

METHOD STATEMENT FOR

AGGREGATE IMPACT

VALUE



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1) PURPOSE

Aggregates is one of the major contributing factors to the quality of concrete is the quality of aggregates used therein. In many situations particular aggregate, it may not be necessary to assess all the qualities. Therefore, it is necessary to assess qualities of the aggregate which a concrete is being used.

2) SCOPE

This method covers the technical provisions relating to testing of aggregates for concrete, and it does not include all the necessary provisions of a contract.

This statement does not address all of the safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices before test.

3) Reference Documents

- IS 2386: Part 4 Methods of test for aggregates for concrete.
- ASTM C535 & ASTM C131
- IS 383 :2016

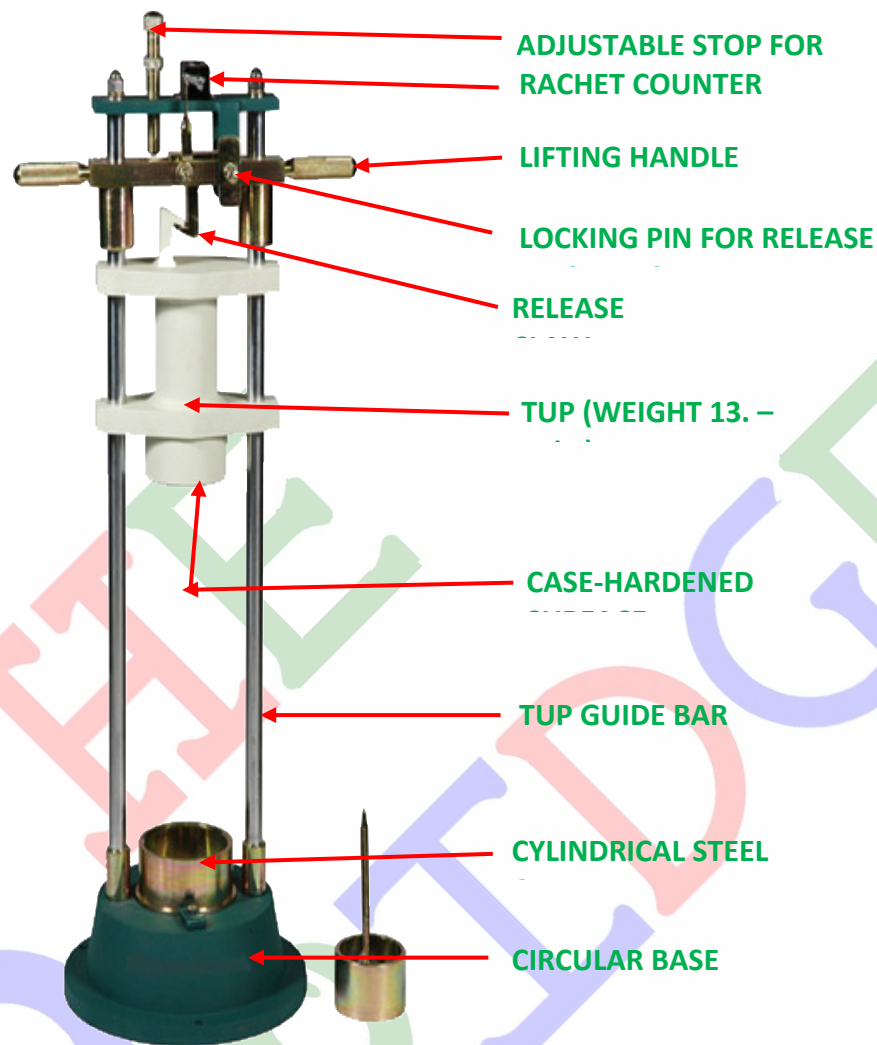
4) DETERMINATION OF AGGREGATE IMPACT VALUE

Object - This method of test covers the procedure for determining the aggregate impact value of coarse aggregate.

NOTE -The 'aggregate impact value' gives a relative measure of the resistance of an aggregate to sudden shock or impact, which in some aggregates differs from its resistance to a slow compressive load.

