OPERATING INSTRUCTIONS

Sand Equivalent Tester

24-4919

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1 Process

Firstly, pour the solution, previously prepared through the washing pipe, into the suitable graduated cylinder to the first mark corresponding to 10 cm.

Fill the measuring cylinder with the testing sand sample without causing strokes or shocks to avoid a possible material compaction, and level using the proper straight edge to the cylinder edge. After removing the washing pipe from the graduated cylinder (where the working solution has been increased to 10 cm), the whole content of the measuring cylinder will be poured into the graduated cylinder by means of a funnel.

Close the graduated cylinder using a cock, beat strongly on the bottom to eliminate the air and help the material soaking, then let it rest for 10 minutes. Once rested, agitate the cylinder, helping the separation and kneading of the testing material particles. The manual stirring will be carried out rhythmically, keeping the cocked cylinder horizontal, by a reciprocating movement of the arms, with a stroke of approximately 20 cm. Carry out 90 cycles both ways in 30 seconds.

The aforementioned conditions cannot easily be obtained manually, consequently use the mechanical stirrer which fulfils the times and conditions required for a proper mixing.

When the stirring is complete, place the graduated cylinder on a plane, remove the cock and, using the washing pipe, remove the material close to the cock. Using this pipe, continue to wash the cylinder walls, introducing it slowly. When the bottom has been reached, give the pipe a slight movement from downwards to upwards and vice-versa, whilst using the free hand to rotate the cylinder until the bottom sand is washed by the solution, which in turn will raise the fine parts to the surface. In this way, the working solution level increases into the graduated cylinder. When this level is near to the upper mark of the 38 cm, extract the pipe from the solution letting the same flow to the exact level marked on the cylinder. The cylinder will now rest, avoiding any vibration and stroke for exactly 20 minutes.

After 20 minutes, read and note the height H of the total level of the settled suspension.

Introduce the specially developed piston into the graduated cylinder and let it decrease very slowly until its lower surface stands on the sand. When the piston stops, read and note the level height h of the cleaned and settled sand.

If the direct reading of the piston position is hindered by the suspension turbidity, move the piston on the sand surface until touching one of the centering screws against the glass. Carry out the reading or lock the screw of the piston sliding cover on the rod at the steady position and, after emptying the graduated cylinder, put the piston in place and read the position of the piston lower surface on the graduated cylinder scale.

The value of the Sand Equivalent (ES) of a fine aggregate will be obtained by using the formula:

$$ES = 100 \times (h / H)$$

Where: h, is the height in mm of the cleaned sand coat;

H, is the height in mm of the settled compl. Coat, noted after exactly 20 minutes.

The ES value is considered right when this is determined by the average of at least three tests.