

7. TEN PERCENT FINES VALUE.

(BS : 812 – PART – 111)

INTRODUCTION:

The 'Ten percent fines' value is a measure of resistance of the aggregates to the crushing.

Object:

To determine the ten percent value of aggregates by crushing machine apparatus.

Apparatus:

- a) Steel cylinder with open ends, and internal diameter 152mm, square base plate, plunger having a piston of diameter 150mm, with a hole provided across the stem of the plunger so that a rod could be inserted for lifting or placing the plunger in the cylinder.
- b) Cylindrical measure having internal diameter of 115mm and height 180mm.
- c) Steel tamping rod with one rounded end, having a diameter of 16mm and length 450 to 600mm.
- d) Balance of capacity 3 kg with accuracy up to 1gm.
- e) Compressive testing machine capable of applying load of 40 tonnes, at a uniform rate of loading of 4 tonnes per minute.

Procedure:

The aggregate passing 14mm IS sieve and retained on 10mm IS sieve is selected for test. The aggregate should be in surface-dry condition before testing. The aggregate may be dried by heating at a temperature 100⁰C to 110⁰C for a period of 4 hours and is tested after being cooled to room temperature.

The cylindrical measure is filled by the test sample of aggregate in three layers of approximately equal depth, each layer being tamped 25 times. The same sample poured in to the cylinder with three equal layers, each layer being tamped 25 times. The test sample in the cylinder with the plunger in position is placed in the compression-testing machine. The load is applied at a uniform rate so as to cause a total penetration of the plunger of about 20mm for normal crushed aggregates in 10 minutes. But for rounded or partially rounded aggregates, the load required to cause a total penetration of 15mm is applied where as for honeycombed aggregate like expanded shale or slag that for a total penetration of 24mm is applied in 10 minutes. After the maximum specified penetration is reached, the load is released and the aggregate from the cylinder is sieved on a 2.36mm IS sieve. The fines' passing this sieve is weighed and is expressed as a percentage by weight of the test sample. This percentage normally falls in the range of 7.5 to 12.5;



Apparatus for determining ten percent fines value

but if it does not fall in this range, the test is repeated with necessary adjustment of the load.

Two tests are carried out at the load 'X tonnes', which give the percentage fines between 7.5 to 12.5 and let the mean of the percent fines be 'Y' for calculating the load required for ten percent fines.

$$\text{Load for 10 percent fines} = \frac{14 X}{(Y + 4)}$$

Results:

The 10 percent fines value of Granular Sub base material is should be more than 50 KN.