



Designation: D 423 - 66 (Reapproved 1972)

Standard Method of Test for LIQUID LIMIT OF SOILS¹

This Standard is issued under the fixed designation D 423; 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.

1. Scope

1.1 This method covers the determination of the liquid limit of soils as defined in Section 2, using the mechanical device specified in Section 3, securing the results of at least three trials, and the plotting of a flow curve. Provision is also made for: (1) a one-point method requiring the calculation of the liquid limit value from data secured from a single trial; and (2) a procedure for check or referee tests.

1.2 The mechanical method shall be used unless specifications for the soil being tested permit the use of the one-point method. The procedure for check or referee tests shall be used in cases of disagreement or when required in the specifications for the soil being tested.

2. Definition

2.1 The liquid limit of a soil is the water content, expressed as a percentage of the weight of the oven-dried soil, at the boundary between the liquid and plastic states. The water content at this boundary is arbitrarily defined as the water content at which two halves of a soil cake will flow together for a distance of $\frac{1}{2}$ in. (12.7 mm) along the bottom of the groove separating the two halves, when the cup is dropped 25 times for a distance of 1 cm (0.3937 in.) at the rate of 2 drops/s.

MECHANICAL METHOD

3. Apparatus

3.1 *Evaporating Dish*—A porcelain evaporating dish about 4 in. (114.3 mm) in diameter.

3.2 *Spatula*—A spatula or pill knife having

a blade about 3 in. (76.2 mm) in length and about $\frac{3}{4}$ in. (19.0 mm) in width.

3.3 *Liquid Limit Device*—A mechanical device consisting of a brass cup and carriage, constructed according to the plan and dimensions shown in Fig. 1.²

3.4 *Grooving Tool*—A combined grooving tool and gage conforming to the dimensions shown in Fig. 1.

3.5 *Containers*—Suitable containers, such as matched watch glasses, that will prevent loss of moisture during weighing.

3.6 *Balance*—A balance sensitive to 0.01 g.

4. Sample

4.1 Take a sample weighing about 100 g from the thoroughly mixed portion of the material passing the No. 40 (425- μ m) sieve, obtained in accordance with ASTM Method D 421, Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants.³

5. Adjustment of Mechanical Device

5.1 Inspect the liquid-limit device to determine that the device is in good working order, that the pin connecting the cup is not worn sufficiently to permit side play, that the screws connecting the cup to the hanger arm are tight, and that a groove has not been worn in the cup through long usage. Inspect the

¹ This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock for Engineering Purposes. Current edition approved Sept. 20, 1966. Originally issued 1935. Replaces D 423 - 61.

² Detailed working drawings for this liquid limit device are available at a nominal cost from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103. Order Adjunct No. 12-404230-00.

³ Annual Book of ASTM Standards, Part 19.