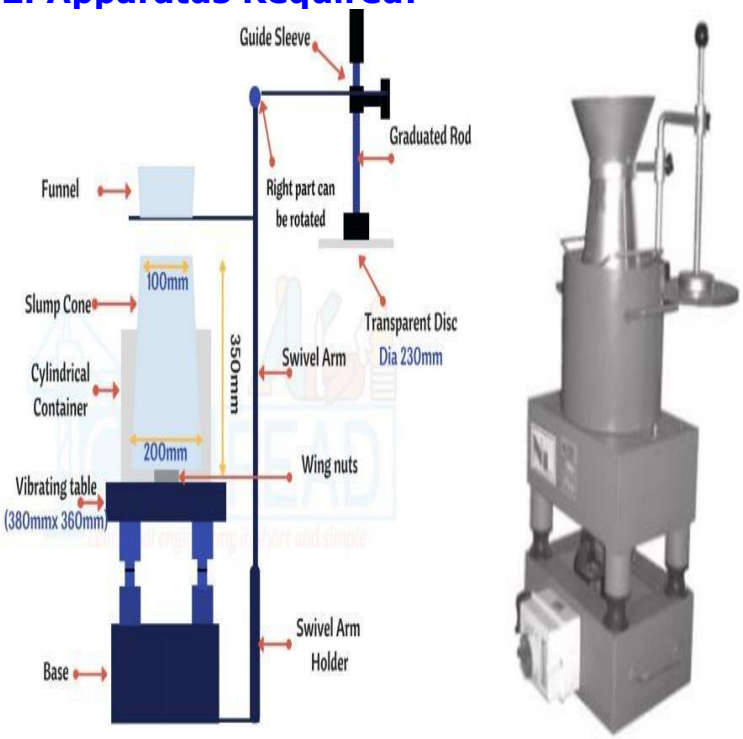
CONSISTENCY OF CONCRETE BY VEE-BEE CONSISTOMETER TEST

1. Objective: The workability of fresh concrete is a composite property, which includes the diverse requirements of stability, mobility, compactability, placeability and finishability. There are different methods for measuring the workability. Each of them measures only a particular aspect of it and there is really no unique test, which measures workability of concrete in its totality. This test gives an indication of the mobility and to some extent of the compactibility of freshly mixed concrete. The test measures the relative effort required to change a mass of concrete from one definite shape to another (i.e., from conical to cylindrical) by means of vibration. The amount of effort (called remoulding effort) is taken as the time in seconds, required to complete the change. The results of this test are of value when studying the mobility of the masses of concrete made with varying amounts of water, cement and with various types of grading of aggregate. The time required for complete remoulding in seconds is considered as a measure of workability and is expressed as the number of Vee-Bee seconds. The method is suitable for dry concrete. For concrete of slump in excess of 50mm, the remoulding is so quick that the time cannot measured.

2. Apparatus Required:



a) A vibrator table resting upon elastic supports

b) A metal pot

c) A sheet metal cone, open at both ends

d) A standard iron rod, Tamper (20 mm in diameter and 500 mm length)

Fig. 1: Vee-Bee Consistometer

3. Reference: IS 1199:1959 Methods of Sampling and Analysis of Concrete (Eleventh revision). Reaffirmed- Dec 2013.

4. Procedure:

1. Slump test as described in "IS 1199:1959 Specifications for Concrete Slump Test Apparatus (Fourth revision). Reaffirmed- Dec 2013" is performed, placing the slump cone inside the sheet metal cylindrical pot of the consistometer.
2. The glass disc attached to the swivel arm shall be moved and placed just on the top of the slump cone in the pot and before the cone is lifted up, the position of the concrete cone shall be noted by adjusting the glass disc attached to the swivel arm. The cone shall then be lifted up and the slump noted on the graduated rod by lowering the glass disc on top of the concrete cone. The electrical vibrator shall then be switched on and the concrete shall be allowed to spread out in the pot.
3. The vibration is continued till such a time as the conical shape of the concrete disappears and the concrete assumes a cylindrical shape. This can be judged by observing the glass disc from the top for disappearance of transparency.
4. Immediately when the concrete fully assumes a cylindrical shape, the stop watch is switched off. The time required for the shape of concrete to change from slump cone shape to cylindrical shape in seconds is known as Vee Bee Degree.
5. This method is very suitable for very dry concrete whose slump value cannot be measured by Slump Test, but the vibration is too vigorous for concrete with a slump greater than about 50 mm.

5. Observation and Recording:

The time required for the shape of concrete to change from slump cone shape to cylindrical shape in seconds is known as Vee-Bee Degree.

6. Result:

The Vee Bee Degree of concrete ..... second(s) indicate Low/ Medium/ High Degree of workability

Work Description	Workability Measurement		Vee-Bee time (seconds)
	Slump (mm)	Compaction Factor	
Moist earth	-	-	40 to 25-20
Very Dry	-	0.70	20 to 15-10
Dry	0 - 25	0.75	10 to 7-5
Plastic	25 - 50	0.85	5 to 4-3
Semi Fluid	75 - 100	0.90	3 to 2-1
Fluid	150 - 175	0.95	More Fluid than 1

Table 1: Workability of Concrete based on Vee-Bee Test