



Standard Test Method for Flow of Freshly Mixed Hydraulic Cement Concrete¹

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1. Scope

1.1 This test method covers determination of the flow of a sample of freshly mixed concrete, either in the field or in the laboratory.

1.2 This test method is applicable to concrete having coarse aggregate up to 37.5 mm in size. If the coarse aggregate is larger than 37.5 mm in size, the test method is applicable when the fraction of concrete larger than 37.5 mm is removed in accordance with Practice C 172.

1.3 The values stated in SI units are the standard.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 172 Practice for Sampling Freshly Mixed Concrete²

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²

3. Summary of Test Method

3.1 A flow apparatus comprising an outer partially perforated hollow tube and an inner calibrated floating rod is inserted into a sample of freshly mixed concrete to a preset level and held in place by a collar floater. A portion of the concrete is allowed to flow into the hollow tube through its perforations for a period of 40 s. The inner floating rod is then lowered onto the concrete surface that has penetrated the hollow tube. The height of the concrete in the hollow tube is read from the scale on the upper portion of the floating rod protruding from the top of the hollow tube. With increasing fluidity of the concrete a higher flow reading is obtained on a scale from zero to one hundred divisions.

4. Significance and Use

4.1 This test method permits a rapid assessment of the flow and consistency of freshly mixed concrete (see Note 1).

4.2 This test method also provides information on the

change in flow and consistency with time of concrete containing superplasticizer admixtures.

4.3 This test method can be used to measure the uniformity characteristics of flow and consistency of freshly mixed concrete and its change with time.

NOTE 1—This test method may not be appropriate for use in evaluating gap-graded aggregate concrete.

5. Apparatus

5.1 Details of the apparatus are shown in Fig. 1. The apparatus consists of (1) measuring rod, (2) scale datum, (3) hollow tube with round holes and longitudinal slots, (4) holding pin, (5) collar floater, and (6) tube point.

5.2 Measuring rod is a hollow tube, 13 mm in outside diameter, 336 mm long with a wall thickness of 1.5 mm and it is capped at both ends with a cap 15 mm in outside diameter. A scale datum is 45 mm in outside diameter and 25 mm wide and fabricated to fit hollow tube and accommodate measuring rod. Hollow tube has an outside diameter of 33 mm, and it is 310 mm long with a wall thickness of 4 mm and has 16 round holes, 9.4 mm in diameter, and 4 longitudinal slots, 9.4 mm wide by 50 mm long, which are distributed around the circumference of the tube as shown in Fig. 1. A pin which is a rivet, 3.2 mm in diameter, protrudes 3.2 mm inside tube. Collar floater, made of a plate 5 mm thick, has an outside diameter of 90 mm and inside diameter of 33 mm, is connected to hollow tube. Tube point is machined from a rod stock and fashioned into a conical shape. It is secured to the bottom end of hollow tube, and it is used to facilitate the insertion of the assembly into the fresh concrete. All individual dimensions shall have a tolerance of $\pm 1\%$ of their value. Make all parts of the apparatus of non-corrosive materials that are not affected by chemicals found in the fresh concrete.

6. Sampling

6.1 Determine the flow either as the concrete is placed in the forms prior to any manipulation or in a suitable container such as a can, a hopper, a pail, or a wheelbarrow. The sample of concrete from which determination of flow is made shall be representative of the entire batch. Obtain the sample in accordance with the requirements of Practice C 172.

7. Procedure

7.1 Bring the surface of the concrete to a smooth and level condition. Use a small wood float or screed, but work the

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.60 on Testing Fresh Concrete.

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² *Annual Book of ASTM Standards*, Vol 04.02.