Apparatus - The apparatus shall consist of the following:

- An impact testing machine of the general form shown in Fig. 2 and complying with the following:
 - Total weight not more than 60 kg nor less than 45 kg.
 - The machine shall have a metal base weighing between 22 and 30 kg with a plane lower surface of not less than 30 cm diameter, and shall be supported on a level and plane concrete or stone block or floor at least 45 cm thick. The machine shall be prevented from rocking either by fixing it to the block or floor or by supporting it on a level and plane metal plate cast into the surface of the block or floor.
 - A cylindrical steel cup of internal dimensions: Diameter 102 mm Depth 50 mm and not less than 6.3 mm thick with its inner surface casehardened, that can be rigidly fastened at the Centre of the base and easily removed for emptying.



- A metal tup or hammer weighing 13.5 to 14.0 kg, the lower end of which shall be cylindrical in shape, 100.0 mm in diameter and 5 cm long, with a 2mm chamfer at the lower edge, and case-hardened. The hammer shall slide freely between vertical guides so arranged that the lower (cylindrical) part of the hammer is above and concentric with the cup.
- Means for raising the hammer and allowing it to fall freely between the vertical guides from a height of 380 ± 5.0 mm on to the test sample in the cup, and means for adjusting the height of fall within 5 mm.
- Means for supporting the hammer whilst fastening or removing the cup.

NOTE - Some means for automatically recording the number of blows is desirable.

B. Sieves - The IS Sieves of sizes 12.5, 10 and 2.36 mm.

- C. Measure - A cylindrical metal measure, tared to the nearest gram, of sufficient rigidity to retain its form under rough usage, and of the following internal dimensions:
Diameter 75 mm Depth 50 mm
- D. Tamping Rod-A straight metal tamping rod of circular cross-section 10 mm in diameter and 230 mm long, rounded at one end.
- E. Balance - A balance of capacity not less than 500 g, readable and accurate to 0.1 g.
- F. Oven - A well-ventilated oven, thermostatically controlled to maintain a temperature of 100 to 110°C.

5) Preparation of the Test Sample

The test sample shall consist of aggregate the whole of which passes a 12.5-mm IS Sieve and is retained on a 10-mm IS Sieve. The aggregate comprising the test sample shall be dried in an oven for a period of four hours at a temperature of 100 to 110°C and cooled.



The measure shall be filled about one-third full with the aggregate and tamped with 25 strokes of the rounded end of the tamping rod further similar quantity of aggregate shall be added and a further tamping of 25 strokes given. The measure shall finally be filled to overflowing, tamped 25 times and the surplus aggregate struck off, using the tamping rod as a straight-edge. The net weight of aggregate in the measure shall be determined to the nearest gram (Weight A) and this weight of aggregate shall be used for the duplicate test on the same material.

6) Test Procedure

The impact machine shall rest without wedging or packing upon the level plate, block or floor, so that it is rigid and the hammer guide columns are vertical.

The cup shall be fixed firmly in position on the base of the machine and the whole of the test sample placed in it and compacted by a single tamping of 25 strokes of the tamping rod.

The hammer shall be raised until its lower face is 380 mm above the upper surface of the aggregate in the cup, and allowed to fall freely on to the aggregate. The test sample shall be subjected to a total of 15 such blows each being delivered at an interval of not less than one second.

The crushed aggregate shall then be removed from the cup and the whole of it sieved on the 2.36-mm IS Sieve until no further significant amount passes in one minute. The fraction passing the sieve shall be weighed to an accuracy of 0.1 g (Weight. e). The fraction retained on the sieve shall also be weighed (Weight C) and, if the total weight (B+C) is less than the initial weight (Weight A) by more than one gram, the result shall be discarded and a fresh test made. Two tests shall be made.

7) Calculations

The ratio of the weight of fines formed to the total sample weight in each test shall be expressed as a percentage; the result being recorded to the first decimal place:

Aggregate impact value = $(B/A) \times 100$

A = weight of oven-dried sample.

B = weight of fraction passing 2.36-mm IS Sieve

8) Acceptance criteria

- 🔔 The aggregate crushing value shall not exceed and 30%. (For concrete for wearing surfaces, such as runways, roads, pavements tunnel lining carrying water, spillway and stilling basins)
- 🔔 The aggregate crushing value shall not exceed 45%. (For concrete)
- 🔔 The aggregate crushing value shall not exceed 22% for grades M65 and above. (For concrete)