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EIE INSTRUMENTS PVT. LTD.

Laboratory Instruments for

- ✓ Bitumen Testing
- ✓ Asphalt Testing
- ✓ Aggregate Testing

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EIE INSTRUMENTS PVT. LTD.

MISSION

- To provide user friendly, simplified, technologically advanced, reliable & robust instrumentation/automation to global customers backed by efficient services
- Applying creative innovations and modern techniques to uplift the standard of quality as to satisfy customers' need of achieving high precision & accuracy in measurement and testing
- Further, to create an environment to nurture and promote innovations and core values amongst the employees so as to leave no stone unturned in fulfilling the expectations of customers.
- To deliver reliability & credibility

VISION

- EIE Instruments envisages itself as an emerging organization standing ahead of the competition through its marketing and manufacturing of the advanced laboratory equipments.
- EIE Instruments evolves itself as a workplace of efficient individuals dedicated to serve the nation & Indian industry with constant improvement driven by innovation, integrity & inspiration.

VALUES

EIE believes to

- Render gentle services to customer.
- Establish a win win relationship with vendors.
- Empower its employees with knowledge, environment and faith.

EIE Instruments Pvt. Ltd., Ahmedabad, INDIA

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TM-041 Marshal Stability Test Apparatus

(As per ASTM : D 1559)

Used for the measurement of resistance to plastic flow of cylindrical specimens of bituminous paving mixtures when being tested in a marshal load frame. Test specimens are producec and tested under standard test condition at a speed of 50.8mm/min.The maximum load(stability) and deformation (flow) of the specimen are recorded. Generally the test is applicable to hot mix designs using bitumen and aggregate of maximum size of 25mm. Widely used for designing and evaluating bituminous paving mixes.

General Description & Specifications :

The apparatus consists of the following.

Load Frame :

A floor standing compression loading frame of 50 KN capacity with motor and worm gear housed within the base unit, producing a speed of 50.8mm/min. Limit switches are provided to cut out the platen over run on the downward travel and upward travel. A handle is provided for manual operation for initial setting. The load frame is fitted with ON/OFF/Reversing switch and power indicator lamp in front. Suitable to work on 230V, 50 Hz, AC single phase.

Marshal Moulds (3 Nos.) :

4"dia X 3" height specimen moulds, base plates and Extension collar. Manufactured from steel.(6" dia mould can be supplied at extra cost).

Compaction Pedestal :

Comprising of a hard wood block with a steel plate, complete with specimen holder, semi circular base and a circular top to hold 4" dia specimen mould in place during compaction of the specimen. (Pedestal to accommodate 6" dia specimen can be supplied at extra cost).

Compaction Hammer (2 Nos.) :

Designed for use with the compaction pedestal and mould. The hammer has a falling weight of 4.535 kg and free fall of 457 mm. Modified compaction Rammer for 6" dia mould can be supplied at extra cost.

Breaking Head Assembly :

Consisting of upper and lower cylindrical segments with provision for fixing flow-meter. Suitable to take 4" dia specimens. (Assembly to accommodate 6" dia specimen can also be supplied at extra cost).

Specimen Extractor :

Consisting of a load transfer bar, a pressure plate and a steel ball.

Optional Accessories :

The following accessories and consumables are not part of the standard supply and are mandatory for the testing work.

1) Proving Ring of 25 KN capacity with calibration certificate with traceability.
2) Flow meter Dial Gauge with 0.01mm graduation and 25mm travel.
3) Water bath with Thermostatic or Digital Control with stirrer.
4) Electronic Balance of capacity 5 kg/1gm or 2 kg/0.1 gm or Two Pan Balance with set of weights and analytical weight box.
5) Pair of Asbestos Gloves.
6) Filter Paper (Pack of 100).
7) Miscellaneous items: Spatula, Scoop, Mixing Tray, Trowel, Light Mineral Oil and Benzene.

The following additional Instruments will speed up the testing process with ease and accuracy (At extra cost).

Sample Extractor :

- Allows the Test sample to be easily removed from the mould. Can also be used for Proctor Moulds and Core cutters.
- Motorized Planetary mixer.
- Automatic Compactor to simulate hand compaction.
- Digital Model is also available to Measure load and flow Value direct on display.
- PC attachment with provision to log Reading directly in computer with graph.

Tech-Mech Automatic Marshal Compactor

(As per ASTM : D 1559)

Introduction :

This Equipment is used to speed up the process with ease and accuracy to prepare cylindrical specimens for Marshal Stability Testing Machine. The compactor has been designed to simulate hand compaction as described in ASTM D1559. This apparatus automatically compacts the sample and stops after preset number of blows has been completed. The Compactor gives Uniformly and accurately compacted marshal moulds for reliable testing.

General Description & Specifications :

It is a motor driven mechanical compactor useful for compaction into 100 mm dia moulds. It is fitted with a compaction rammer of 98.5mm dia, weighing 4.535 kg. with a free fall of 457 mm. The rammer assembly is provided with a ratchet and pawl arrangement to lift it from the top of the test sample. When the rammer reaches the required height, the pawl release the rammer which falls freely on test specimen. The release mechanism is connected by an arm moving up and down which is connected to a reduction gear coupled to the motor through another arm. Digital blow counter fitted to the compactor is used to set the number of blows. The Compactor is supplied completely with a wooden pedestal. Suitable to work on 230V, 50 Hz, AC single phase.

Compactor for 6" diameter Marshal Mould is also available.

TM-040 Ductility Testing Machine

(As per IS 1208-1978)

Introduction :

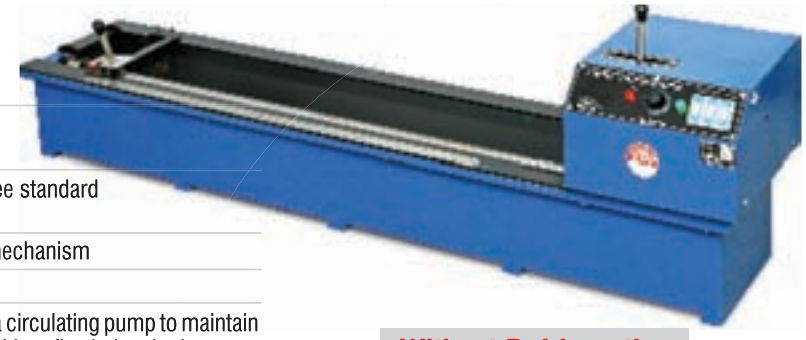
This method is used for determining the ductility of bituminous materials by measuring the elongation before breaking when two ends of a briquette specimen are pulled apart at a speed of 50 mm/min ± 2.5 mm/min at temperature of 27^0 C ± 0.5^0 C.

