

Compaction Factor Test for Concrete Workability – Method and Procedure

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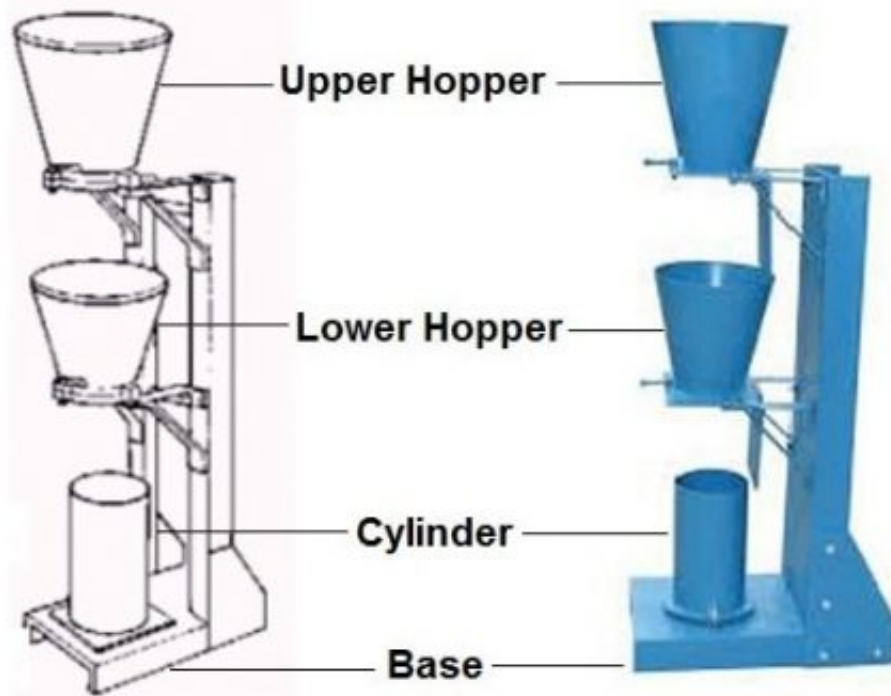
Compaction factor test is the workability test for concrete conducted in laboratory. The compaction factor is the ratio of weights of partially compacted to fully compacted concrete. It was developed by Road Research Laboratory in United Kingdom and is used to determine the workability of concrete. The compaction factor test is used for concrete which have low workability for which slump test is not suitable.

Apparatus

Compaction factor apparatus consists of trowels, hand scoop (15.2 cm long), a rod of steel or other suitable material (1.6 cm diameter, 61 cm long rounded at one end) and a balance.

Sampling

Concrete mix is prepared as per mix design in the laboratory.



Compaction Factor Test on Concrete

Procedure of Compaction Factor Test on Concrete

1. Place the concrete sample gently in the upper hopper to its brim using the hand scoop and level it.
2. Cover the cylinder.
3. Open the trapdoor at the bottom of the upper hopper so that concrete fall into the lower hopper. Push the concrete sticking on its sides gently with the rod.
4. Open the trapdoor of the lower hopper and allow the concrete to fall into the cylinder below.
5. Cut off the excess of concrete above the top level of cylinder using trowels and level it.
6. Clean the outside of the cylinder.
7. Weight the cylinder with concrete to the nearest 10 g. This weight is known as the weight of partially compacted concrete

(W1).

8. Empty the cylinder and then refill it with the same concrete mix in layers approximately 5 cm deep, each layer being heavily rammed to obtain full compaction.
9. Level the top surface.
10. Weigh the cylinder with fully compacted. This weight is known as the weight of fully compacted concrete (W2).
11. Find the weight of empty cylinder (W).

Note: The test is sufficiently sensitive to enable difference in workability arising from the initial process in the hydration of cement to be measured. Each test, therefore should be carried out at a constant time interval after the mixing is completed, if strictly comparable results are to be obtained. Convenient time for releasing the concrete from the upper hopper has been found to be two minutes after the completion of mixing.

Calculation of Compaction Factor Value

The compaction factor is defined as the ratio of the weight of partially compacted concrete to the weight of fully compacted concrete. It shall normally to be stated to the nearest second decimal place.

Compaction Factor Value= $(W1-W) / (W2-W)$

Result of Compaction Factor

Compaction factor of the concrete = The Compaction factor values ranges from 0.7 to 0.95.