

6.DETERMINATION OF COMPRESSIVE STRENGTH OF CONCRETE.

(IS : 516 – 1959)

Object:

Determination of compressive strength of concrete.

Apparatus:

Testing Machine: The testing machine may be of any reliable type of sufficient capacity for the tests and capable of applying the load at the specified rate. The permissible error shall not be greater than 2 percent of the maximum load. The testing machine shall be equipped with two steel bearing platens with hardened faces. One of the platens shall be fitted with a ball seating in the form the portion of a sphere, the center of which coincides with the central point of the face of the platen. The other compression platen shall be plain rigid bearing block. The bearing faces of both platens shall be at least as large as, and preferably larger than the nominal size of the specimen to which the load is applied. The bearing surface of the platens, when new, shall not depart from a plane by more than 0.01mm at any point, and they shall be maintained with a permissible variation limit of 0.02mm. the movable portion of the spherical seated compression platen shall be held on the spherical seat, but the design shall be such that the bearing face can be rotated freely and tilted through small angles in any direction.

Age at test: Tests shall be made at recognized ages of the test specimens, the most usual being 7 and 28 days. The ages shall be calculated from the time of the addition of water of the dry ingredients.

Number of Specimens: At least three specimens, preferably from different batches, shall be made for testing at each selected age.

Procedure:

Specimens stored in water shall be tested immediately on removal from the water and while they are still in the wet condition. Surface water and grit shall be wiped off the specimens and any projecting find removed specimens when received dry shall be kept in water for 24 hours before they are taken for testing. The dimensions of the specimens to the nearest 0.2mm and their weight shall be noted before testing.

Placing the specimen in the testing machine the bearing surface of the testing machine shall be wiped clean and any loose sand or other material removed from the surface of the specimen, which are to be in contact with the compression platens. In the case of cubes, the specimen shall be placed in the machine in such a manner that the load shall be applied to opposite sides of the cubes as cast, that is, not to the top and bottom. The axis of the specimen shall be carefully aligned with the center of thrust of the spherically seated platen. No packing shall be used between the faces of the test specimen and the steel platen of the testing machine. As the spherically seated block is brought to bear on

the specimen the movable portion shall be rotated gently by hand so that uniform seating may be obtained. The load shall be applied without shock and increased continuously at a rate of approximately $140 \text{ kg/cm}^2/\text{min}$. until the resistance of the specimen to the increasing load breaks down and no greater load can be sustained. The maximum load applied to the specimen shall then be recorded and the appearance of the concrete and any unusual features in the type of failure shall be noted.

Calculation: The measured compressive strength of the specimen shall be calculated by dividing the maximum load applied to the specimen during the test by the cross sectional area, calculated from the mean dimensions of the section and shall be expressed to the nearest kg per cm^2 . Average of three values shall be taken as the representative of the batch provided the individual variation is not more than ± 15 percent of the average. Otherwise repeat tests shall be made.

A correction factor according to the height / diameter ratio of specimen after capping shall be obtained from the curve shown in Fig.1 of IS:516-1959. The product of this correction factor and the measured compressive strength shall be known as the corrected compressive strength this being the equivalent strength of a cylinder having a height/diameter ratio of two. The equivalent cube strength of the concrete shall be determined by multiplying the corrected cylinder strength by $5/4$.