General Description & Specifications :

The Machine consists of the following :

- Stainless steel bath
- Temperature controller (Thermostatic/Digital)
- Immersion electric heater
- Carriage holding up to three standard briquette moulds
- Constant speed pump cum stirrer
- Electric motor with gear mechanism
- Stainless steel scale and pointer
- Control Panel

The apparatus consists of water bath with a thermostatic heater and a circulating pump to maintain uniform water temperature. One half of the briquette moulds is fixed in a fixed plate in the water bath, the other half of the briquette mould is fixed to a carrier which slides over a rotating threaded shaft with a clutch. The motor and gears that rotate the shaft are housed in a cabinet fixed above the other end of the bath. A pointer fixed to the carrier moves over a scale graduated from 0-100 cm x 1mm fixed on the bath with "0" (Zero) of the scale towards the fixed plates side. The rotating shaft has 2 speeds of travel for the bracket, 50 mm/min. and 10 mm/min. selected by a handle. Inside of Water bath is made of Stainless steel with insulation. A thermostatically controlled heater is fitted inside the water bath. Control switches for motor, stirrer, heater and indicator lamps are fitted to a control panel located at a convenient place on the water bath. Completes with three briquette moulds and one base plate. Works on 230 Volts, single phase, 50 cycles, AC.



Without Refrigeration

With Refrigeration

Optional Accessories :

1) Digital Temperature indicator cum controller (in place of Thermostatic control).
2) Digital display for Elongation.
3) The more advanced model with refrigeration system which ensures better temperature control in tropical conditions. The Machine is mounted on a steel stand with refrigeration unit at its base.
4) Base plate for mould.
5) Mould for elastic recovery.

TM-052 Planetary Mixer

(As per IS 10890-1984)

Introduction :

This Equipment is used to speed up the process with ease and accuracy to prepare cylindrical specimens for Marshal Stability Testing Machine. The mix is uniformly heated and mixed to yield homogenous mix and better moulds for testing. The same mixer without heating jacket and some modifications can also be used for mixing of soil, cement paste, mortars and pozzolanas etc.

General Description & Specifications :

Electrically operated, fitted with heating jacket for thorough mixing of Bitumen. The mixer is operated by 0.5 HP single phase electric motor connected to epicyclic type stainless steel paddle to impart both planetary and revolving motion for uniform mixing. Mixer blade has low speed of 140 ± 5 rpm and high speed of 285 ±10 rpm, while it also has a planetary movement of 62 ± 5 rpm in low range and planetary movement of 125 ± 10 rpm in high range. A stainless steel bowl of approx. 5 ltr. capacity with handle is also supplied. The 500 Watts heating jacket with energy regulator to control the temp. is fitted below the bowl. Complete unit is supported on a strong iron frame. Suitable to work on 230V, 50 Hz, AC single phase.

Optional Accessories :

1) Asbestos hand gloves.
2) Transfer tray.
3) Stainless Steel scoop.

TM-043 Softening Point Apparatus

(As per IS 1205-1978 ASTM D-36) (Hand Operated/Electrical)

Introduction :

This apparatus is meant for determination of softening point of bituminous materials according to IP 58 and IS 1205. Softening point is that temp. at which the specimen under test becomes soft enough to allow a steel ball of specific dimension to fall a required distance under test condition.

General Description & Specifications :

The apparatus consists of a beaker made up of heat resistant glass having internal dia of 8.5 cm &depth of 12 cm (approx.). Two steel balls each of 9.5 mm dia (Weighing 3.50 ± 0.05 gm), two tapered brass mould, two ball guides, a ring stand are also the part of assembly. Supplied with a heating unit designed to give temperature rise at 5°C per minute required under standard. The temperature is controlled with an energy regulator. In addition, there is an electrically operated stirrer mounted on a stand with chuck and glass rod or aluminum rod for stirring the water in the water bath. Operation on 230 Volts. single phase, 50 Cycles, AC.

Optional Accessories :

The following accessories are not part of the standard supply and supplied at an extra cost.

1) Thermometer IP 60° C.	4) Thermometer IP 61° C.
2) Programmable Digital Temp. indicator cum controller.	5) Glycerin.
3) Brass plate for specimen preparation.	6) Cooling Cabinet.

Note : In Hand operated model stirrer and heating unit is not supplied.

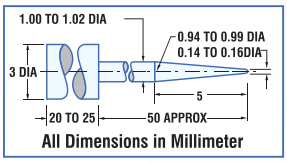
Advanced Softening Point Apparatus:

The unit consists of a stirrer and a digital temperature controller to precisely control the rate of rise of temperature. Suitable model for research purpose with glass beaker, a tray, a ring, a standard brass mould, a ball guide and a steel ball etc.

Advanced Model

TM-044 Standard Penetrometer

(As per IS 1203-1978, ASTM D-35) (Automatic/Hand Operated)



Introduction :

A depression is made in the sample by a needle of a definite weight, which is measured in tenths of a millimeter and expressed, as penetration number. A standard needle penetrates vertically under surcharge weight of 50 gm into a sample under test temperature at 25^0 C for 5 seconds of duration. This test determines the consistency and thereby the grade of the bitumen.

General Description & Specifications :

The apparatus is available in two versions, Hand operated and Electrically operated with automatic timer. The apparatus consist of a cast aluminum base with an iron stand on which moves an aluminum arm. A 6" dial is fixed on this arm and a brass chromium plated rod slide through the lower portion of the arm. A needle with weight is fitted to this rod. The dial is graduated from 0-400 in one tenth millimeter sub division. Supplied complete with adjustable needle holder, penetration needle, sample container, transfer dish and weight of 50 gm.

