

## Range Available

### Cement / Concrete

#### **MICRO-1 CEMENT SAMPLER:- As per IS : 7535 – 1986**

It is a brass tube approx. 53cm long and 2.8cm I.D. with a wooden handle. Total length Approx. 73cm. The tube has the sharp angular edge which conveniently pierces cement An air hole of of approx. 3mm dia is drilled on the tube near handle. Total sample Collected at one time is 300cm<sup>3</sup> approx.

#### **MICRO-2 BLAIN'S AIR PERMEABILITY APPARATUS:- As per IS : 4031, 5516, ASTM C-204.**

The apparatus is used for determining the fineness of cement in terms of specific surface expressed as total surface area in square cms. Per gram of cement. The app. Consists of permeability cell 12.5mm I.D., Manometer U Tube mounted on stand with built in a stop cock, perforated disc and a bottle of 100 cc dibutyphthalate liquid.

#### **MICRO-3 VICAT NEEDLE APPARATUS :- As per IS : 4031, 2645, 2542(Part – I)**

This Instrument is used for determining the normal consistency and setting of Cement and Á' Class Limes. The App. consists of metallic frame bearing a freely moveable rod with a Cap. at top, One Vicat Mould, Split type and Glass base plate and One Set of Needles.

#### **MICRO-4 VICAT NEEDLE APPARATUS WITH DASHPOT:-**

Same as above but in addition is fitted with a Dashpot which facilitates gentle lowering of the needles.

#### **MICRO-5 LE-CHATLIER MOULD:- As per IS: 269, 712, 5514, 1727, 2645, 4031**

It is used for the determination of soundness by expansion method of ordinary and rapid Hardening Portland cement, low heat Portland cement and class A Limes. The App. Consists of small split cylinder forming a mould. On other side of the split cylinder, two Parallel indicating arms with pointed ends are attached and with two glass plates and a lead Weight.

#### **MICRO-6 LE-CHATLIER FLASK:- As per IS: 4031 – 1968**

It is used for finding specific gravity of Hydraulic Cement. Made of Borosilicate Glass. Ht. of Flask is 243mm with bulb of 90mm dia and cap. 250ml approx. with long neck And stopper. Graduation from 18ml to 24ml with .1 ml Graduation.

#### **MICRO-7 SLUMP TEST APPARATUS:- As per IS:7320**

It is used for the determination of the consistency of freshly mixed concrete, where the maximum size of aggregate does not exceed 38mm.

#### **MICRO-8 AIR ENTRAINMENT METER:- As per IS: 1199 – 1959.**

As Entrainment of Air in limited percentage improves durability of concrete and very low percentages deteriorate it, measurement of air entrapped in freshly mixed concrete becomes important. The use of chemical additives to increase workability of concrete requires an air content check to be made. Air Entrainment meters are used to determine air entrained in freshly mixed concrete by pressure method.

**Capacity:-** 0.005 cubic meter capacity for maximum size of aggregate 38mm.

0.007-----do----- size of aggregate 38mm

0.01 -----do-----size of aggregate 75mm.

0.1 -----do-----maximum size of aggregate 150mm

#### **MICRO-9 COMPACTION FACTOR APPARATUS: As Per IS:- 1199,5515**

The App. Is used for determining the workability of fresh concrete , provided the maximum size of aggregate does not exceed 38mm. The test is particularly useful for concrete mixes of very low workability where true slump values are not reliable.

**MICRO-10 FLOW TABLE:- As Per IS: 5512**

This is used for measuring the consistency of Pozzolanas and also cement mortar and hydrated lime. The App. consists of machined brass table top 250 mm dia mounted on a rigid stand. The table top is reinforced with equally disposed ribs and allowed to conical brass mould 100mm I.D. top dia and 50mm high.

**MICRO-11 FLOW TABLE MOTORISED:- As Per IS: 5512**

Same as above but fitted with motor connected to cam shaft through reduction gear to give approx. 100 rpm. Suitable for operation in single phase 230 Volts, 50 Cycles, A.C. supply.

**MICRO-12 MORTAR MIXER:- As per IS: 4031, 1727.**

It is used for mixing of Cement pastes, mortars and pozzolanas.

