Designation: D7560 – 16

Standard Test Method for Determination of Fiber Length Percentages in Hydraulic Erosion Control Products (HECPs)[1]

This standard is issued under the fixed designation D7560; 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 provides the requirements and procedures needed to determine quantitatively the fiber length percentages of hydraulic erosion control products (HECPs).

1.2 This test method allows for comparative evaluation of in-process HECPs to a manufactured product specification.

1.3 *Units*—The values stated in SI units are to be regarded as the standard. US standard units are provided in parentheses.

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

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:*[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 common definitions of technical terms used in this standard, refer to Terminology D653.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *hydraulic erosion control product, HECP, n*—a manufactured, temporary, degradable, pre-packaged fibrous material that is mixed with water and hydraulically applied as a slurry designed to reduce soil erosion and assist in the establishment and growth of vegetation.

3.2.2 *hydraulically applied, adj*—in erosion control, applied within a water slurry, solution, or emulsion to the soil surface as a spray-on or dropped-on application through various means, such as nozzle, tower, and aerially.

4. Summary of Test Method

4.1 A sample of HECP is placed in a sieve shaker machine and after five minutes, the various screens are emptied and the cumulative fiber retained on each sieve is weighed and the percent retained for each sieve is recorded on the data sheet.

5. Significance and Use

5.1 This test method determines the various fiber lengths that make up an HECP fiber mulch material. HECP fibers are engineered and processed to specific length and width dimensions that facilitate the hydraulic application and prevent clogging of the pump, recirculation pipes, nozzles, and tips.

5.2 This test method is used by manufacturers of HECP products for quality assurance testing.

6. Apparatus

6.1 A balance or scale conforming to the requirements of Guide D4753 readable to 0.1% of the total test mass, or better. See Annex A1 for examples.

6.2 Sieve shaker machine capable of a minimum of 270 oscillations in a circular motion and a minimum of 150 vertical taps per minute. The sieve shaker must be able to hold six full height 50 mm (2 in.) sieves with a diameter of 200 mm (8 in.).

6.3 Test sieves compliant with E11 - 13, Requirements. The specified sieve frame are 203 mm (8 in.) in diameter and 50.8 mm (2 in.) in height.

[1] This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.25.01 on Mulches.

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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.

6.4 Standard sieve set consisting of 2.36 mm No. 8 (.0937 in.), 1.18 mm No. 16 (0.0469 in.), 0.71 mm No. 25 (0.0278 in.), 0.3 mm No. 50 (0.0117 in.), 0.150 mm No. 100 (0.0059 in.), and sieve pan.

7. Hazards

7.1 7.1 HECPs may be dusty and a dust mask is recommended when working with these products.

8. Sampling, Test Specimens, and Test Units

8.1 When testing during the manufacturing process, obtain a sample of at least 90 g (3.17 oz) with a moisture content of 10 ± 5 % before the bagging procedure.

8.1.1 Place the fiber in a large mixing bowl and break the compressed fibers apart with your thumb and fingers.

8.2 When testing from a full, sealed bag, prepare the specimen by separating 90 g (3.17 oz) of fiber from an undamaged bag or bale taking one third from the top, one third from the middle, and one third from the bottom of the bag.

8.2.1 Place the fibers in a large mixing bowl and gently break the compressed fibers apart with your thumb and fingers.

9. Procedure

9.1 Assemble the sieve set as described in 6.4 from largest diameter openings to the smallest and sieve pan.

9.2 Measure out 10 g (0.35 oz) of fiber, place it on the top screen of the sieve stack, and place the sieve stack in the sieve shaker machine.

9.2.1 Set the timer for five minutes and allow the sieve pans to shake.

9.2.2 After five minutes, remove the fiber from each sieve and the bottom sieve pan; determine and record the mass to 0.1 g (0.0035 oz).

NOTE 1—The quality of the result produced by these test methods 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 these test methods 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.

10. Calculation or Interpretation of Results

10.1 Total the volume of fiber retained on each sieve including the sieve pan, divide the mass of a single sieve or sieve pan by the total to determine percent collected, and report the percent cumulative retained for each sieve and sieve pan.

11. Report: Test Data Sheet(s)/Form(s)

11.1 Record as a minimum the following test specimen data.

11.1.1 Date the test was performed, technician performing the test and the material that was tested and the manufacturer of the HECP product.

11.1.2 The percentage of cumulative retained fiber on each sieve and the pan.

11.2 Fig. X1.1 shows an example data recording sheet for HECP sieve analysis.

11.3 *Reporting of Significant Digits:*

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

11.3.2 The procedures used to specify how data are collected/recorded or calculated, in this 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 design.

12. Precision and Bias

12.1 *Precision*—Test data on precision is not presented due to the nature of the HECP materials tested by this test method. It is either not feasible or too costly at this time to have ten or more laboratories participate in a round-robin testing program with varying brands of sieve shakers capable of meeting the requirements stated in 6.2.

12.2 The Subcommittee D18.25 is seeking any data from the users of this test method that might be used to make a limited statement on precision.

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

13. Keywords

13.1 fiber mulch; HECP; hydraulic erosion control products

APPENDIX

(Nonmandatory Information)

X1. EXAMPLE DATA SHEET

X1.1 See Fig. X1.1.

DATE:						
TECHNICIAN:						
SHIFT:						
Test Number	2.36 mm No. 8 (0.0937 in.)	1.18 mm No. 16 (0.0469 in.)	0.71 mm No. 25 (0.0278 in.)	0.3 mm No. 50 (0.0117 in.)	0.150 mm No. 100 (0.0059 in.)	**Sieve Pan**

FIG. X1.1 Example Data Sheet