The Automatic model is supplied with automatic digital timer and electrical arrangement to conduct the test as to eliminate the need of stop watch and to carry out the test with great ease and accuracy.

Optional Accessories :

The following accessories and consumables are not part of the standard supply and are supplied at an extra cost.

1) Constant Temperature water Bath EIE-403/406.
2) Glass Thermometer.
3) Electric Hot Plate.
4) Spare Bitumen Container 55 mm x 35 mm.
5) Spare Container 70 mm x 45 mm.
6) Enamel Tray.
7) Stop Watch Mechanical / Digital.
8) Spare penetration needle.
9) Spare Weight 50 gm.

Note :

The above Instrument with some modification can also be used for testing of Grease / soil / food products and other similar materials for penetration test. The brass cone is used in place of needle for penetration. Variety of accessories are available for different applications. Prices and details are provided on request.

Advanced Standard Penetrometer :

- Same as above but with Digital display of Penetration Value with built in timer.
- Lifting table with adjustable mechanism for initial precise setting.
- With rack and pinion movement to fix an aluminum arm at desired position.

TM-047 Tar Viscometer

(As per IS 1206 PART-I & IP 72)

Introduction :

Viscosity is the property of the fluid by which it resist flow due to internal friction. Used for determining viscosity of cut - back bitumen and road oil. Viscosity is measured by determining the time taken by 50 cc of the material to flow from a cup through a specified orifice under standard condition of test.

General Description & Specifications :

The apparatus consists of a bath with cup of 10 mm orifice and a sleeve stirrer with ball lifting clip. The bath is fitted with an immersion heater to take the water to the required temperature and a drain valve. The temperature is controlled by energy regulator or voltage varrier. (extra cost) The assembly is kept on suitable stand with leveling screws. Suitable to operate on 230 V.50 Hz, AC single phase.

Optional Accessories :

The following accessories and consumables are not part of the standard supply and are mandatory for the testing work

1) Thermometer IP 8C/9C/10C.
2) Measuring Cylinder 100 ml.
3) Mechanical/Digital Stop Watch.
4) Silver plated orifice cup 4mm.
5) Solvent (Benzene/Toluene) for cleaning.

Note :

The Tar Viscometer is also available for multiple test fitted with Digital Temperature indicator cum controller and FHP electric stirrer. Supplied with Tar Cups of 10 mm and 4 mm orifice with valves.

TM-048 Saybolt Viscometer

(As per ASTM D 88)

Introduction :

Used for determining the viscosity of petroleum products and lubricants. Viscosity is measured by determining the time taken by 60 cc of the material to flow through a specified orifice.

General Description & Specifications :

The apparatus consists of stainless steel bath with oil cup which is centrally placed in a water bath. The bath has a lid which contains a water cooling tube, two handles with two stirring blades, thermometer socket and a straight heater. Stirring is done by turntable arrangement. A thermometer can also be inserted into the cup cover. Two jets one universal and one furol can be screwed to the cup by a handle (without strainer, withdrawal tube and glassware) The temperature is controlled by energy regulator or voltage varrier.(extra cost) Suitable to work on 230V,50 Hz, AC single phase..

Optional Accessories :

The following accessories and consumables are not part of the standard supply and are mandatory for the testing work.

1) Strainer for filtering oil.
2) Withdrawal tube.
3) Saybolt Viscosity Flask 60 cc.
4) Glass Thermometer ASTM 17C /18C/19C/20C/21C/22C.
5) Common range Thermometer 0-100^0 C.
6) Universal Orifice.
7) Furol Orifice.

Note :

The Saybolt Viscometer is also available for multiple test fitted with Digital temperature indicator cum controller and FHP electric stirrer. Complete with two Saybolt tubes and electrical control

TM-049 Flash and Fire Point Apparatus

(As per IS 1209-1978)

Introduction :

This is widely used to determine closed cup Flash Point of Fuel Oil, cut back asphalts, other viscous materials and suspension of solids having a flash point above 49^0 C (120^0 F).

General Description & Specifications :

This apparatus is made as per IP 34. ASTM D-93 and IS 1209-1978 method B. The apparatus consists of a brass test cup with handle, a removable cup cover with spring operated rotating shutter having Oil Test Jet/Gas Test Jet Flame Device and a Stirrer with flexible shaft. The assembly rests in air bath, which is covered, with dome shape metal top. The cup is fitted with insulated handle and locking arrangement near cup flange. The assembly is kept on round shaped electric heater with Energy regulator temperature control. Suitable for operation on 230 Volts 50 cycles AC.

Optional Accessories :

The following accessories are not part of the standard supply and supplied at an extra cost.

1) Open clip for converting Close model to open cup test model as per IP 35.
2) IP 15C Low range(-7-110^{0}C x 0.5^{0}C) thermometer.
3) IP 16C High range (90^{0}C-370^{0}C x 2^{0}C) thermometer.
4) Electric FHP motor with stirrer (in place of hand stirring).
5) Voltage variac temperature controller with Digital temperature indicator cum controller.

EIE-410 Kinematic Viscosity Bath

Without refrigeration

With refrigeration

Introduction :

Used for determination of kinematic and intrinsic viscosity of fuels, lubricants & petrochem raw materials at constant temperatures in accordance with ASTM D 445 and other equivalent methods. Available in two versions, to work at above ambient temperature and below ambient temperature.

General Description & Specifications :

Double walled, outer chamber made of G.I. - powder coated, with removable toughened Glass window panel, inner chamber made of Stainless steel, FHP motorised stirrer for uniform temperature, Dual display Microprocessor based Digital temp. controller with PT-100 sensor. Temperature range from 5° C above ambient to 100° C., Control accuracy ± 0.1°C. Below ambient Viscosity Baths are fitted with Refrigeration system (Temperature Range : 10°C to 100° C). The Bath can accommodate 2 / 4 / 8 Viscometers with varying tank volumes.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost.

