Designation: F 1632 – 99

Standard Test Method for Particle Size Analysis and Sand Shape Grading of Golf Course Putting Green and Sports Field Rootzone Mixes[1]

This standard is issued under the fixed designation F 1632; 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 covers the determination of particle size distribution of putting green and other sand based root zone mixes. Particles larger than 0.05 mm (retained on a No. 270 sieve) are determined by sieving. The silt and clay percentages are determined by a sedimentation process, using the pipet method. This procedure was developed for putting green rootzone mixes; those assumed to have sand contents of 80 % by weight or greater. Particle size analysis of soils may be performed by this test method or Test Method D 422. This test method also describes a qualitative evaluation of sand particle shape.

1.2 *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 Document

2.1 *ASTM Standard:*

D 422 Test Method for Particle-Size Analysis of Soils[2]

3. Apparatus

3.1 *Balance,* sensitive to 0.001 g.

3.2 *Stirring Apparatus,* may be either of the following types:

3.2.1 *For Method A—An Electric Mixer,* made for mechanical mixing of soils, or

3.2.2 *For Method B—A Horizontal Reciprocating Shaker,* with holder for 250 mL flasks or bottles.

3.3 *Sedimentation Cylinder,* a glass cylinder marked for a volume of 1000 mL. The height of the 1000 mL must be 36 ± 2 cm from the bottom on the inside.

3.4 *Thermometer,* accurate to 0.5°C.

3.5 *Pipet Rack,* a device for lowering a pipet to a precise depth in the sedimentation cylinder.

3.6 *Pipets,* Lowy or other wide tipped type, 25 mL capacity.

3.7 *Weighing Bottles or Beakers,* glass with a capacity of 100 mL.

3.8 *Sieves,* square mesh with woven wire (brass or stainless steel). A full set of sieves shall include the following:

3.8.1 *No. 10*—2 mm,

3.8.2 *No. 18*—1 mm,

3.8.3 *No. 35*—500 μm,

3.8.4 *No. 60*—250 μm,

3.8.5 *No. 100*—149 μm,

3.8.6 *No. 140*—105 μm, and

3.8.7 *No. 270*—53 μm.

3.9 *Sieve Shaker,* type that provides vertical tapping action as well as horizontal shaking.

3.10 *Desiccator.*

3.11 *Dispersing Agent,* a 5 % sodium hexametaphosphate (HMP) solution, made by dissolving 50 g of reagent or technical grade HMP in 1000 mL of distilled or demineralized water.

3.12 *Oven,* capable of maintaining a temperature of 105°C.

3.13 *Water,* shall be distilled or demineralized, and brought to the temperature that is expected to prevail during the sedimentation process. If air temperatures are expected to fluctuate, cylinders should be placed in a constant temperature water bath, and the distilled or demineralized water brought to the temperature of the water bath.

3.14 *Dissecting Microscope,* 25 to 50× power.

TEST METHOD 1—PROCEDURE FOR PARTICLE SIZE ANALYSIS

4. Procedure

4.1 *Dispersion of Sample:*

4.1.1 Weigh 100 ± 5 g of air-dried rootzone mix to the nearest 0.1 g and place in mixing cup (Test Method A) or flask (Test Method B). Place a duplicate sample into a drying oven set at 105°C for correction to oven dried basis.

4.1.2 Add 100 mL of dispersing agent. Stir or swirl until the rootzone mix is thoroughly wet. Allow to stand for 4 h. If using Test Method B, place the flasks or bottles on the shaker and shake for 16 h or overnight.

4.1.3 *Test Method A*—Add about 100 mL of water to the mixing cup and place onto the mixer. Mix for 5 min on low speed.

4.2 *Determination of the Sand (2.0 to 0.05 mm) Fractions*

[1] This test method is under the jurisdiction of ASTM Committee F-8 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.52 on Playing Surfaces and Facilities.

Current edition approved May 10, 1999. Published August 1999. Originally published as F 1632 – 95. Last previous edition F 1632 – 98a.

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