**MICRO-13 LABORATORY CONCRETE MIXER MOTORISED**

It is electrically operated. The counter balance Drum is easy to tilt 1.1/2 to 2 cu.ft mix. The total drum volume is however 3 cu.ft. equipped with ½ H.P. electric motor. Suitable for operation on 20 Volts A.C. single phase.

**MICRO-14 LABORATORY CONCRETE MIXER HAND OPERATED**

Same as above but without motor hand operated.

**MICRO-15 CEMENT AUTOCLAVE (21 Kg/Cm.sq. pressure) As per IS: 4031-1968, 1624-1960**

It is made of Stainless Steel (Inner Chamber). It is suitable for soundness test of cement or the autoclave expansion test requiring constant steam pressure with the correspondent constant pressure. Chamber Dimensions 10.5 cm dia x 40.5 cm height suitable operation on 230 Volts 50 Hz, Single Phase, A.C. Supply.

**MICRO-16 SHRINKAGE BAR MOULD:- As per IS: 4031, 10086**

The mould is used for casting specimens of Cement aggregate combination for measuring potential expansive alkali reactivity. Size 25mm x 25mm x 250mm. effective length gauge is made of mild steel. Supplied with base and four stainless steel smooth reference pins. Available in Two Gang, Three Gang & Four Gang.

**MICRO-17 STANDARD SPATULA:- As per IS: 4031, 269**

It consists of Steel Blade with wooden Handle. It is for use while casting of cement briquette.

**MICRO-18 GAUGING TROWEL:- As Per IS: 4031**

Best quality with hardwood handle Blade Length 200mm & Wt. 210gm approx.

**MICRO-19 LENGTH COMPRACTOR:- As per IS: 1199 – 1959**

It is used to measure the drying shrinkage of Concrete autoclave expansion Portland Cement and potential expansive reactivity of Cement aggregate combinations in Mortar Bars during storage, on self drying. The App. consist of channelled base over which two Vertical pillars are fixed. An adjustable cross plate is at top. Dial gauge(.002mmx12mm) Can be fixed to the top cross plate.

**MICRO-20 TAMPING ROD:- As per IS: 516**

It is used for compaction of concrete in cube moulds. It is made of Steel with 16mm dia and 60mm length. Rounded or bullet shaped at one end.

**MICRO-21 MOULDS:- As per IS: 4031, 516, 10082 & 10086.**

A. CUBE MOULDS:- Made of Cast Iron complete with Base Plate.

**Size:-**

- a. 50mm x 50mm x 50mm
- b. 70.6mm x 70.6mm x 70.6mm
- c. 100mm x 100mm x 100mm

d. 150mm x 150mm x 150mm

**CYLINDRICAL MOULDS:-** Made of Cast Iron and used for testing of concrete cylinder  
For compressive strength tests.

Size:- (a) 10 cm dia x 20 cm height  
(b) 15 cm dia x 30 cm height  
(c) 30 cm dia x 60 cm height

**(C) BEAM MOULDS :-** Made of Cast Iron for casting, concrete specimens for flexure test.

Size:- (a) 100mm x 100mm x 150mm  
(b) 150mm x 150mm x 750mm  
(c) 150mm x 150mm x 750mm

#### **MICRO-22 VIBRATING TABLE**

It is used for compacting concrete cubes and cylinders. The apparatus consists of a motor fitted with variable pitch pulley housed in a cabinet. The variable pitch pulley arrangement permits the frequency to be varied steplessly between a maximum of 3600 vibrations down to 2600 vibrations per minute. A speed regulation handle is provided for starting the motor suitable for operation on 440 volts, 3 phase, 50 cycles, A.C. supply.

**Size :-** 50cm x 50cm, 75cm x 75cm and 100cm x 100cm.

#### **MICRO-23 VIBRATING MACHINE:- As per IS: 4031 – 1968**

It is used for preparation of mortar cubes for the determination of compression strength of ordinary and rapid hardening Portland cement, Portland blast furnace cement and high alumina cements. The machine consists of a vibrating frame assembly and an electric motor mounted on a sturdy base. The complete frame assembly consists of a vice to hold a 70.6mm cube mould and two studs threaded at top and a hooper to feed the sample in the Mould. This assembly is supported by four springs. The Electric motor drives the shaft of the frame and thus imparts required vibrations to the mould. The frequency of vibrations is 12000 +/- 400 vibrations per minute. Supplied with timer also.