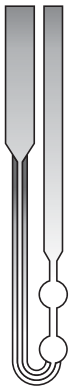
1) Lighting Attachment with long life low wattage lamp.
2) Viscometer Holder.
3) Different Type of Glass U Tube Viscometers with certificate of constant.
4) Voltage Stabilizer (for Refrigerated Model Only).
5) Bath with High Resolution 0.01°C.
6) Calibration Certificate with National Traceability.
7) Refrigerated Models for Temperature up to -80°C.
8) High temperature bath, Temperature range from ambient to 150°C.

Glass Tube Viscometer : It is used for the determination of the 'Kinematic Viscosity' of paving grade and cutback bitumens and distillation residues of cutbacks. It is applicable to the materials having a viscosity range of 30 to 1,00,000 cst. Viscometers are the capillary type of borosilicate glass annealed suitable for the test.

Reverse Flow Viscometer :

The viscometer is made of clear borosilicate glass free from visible defects. All glass tubing used in the construction of a single viscometer is of the same composition and the finished instrument is throughly annealed. The design and details of the viscometer are given in the right-hand side table. The size, approximate constant and Kinematic Viscosity is as per table.

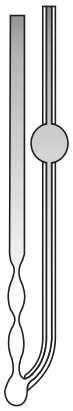
Size No.	Approximate Constant (cst/s)	Kinematic Viscosity Range (cst)
4	0.1	6 to 100
5	0.3	18 to 300
6	1.0	60 to 1000
7	3.0	180 to 3000
8	10	600 to 10000
9	30	1800 to 30000
10	100	6000 to 100000
11	300	18000 to 300000



Cannon Fenske Viscometer for opaque and transparent liquids :

Detailed drawings of the reverse flow 'Cannon-Fenske' viscometer is given in the figure. The size, approximate constant and kinematic viscosity range, is given in the table.

Size No.	Approximate Constant (cst/s)	Kinematic Viscosity Range (cst)
150	0.035	2.1 to 35
200	0.1	6 to 100
300	0.25	15 to 200
350	0.5	30 to 500
400	1.2	72 to 1200
450	2.5	150 to 2500
500	8	480 to 8000
600	20	1200 to 20000



TM-051 Core Drilling Machine

Introduction :

Used to Drill cores of Concrete, Rocks, Stones, Bitumen Pavement, Tiles or the similar material.

General Description & Specifications :

The Machine is provided with hand operated rapid screw feed through a lever drive with built in ball bearing. The drill spindle is floating on tapered roller bearings. Water swivel is totally enclosed and mounted on the drill spindle. The drill drive shaft is mounted on two ball bearings in the drill head. The drill is provided with water tank to deliver the water to the cutting operation. The drill is mounted on a sub base which is further mounted on trolley. The trolley is mounted on Scooter tyre wheels and leveling screws to facilitate easy shifting and setting. The drill has an end towing attachment. For longer travels and towing, extra attachment of Rubber tyre (Scooter Wheel) is highly recommended.

Available in two versions, Electrically Operated and Engine Operated for field operation. The Electrically Operated machine is fitted with 3 HP 3 Phase AC Motor while on field use Engine powered models have petrol/kerosene run, air cooled 4 strokes single cylinder engine developing 3 to 4 HP at 3000 RPM. The drive from engine to drill head is through V belt and socket speed reducer with a standard reduction 8 : 1 and totally enclosed in belt guard and sealed. The engine starts with petrol and later on run on kerosene oil. The engine is with ISI certification Mark. The Engine Operated Models are also fitted with a water tank for on site application. Depending upon the application and preference of user, in option to Petrol/Kerosene driven Engines, Diesel powered Engines developing power of 5 or 7 HP can also be supplied at extra cost.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost.

1) Diamond impregnated Core Drill Bit of 75 / 100 / 150 mm dia., with barrel.
2) Full 360 operation for coring at any angle.
3) Surcharge Weights to keep the machine stable and vibration free during operation.
4) Core Extractor for easy removal of the core sample from the hole.

TM-050 Bankleman beam Apparatus

(As per AASHTO T 256 77)

Introduction :

The device was developed by U.S. Bureau of Public Roads and is used to determine the rebound deflection of flexible pavement under static load.

General Description & Specifications :

Benkleman Beam : Beam Ratio : - 2 : 1.

(a) Length of the probe arm from pivot to probe point 244 cm.
(b) Length of measurement arm from pivot to dial 122 cm.
(c) Distance form pivot to front legs 25 cm.
(d) Distance from pivot to rear legs 166 cm and
(e) Lateral spacing of front support legs 33 cm.

The complete instrument is light weight and is supplied with two parts for easy assembling and disassembling on site with help of hand tools and also it becomes easy to carry with the help of handle.

In use one end of the beam rests at a point under investigation while the beam is pivoted at the centre. The free end carries a dial gauge to record the deflections and the other end is kept on the a stable platform. Because of beam ratio, small deflection is magnified and recorded on the dial gauge. The instrument is leveled with the help of the knob of the foot screw. The horn is provided for signaling.

Optional Accessories :

Dial Gauge : 0.01 x 25 mm., Spirit Level.

Same as above but a compact test model, light weight, packed in wooden box for easy portability. Beam ratio 2:1.

TM-3001 Vacuum Pump & Filtering Flask

Introduction :

Used for specific gravity test by removing air voids from the Bitumen Mix. Very useful for other general laboratory tests where vacuum is required.

General Description & Specifications :

Complete with base, motor, pulley and belt. The pump mechanism is contained in a metal case with oil level and drain plug at base. Pump runs at 450 RPM. Ultimate vacuum 0.01 mm/Hg. (Single stage). Complete with non-return valve, belt guard and vacuum gauge with regulator.

Displacement :

50 Ltr./Min, Motor Rating : 0.25 HP Single Phase. To work on 230 V AC, 50 Hz. Single Phase. Supplied complete with filtering flask of 1000/ 2000 ml. Capacity with rubber cork and pressure pipe to carry out the test.

