
Standard Method of Test for

Sampling and Fabrication of 50-mm (2-in.) Cube Specimens Using Grout (Non-Shrink) or Mortar

AASHTO Designation: TP 83-10



1. SCOPE

- 1.1. This method covers field sampling and fabrication and initial curing of 50-mm (2-in.) cube specimens of non-shrink grout or mortar materials, or both.
- 1.2. The values stated in either inch-pound or SI units shall be regarded separately as standard. The inch-pound units are shown in parentheses. The values stated might not be exact equivalents; therefore, each system must be used independently of the other.
- Note 1**—Unit weight was the previous terminology used to describe the property determined by this test method, which is mass per unit volume.
- 1.3. The text of this test method references notes and footnotes that provide explanatory information. These notes and footnotes (excluding those in tables) shall not be considered as requirements of this test method.
- 1.4. *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.*
- Warning**—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- R 60, Sampling Freshly Mixed Concrete
 - T 106M/T 106, Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)
- 2.2. *ASTM Standards:*
- C 109/C 109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
 - C 1107/C 1107M, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

3. TERMINOLOGY

3.1. Definitions of Terms Specific to This Standard:

- 3.1.1. *plastic mix*—material viscous enough that an indentation will be left in the surface of the grout after tamping.
- 3.1.2. *fluid mix*—material fluid enough that little or no indentation will be left in the surface after puddling.

4. APPARATUS

- 4.1. *Specimen Molds Including Cover Plate(s)*—The 50-mm (2 in.) cube specimen molds shall be tight-fitting and made of brass or other suitable material. This material shall not be susceptible to attack by the cement mortar. The mold portion shall have not more than three cube compartments and shall be separable into not more than two parts. The parts of the molds (mold halves and cover plate(s)), when assembled, shall be positively held together. The working surface of the cover plate(s) shall be plane and shall be positively attached to the side walls of the mold. The interior faces of the molds shall conform to the tolerances of Table 1.

Table 1—Permissible Variations of Specimen Molds

Parameter	50-mm Cube Molds		2-in. Cube Molds	
	New	In Use	New	In Use
Planeness of sides	<0.025 mm	<0.05 mm	<0.001 in.	<0.002 in.
Distance between opposite sides	50 mm ± 0.13 mm	50 mm ± 0.50 mm	2 in. ± 0.005 in.	2 in. ± 0.02 in.
Height of each compartment	50 mm + 0.25 mm to −0.13 mm	50 mm + 0.25 mm to −0.38 mm	2 in. + 0.01 in. to −0.005 in.	2 in. + 0.01 in. to −0.015 in.
Angle between adjacent faces ^a	90 ± 0.5°	90 ± 0.5°	90 ± 0.5°	90 ± 0.5°

^a Measured at points slightly removed from the intersection. Measured separately for each compartment between all the interior faces and the adjacent face and between interior faces and top and bottom planes of the mold.

- 4.2. *Tamper*—A nonabsorptive, nonabrasive, nonbrittle material such as a hard rubber compound having a Shore A durometer hardness of 80 ± 10. The tamper shall have a cross section of about 13 mm by 25 mm (1/2 in. by 1 in.) and a length of 125 to 150 mm (5 to 6 in.). The tamping face shall be flat and at right angles to the length of the tamper.
- 4.3. *Trowel*—Steel bladed, 100 to 150 mm (4 to 6 in.) in length, with straightedges.
- 4.4. *Watertight Container*—A 150-mm by 300-mm (6-in. by 12-in.) concrete cylinder mold with lid.
- 4.5. *Other Equipment*—Rubber gloves, scoop, clamps to secure the cover plate, light release oil for oiling the molds, small brush or lint-free cloth for applying and removing excess release oil, and burlap or wrapping cloth capable of retaining moisture.

5. SAMPLING

- 5.1. Samples shall be obtained in accordance with R 60 when the batch equals or exceeds 1 m³ (1 yd³). When the batch is less than 1 m³ (1 yd³), sample from the batch after discharge. If remixing is required, sample after remixing. Begin molding the specimens within an elapsed time of not more than 2 1/2 min from completion of the mixing.