#### **MICRO-24 COMPRESSION TESTING MACHINE:-**

It is for use of strength of concrete is obtained by crushing the sample in form of cubes and Cylinders. Concrete is carefully designed for a particular compressive strength by the Engineers and specimen is tested by applying load in Compression Testing Machine. The range of Compression Testing Machine is 10 Tonnes to 200 Tonnes in different Models like Pillar Model & channel models. With special attachment the machine can also be used for Bricks. Compression Testing Machine consist of a load frame with suitable platens and a pumping unit with Pressure Gauge, Either **Hand operated or Electrical-Cum-hand operated**. Load Frame and pumping Units are connected by pressure pipes.

#### **MICRO-25 CONE PENETROMETER:- As Per IS: 2250-1965**

For determining the consistency of masonry mortar. It consists of a moveable bearing rod to which a cone 145mm long and 75mm dia at a base is fixed. The bearing rod passes freely through bracket which is provided with release mechanism. A dial graduated in mm with rack & pinion is provided for measuring the penetration. Complete with a conical container 150mm I.D. x 180mm deep and a platform.

#### **MICRO-26 POCKET CONCRETE PENETROMETER**

Consist of needle having face area 3/10 sq. cm. and graduated at a distance of 25 cm. The Needles point is an integral part of barrel which houses a calibrated spring. The spring is Confined in a sleeve. The resistance offered by the concrete mortar is shown on the direct reading scale with a marker ring which holds its position when released. Scale range is 0-50 kg/cm<sup>2</sup> when the penetration resistance reaches a value of 35 kg/cm<sup>2</sup> the concrete is assumed initially set. It is used for fast evaluation of the initial setting of concrete.

#### **MICRO-27 TENSILE STRENGTH TESTER:- As per IS: 269 - 1950**

It is used for making tensile strength test on cement briquettes. It is suitable for tensile test s upto 1200 Lbs or 540 kg. It is hand operated, with automatic loading by lead shots. Two calibrated scales 100 lbs x 1 lb. and 50

kg. x 0.5 lb. are engraved. Complete with one brass briquette mould with base plate, lead shots 15 kgs, weights to weigh 50kg. 100kg., 150kg. and 200kg. Lead shots & Briquette Mould in spares also.

#### **MICRO-28 CONCRETE TEST HAMMER**

It is used for quick and approximate measurement of the resistance of manufactured concrete products. The principal on which based on the rebound impact of a hammer on a piston which rests against the surface on the concrete products. The greater the resistance of the concrete, greater is the rebounded impact. By reading this rebound impact on a scale and relating it to curves on a graphs supplied with the instrument, the resistance to compression in MPa or PSI can be found, with +/- 20% of actual. Each hammer is calibrated against at standard Test Hammer, and is suitable for specimen of compressive strengths 100 – 700 kg/cm. The Instrument, complete with a grinding stone for polishing the test surface, is supplied in carrying case.

#### **MICRO-29 FLEXURE TESTING MACHINE :- As Per IS: 516, ASTM C78 (Hand Operated)**

The machine consists of a hand operated load frame. Lower platen has two rollers, the distance between which is adjustable. For 150mm x 150mm x 700mm beam, the centre distance between the rollers is 600mm, while it is 400mm for beams of size 100mm x 100mm x 500mm size beam. The upper platen has also a pair of rollers whose distance is adjustable. A pressure gauge to indicate load is fixed on the load frame. A small pumping unit is attached to the load frame. Total capacity of the machine is 100kN.

#### **MICRO-30 FLEXURE TESTING MACHINE (Electrical)**

Same as above but instead of hand pumping unit, a separate electrically-cum-hand operated pumping unit housed in a cabinet is supplied. The pressure gauge 0-100kN is fitted on the front panel of the pumping unit. A micro switch and relay fitted inside the pressure gauge for protection of overloading. Hand Operated facility is also provided.

#### **MICRO-31 NEEDLE VIBRATOR:-**

A motor fitted on a swivel base drives a flexible shaft, which is turn, vibrates the needle at about 10,000 vibrations per minute approx. With 25mm diameter x 350mm long needle, a one meter long flexible shaft and a motor drive with a swivel head and on/off switch. Needle size 20mm & 40mm.

