



Standard Test Method for Rapid Determination of Percent Compaction¹

This standard is issued under the fixed designation D5080; 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 describes the procedure for rapidly determining the percent compaction and the variation from optimum moisture content of an in-place soil for use in controlling construction of compacted earth. These values are obtained by developing a three-point compaction curve at the same moisture content as the in-place soil without knowing the value of the moisture content. The soil used for the compaction curve is normally the same soil removed from the in-place density test. For the remainder of this designation, this test method will be referred to as the *rapid method*.

1.2 This test method is normally performed for soils containing more than 15 % fines (minus No. 200 sieve size).

1.3 When gravel-size particles are present in the soil being tested, this test method is limited to a comparison of the minus No. 4 sieve-size fraction of the in-place density material to a laboratory compaction test of minus No. 4 sieve-size material (Method A of Test Methods D698). Subject to the limitations of Practice D4718, this test method is also applicable to comparisons of other sieve-size fractions (for example, Method C of Test Methods D698) or other compactive efforts (for example, Test Methods D1557) if new moisture adjustment values are determined (see 6.1 and Appendix X2).

1.4 The values stated in SI units are to be regarded as the standard.

1.4.1 The use of balances or scales recording pounds of mass (lbm), or the recording of density in pounds of mass per cubic foot (lbm/ft³) should not be regarded as nonconformance with this test method.

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values shall conform to the guidelines for significant digits and rounding established in Practice D6026 unless superseded by this standard.

1.5.1 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; 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 analytical methods for engineering design.

1.6 *This standard does not purport to address all of the safety problems, 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.* For specific hazard statements, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:²

- D653 Terminology Relating to Soil, Rock, and Contained Fluids
- D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
- D1556 Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
- D1557 Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- D2167 Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2216 Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D2937 Test Method for Density of Soil in Place by the Drive-Cylinder Method
- D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- D4718 Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles
- D6026 Practice for Using Significant Digits in Geotechnical Data

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.08 on Special and Construction Control Tests.

Current edition approved Feb. 1, 2008. Published March 2008. Originally approved in 1990. Last previous edition approved in 2000 as D5080 – 00. DOI: 10.1520/D5080-08.

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.