



Standard Test Methods for Organic Matter Content of Putting Green and Sports Turf Root Zone Mixes¹

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1. Scope

1.1 These test methods cover the determination of the percent organic matter of a putting green root zone mixture using a loss on ignition method or the Walkley Black method. These test methods are useful for quantifying the organic matter content of volume ratio mixed root zone mixes. Test Method D 2974 is recommended for peat and other organic soils.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use, nor the disposal of hazardous waste that may be generated. 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.* For a specific precautionary statement, see 8.2.6.

2. Referenced Documents

2.1 ASTM Standards:

D 2974 Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils²

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods³

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method³

3. Summary of Test Methods

3.1 *Method A*—Organic matter content is determined by loss on ignition (LOI).

3.2 *Method B*⁴—Organic matter content is determined by the Walkley-Black method; a dichromate oxidation procedure whereby the color intensity of the reaction product is determined colorimetrically.

4. Apparatus—Method A

4.1 *Oven*, capable of maintaining a constant temperature of $105 \pm 5^\circ\text{C}$.

4.2 *Muffle furnace*, capable of producing constant temperatures of $360 \pm 10^\circ\text{C}$.

4.3 *Evaporating dish or crucible*, made of high silica or porcelain of not less than 10-mL capacity.

4.4 *Desiccator*,

4.5 *Aluminum foil*, heavy duty, and

4.6 *Balance*, sensitive to 0.001 g.

5. Apparatus—Method B

5.1 *Soil grinder*,

5.2 *Balance*, sensitive to 0.01 g.

5.3 *Sulfuric acid*, concentrated (not less than 96 %),

5.4 *Potassium dichromate*, 1 N, made by dissolving 49.04 reagent-grade potassium dichromate in water, and diluting to a volume of 1 L,

5.5 *Spectrophotometer or colorimeter*, set at or adjustable to 610-nm wavelength.

5.6 *Standard*, 10 000 mg/L as CO_2 ,

5.7 *Pipets*, assorted, capable of measuring volumes of 0.1 to 10 mL,

5.8 *Glassware*, assorted, to include 250-mL Erlenmeyer flasks and funnels (75-mm ID), and

5.9 *Oven*, capable of maintaining a constant temperature of $105 \pm 5^\circ\text{C}$.

6. Procedure—Method A

6.1 Scoop 5 to 10 g of oven-dried ($105 \pm 5^\circ\text{C}$) soil into tared crucibles.

6.2 Weigh and record weight to the nearest 0.001 g.

6.3 Place the sample into a muffle furnace heated to $360 \pm 10^\circ\text{C}$. Leave the sample in the furnace for 2 h.

6.4 Cool to 105°C , or cover with a piece of foil and cool in a desiccator.

6.5 Weigh ash in a draft-free environment to the nearest 0.001 g.

7. Calculation of Percent Organic Matter, Method A

7.1 Calculate percent organic matter as follows:

¹ These test methods are under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and are the direct responsibility of Subcommittee F08.64 on Natural Playing Surfaces.

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² *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 14.02.

⁴ Procedure was based on procedure published in "Methods of Soil Analysis, Part 2: Chemical and Microbiological Properties," American Society of Agronomy Monograph No. 9, 2nd Ed.