### **SOIL**

#### **MICRO-51 PLASTIC LIMIT SET:- As per IS: 2720 ( Part-VII)**

Moisture Contents at which soil has smallest plasticity is called limit. For determination purpose Plastic limit is defined as the water content at which a soil will just begin to crumble when rolled into a thread of 3mm dia. The complete set consists of Glass Plate 20cm x 15cm having ground ends and one side frosted. Brass Rod 3mm dia x 150mm long flexible spatula, Moisture Tins -6 Nos, Porceline Dish and wash bottle 500ml.

#### **MICRO-52 SHRINKAGE LIMIT SET:- As per IS: 2720 (Part-VII)**

Shrinkage Limit is the maximum water content at which a reduction in water contents does not cause an appreciable reduction in volume of the soil mass. At shrinkage limit, on further reduction in water, air enter into the voids of soils and thus keep the volume constant. It consists of Porceline Dish, Shrinkage dish, glass cup 4, Perspex plate with three metal prongs, Flexible spatula, Glass Cylinder 25ml., Mercury.

#### **MICRO-53 CONE PENETROMETER:- As per IS: 2720 (Part V)**

For determining the liquid limit of Soils. This specially useful to obtain reliable and accurate results for those soils which have low plasticity index. The percentage moisture contents determined when cone with half angle of 15-30 minutes under a total sliding weight of 148 gm penetrates 25mm gives the liquid limit.

#### **MICRO-54 HIGH SPEED STIRRER**

It is for mechanical analysis and also other laboratory applications for stirring. Speed Approx. 4000 rpm under load. For operation on 230 volts A.C.

**MICRO-55 LIQUID LIMIT DEVICE:- As per IS: 2720 (Part-V) 9259**

It is also known as Casagrande Apparatus. For determination purpose liquid limit is that water content at which a part of soil cut by a groove of standard dimensions will flow together for a distance of 1.25cm under an impact of 25 blows in a standard liquid limit apparatus. The soil at the water content has some strength which is about 0.17 N/cm.sq. (17gms/sq.cm.). At this water content soil just passes from liquid state to plastic state. It consists of a brass cup held on adjustable bracket. The cup can be adjusted for a fall of 1cm and can be raised and dropped on a rubber base of standard hardness by cam action. Complete with grooving tools.

**MICRO- 56 LIQUID LIMIT DEVICE (WITH COUNTER)**

Same as above but fitted with a counter to count the number of blows.

**MICRO-57 LIQUID LIMIT DEVICE (MOTORISED)**

Same as above but fitted with motor geared down to give approx. 120 r.p.m. Suitable for operation on 230 volts, single phase, 50cycles, A.C. supply.

**MICRO-58 GRAIN SIZE ANALYSIS (PIPETTE METHOD) As per IS: 2720 (Part-IV)**

It is used for the determination of the sub sieve particle distribution in a soil sample by mechanical analysis. The app. consists of a sliding panel which moves up and down by means of a screw allowing Anderson pipette fixed it to be raised or lowered vertically. Sedimentation tube is held by a laboratory clamp provided on the stand below the pipette. The depth of immersion is measured by a scale graduated in mm at the side of the sliding panel. Complete with Anderson Pipette 10ml. and a sedimentation tube of 500ml. & Test Form pad of 50 nos.

**MICRO-59 MARSH CONE**

It is used to find out Viscosity of Bentonite slurry and like material. Size of Marsh Cone is 15cm dia at the top and 30cm long and tapers to join a tube 5cm long. The capacity of the funnel is 1500 cc. Time in seconds required to flow out 1000 cc of slurry from cone is measured as funnel viscosity of the material.

**MICRO-60 SOIL HYDROMETER:- As per IS: 2720 (Part-IV) & 3104**

It is used for grain size analysis of soils where more than 10% of the material will pass through 75 microns I.S. Sieves. Made of Glass having uniform clarity. The scale range is 0.995 to 0.130 density (gms/cc) at 27 degree C. Accuracy is 0.0005.

**MICRO-61 SAND POURING CYLINDER:- As per IS: 2720 (Part-XXVII) – 1966**

This apparatus is used for dry density of compact, fine and medium grained soils and for layers not exceeding 50cm thickness. The app. consists of small sand pouring cylinder with 3 litre cap. Fitted with conical funnel and shutter. Cylinder calibrated container I.D. 10cm and depth 15cm. fitted with a flange, Metal tray, 30cm. square and 4 cm deep With hole of 10cm dia in the centre. ( Sand Pouring Cylinder is also available in 15cm dia and 20cm dia.)

