
Standard Method of Test for Thin-Walled Tube Sampling of Soils

AASHTO Designation: T 207-22¹

Technically Revised: 2022

**Technical Subcommittee: 1b, Geotechnical Exploration,
Instrumentation, Stabilization, and Field Testing**

ASTM Designation: D1587/D1587M-15



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, D.C. 20004**

Standard Method of Test for

Thin-Walled Tube Sampling of Soils

AASHTO Designation: T 207-22¹

AASHTO

Technically Revised: 2022

Technical Subcommittee: 1b, Geotechnical Exploration,
Instrumentation, Stabilization, and Field Testing

ASTM Designation: D1587/D1587M-15

1. SCOPE

- 1.1. This method covers a procedure for using a thin-walled metal tube to recover relatively undisturbed soil samples suitable for laboratory tests of engineering properties, such as strength, compressibility, permeability, and density. Thin-walled tubes used in piston-, plug-, or rotary-type samplers, such as the Denison or Pitcher, must comply with the portions of this practice that describe the thin-walled tubes (Section 5.3).
- Note 1**—This method does not apply to liners used within the above samplers.
- 1.2. Not all tubes specified in this method may be of sufficient diameter to perform all strength or consolidation testing. Refer to the appropriate test method for the minimum sample size to determine if the tube will be appropriate for that test.
- 1.3. The values stated in SI units are to be regarded as the standard.
- 1.4. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of whoever uses this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*
- 1.5. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*
-

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- R 13, Conducting Geotechnical Subsurface Investigations
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.2. *ASTM Standard:*
-

3. SUMMARY OF METHOD

- 3.1. A relatively undisturbed sample is obtained by pressing a thin-walled metal tube into the *in situ* soil at the bottom of a boring, removing the soil-filled tube, and sealing the ends to prevent the soil from being disturbed or losing moisture.

4. SIGNIFICANCE AND USE

- 4.1. This method is used when it is necessary to obtain a relatively undisturbed specimen suitable for laboratory tests of engineering properties or other tests that might be influenced by soil disturbance.

5. APPARATUS

- 5.1. *Drilling Equipment*—Any drilling equipment may be used that provides a reasonably clean hole, that minimizes disturbance of the soil to be sampled, and that does not hinder the penetration of the thin-walled sampler. Open borehole diameter and the inside diameter of driven casing or hollow stem auger shall not exceed 3.5 times the outside diameter of the thin-walled tube.
- 5.2. *Sampler Insertion Equipment*—shall be adequate to provide a relatively rapid continuous penetration force. For hard formations it may be necessary, although not recommended, to drive the thin-walled tube sampler.
- 5.3. *Sampler Head*—serves to couple the thin-walled tube to the insertion equipment and, together with the thin-walled tube, comprises the thin-walled tube sampler. The sampler head shall contain a suitable check valve and a venting area to the outside equal to or greater than the area through the check valve. In some special cases, a check valve may not be required, but venting is required to avoid sample compression. Attachment of the head to the tube shall be concentric and coaxial to assure uniform application of force to the tube by the sampler insertion equipment.
- 5.4. *Thin-Walled Tubes*—should be manufactured as shown in Figure 1. They should have an outside diameter of 50.8 to 127.0 mm (2 to 5 in.) and be made of metal having adequate strength for use in the soil and formation intended. Tubes shall be clean and free of all surface irregularities including projecting weld seams. Other diameters may be used, but the tube dimensions should be proportional to the tube designs presented here.