

Concrete technology laboratory

Lecturer: Dr. Wail Asim

Experiment No.1 :(Test Method for Consistency of the Cement).

Specifications: I.Q.S. 5/1984
B.S.12 part: 2



Purpose of Experiment: determination of the normal consistency of hydraulic cement (determination the amount of water required to prepare cement paste for the testing)

Equipment and Materials:

1. Vicat Device the device for this test method shall have a movable rod of mass 300 g. The end of the rod used for measuring penetration shall have a removable needle (plunger) with a diameter of 10 mm and length no less than 50 mm, adjustable indicator, rigid conical ring, and glass square base plate.
2. Weighting Devices
3. Trowel, container for mixing, hand gloves, etc....
4. Materials (cement and water)

Test Procedure:

1. Place 400 g of cement into mixing container, add then an amount of water.
2. Start mixing by gloved hand and then completely filling the ring with cement paste.
3. Place the ring and cement paste onto the glass plate, and remove the excess paste from the top of the ring with small steel trowel, creating a reasonably smooth plane at the top.
4. The plunger end should be brought into contact with top of the cement paste in the ring, tighten the screw.
5. Set the movable indicator to the zero mark on the scale and release the rod immediately.
6. The paste will be considered to have normal consistency if the plunger settles 5 ± 1 mm into the cement paste from the bottom of ring.
7. Repeat the procedure with fresh cement batches, varying the amount of water until a paste of normal consistency is obtained.

8. The amount of water required to obtain a cement paste of normal consistency should be expressed as percentage of the weight of cement to the nearest 0.5%.

Experiment No.2 :(Test Method for Setting Time of the Cement).

Purpose of Experiment: determination of the setting time of hydraulic cement.

Specifications limits: Iraqi Specifications (IQS No.5/1984), B.S.12 part: 2.

Initial setting time: not less than 45 min.

Final setting time: not more than 10 hrs.

Equipment and Materials:

1. **Vicat Device** the device for this test method shall have a movable rod of mass 300 g. The end of the rod used for measuring penetration shall have a removable needle with a diameter of 1 mm and length no less than 50 mm for initial setting, and for final setting the needle diameter of 1 mm and length no less than 50 mm with metal attachment, adjustable indicator , rigid conical ring , glass square base plate .

2. Weights Devices

3. Trowel, container for mixing, hand gloves, etc....

Test Procedure:

1. Prepare cement paste with normal consistency (use 400 g of cement).
2. Completely filling the ring with paste, then place the ring and cement paste onto the glass plate, and remove the excess paste from the top of the ring with a small steel trowel, creating a reasonably smooth plane at the top.
3. The needle, should now be brought into contact with the top of the cement paste in the ring; tighten the set screw,
4. Set the movable indicator to the zero mark on the scale and release the rod immediately.
5. Determine the penetration of the 1-mm needle in 30 seconds and every 10 minutes thereafter; until a penetration less than 5 mm is obtained which is the initial setting time (repeat the penetration in different position).
6. Record the results of all penetration readings.
7. For final setting time, replace the needle and then repeat the same Procedures
8. The final set is said to be reached when the needle makes an impression on the surface of the paste but does not penetrate (the time from adding water to cement)