**MICRO-62 CORE CUTTER APPARATUS:- As per IS: 2720 (Part- XXIX) - 1966**

It is used for determination of in situ dry density of natural or compacted fine grained soil free from aggregate. A cylindrical cutter is used to extract a sample of soil with the help of a dolly and rammer. From the weight, density and the moisture and dry density of the soil is readily calculated. Cylindrical core cutter 127.3mm long x 100mm internal dia, made of steel. Steel Dolly 25mm high. & Rammer (Wt. 12kg.approx.) with detachable steel rod.

**MICRO-63 STANDARD COMPACTION SET:- As per IS: 2720 (Part-VII)**

The apparatus consists of Compaction Mould 100 mm I.D. x 127.3 mm height x 1000 cc volume complete with collar and base plate & Rammer 2.6 kg. x 310mm controlled fall.

**MICRO-64 HEAVY COMPACTION SET:- As per IS: 2720 (Part-VII)**

The apparatus consists of Compaction Mould 150 mm I.D. x 127.3 mm height x 2250 cc volume complete with collar and base plate & Rammer 4.89 kg. x 450mm controlled fall.

#### **MICRO-65 UNIVERSAL AUTOMATIC COMPACTOR:- As per IS: 2720 (Part VII & VIII)**

It is a motor driven mechanical compactor useful for soil compaction into 100mm or 150mm diameter moulds. Two sets of rammers are provided, one of 2.6 kg. and arranged for 310 mm drop and other 4.9 kg and arranged for 450 mm fall for compaction soil into 150 mm dia moulds, 100 mm face dia rammers having weight 2.6 kg. and 4.89 kg are used. Where as for 100 mm dia moulds they are of 50 mm dia. The rammer assembly is provided with a ratchet and pawl arrangement to lift it from the top of the soil layer. When the rammer reaches the required height the pawl release the rammer which falls freely on soil surface. The release mechanism is operated by an arm moving up and down which is connected to a reduction gear coupled to the motor through another arm. An automatic blow counter fitted to the compactor is used to set the number of blows. The base plate of the specimen mould is to be fitted to the rotating base plate of the instrument which makes 1/5<sup>th</sup> revolution per stroke. The equipment is suitable for operation on 230 volts, 50 cycles, single phase, A.C. supply.

#### **MICRO-66 MOISTURE TINS**

To determine moisture contents in soil and other material. These are made of aluminium or Stainless Steel. Sizes available are 25mm, 50mm, 75mm and 100mm dia.

#### **MICRO-67 POCKET PENETROMETER**

It is used to estimate approx. unconfined compressive strength and the estimation of shear strength of soil. Cohesive soils can also be classified in term of consistency using this penetrometer. This is a handy and convenient instrument.

#### **MICRO-68 PYCNOMETER**

It is used to determination specific gravity of clays, sand and gravel of size smaller than 10 mm. Comprises of 1 gk. glass jar with brass cone, locking ring and rubber seal.

#### **MICRO-69 RAPID MOISTURE METER**

For quick determination of moisture content of material in powder from viz. soil, sand, coal, pottery slip, and cement etc. The unit consists of a pressure vessel with clamp for sealing cap, rubber sealing gasket, pressure gauge is calibrated in percentage moisture content 0-25% / 0-50% on the wet weight basis a counter poised balance for weighing sample, a scoop for measuring carbide reagent, a bottle of reagent. One cleaning brush and a set of 4 steel balls for thorough mixing. Complete in highly polished wooden carrying case with handle.

#### **MICRO-70 SOIL TESTING KIT**

A very useful kit to determined on the spot soil pH value. This a compact kit easy to carry on site. It consists of 12 test tubes with rubber bungs. 1 tube cleaning brush, 1 bottle of barium sulphate(100 gm), 1 bottle of soil indicator (100 gm), 1 bottle of distilled water (500 gm), 1 spatula, 1 colour chart, range 4.0 to 8.0 pH in 0.5 pH steps. Complete with carrying case.

