

Concrete Laboratory

Purpose: To learn the basics of different tests performed for quality control of cement, fine aggregates, coarse aggregates, and water. The objective of concrete laboratory is to determine the physical properties of building construction materials like cement, fine and coarse aggregate, steel, wood, and strength characteristics of cement mortar, plain cement concrete and reinforced cement concrete.

S. No.	Experiment Name	Equipment Used
1	To determine the quantity of water for cement paste for normal consistency	Vicat needle apparatus with plunger of 10 mm dia, Trowel, Balance, Stopwatch, etc.
2	To determine initial and final setting time of cement	Vicat's needle apparatus, Balance, Mixing Bowl, Glass Plate, Graduated Cylinder, Stopwatch, etc.
3	To determine the soundness of a given cement by Le Chatelier method	Le Chatelier apparatus, Measuring scale
4	To determine the fineness of cement	IS Sieve No. 9 (90 microns), Balance
5	To determine the compressive strength of cement	Compression testing machine, Balance, Cube Mould 7.06 cm size, Vibrater Machine For Cement Cube
6	Determination of tensile strength of cement	Briquette testing machine, Balance, Briquette Mould assembly
7	To determine the specific gravity of the cement	Le-Chatelier Flask OR Specific Gravity Bottle (250 mL cap., the neck graduated 0-1 mL and 15-24 mL/100 mL), Desired kerosene Oil, Funnel, Wash Bottle, Pipette, etc.
8	To determine the fineness modulus of coarse, and fine aggregate	IS sieves as per IS:2386 (part I)-1963 (from 80 mm to 4.75 mm) for coarse aggregate, From 10 mm to 150 microns for fine aggregate
9	To determine the workability of concrete by compaction factor test	Compacting factor apparatus, two trowels, hand scoop, tamping rod, weighing machine, graduated cylinder of 1000 mL capacity.
10	To determine the workability of concrete by Flow Table Method	Flow table, mould in the form a frustum of cone, weighing balance, tamping rod, calipers

11	To determine the workability of concrete by Slump test	Slump Test Apparatus, two trowels, hand scoop, tamping rod, weighing machine, graduated cylinder, concrete mixer
12	To determine the compressive strength of normal mix concrete of a given grade.	Compressive testing machine, Mould, Tempering rod, concrete mixer, etc.
13	Concrete mix design by Indian Standard code recommendations	Compressive testing machine, Mould, Tempering rod, concrete mixer, etc.



CONCRETE MOULDS



Waknaghat, Himachal Pradesh, India

Civil Engineering Department , JUIT-Waknaghat , Waknaghat,
Himachal Pradesh 173221, India

Lat N 31° 0' 57.1752"

Long E 77° 4' 9.786"

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COMPRESSION TESTING MACHINE (CTM 1000kN)



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DIGITAL COMPRESSION TESTING MACHINE (CTM 2000kN)



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FLEXURAL TESTING TESTING MACHINE



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HOBART MIXTURE



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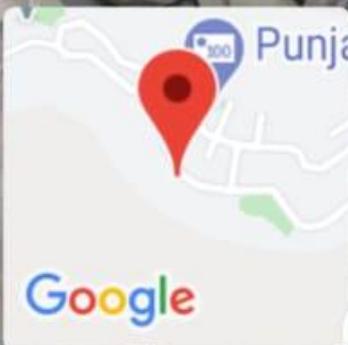
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LE-CHATELIER WATER BATH

Le-Chatelier Water Bath

JUIT/CONCRETE LAB/STOCK
REG/88/ LA Chatelier BT

HYDRAULIC & ENG. INSTRUMENTS



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PAN MIXTURE



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SLUMP CONE TEST APPARATUS



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TENSILE TESTING OF CEMENT APPARATUS



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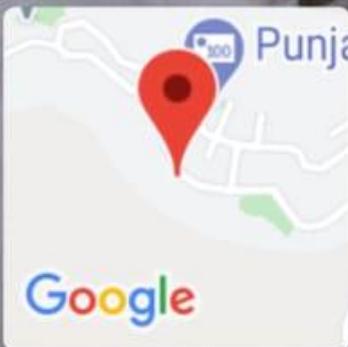
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UNIVERSAL TESTING MACHINE



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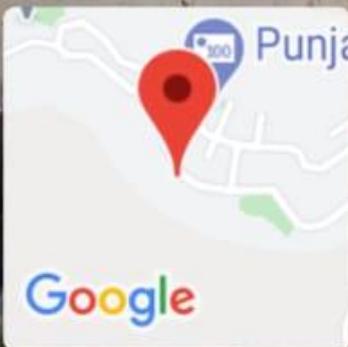
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VIBERATION TABLE



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VIBRATORY SEIVE SHAKER

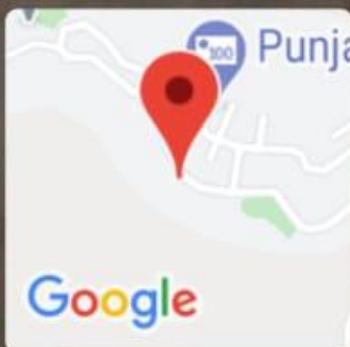
mass of ball + cement + kerosene = 114.5

$$\text{Sp. gr. of Kerosene} - S = \frac{W_3 - W_1}{W_2 - W_1} = \frac{34.5}{55.5}$$

$$\text{Sp. gr. of cement} - S = \frac{W_5 (W_3 - W_1)}{(W_5 + W_3 - W_4) (W_2 - W_1)}$$

$$\frac{40 (34.5)}{(40 + 34.5) (55.5 - 114.5)} = \frac{380}{171.75}$$

$$\frac{13600}{85 \times 55.5} = 0.92$$



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