Optional Accessories :

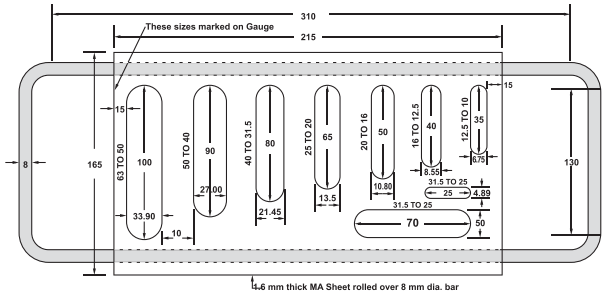
1) Air Ballast.
2) Moisture Trap
3) Hard Rubber Pipe of required length.

TM-191 Thickness Gauge or Flakiness Gauge

(As per IS : 2386 - I)

Used to determine the Flakiness Index of the Aggregate. The aggregate particles are to be considered flaky, if their thickness is less than 0.6 of their nominal size.

It consists of a frame with sliding panel having accurate slots of different standard width and length. The complete assembly is chrome plated or powder coated.



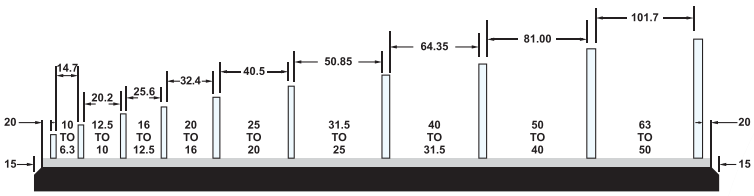
Thickness Gauge As per IS 2386 (P-1) 1963)

TM-104 Length Gauge or Elongation Gauge

(As per IS : 2386 - I)

Used to determine the Elongation Index of the Aggregate. Aggregate particles are considered elongated when their length is more than 1.8 of the nominal size.

It Consists of a hard wooden base with vertically mounted metal studs as specified in the IS.



Length Gauge (As per IS 2386 (Part-I) 1963) All Dimensions in Millimeter

TM-103 Los Angeles Abrasion Testing Machine

(As per IS : 2386 - IV)

Introduction :

The machine is used for testing crushed slag and crushed & uncrushed gravel for resistance to abrasion. The aim of the test is to find the percentage wear due to the relative rubbing action between the aggregates and steel balls used as abrasive charge. The oven-dried aggregates are weighed and rotated along with abrasive charge in the machine at 500 or 1000 revolutions and percentage of wear so found out is reported as Los Angeles abrasion value.

General Description & Specifications :

Consists of a hollow steel cylinder, closed at both ends, having an inside diameter of 700 mm and inside length of 500 mm. The cylinder mounted on a sturdy frame on ball bearings. The opening is dust tight with a removable bolted cover in place. A detachable shelf which extends through the drum catches the abrasive charge and does not allow it to fall on the cover. The drum is rotated at a speed of 30-33 RPM by an electric motor through a heavy duty reduction gear. Fitted with revolution counter and push button starter. Supplied complete with a tray for collection of the material. Abrasive Charge consists of set of 12 Nos. cast iron spheres or steel spheres (Hardened steel balls) approximately 48 mm diameter each weigh between 390-445 gram. Complete as above.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost.

1) Laboratory Oven.
2) Electronic Balance of 15 kg X 1 gm.
3) Test Sieve 1.7mm.
4) Spare Abrasive Charge.

TM-017 Aggregate Crushing Value Apparatus

(As per IS : 2386 IV, IS : 9376-1979)

Introduction :

The Aggregate Crushing Value provides a relative measure of resistance of aggregate to crushing under a gradually applied compressive load. The oven dried and accurately weighed aggregates are subjected to crushing test on compression testing machine and weight of the resultant fines passing the specified IS sieve to the total weight of the sample expressed as a percentage is defined as Aggregate Crushing Value. The apparatus is available in three sizes

1) 75 mm dia for 1/8" to ¼" size aggregate
2) 150 mm dia for 3/8" to ¾" aggregate (standard)
3) 300 mm dia for 1" to 2" aggregate.

General Description & Specifications :

Consists of case hardened Mild Steel Cylindrical container of 150mm dia ± 0.5 mm. The container is 130mm-140mm taller having square base plate of dimensions 200-230mm and thickness of 6mm. A plunger of 148 mm ± 0.5 mm dia having height of 100-115 mm is also supplied. All parts directly coming in to contact with the specimen during the test are made of mild steel duly case hardened. Supplied complete with tamping rod, 16 mm dia X 600 mm long, one end rounded.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost.

1) Cylindrical Metal Measure 11.5 cm dia x 18 cm height with handle.
2) Electronic Balance 3 kg X 1 gm.
3) Compression Testing Machine capacity : 500 KN.
4) Test Sieve 2.36 mm, 10 mm, 12.5 mm and 14 mm.

TM-146 Riffle Sample Devider

(As per IS : 1607, IS : 2720, BS : 812)

Introduction :

Used for rapid collection of the true representative samples from aggregate. Consists of a metal box fitted with a series of chutes having equal width which alternatively discharge the material in opposite directions into separate pans. The chutes of the riffle are steep enough to allow rapid flowing of the material. Each riffle sample divider supplied with two pans and one scoop.

Available in following sizes

Size (mm)	13	20	25	40
No. of Slot	14	16	16	16

TM-070 Density Basket

(As per IS : 2386 - III)

Introduction :

Used for specific gravity and water absorption test of aggregate. The basket is used in conjunction with a suitable electronic balance, a specially designed robust frame to support the electronic balance and water tight container. The density basket is of 20 cm dia. x 20 cm high fitted with Galvanized wire mesh of 6.3 mm with handle for suspending it from the balance.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost.

1) Electronic Balance capacity 5 kg. X 0.5 gm. / 5 kg. X 0.1 gm. with under bench weighing facility.
2) Laboratory Oven.
3) Water tight container.
4) A frame is designed specially with moving platform to carry the water container allows the test specimens to be weighed in both air and water.

