



# Standard Test Method for Time of Setting of Grouts for Preplaced-Aggregate Concrete in the Laboratory<sup>1</sup>

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## 1. Scope

1.1 This method covers the determination test of time of setting of hydraulic cement grout mixtures used in preplaced-aggregate (PA) concrete using the vicat apparatus.

1.2 *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 191 Test Method for Time of Setting of Hydraulic Cement by Vicat Needle<sup>2</sup>

C 938 Practice for Proportioning Grout Mixtures for Preplaced-Aggregate Concrete<sup>3</sup>

C 511 Specification for Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes<sup>2</sup>

## 3. Summary of Method

3.1 The time of setting, initial and final, of a sample of fluid grout is determined using the Vicat apparatus.

## 4. Significance and Use

4.1 This test method determines the setting time of grout mixed to the fluid consistency required for its use in PA concrete.

4.2 The time of setting is also useful in determining the acceptability of components of grout that must be mixed to the fluid consistency required for production of PA concrete.

## 5. Apparatus

5.1 *Vicat Apparatus*, in accordance with Test Method C 191.

5.2 *Moist Room*, maintained in accordance with Specification C 511.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.41 on Concrete for Radiation Shielding.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.02.

## 6. Test Sample

6.1 The test sample shall consist of at least 300 mL of grout taken from a freshly-mixed batch prepared in accordance with Practice C 938 obtained from a mixer at the laboratory or construction site.

## 7. Procedure

7.1 Warm the Vicat conical ring and base plate to approximately 100°C.

7.2 Apply a thin film of paraffin wax to the base of the conical ring and place the waxed conical ring on the base plate. Place a weight on the conical ring to ensure intimate contact with the base plate and allow the conical ring and plate to cool to room temperature.

7.3 Fill the conical ring apparatus with grout flush with its top within 2 min after completion of mixing. Strike off the grout flush with the top of the conical ring by a single oblique stroke of a sharp-edged trowel held at a slight angle to the top of the ring. Smooth the top, if necessary, with a few light touches of the pointed end of the trowel. Take care not to compress the sample during these cutting and smoothing operations. The time of completion of molding shall be taken as the start of measurement of time of set.

7.4 Store the specimen in the moist room.

7.5 Determine the time of setting using the procedure described in Test Method C 191 except that the first reading shall be taken  $3 \text{ h} \pm 15 \text{ min}$  after pouring the specimen.

NOTE 1—Grouts used to evaluate grout fluidifier or for use in PA concrete will normally reach initial set in about 4 h.

## 8. Report

8.1 The report shall include the following:

8.1.1 Identification of the grout sample,

8.1.2 Time of initial setting and final setting in hours and minutes,

8.1.3 Temperature of group sample at the beginning of the test, and

8.1.4 Ambient temperature during the test.

## 9. Precision and Bias

9.1 *Precision*—When data have been compiled that are suitable for use in preparing a precision statement, such statement will be prepared.

9.2 *Bias*—No statement on Bias can be prepared because there are no standard reference materials.

## 10. Keywords

10.1 grout; preplaced-aggregate concrete; time of setting

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