DETERMINATION OF COMPRESSIVE STRENGTH

STANDARD

DEFINITION
- Compressive strength is defined as the ratio of the load per unit area.

APPARATUS
- Poking rod confirming to IS: 10080-1982.
- Cube moulds shall be of 70.60mm size confirming to IS: 10080-1982.
- Gauging trowel having steel blade 100 to 150mm in length with straight edge weighing 210 ±10gms.
- Balance of capacity 10Kg and sensitivity 1gram.

PROCEDURE
- Unless otherwise specified this test shall be conducted at a temperature 27°C ± 2°C.
- Weigh the material required for each cube separately.
- The quantity of cement, standard sand and water required for each cube are as follows:
  Cement = 200gms
  2mm to 1mm - 200gms
  Standard Sand = 600gms
  1mm to 500mic - 200gms
  500mic to 90mic - 200gms
  Water =\( P/ 4+3 \) Percentage of combined mass of cement and sand.
  \( P \) is the consistency of cement as per IS: 4031 (Part 4) 1988.
- Place on a nonporous plate, a mixture cement and standard sand.
- Mix it dry with a trowel for one minute and then with water until the mixture is of uniform colour.
• The time of mixing shall in any event be not less than 3 minutes and should be the
time taken to obtain uniform colour exceeds 4 minutes.

• In assembling the moulds ready for use, cover the joints between the halves of the
mould with a thin film of petroleum jelly and apply a similar coating of petroleum
jelly between the contact surface of the bottom of the mould and base plate in
order to ensure that no water escapes during vibration.

• Place the assembled mould on the table of the vibration machine and hold it firmly
in position by means of suitable clamp, attach a hopper of suitable size and shape
securely at the top of the mould to facilitate filling and hopper shall not be
removed until the completion of vibration period.

• Immediately after fixing the mould in the vibrating machine, place the mortar in
the cube mould and prod with the rod.

• Prod the mortar 20 times in about 8 seconds to ensure elimination of entrapped air
and honey combing.

• Place the remaining mortar in the cube mould and prod again as specified for the
first layer and then compact the mortar by vibration.

• The period of vibration shall be two minutes at the specified speed of 12000 ± 400
vibrations per minute.

• Remove the mould from the vibrating machine and cut of the excess mortar with a
straight edge.

• Store the test specimens in a place free from vibration, in moist air of at least 90
percent relative humidity and at a temperature of 27 ± 2°C for 24 ± 1/2 hours from
the addition of water to the dry ingredients.
Casting of cement mortar cubes.

- After this period, mark the specimens and remove from the moulds and unless required for test within 24 hours.
- Immediately submerge the cubes in a clean, fresh water or saturated lime solution and keep there until taken out just prior to test.
- Renew the water or solution in which the specimens are submerged for every seven days, and the temperature of water is maintained with the specified limits.
- Conduct testing at recognized ages of the specimens, the most usual being 7 and 28 days.
- When it may be necessary to obtain the early strength, tests may be conducted at the age of 72 ± 2 hours.
- Calculate the ages from the addition of water to the dry ingredients.
- Test at least three specimens preferably from different batches at each selected age.

**CALCULATIONS**

- Compressive strength = \( \frac{\text{Load}}{\text{Cross sectional area of the specimen}} \) N / mm\(^2\)
REPORT
- Report the individual and the mean results to the second decimal and express in N/ mm$^2$.

PRECAUTION
- The time of mixing is very important and in no case shall not be less than 3 minutes and not to exceed 4 minutes.