#### **MICRO-71 DIRECT SHEAR APPARATUS:- As Per IS: 2720 (Part – VIII)**

For determination of direct shear strength of soils on specimen size 60 x 60 x 25 mm the App. consists of load yoke with direct and lever system for applying load. Normal stress cap. 8kg./sq.cm. Load is applied either directly or through a counter balanced detachable lever. Provision is made for the load to be applied either directly or through a steel ball recessed in the loading pad or direct through boss on the pre calibrated loading yoke. The loading unit is provided with V strips and roller strips for frictionless movement of shear box housing. Shear Box Assembly:- Comprising Direct shear box in two halves for a square specimen Size 60 x 60 x 25 mm one pair of plain gripper plates, one pair of perforated gripper plates one pair of porous stones, one top loading pad. Shear box housing: Accommodates the Direct Shear Box assembly. Complete with two ball roller strips.

**Specimen Cutter:-** For cutting 60 x 60 x 25 mm specimen from larger samples. Set of weights to give a normal stress of 3 kg./sq.cm. through lever as follows:

To give Kg/cm.sq. Qty. 4 Nos. 0.1, 1 No. 0.2, 1 No. 0.5, 3 Nos.1.0, 1 No.

Complete with Proving Ring cap. 200 Kg. One consolidation dial gauge and one strain dial gauge 0.01mm x 25mm.

**MICRO-72 DIRECT SHEAR APPARATUS (MOTORISED SINGLE SPEED)**

Same as above but electrically operated to give a single constant rate of strain 1.25 mm/min. Suitable for 230 V A.C.

**MICRO-73 DIRECT SHEAR APPARATUS (MOTORISED SIX SPEED)**

Same as above but having 6 rates of strain 1.25, 0.25, 0.05, 0.01, 0.002 & 0.0004 mm/min. Works on 230 V A.C..

**MICRO-74 DIRECT SHEAR APPARATUS (MOTORISED 12 SPEEDS)**

Same as above but having 12 rates of strain. 1.25, 0.625, 0.25, 0.125, 0.05, 0.025, 0.01, 0.005, 0.002, 0.001, 0.0004 and 0.0002 mm/min. Works on 230 V A.C.

**MICRO-75 PERMEABILITY APPARATUS:- As per IS:2720 (Part – XIII) – 1966**

It is used for the laboratory determination of permeability of soils using a constant or a variable head. This test is recommended for soils with co-efficient of permeability in the range of  $10^{-3}$  to  $10^{-7}$  cm/sec. The maximum particle size of the soil which can be tested in the mould is 10 mm. The equipment comprises one each Gun metal mould 100 mm I.D. x 127.3 mm high x 1000 ml volume. Gun Metal mould extension collar 100mm dia x 60 mm high for the above mould. Gun metal drainage base plate with a recess for a porous stone and with an outlet valve. Metallic clamping ring. Gun Metal drainage cap. Gun metal dummy plate to serve as a false bottom during compaction. Porous stone for drainage cap. Porous stone for base plate. Set of glass stand pipes Approx. 6 mm dia., 10mm dia and 20mm dia mounted on a wooden board. Each glass tube is longer than 1 meter and has a serrested end at the bottom. To read water head 2 nos. meter scales are fixed between the tubes. A length of 3 meter long rubber tubing with pinch cock is also supplied.

**MICRO-76 UNCONFINED COMPRESSION TESTING MACHINE (HAND OPERATED)**

As per IS: 2720 (Part – X) Proving Ring Type

This is hand operated instrument for determining the unconfined compression strength of soil specimens of diameter ranging from 38mm to 100mm. Load on the sample is applied gradually by a hand operated load frame and loads are measured on a sensitive proving ring attached to the load frame. It comprises of a hand operated load frame, cap. 5000 kgf with screw jack for loading, handle and strain dial gauge bracket, adaptor for proving ring, conical seats and male/female coning tools for 38mm dia samples.

**MICRO-77 UNCONFINED COMPRESSION TEST MACHINE (MOTORISED)**

Same as above but fitted with motor driven permitting a choice of three constant rates of strain. Comprises a screw operated load frame 5000kg with a gear box and motor drive giving 1.25, 1.5, 2.5 mm/min. rates of strain, a pair of cone seating, adaptor for proving ring, and strain dial gauge bracket. Suitable for operation on 230 volts, single phase A.C supply. Coning tools in pairs (male & female) for samples having diameter 38, 50, 75 & 100 mm.

