



Designation: **D1997—13 D1997 – 20**

## Standard Test Method for Laboratory Determination of the Fiber Content of Peat Samples and Organic Soils by Dry Mass<sup>1</sup>

This standard is issued under the fixed designation D1997; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope\*

1.1 This test method covers the laboratory determination of the fiber content of peat ~~(as defined in and organic soils by dry mass. Classification D4427)~~ by dry mass. It also may be used for non-peat organic soil materials. provides the methodology to classify peat as it is used in this standard.

1.2 Pieces of plant material such as roots or wood, larger than 20 mm in smallest dimension are not considered fibers.

1.3 Because this test method is simple and ~~requires no~~ does not need sophisticated equipment ~~to perform, in order to be performed,~~ it is especially recommended for routine reconnaissance ~~work,~~ work where large numbers of samples need to be tested and mineral contents are low.

1.4 Units—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard. Alternate sieve designations in parentheses are as provided in Specification E11. ~~Use Practice D6026 for determining significant digits to report.~~

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

1.6 *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~~ safety, health, and healthenvironmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *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:<sup>2</sup>

[D653 Terminology Relating to Soil, Rock, and Contained Fluids](#)

[D2216 Test Methods for Laboratory Determination of Water \(Moisture\) Content of Soil and Rock by Mass](#)

[D2974 Test Methods for Determining the Water \(Moisture\) Content, Ash Content, and Organic Material of Peat and Other Organic Soils](#)

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

[D4427 Classification of Peat Samples by Laboratory Testing](#)

[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](#)

[D6913 Test Methods for Particle-Size Distribution \(Gradation\) of Soils Using Sieve Analysis](#)

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.22 on Soil as a Medium-Media for Plant Growth.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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

### 3. Terminology

#### 3.1 ~~Definitions:~~

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

#### 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:~~

3.2.1 ~~fiber~~—a fragment or piece of plant tissue that retains a recognizable cellular structure and is large enough to be retained on a 150- $\mu\text{m}$  (No. 100) sieve. Plant materials larger than 20 mm in smallest dimension are not considered fibers.

### 4. Summary of Test Method<sup>3</sup>

4.1 ~~A known mass of intact, undried peat is soaked in a dispersing agent (5 % sodium hexametaphosphate) sample of peat or organic soil is reduced using quartering to obtain a representative sample. The representative sample is further reduced via quartering to obtain a test specimen. A portion of the test specimen is used to obtain a water content determination. Another portion of the test specimen is placed in a beaker and mixed with a dispersing agent and allowed to stand for approximately 15 h. The material mixture is then washed through a 150- $\mu\text{m}$  (No. 100) sieve (see Specification poured over a sieve stack. Materials E11) by application of a gentle flow of tap water. The fibrous material left on the sieve is oven-dried (at  $110 \pm 5^\circ\text{C}$ ) until the mass does not change more than 0.1 % per hour. The mass of fiber is expressed as a percentage of the oven-dried mass of the original sample. Larger than 20 mm are removed and the remaining specimen is washed until the water runs clear. Then, the sieve with the specimen is soaked in HCl for 10 min and rewashed. The specimen is then filtered. The specimen retained on the filter and the filter paper is then dried to constant mass. The fiber content is then calculated.~~

~~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.~~

### 5. Significance and Use

5.1 ~~The purpose of this test method is to standardize the procedure for determining fiber content of peat by dry mass.~~

5.1 ~~This test method is useful for determining the quantity of fibers in a peat sample is necessary not only for classifying peats and organic soils (as or organic soil specimen. Fiber content is one parameter used to classify the peat as determined in Classification D4427), but. It is also a significant parameter in predicting or defining the many end uses of these materials. In this regard, fiber content has been related to agricultural and horticultural end uses (such as mulching, soil enrichment, etc.), mulching and soil enrichment), geotechnical measurements (such as strength, compressibility, permeability, etc.), and permeability), industrial chemical uses (such as production of waxes, activated carbon, medicines, etc.), and even and medicines), and energy uses (such as direct combustion, methanol production, and gas yields, etc.).~~

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### 6. Apparatus

6.1 ~~Sieve, Sieve—A 150- $\mu\text{m}$  (No. 100) (in compliance with sieve and 19 mm (3/4 in.) sieve. The sieve cloth of the 150- $\mu\text{m}$  (No. 100) sieve must be made of stainless steel to offer more resistance to wear and damage. These sieves must conform to the requirements given in Specification E11).~~

6.2 ~~Drying Oven, Oven—capable of being set at  $110^\circ\text{C} \pm 5^\circ\text{C}$ . Vented, thermostatically controlled oven capable of maintaining a uniform temperature of  $110^\circ\text{C} \pm 5^\circ\text{C}$  throughout the drying chamber. The oven shall not have any “hot spots.” The uniformity of the oven’s temperature shall be verified annually and the temperature should be checked or monitored as detailed in Test Methods D2216 (Note 2).~~

~~NOTE 2—The temperature of the drying oven is very important for organic soils. Hot spots in the oven could alter the specimen. Care should be taken when monitoring the oven’s temperature and placement of the specimens within the oven to avoid possible alteration.~~

6.3 ~~Balance, Balance—capable of measuring at least to the nearest milligram. The balance shall conform to the requirements of Guide D4753. The balance must have a minimum capacity of 200 g and have a readability without estimation of 0.001 g (1 mg).~~

6.4 ~~Standard Laboratory Stirrer, Stirrer—A mechanical stirring device capable of being set to achieving and maintaining 240 r/min.~~

<sup>3</sup> This test method is a modified version of one described in: Riley, J. L., “Laboratory Methods for Testing Peat,” *Ontario Peatland Inventory Project*, Ontario Geological Survey Open File Report 5572, 1986, pp. 21–22.