capacity of Fiber Mulches for Hydraulic Planting[1]

This standard is issued under the fixed designation D7367; 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.

ε[1] NOTE—Editorially corrected 9.12 in August 2019.

1. Scope*

1.1 This quantitative test method determines the water holding capacity of fiber mulches, including wood, paper, and agriculturally derived and blended fiber mulches that are used for hydraulic seeding and planting. Results from this testing can be used as a quality assurance and/or quality control data for manufacturing processes.

1.2 There are no known limitations to this test method.

1.3 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026.

1.4.1 The procedures used to specify how data are collected/recorded or 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 this standard to consider significant digits used in analysis methods for engineering data.

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.*

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]

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

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 in Geotechnical Data

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 *Definitions*—For definitions of common technical terms used in this standard, refer to Terminology D653.

[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.

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

4. Summary of Test Method

4.1 A representative sample of a fiber mulch is taken from a packaged bale or bag. The representative sample is thoroughly mixed to obtain 3 test specimens. The test specimens are allowed to condition for 24 h. Then, the mass of each test specimen is determined as is the mass of a sieve and a sieve pan. Test water is then added to the test specimen and mixed. The test water and fiber is then poured over a sieve and evenly distributed. The sieve is then placed in bowl to allow the fiber mulch to saturate. After saturation, the sieve is allowed to drain and the sieve and pan are dried off before the mass of the sieve plus sieve pan plus saturated fiber mulch is determined. This process is repeated for the other 2 test specimens. The water holding capacity is expressed as a percentage of increased mass after saturation.

5. Significance and Use

5.1 The meaning of the test is related to the manufacturing quality assurance and quality control and end use of the material, to determine characteristics of products. The water holding capacity of hydraulically applied mulches for hydraulic planting correlates directly with enhanced slurry and spray patterns by providing better soil/slurry binding ability, mixing ability in a tank, and rate of seed germination.

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 *Sieves*—A 2.36 mm full height sieve and full height (50 mm) pan both having a diameter of 203.2 mm and conforming to Specification E11.

6.2 *Thermometric Device*—A thermometric device capable of measuring the temperature range within which the test is being performed readable to 1°C or better and having an accuracy of at least ±0.5°C.

6.3 *Mixing Bowl*—A large metal or glass mixing bowl having a capacity of 5.5 L ± 0.5 L for use with the mixer.

6.4 *Balance*—Balances shall conform to the requirements of Specification D4753. The balance shall have readability without estimation of 0.01 g. The capacity of this balance will need to exceed the mass of the sieve plus sieve pan and saturated fiber. In general, a balance with a minimum capacity of 1,500 g is sufficient.

6.5 *Pan/Tray*—A 457 mm × 279 mm or larger baking pan or tray.

6.6 *Mixer*—A device capable of producing a speed between 60 and 90 rpm and having a dough kneader attachment. A stand mixer with a low setting typically meets this requirement.

6.7 *Hygrometer*—A device capable of measuring the humidity within which the test is being performed readable to 1 % or better.

6.8 *Miscellaneous*—Items such as a large bowl, spoons, spatulas, paper towels, and a squirt/water bottle may be useful.

7. Reagents

7.1 *Test Water*—Distilled or demineralized water is the only permissible test fluid. The use of tap water is not permitted.

8. Sampling and Testing Specimens

8.1 Obtain the sample from an undamaged packaged bale or bag that has no visible signs of tears or openings in the packaging. If the packaging of the bale or bag is torn, do not use the bale for testing.

8.2 Cut open the bale or bag and select 30 g from each the top, middle, and bottom ⅓ of the bale for a total of 90 g. Heterogeneous blends should be mixed at the same ratio by mass per manufacturer's specifications to equal 30 g. Place the fibers in a large mixing bowl and gently break the compressed fibers apart with your thumb and fingers. Mix thoroughly to make sure the sample is representative.

8.3 Allow the fibers to condition at a room temperature of 24°C ± 2°C with a relative humidity of 50 ± 10 % RH for at least 24 h. At the same time, allow the test water to equilibrate to this same temperature.

8.4 Determine and record the humidity to the nearest 1% and the temperature of the fibers and test water to the nearest 1°C. After conditioning, obtain 3 representative test specimens each having a mass of 15 ± 0.1 g.

9. Procedure

9.1 Determine and record the mass of one of the test specimens, M_{ts}, to the nearest 0.01 g. Place the test specimen in the large mixing bowl and add 300 mL of test water. Attach the dough kneader to the mixer and make sure the mixer is set on the low setting (60 to 90 rpm) to reduce damage to the fibers. Using the mixer, blend the fiber and test water for 5 min.