



Designation: ~~D2977–14~~ D2977 – 22

## Standard Practice for Particle Size Range of Peat Materials for Horticultural Purposes<sup>1</sup>

This standard is issued under the fixed designation D2977; 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 Peat materials consist of particles with various sizes. This practice covers measurement of the mass percentage of fractions of a peat material defined in terms of selected ranges of screen sizes; the separation of peat particles into coarse, medium, and fine size fractions using the 2.36 mm (No. 8) and 0.850 mm (No. 20) sieves equipped with cover and bottom pan. This practice is applicable for peat materials used in the horticultural industry and can be used to verify the degree of decomposition of peat and to determine the foreign matter content.

1.2 Units—The values stated in SI units are being to be regarded as standard. Units of inch-pound—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<sup>3</sup> shall not be regarded as nonconformance with this standard.

1.3 All measured/observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#).

1.3.1 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.

1.4 This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the

<sup>1</sup> This practice 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.

Current edition approved Nov. 1, 2014/Oct. 1, 2022. Published November 2014/October 2022. Originally approved in 1971. Last previous edition approved in 2003/2014 as D2977 – 03, which was withdrawn February 2012 and reinstated in November 2014. DOI:10.1520/D2977-14.14. DOI:10.1520/D2977-22.

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

adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.

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~~ safety, health, and health 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:<sup>2</sup>

D653 Terminology Relating to Soil, Rock, and Contained Fluids

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

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

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

## 3. Terminology

### 3.1 Definitions:

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

## 4. Summary of Practice

4.1 A representative test specimen of air-dried peat is separated into ~~four designated fractions by means of a 2.36 mm (No. 8) sieve and an 0.85 mm (No. 20) sieve. The fractions are: (three designated size fractions, four if 1) foreign matter removed manually from the 2.36 mm (No. 8) sieve, (foreign matter is present, by sieving. 2) coarse fiber retained on the 2.36 mm (No. 8) sieve, (3) medium fiber through the 2.36 mm (No. 8) sieve but retained on the 0.85 mm (No. 20) sieve and fine fibers and fines through the 0.85 mm (No. 20) sieve.~~ The mass percentage of each fraction is reported on the then determined and recorded on an as-received basis.

## 5. Significance and Use

5.1 This practice is primarily used in the horticulture industry to separates peat material into arbitrary fractions based on particle size. Physical separation of peat material according to particle size provides a useful indicator of the properties of a peat specimen such as pore space, decomposition, etc. It space and degree of decomposition for unprocessed peat. It also provides a means of determining the amount of foreign matter not in a divided state such as sticks, stones, and glass.

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/ and the like. 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 Mechanical Sieve Shaker—Shaker—A device that holds a stack of sieves while imparting sufficient motion to the sieves. The "Standard Shaking Period" must be from 10 to 20 minutes. The shaker shall have a timing device or a timing device shall be used in conjunction with the shaker.

<sup>2</sup> 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.

6.2 Sieves—2.36 mm (No. 8) and 0.850.850 mm (No. 20) sieves equipped with cover and bottom pan and meeting requirements of Specification E11.

6.3 Balance or Scale, Scale—a balance or scale for determining the mass of the Balances/scales shall conform to the requirements of Guide D4753 soil having. The balance/scale shall have a minimum capacity of 500 g and meeting the requirements of Standard shall have D4753 for a balance or scale of 0.01 g readability a readability without estimation of 0.01 g.

## 7. Preparation of Sample

7.1 Air-dry sample in accordance with Method B of Test Methods D2974, and record the mass percentage of moisture removed by air-drying. Information on obtaining a representative sample is covered in Test Methods D2974.

## 7. Procedure

7.1 This practice does not address, in any detail, procurement of the field/bulk sample. It is assumed the field/bulk sample is obtained using appropriate methods and is representative of the peat under evaluation.

7.1.1 From the field/bulk sample, obtain a representative sample in accordance with 7.2 and 7.3 of Test Methods D2974. Record the mass of the representative sample to the nearest 0.01 g. Air dry the representative sample in accordance with Method B of Test Methods D2974 (see Note 2).

NOTE 2—The representative sample referred to in this standard is equivalent to the test specimen as described in 7.3 of Test Methods D2974.

7.2 Assemble the sieves by stacking the 2.36 mm (No. 8) sieve followed by the 0.850 mm (No. 20) sieve and then the pan.

7.3 Thoroughly mix the air-dried representative sample and take  $50.00 \pm 10$  g of it to obtain the air-dried test specimen. Measure and record the mass of the air-dried test specimen,  $M_s$ , to the nearest 0.01 g. Place the test specimen on top of the first sieve.

7.4 Put the cover on the 2.36 mm (No. 8) sieve and secure in the mechanical shaker.

7.5 Shake at a suitable speed for 10 min.

7.6 After shaking, remove any foreign matter, such as rocks, metal, plastic, soil clumps, from the 2.36 mm (No. 8) sieve and record the mass of foreign matter fraction,  $FM_M$ , to the nearest 0.01 g.

7.7 Once the foreign matter has been removed, measure and record the mass of coarse fiber,  $CF_M$ , of the remaining material retained on the 2.36 mm (No. 8) sieve to the nearest 0.01 g.

7.8 Mix the air-dried sample thoroughly and place an approximately 20-g specimen on the 2.36 mm (No. 8) sieve. Secure the 2.36 mm (No. 8) and 0.85 mm (No. 20) sieves equipped with cover and bottom pan and shake at a suitable speed for 10 min. Remove foreign matter from the 2.36 mm (No. 8) sieve and determine the mass. Designate this fraction as foreign matter. Determine the mass of the remaining Measure and record the mass of medium fiber,  $fraction MM_M$ , retained on the 2.36 mm (No. 8) sieve and designate this fraction as coarse fiber. Determine the mass of the fraction retained on the 0.850.850 mm (No. 20) sieve and designate this fraction as medium fiber. Determine the mass of the fraction found in the bottom pan and designate this fraction as fines to the nearest 0.01 g.

7.9 Measure and record the mass of fine fiber,  $FF_M$ , of the fraction found in the bottom pan to the nearest 0.01 g.

## 8. Calculation

8.1 If foreign matter is absent, conversion to the as-received basis is not necessary. Otherwise, calculate the specimen mass and foreign matter mass using the following equation:

$$FM_F = \frac{FM_M}{M_s} \times 100 \quad (1)$$