Buoyancy Balance

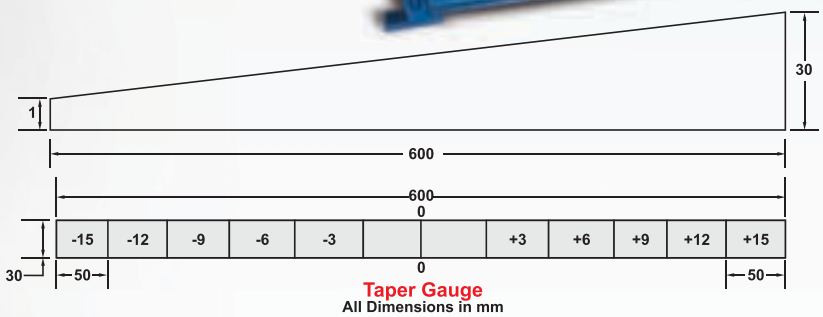
Introduction :

This setup is useful for finding out specific gravity of aggregate by immersing & weighing aggregate in water and in air under specified condition.

It consists of a rigid support frame and it incorporates a water tank mounted on a platform inside a supportive frame. A mechanical lifting device is used to rise the water tank through the frame height immersing the specimen suspended below the balance. The balance supplied may also be used as a standard weighing device, thus providing a versatile and comprehensive weighing system in the laboratory. Complete with density basket and water tank.

Tech-Mech Straight Edge

Used to measure irregularities in road pavement. Made from steel channel or Aluminum alloy, 3 meter length. Complete with measuring wedge.

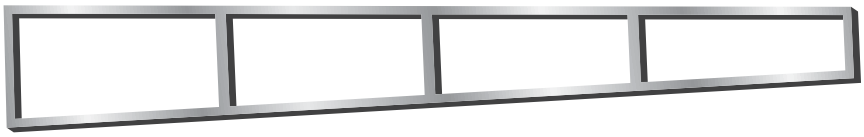


Taper Gauge
All Dimensions in mm

Tech-Mech Camber Board

Used to check and maintain the camber of the road as per design.

Material	:	Aluminum section of size 24 mm x 45 mm of thick gauge.
Size	:	3 meter, 3.5 meter, 3. 75 meter or as per requirement.
Ratio	:	2.0%, 2.5%, 3.0% or as per requirement.
Accessories	:	Highly sensitive magnetic spirit level and seat for magnetic spirit level at its centre.



TM-019 Bulk Density Cylindrical Measure

(As per IS : 2386 Part III)

Used for the determination of loose bulk density and voids of aggregate. The apparatus consists of a precision machined mild steel cylinder with handles. The top rim is smooth & plane and it is parallel to the bottom. Complete with tamping rod.

Available in following capacities.

3 liters, 10 liters, 15 liters, 20 liters and 30 Liters. Straight edge can be supplied at an extra cost.

Size of Container Bulk Density Test

Size of Largest Particles	Nominal Capacity (Liter)	Inside Diameter (mm)	Inside Height (mm)
4.75 mm and under (made from tube)	3	150	170
Over 4.75 mm to 40 mm	15	250	300
Over 40 mm	30	350	310

Tech-Mech Cleaveland Flash & Fire Point Apparatus

Introduction :

This apparatus is used for determination of Flash Point & Fire Point of Petroleum products except fuel oil with open flash at 80^0 C as per specification IP 36/57, IS 1448 (P :69) 1969 and ASTM-D-92-67.

General Description & Specifications :

The apparatus consists of a cup, heating plate, thermometer clip and test flame attachment with swivel joint for passing over liquid surface in the prescribed manner, heater is controlled by means of Energy regulator for operation on 230 Volts, 50Hz, AC single phase.

Optional Accessories :

1) Cleaveland Flash Point Apparatus electric heated with voltage varric copper coil type.
2) Thermometer IP 28C range -6 to +40^{0}C.
3) Polished wooden case.
4) Spare cup with handle only.
5) Digital temperature indicator.

Hardness Tester for Mastic Asphalt

Introduction :

Hardness tester for Mastic Asphalt has been fabricated to meet the essential requirements of IS 1995-1968 in finding out of the Hardness Number of mastic asphalt.

Hardness Number is defined as the figure denoting the depth in hundreds of a centimeter, to which a flat ended pin in the form of a rod having diameter of 6.35mm penetrates the mastic asphalt under a load of 31.7 kg applied for 60 seconds. The temperature is being maintained at 35^{0}C+/-0.5^{0}C or 45^{0}C+/-0.5^{0}C. The unit is complete with release mechanism.

General Description & Specifications :

The apparatus consists of a frame supported by means of four leveling screws. On the top plate, a lever with a counter balance weight and a load hanger is fixed. The ratio of the lever to weight is such that when the weight is kept on the hanger, the ultimate load acting on the penetration pin is 31kg. A thermometer is fixed by a clip, which records the temperature of the water in the container.

The load transfer bar passes through the support bracket and rest on the specimen. The penetration load can be adjusted and locked before the test is conducted. An adjustable ring is provided on the load transfer bar and a rest point. The dial gauge of 0.01mm accuracy to record the depth of penetration is also provided. The ring can be adjusted and locked in position for initial setting of dial gauge. A cam which is operated by the handle is provided to lock or free the load transfer bar.

Distillation Apparatus for Emulsified Asphalt

Introduction :

Used to examine the asphalt emulsions composed principally of a semi-solid or liquid asphaltic base, water and an emulsified agent. The apparatus consists of an aluminum-alloy still with ring burner, a meter/glass connecting tube with water-cooled condenser, a graduated cylinder having 10 ml capacity, support stands, holders and two thermometers of range -2^{0}C to 300^{0}C.

Oven is designed to measure the loss in weight (exclusive of water) of bituminous materials when heated to a standard temperature under specified conditions.

Separation Test

Introduction :

The separation of modifier and bitumen during Hot strong and cold static condition is evaluated by comparing the ring and ball softening point of the top and bottom sample taken from conditioned, sealed tube of polymer modified bitumen.

The conditioning consist of placing a sealed tube of modified bitumen in a vertical position at 163+/-5° C in an oven and at 6.7+/-5° C in a freezer for specified time.

Supplied complete with the following

1) Oven capable of maintaining 163+/-5° C.
2) Freezer, capable of maintaining 6.7+/-5° C.
3) A rack capable of supporting the 3 aluminum tube in vertical condition and a hammer.
4) Spatula and a hammer.
5) 20cm dia fine sieve of 600 micron mesh.
6) Glass rod.
7) Tweezer.
8) Pair of Asbestos Hand Gloves.
9) Aluminum tubes of 25.4mm dia X 136.7mm length X 1mm thickness.
10) Glass Funnel.

