
Standard Method of Test for

Determining the Plastic Limit and Plasticity Index of Soils

AASHTO Designation: T 90-22

Technically Revised: 2022

Technical Subcommittee: 1a, Soil and Unbound Recycled Materials



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1. The plastic limit of a soil is the lowest moisture content at which the soil remains plastic. The plasticity index of a soil is the range in moisture content, expressed as a percentage of the mass of the oven-dried soil, within which the material is in a plastic state. The plasticity index is calculated as the numerical difference between the liquid limit and plastic limit of the soil.
- 1.2. The following applies to all specified limits in this standard: For the purpose of determining conformance with these specifications, an observed value or a calculated value shall be rounded off “to the nearest unit” in the last right-hand place of figures used in expressing the limiting value, in accordance with ASTM E29.
- 1.3. Two procedures for rolling out soil samples are provided in this method: the Hand Rolling Method and the Plastic Limit Device Method. The Hand Rolling Method shall be used as the referee procedure.
- 1.4. This test method is often conducted in conjunction with T 89, which is used to determine the liquid limit of soils.
- 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:*
 - M 231, Weighing Devices Used in the Testing of Materials
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - R 58, Dry Preparation of Disturbed Soil and Soil–Aggregate Samples for Test
 - R 61, Establishing Requirements for Equipment Calibrations, Standardizations, and Checks
 - R 74, Wet Preparation of Disturbed Soil Samples for Test

- T 89, Determining the Liquid Limit of Soils
- T 265, Laboratory Determination of Moisture Content of Soils

2.2. *ASTM Standards:*

- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E29, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E2877, Standard Guide for Digital Contact Thermometers

2.3. *International Electrotechnical Commission Standard:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances

3. APPARATUS

3.1. *Dish*—A porcelain evaporating dish or similar mixing dish about 115 mm in diameter.

3.2. *Spatula*—A spatula or pill knife having a blade about 75 mm in length and about 20 mm in width.

3.3. *Surface for Rolling*—Shall consist of one of the following:

3.3.1. A ground glass plate or piece of smooth, unglazed paper on which to roll the sample. Paper, if used, shall not add foreign matter (fibers, paper fragments, etc.) to the soil during the rolling process and shall lay flat on a smooth horizontal surface.

3.3.2. *Plastic Limit Rolling Device*^{1,2}—A device made of acrylic conforming to the dimensions shown in Figure 1.