**MICRO-78 TRIAXIAL SHEAR TEST APPARATUS (HAND OPERATED)**

For determination of triaxial shear strength of soil specimens of 28 mm diameter. The length to diameter ratio of sample is 1:2. Specifications:- One loading unit, for single unit, for single cell mounting, cap. 5 tonnes, Hand operated. The loading unit is supplied with one dial gauge bracket. One triaxial cell for 38 mm dia specimen, stationary bushing, lateral pressure assembly, 0-10 kg/cm sq., complete with foot pump and rubber hose. One dial gauge 0.01 mm x 25 mm for strain measurement. One high sensitive Proving Ring cap. 200/250 kg. with calibration report and carrying case.

**MICRO-79 TRIAXIAL SHEAR TEST APPARATUS (MOTORISED) SINGLE SPEED**

Same as above but supplied with motorised load frame. The load frame is supplied with this outfit is bench mounting type motorised load frame of cap. 5000kgf having constant rate of strain 1.25 mm/min. Suitable for operation 230 volts A.C.

**MICRO-80 TRIAXIAL SHEAR TEST APPARATUS (MOTORISED) SIX SPEED**

For determination the triaxial shear strength of soil specimens of 38 mm, 50 mm, 75mm, and 100 mm dia. Consists of load frame cap. 5000 kgf motor driven, constant six rates of strain 1.25, 0.25, 0.05, 0.01, 0.002 0.0004 mm/min.

**(TRIXIAL SHEAR TEST APPARATUS ALSO AVAILABLE IN 30 SPEEDS)**

**MICRO-81 CALIFORNIA BEARING RATIO APPARATUS (C.B.R) (HAND OPERATED)**

As per IS: 2720 (Part – XVI)

The C.B.R. method is used for finding the relative bearing ratio and expansion characteristics of soil of base, sub-base and sub grade for the design of roads, pavements and runways. The equipment consists one each of the following:- Load frame hand operated Cap. 5000 Kg. with high low rates of travel of the lead screw. Made of Gun Metal/M.S. 150 mm I.D. X 175 mm high, with perforated brass plate and extension collar 50mm high, penetration Piston face dia 50mm with adj. bracket for penetration dial gauge. Circular metal space disc 148mm dia with 53 mm dia central hole. Slotted metal weight 2.5 kg. 147mm dia with 53mm dia slot. Metal tripod for dila gauge, cutting collar, rammer 2.6 kg wtx310mm drop, Rammer 4.89 kg. x 450mm drop with proving ring and dial gauge.

**MICRO-82 CALIFORNIA BEARING RATIO APPARATUS (MOTORISED)**

Same as above but fitted with motor bench mounting type cap. 5000 kgf load frame. The lead screw of the load frame has a single constant rate of travel of 1.25mm/min. Acc.:- High sensitivity Proving Ring Cap. 1000/3000 kg. with calibration chart and carrying case. Dial gauges 0.01 mm x 25 mm. Annular metal weight 5 kg 147 mm dia with 53 mm dia slot.

**MICRO-83 SPLIT SPOON SAMPLER:- As per IS: 2131 – 1963**

It is used for Standard Penetration Test. For determination of penetration resistance (N Value) of soil which can be related to unconfined Compressive strength. Penetration resistance (N value) of soil is determined by giving a number of blows with a 65 kg. wt. falling through a given distance of 75 cm required to penetrate the assembly to a depth of 30 cm, when properly seated on the ground. The sampler is made from steel tube split lengthwise and held together by a head fitted with a ball check valve and a hardened steel shoe of inside cutting edge of 35mm dia. The Á'type drill rods is also supplied.

**MICRO-84 SPLIT SPOON SAMPLER WITH LINER**

Same as above but the diameter is increase to accommodate a brass liner.

**MICRO-85 SIEVES**

Sieves are used for for sieving of medical powders, aggregate, sand, soil and cement etc. These sieves are manufactured as per ISS, BSS and ASTM standard. These are available in Brass frame and G.I. frame. Sizes are available in 200mm, 300mm and 450mm dia.

