

Experiment No. 9. Slump of Freshly Mixed Portland Cement Concrete

ASTM Designation

ASTM C143—Slump of Portland Cement Concrete

Purpose

To determine the slump of freshly mixed portland cement concrete both in the laboratory and in the field.

Significance and Use

This method measures the consistency of freshly mixed portland concrete cement PCC. To some extent, this test indicates how easily concrete can be placed and compacted, or the workability of concrete. This test is used both in the laboratory and in the field for quality control.

Apparatus

- Mold in the form of lateral surface of frustum with a top diameter of 102 mm (4 in.), bottom diameter of 203 mm (8 in.), and height of 305 mm (12 in.) (Figure 7.3)
- Tamping rod with a length of 0.6 m (24 in.), diameter of 16 mm (5/8 in.), and rounded ends

Test Procedure

1. Mix concrete either manually or with a mechanical mixer. If a large quantity of mixed concrete exists, obtain a representative sample.
2. Dampen the mold and place it, with its larger base at the bottom, on a flat, moist, nonabsorbent rigid surface.
3. Hold the mold firmly in place by standing on the two foot pieces.
4. Immediately fill the mold in three layers, each approximately one-third of the volume of the mold. Note that one-third of the volume is equivalent to a depth of 67 mm (2-5/8 in.), whereas two-thirds of the volume is equivalent to 155 mm (6-1/8 in.).
5. Rod each layer 25 strokes using the tamping rod. Uniformly distribute the strokes over the cross section of each layer. Rod the second and top layers each throughout its depth so that the strokes penetrate the underlying layer. In filling and rodding the top layer, heap the concrete above the mold before rodding is started. If the rodding operation results in subsidence of 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.



FIGURE A.6 Measuring the slump of freshly mixed concrete.

6. After the top layer has been rodded, strike off the surface of concrete by means of a screening and rolling motion of the tamping rod.
7. Remove the mold immediately from the concrete by raising it up carefully without lateral or torsional motion. The slump test must be completed within 2.5 min after taking the sample.
8. Measure the slump by determining the vertical difference between the top of the mold and the displaced original center of the top of the specimen as shown in Figure A.6. If two consecutive tests on a sample of concrete show a falling away or a shearing off of a portion of concrete from the mass of the specimen, the concrete probably lacks the necessary plasticity and cohesiveness for the slump test to be applicable and the test results will not be valid.

Report

- The slump value to the nearest 6 mm (1/4 in.)