

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Transportation Laboratory
5900 Folsom Blvd.
Sacramento, California 95819-4612



METHOD OF TEST FOR SLUMP OF FRESH PORTLAND CEMENT CONCRETE

A. SCOPE

This test method describes the procedure to determine the slump of plastic portland cement concrete.

This test method is considered applicable to plastic concrete having coarse aggregate up to 1½ in. in size. If the coarse aggregate is larger than 1½ in., the test method is applicable when it is performed on the fraction of concrete passing a 1½ in. sieve with larger aggregate being removed by wet sieving procedures.

This test method is not considered applicable to non-plastic and non-cohesive concrete. Concrete having a slump less than 0.6 in. may not be adequately plastic and concrete having a slump greater than 9 in. may not be adequately cohesive for this test to have significance. Caution should be exercised in interpreting such results.

B. REFERENCES

California Test 539 – Sampling Fresh Concrete
AASHTO T 119 – Standard Method of Test for Slump of Hydraulic Cement Concrete
ASTM C 143 – Standard Test Method for Slump of Hydraulic-Cement Concrete

C. APPARATUS

1. Mold: a mold made of metal not readily attacked by the cement paste. The metal must not be thinner than 0.06 in. and, if formed by the spinning process, no point on the mold must be less than 0.05 in. thick. The mold must be in the form of the lateral surface of the frustum of a cone with the base diameter of 8 in., the top diameter of 4 in., and the height of 12 in. Individual diameters and heights must be within ⅛ in. of the prescribed dimensions. The base and top must be open and parallel to each other and at right angles to the axis of the cone. The mold must have foot pieces and be constructed without a seam. The interior of the mold must be relatively smooth and free from projections or dents. A mold that clamps to a nonabsorbent base plate is acceptable provided the clamping arrangement is such that it can be fully released without movement of the mold.
2. Tamping rod: a round, straight steel rod with a diameter of ⅝ in. ± ⅛ in. and length of at least 4 in. greater than the depth of the measure in which rodding is to be performed (but not more than 24 in.). One or both ends of the tamping rod must be rounded to a hemispherical tip of the same diameter as the rod.

D. SAMPLE

Obtain the sample in accordance with California Test 539.

E. PROCEDURE

1. Dampen the mold and place it on a flat, moist, nonabsorbent, and rigid surface.

Standing on the foot pieces and holding it firmly in place, fill the mold using the sample obtained.
2. Using a scoop, fill the mold in 3 layers of equal depth. Move the scoop around the perimeter of the mold to ensure an even distribution of the material with minimal segregation. Fill the topmost layer to over flowing.
 - a. Rod each layer 25 times with the rounded end of the tamping rod, distributing the strokes evenly over the surface of the layer.
 - b. While rodding the first layer, incline the rod slightly making approximately half of the strokes near the perimeter and progress with vertical strokes spirally toward the center. Penetrate full depth into the layer.
 - c. While rodding the second and third layers, penetrate approximately 1 in. into the layer below with each stroke.
 - d. If rodding the third layer results in subsidence of the concrete below the top edge of the mold, add additional concrete to keep an excess of concrete above the top of the mold at all times.
3. After the top layer has been rodded, strike off the surface of the concrete by means of a screeding and rolling motion of the tamping rod. Remove concrete from the area surrounding the base of the slump cone to preclude interference with the movement of slumping concrete.
4. Remove the mold immediately from the concrete by raising it carefully in a vertical direction. Raise the mold a distance of 12 in. with a steady upward lift and no lateral or torsion motion in $5 \text{ s} \pm 2 \text{ s}$.
5. Complete the entire test from the start of the filling through removal of the mold without interruption and complete it within an elapsed time of $2\frac{1}{2}$ min.
6. Immediately measure the slump by determining the vertical difference between the top of the mold and the displaced original center of the top surface of the specimen.
7. If a decided falling away or shearing off of concrete from 1 side or portion of the mass occurs, disregard the test and make a new test on another portion of the sample.

If 2 consecutive tests on a sample of concrete show a falling away or shearing off of a portion of the concrete from the mass of the specimen, the concrete probably lacks necessary plasticity and cohesiveness for the slump test to be applicable.

F. REPORTING OF RESULTS

Record the slump in terms of inches to the nearest 0.2 in. of subsidence of the specimen.

G. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

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(California Test 556 contains 3 Pages)**