

## **Tests on Cement:**

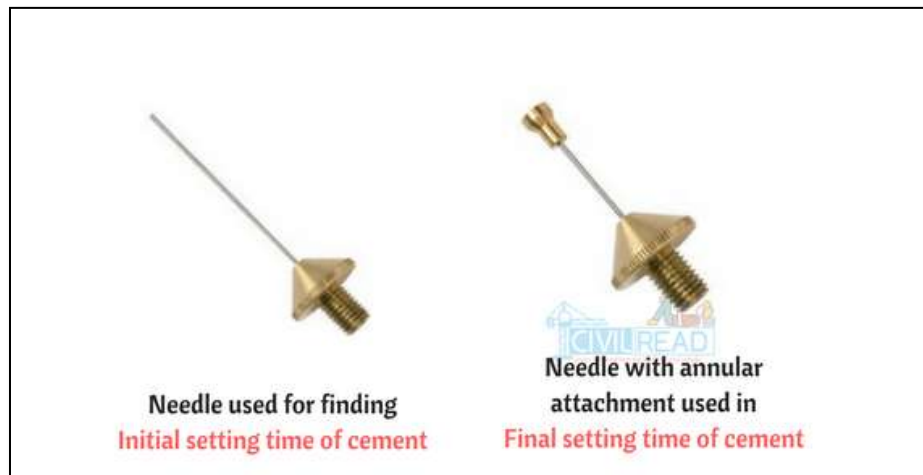
### **Initial & Final Setting Times of Cement**

#### **Objective**

Determine the Initial & Final Setting Time of Cement .

#### **Apparatus**

- Vicat apparatus with the mould and its initial and final setting needles.
- Pan.
- Digital Weighing scale: to measure the weight of dry cement.
- Graduates cylinder: to measure the volume of water.
- Mixing bowl.
- Trowel.
- Stop watch.



#### **Materials**

- Ordinary Portland Cement.
- Water.

# Laboratory -Concrete Technology

---

## Test Procedure

1. Prepare the paste by adding the amount of water required for standard consistency of the paste to 500 gm of cement.
2. Fill the Vicat mould with the cement paste.
3. The initial setting needle of cross-section 1 mm x 1 mm is attached to the movable rod of the Vicat apparatus.
4. Then the needle is allowed to quickly release and allowed to penetrate in the cement paste.
5. Let the needle to fall under its own weight to penetrate the paste (this must not exceed 30 seconds after completion of mixing).
6. Read the gauge or the penetration depth taking the distance from the base plate to the tip of the needle.
7. Repeat step 5 each 5-10 minutes time on different points of the paste.
8. When the reading on the gauge equal to 5 mm or higher, initial set has occurred and the time taken from the moment of addition of water to cement up to this gauge reading.
9. Replace initial setting needle by final setting needle.
10. Repeat steps 5 and 6 for approximately 15 minutes times interval.
11. When the set of needle behind the tip of needle made an impression on the paste while the circular cutting edge failed to do so this is by visual inspection, final set has occurred. The time taken from the moment of addition of water to cemen

## Standard Specifications

Setting Time	Specifications		
	<i>I.Q.S No.5</i>	<i>BS 12:91</i>	<i>ASTM C150</i>
Initial Setting Time	$\geq 45$ mins	$\geq 45$ mins	$\geq 45$ mins
Final Setting Time	$\leq 10$ hours.	$\leq 10$ hours	$\leq 375$ mins

## **Discussion:**

1. Draw a curve between w/c ratio (x-axis) and initial setting time (mins) (y-axis).
2. Discuss the curve in 1.
3. Compare the results with the standard specifications.
4. What are the factors that affect the test results?