(The facility for weighting up to 50 gms of Hot Bitumen should be arranged. A Ring & Ball Apparatus as per IS:1205 should also be arranged by the customer.)

Oven

Freezer

TM-015 Aggregate Impact Testing Machine

(As per IS : 2386-IV)

Introduction :

The aggregate impact value of coarse aggregate provides a relative measure of the resistance of an aggregate to sudden shock or impact. The oven dried and accurately weighed aggregates are subjected to a total of 15 blows of specified weight and fall and percentage of fines formed in terms of the total weight of the sample is expressed as the aggregate impact value.

General Description & Specifications :

Consists of a base weighing between 20-30 kg with a lower surface of not less than 30 cm and support columns to form a rigid frame work around the quick release trigger mechanism to ensure an effective free fall of the hammer during the test. The free fall can be adjusted through 380 ± 5.0 mm. The hammer is provided with a locking arrangement. A metal tup (hammer) weighs at 13.5 to 14.0 kg. The lower end is in cylindrical shape having 100 mm diameter and it is 5 cm long. A 2 mm chamfer at the lower edge is also provided. Complete with a cylindrical cup of 102 mm diameter and 50 mm depth; one measure of 75 mm diameter and of 50 mm depth; a tamping rod of circular cross section of 10 mm diameter and 230 mm long, rounded at one end.

Optional Accessories :

The following accessories are not part of the standard supply and are supplied at an extra cost

1) Test Sieve 10mm, 12.5mm and 2.36mm opening.
2) Automatic Blow Counter.
3) Laboratory Oven.
4) Electronic Balance 500gm. X 100mg./Two Pan Balance.

TM-171 Sand Absorption Cone & Tamper

(As per ASTMC : 128, AASHO : T 84)

Used for determining specific gravity and absorption of fine aggregates. The equipment comprises of a conical metal mould having 1.5" dia at the top, 3.5" dia at the base & 2.7/8" in height and a metal tamping rod of 12 ounces having flat circular tamping face of 1" dia.

Thin Film Oven

Introduction :

Thin Film Oven is designed to determine the effect of heat & air on asphaltic materials(thin film test).

The unit is heavily insulated & has a double glass viewing door to see on going experiment inside the chamber. The temperature is controlled at 163^{0}C± 1^{0}C. by means of a calibrated PID based Digital Temperature Indicator Controller. Inside platform is rotated by an external motor at 5 to 6 R.P.M. (supplied with cups). Inner chamber is made of stainless steel of 304 grade & exterior body is made of mild steel sheet-power coated. The unit works on 230 volts AC, 50 Hz supply.

Tech-Mech Soundness Test of Aggregate

(As per IS 2386 Part-V)

The test is Intended to study the resistance of Aggregates to weather condition. The test is conducted to judge the durability of soundness of the Aggregate.

Absolute Viscosity Testing Equipment

Introduction :

The following testing equipment is used to measure absolute viscosity of graded paving bitumen (IS:73:2006) at 60^{0}C in accordance with IS:1206 (Part-II) (similar to ASTM D 2171). The equipment also uses a vacuum capillary viscometer. It may be noted that any other viscometer such as rotational viscometer cannot be used to measure the absolute viscosity at 60^{0}C since the bitumen is in non-newtonian nature at this temperature.

Complete Absolute Viscosity Testing Equipment conforming to IS:1206(Part-II) Method for Testing Tar and Bitumen Material.

Determination of Absolute Viscosity with the following components:

1) Constant Temperature Bath - A suitable bath to immerse at least 2 vacuum capillary viscometer tubes with a digital temperature controller. The accuracy of the temperature in maintained at +/- 1^{0}C throughout the bath.

2) Vacuum System - Capable of maintaining vacuum with +/- 0.05 cm of the desired level. The system consists of a vacuum pump, a moisture trap, a vacuum regulator, a bleed valve, all interconnecting tubing/piping and any other accessory as require to complete the vacuum system.

3) Thermometer for Water Bath - Mercury in glass, range 37.8^{0}C to 82^{0}C and graduations of 0.2^{0}C.

4) Timing Device - A stop watch or stop clock capable of reading up to1/2 second.

5) Cannon-Manning Vacuum Viscometer - With manufactures' calibration certificate, viscometer holder and silicon cork. Size 12 and Size 13 (one each) (Size 12 is suitable for testing VG-20, VG-30 and VG-40 bitumen).

6) Viscometer Stand - for holding 2 viscometers.

TM-071 Centrifuge Extractor

Introduction :

The Centrifuge Extractors are used for determination of bitumen percentage in hot mixed paving mixtures and pavement samples. The mix is added with a solvent and dissolved bitumen is removed by centrifugal action. The Extractors are available in two versions, Hand operated and motorised electrically operated.

General Description & Specifications :

Hand Operated:

The Centrifuge Extractor comprises of a precision machined rotor bowl and bowl cover housed in a cylindrical box. A knurled nut is provided to press filter paper disc between the rotor bowl and cover plate. The complete bowl assembly is removable for sample-weight determination. The bowl assembly is mounted on a vertical shaft, which comes out from a casted housing. The shaft attached to the bowl is rotated manually by a handle. The gears operate in a casted housing with proper grease-lubricating media. A drain is provided to collect dissolved bitumen coming out from the rotating bowl. The range of speed is 2400 to 3600 RPM. The bowl capacity is 1.5 Liter.

Moptorized Electrically Driven :

The motorised version is provided with a variable speed control device. The electric motor is of 0.25 HP capacity coupled to a geared assembly. Suitable for operation on 230 Volts, 50 Hz, AC single phase.

Optional Accessories :

The following accessories and consumables are not part of the standard supply and are mandatory for the testing work.

