
Standard Method of Test for

Determining the Shrinkage Factors of Soils

AASHTO Designation: T 92-97 (2005)



American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001

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1. SCOPE

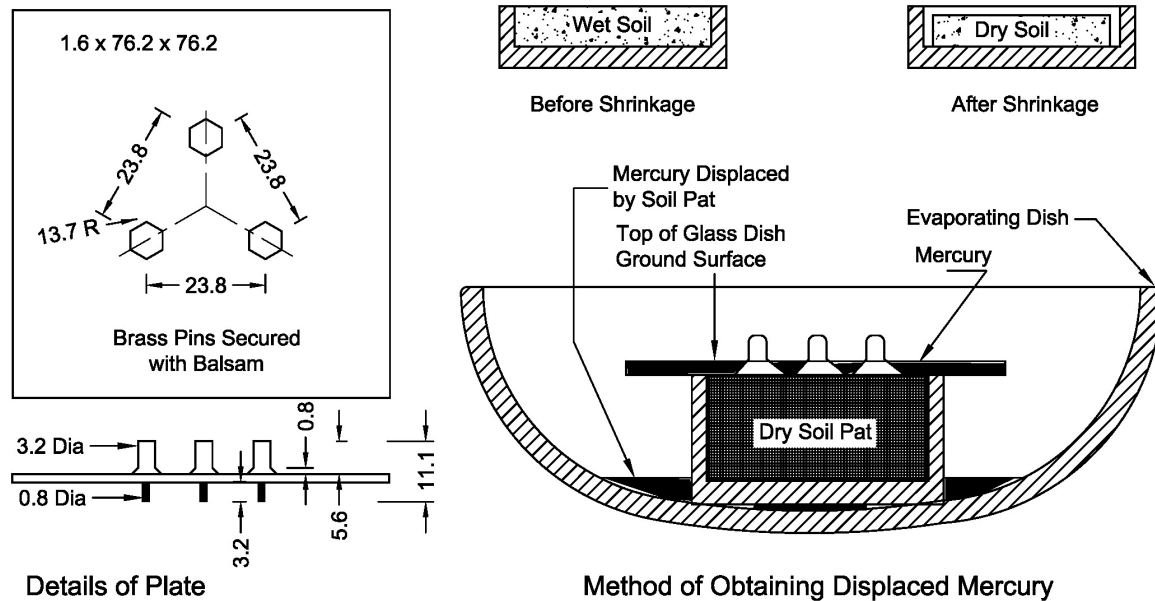
- 1.1. This procedure furnishes data from which the following soil characteristics may be calculated: (a) shrinkage limit, (b) shrinkage ratio, (c) volumetric change, and (d) lineal shrinkage.
- 1.2. The following applies to all specified limits in this standard: For the purposes of determining conformance 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 limited value, in accordance with R 11, Indicating Which Places of Figures Are to Be Considered Significant in Specified Limiting Values.
- 1.3. The values stated in SI units are to be regarded as the standard.
- 1.4. Refer to R 16 for regulatory information for chemicals.

DETERMINATION OF THE VOLUMETRIC SHRINKAGE

2. APPARATUS

- 2.1. The apparatus shall consist of the following:
 - 2.1.1. *Dishes*:
 - 2.1.1.1. A porcelain evaporating dish, or similar mixing dish, about 115-mm ($4\frac{1}{2}$ -in.) diameter.
 - 2.1.1.2. A porcelain evaporating dish about 150 mm (6 in.) in diameter.
 - 2.1.2. *Spatula*—A spatula or pill knife having a blade about 75 mm (3 in.) long and about 20 mm ($\frac{3}{4}$ in.) wide.
 - 2.1.3. *Milk Dish*—A porcelain or monel metal milk dish having a flat bottom and being about 45 mm ($1\frac{3}{4}$ in.) in diameter by about 12.7 mm ($\frac{1}{2}$ in.) high.
 - 2.1.4. *Straightedge*—A steel straightedge 100 mm (4 in.) or more in length.
 - 2.1.5. *Glass Cup*—A glass cup about 50 mm (2 in.) in diameter by 25 mm (1 in.) high, the top rim of which is ground smooth and parallel with its base.

- 2.1.6. *Transparent Plate*—A transparent plate with three metal prongs for immersing the soil pat in mercury as shown in Figure 1.



Dimensional Equivalents

mm	in.
0.8	$\frac{1}{32}$
1.6	$\frac{1}{16}$
3.2	$\frac{1}{8}$
5.6	$\frac{7}{32}$
11.1	$\frac{7}{16}$
13.7	0.54
23.8	$\frac{15}{16}$
76.2	3

Note: All dimensions shown in millimeters unless otherwise noted.

Figure 1—Apparatus for Determining the Shrinkage Factors of Subgrade Soils

- 2.1.7. *Glass Graduate*—A glass graduate having a capacity of 25 mL and graduated to 0.2 mL.
- 2.1.8. *Balance*—The balance shall have sufficient capacity and conform to M 231, Class G 1.
- 2.1.9. *Mercury*—Sufficient mercury to fill the glass cup to overflowing.
- 2.1.10. *Oven*—A thermostatically controlled drying oven capable of maintaining temperatures of $110 \pm 5^\circ\text{C}$ ($230 \pm 9^\circ\text{F}$) for drying soil samples.

3. SAMPLE

- 3.1. A sample with a mass of about 30 g shall be taken from the thoroughly mixed portion of the material passing the 0.425-mm (No. 40) sieve prepared in accordance with the Standard Method of