



Designation: D 4943 – 9502

Standard Test Method for Shrinkage Factors of Soils by the Wax Method¹

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INTRODUCTION

Given the concern that mercury is a hazardous substance, this test method is offered as an alternative to Test Method D 427, which is used to determine the shrinkage limit and other shrinkage factors of soils using mercury (see Caution statement in Test Method D 427). Since this test method has been performed by only a few organizations to date, others are encouraged to perform both test methods and to report their findings to Subcommittee D18.03. (See Appendix X1 for a rationale of this test method.)

1. Scope *

- 1.1 This test method covers the procedure for determining the shrinkage limit of soils.
- 1.2 The data obtained using this test method may also be used to calculate shrinkage ratio, volumetric shrinkage, and linear shrinkage.
- 1.3 This test method is applicable only for cohesive soils.
- 1.4 Since this test method is performed only on that portion of a soil which passes the No. 40 (425- μ m) sieve, the relative consistency of this portion of the soil to the properties of the sample as a whole must be considered when using these procedures to evaluate the properties of a soil.
- 1.5 The shrinkage limit along with the liquid limit and plastic limit of soils are often collectively referred to as the Atterberg limits in recognition of their formation by Swedish soil scientist, A. Atterberg. These limits distinguish the boundaries of the several consistency states of cohesive soils.
- 1.6 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.
- 1.7 *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.* For specific safety hazards, see Section 7, Note 1, 2, and Note X1.1.

2. Referenced Documents

2.1 ASTM Standards:

- C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²
- C 702 Practice for Reducing Samples of Aggregate to Testing Size²
- D 75 Practice for Sampling Aggregates³
- D 420 Guide to Site Characterization for Engineering, Design, and Construction Purposes⁴
- D 427 Test Method for Shrinkage Factors of Soil by the Mercury Method⁴
- D 653 Terminology Relating to Soil, Rock, and Contained Fluids⁴
- D 854 Test Method for Specific Gravity of Soils⁴
- D 2726 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens³
- D 3740 Practice for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used Engineering Design and Construction⁴
- D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils⁴

¹ This test method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.03 on Texture, Plasticity and Density Characteristics of Soils.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.03.

⁴ Annual Book of ASTM Standards, Vol 04.08.

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