1) Filter paper (Pack of 100).
2) Transfer Tray.
3) Electronic balance (5 kg/500mg or 5 kg/100mg or 5 kg/10 mg).
4) Spatula.
5) Two Pan Balances, each of 5 kg capacity with weights. (From 5 kg to 50 gm).
6) Solvent (Benzene/Toluene).
7) Analytical weight Box (from 200 gm to 1 mg).
8) Asbestos hand Gloves.

EIE-403/406 Constant Temperature Water Bath

Introduction :

Used to maintain in water the Marshal specimens to be tested at $60^0 \pm 1^0$ C (Asphalt specimens) or 37.8 ± 1^0 C (Tar Specimens) as prescribed by the specifications. The Same Water bath can also be used for Penetration test, Stripping test or even Soundness test of cement with the use of additional accessories. Available in different sizes and temperature control system.

Specification :	Digital Temp. Controller	Thermostatically Controlled
Chamber Size	9.5" X 9.5" X 8.0" (4 Mould Capacity) 13.5" X 13.5" X 8.0" (9 Mould Capacity)	9.5" X 9.5" X 8.0" (4 Mould Capacity) 13.5" X 13.5" X 8.0" (9 Mould Capacity)
Material of Const	Inside : Stainless Steel Outside : Mild Steel, Duly Powder Coated	Inside : Stainless Steel Outside : Mild Steel Duly Powder Coated
Controller	Digital Temperature Controller cum Indicator with dual display	Thermostatically controlled
Accuracy	0.5° C or better	1° C or better
Resolution	0.1°C	1° C
Insulation	Glass Wool Insulatio.	Glass Wool Insulation
Heater	U-Type immersion heater (2/3 k.w.)	U-Type immersion heater (2/3 k.w.)
Control Panel	Switch of Mains, Stirrer, Permanent Heater and Booster Heater, Digital Temperature Controller	Mains Indicator & Control Indicator Control Switch, Thermostat.
Standard Supply	Stirrer with FHP Motor Sample carrying tray with handle	Sample carrying tray with handle
Power Supply	230 V, Single Phase, A.C.	230 V, Single Phase, A.C.
Optional fitting	Digital Timer 0-24 hour Refrigeration System to work below ambient temperature	

NOTE : Water-bath able to accommodate 18 Test Samples can also be supplied.

Loss on Heating Test Oven

Introduction :

Apparatus for loss on heating test of Tar & Bitumen as per IP 45, IS 1212. With digital temperature controller.

The unit is heavily insulated & has a double glass viewing door to see on-going experiment inside the chamber. The temperature is controlled at 163^{0}C±1^{0}C by means of a calibrated PID based Digital Temperature Indicator Controller. Inside platform rotated by external motor from 5 to 6 R.P.M. (supplied with cups). Inner chamber is made of stainless steel of 304 grade & exterior body is made of mild steel sheet-power coated. The unit works on 230 volts AC, 50 Hz power supply.

Tech-Mech Specific Gravity Bottle

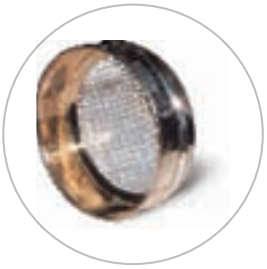
(As per IS 1202-1978)

Specific Gravity Bottle with stopper of 50 ml capacity, which is available in two patterns :

1) The ordinary capillary type specific gravity bottle with 6 mm neck diameter.
2) The wide mouthed capillary type specific gravity bottle with 25 mm neck diameter.

The ordinary specific gravity bottle is used for the materials which remain in absolute fluid form at 27^{0}C while the wide mouth capillary type is used for materials which remain in absolute semisolid form of high viscous at 27^{0}C.

Test Sieves

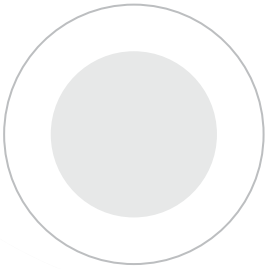


Hot Plate-Rectangular

Screw Gauge

Thickness Gauge

Filter Papper

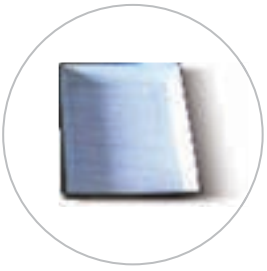


Scoops

Electronic Balance

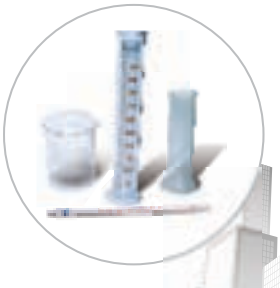
Asbestos Hand Gloves

Enamel Tray



Bitumen Cleaning Agent

Glass/Plastic Ware



AUG-2012/QTY-3000/Paper Title-300GSM MATT & In-130 GSM MATT

'Feel Good Factor'

Earth Consists a plenty of Gems and Jewels in her lap. Bitumen is one of it. Although a hard black in colour and having a typical unique smell, Bitumen is one of the most important gradients in constructing the roads & highways.

The Strength, Rigidity, Flexibility, Lucidity, Smoothness, Shock-absorbance,Bonding strength of the mix, Load bearing capacity of the roads & many other qualities of the highways are due to the Bitumen, which is spreaded with its well calculated mix material through out the pavement.

The economy of the country & progress of the nation much depend upon the infrastructure of good quality of highways. Even a small village requires reasonably good roads for economic progress & developments. A nation is nothing but a group of such villages, towns, cities, megacities, metro-cities,which are connected with one another with the network of Roads, State Highways, National Highways and Express Highways. In a true sense, highways are the lifeline of our nation.

It is well understandable that testing of bitumen plays a vital role in making the roads. The well prepared mix design creates a beautiful & classic highways. It is our privilege at this instance that our honorable Prime Minister and IRC/NHAI authorities have taken up the challenge to redefine the total network of the highways with modern approach throughout the country.

At this juncture we humbly present our range of Testing equipments for Bitumen, Asphalt and Aggregates. We have tried to provide maximum details of Testing equipments with designs & diagrams for modern laboratories. We assure you to continue our efforts to provide you the more and more precise, sturdy and reliable testing instruments to lessen your burden of hard working projects for creation of better & prosperous nation.

Your valued suggestions are always welcome.

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