




**CIVIL ENGINEERING DEPARTMENT
INTEGRAL UNIVERSITY LUCKNOW
CONCRETE TECHNOLOGY LAB**

The students will become familiar with the nature and properties of concrete making material by conducting laboratory tests. These tests have been selected to illustrate the basic properties and methods of testing of cement, aggregates, paste, mortar and concrete. This laboratory facilitates almost all the test which are required in curriculum as well as field aspect.

S.NO.	APPARATUS NAME	IMAGE	DISCRIPTION
1.	Concrete Mixer Machine		A concrete mixer (also commonly called a cement mixer) is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components.

2.	<p style="text-align: center;">Moulds Cube, Beam, Cylinder,</p>		<p>These Moulds offer optimum functional support and find suitability for testing compressive strength, split tensile strength and flexural strength of concrete.</p>
3.	<p style="text-align: center;">Vibration Table</p>		<p>The vibration table is used for Proper compaction of cement concrete while casting specimens for testing. The table top is suitable to hold moulds and has stops along its edges to prevent moulds from sliding off the table during operation.</p>



4	J- Ring Apparatus		<p>The J-ring test can be used to determine the passing ability of self-consolidating concrete. It is applicable for laboratory use in testing different concrete mixtures for passing ability or can be used in the field as a quality control test.</p>
5.	L-box		<p>Method used to determine flow rates and passing ability of Self-consolidating concrete in confined spaces, as well as an evaluation of filling and segregation resistance. Applicable to concrete with aggregates of 1" (25mm) maximum size. Test box is comprised of concrete reservoir, a slide gate, an obstacle grid comprised of 3 bars and a test basin.</p>



6.

Hot Air Oven



Hot air ovens are electrical devices which use dry heat to sterilize. Generally, they can be operated from 50 to 400 °C, using a thermostat to control the temperature. Their double walled insulation keeps the heat in and conserves energy, the inner layer being a poor conductor and outer layer being metallic. There is also an air filled space in between to aid insulation. An air circulating fan helps in uniform distribution of the heat.

7.	Mortar Flow Table		<p>The flow table test of cement mortar is done only to calculate the amount of water required for gauging for conducting strength test of masonry cement and for drying shrinkage test of cement. It also gives us some idea on the workability of cement mortar.</p>
8.	Concrete Penetrometer		<p>Concrete Penetrometer allow rapid in-place estimates of the concrete initial set. After the initial set, concrete can no longer be effectively consolidated and is nearly ready for final finishing operations.</p>

9.	Slump Test		<p>Slump test is used to measure the workability of fresh concrete. It's a simple and most popular test. More specifically; it measures the consistency of the concrete in that specific batch. This test is performed to check the consistency of freshly made concrete. Consistency is a term very closely related to workability. It is a term which describes the state of fresh concrete. It refers to the ease with which the concrete flows. It is used to indicate the degree of wetness. It is also used to determine consistency between individual batches.</p>
10.	Concrete Airentrainment Meter		<p>An air entrainment meter is used to measure the amount of air that is trapped within the concrete mix</p>

11.	Vee- Bee consistometer		<p>The instrument is used for workability as well as consistency for fresh concrete. A slump cone and a graduated rod supplied with the instrument helps the operator to find out slump values and Vibration Table with container and acrylic disc is used to find out workability of concrete expressed in Vee Bee degrees, which is defined as the time in seconds to complete required vibration at which the fresh concrete flows out sufficiently to come in contact to the entire face of acrylic disc.</p>
12.	Vicat's Apparatus		<p>Vicat's apparatus is used for determining the standard stiffness as well as initial setting time and final setting time of cement paste and gypsum paste.</p>

13.

V Funnel



The equipment consists of a v shaped funnel. The test was developed in Japan. The described V-funnel test is used to determine the filling ability (flow ability) of the self compacting concrete with a maximum aggregate size of 20mm. The funnel is filled with about 12 liter of concrete and the time taken for it to flow through the apparatus measured. After this the funnel can be refilled concrete and left for 5 minutes to settle. If the concrete shows segregation then the flow time will increases significantly.

14.

**Wired bucket Apparatus
(IS-2386 part 3)**



This apparatus is used to determine specific gravity, voids absorption and density of coarse aggregate.

15.

Le - chatelier flask



Used to determine the specific gravity of hydraulic cement and lime.

16.

Rebound Hammer



Rebound hammer test is done to find out the compressive strength of concrete by using rebound hammer as per IS: 13311 (Part 2) – 1992.

The rebound of an elastic mass depends on the hardness of the surface against which its mass strikes. When the plunger of the rebound hammer is pressed against the surface of the concrete, the spring-controlled mass rebounds and the extent of such a rebound depends upon the surface hardness of the concrete. The surface hardness and therefore the rebound is taken to be related to the compressive strength of the concrete. The rebound value is read from a graduated scale and is designated as the rebound number or rebound index. The compressive strength can be read directly from the graph provided on the body of the hammer.

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Accelerated Curing Tank



Accelerated Curing Tank is used for concrete testing purposes.. It is Suitable for accommodating 6 or 12 cube moulds of 150mm. The temperature can range from room temperature to 100 degree celcius.