**MICRO-86 SIEVES IN BRASS FRAME 200MM DIA**

Sizes:-

As per (BS 410-1969)	As per IS 460 Part-I, 1985	(ASTM E 11-70) Microns	Aperture
-	4.75 mm	4	4750
4	4.00 mm	5	4000
5	3.35 mm	6	3350
6	2.80 mm	7	2800
7	2.36 mm	8	2400
8	2.00 mm	10	2000
10	1.70 mm	12	1680
12	1.40 mm	14	1400
14	1.18 mm	16	1200
16	1.00 mm	18	1000



18	850 microns	20	850
22	710 microns	25	710
25	600 microns	30	600
30	500 microns	35	500
36	425 microns	40	425
44	355 microns	45	355
52	300 microns	50	300
60	250 microns	60	250
72	212 microns	70	210
85	180 microns	80	180
100	150 microns	100	150
120	125 microns	120	125
150	106 microns	140	106
170	90 microns	170	90
200	75 microns	200	75
240	63 microns	230	63
300	53 microns	270	53
350	45 microns	325	45
400	38 microns	400	38
500	25 microns	-	25

#### **MICRO-87 SIEVES IN G.I. FRAME 300MM & 450 MM DIA**

Size:- 125, 106, 100, 90, 80, 75, 63, 53, 50, 45, 40, 37.5, 31.5, 26.5, 25, 22.4, 20, 19, 16, 13.2, 12.5, 11.2, 10, 9.5, 8, 6.3, 5.6, 4.75, 2.36 & 1.18 mm.

#### **MICRO-88 LID & PAN (L.P.)**

Lid and pan in Brass frame for 200mm dia sieves and in G.I. frame for 300 and 450 mm dia is also provided.

#### **MICRO-89 SIEVE SHAKER (HAND OPERATED)**

This is a portable sieve shaker suitable for bench mounting. The side to side movement to the carrier which can take sieves of 200mm, 300mm and 450 mm dia is through a train of gears operated by a hand wheel. A heavy fly wheel ensures smooth operation.

#### **MICRO-90 SIEVE SHAKER (GYRATORY)**

It carries upto 7 sieves of 200 mm dia. The shaker is driven by a ¼ h.p. motor through a reduction gear immersed in oil. There is an upward and downward movement ensuring that each square cm of the sieve is utilised. A pair of rods and a holder are supplied. The holder can be fixed on the top of the upper most sieve thus the sieve set is firmly held. Suitable for 230 volts, 50 cycles A.C. supply. Time switch of 0-60 mins is also provided. Graduation on time switch is 5 mins.

#### **MICRO-91 SIEVE SHAKER (ROTAP)**

For simple and quick sieving Rotap Sieve Shaker is useful. This produces circular shaking of the sieves. At the same time the sieves are tapped. The mechanism for imparting circular action and tapping is oil immersed in a tank and is motorised. The shaker can accommodate upto 7 sieves of dia 200 mm. Suitable 230 Volts, A.C.

#### **MICRO-92 SIEVE SHAKER (WET)**

This is Yodar type, motor driven sieve shaker for carrying out wet sieve analysis of material. It consists of a water reservoir and a holder for sieves, which can take upto 7 sieves of 200 mm diameter. Shaker is driven by ¼ H.P. motor through a belt drive. Shaker mechanism moves the sieves up and down in the reservoir. The reservoir has a water out-let for draining out the used water. Suitable 230 Volts, A.C.

#### **MICRO-93 SIEVE SHAKER (WET) FOR 4 SIEVE SETS**

Same as above but with a provision for mounting 4 sieve sets at a time.

## **BITUMEN**

### **MICRO-94 Ring & Ball Apparatus:-** As Per IS:1205-1985, IP:58/63

This App is used to determine softening point of bitumen. It is that Temp. at which of bituminous material loaded by a 9.5mm dia steel ball, drops at a distance of 25mm.

### **MICRO-95 Ring & Ball Apparatus (Electrical):-**

Same as above but supplied with a thermostatic hot plate. Suitable for operation on 230V A.C. Accessories: Thermometer IP60\*c range -2\*c to 80\*c x 0.2\*c, Thermometer IP61\*c Range 30\*c to 300\*c x 0.5\*c, Electrical Stirrer with stand and blades to gently stir water In the beaker . suitable for operation on 230v A.C.

### **MICRO-96 Standard Penetrometer:-** As Per IS: 310, 1203, 1448, IP: 60, 50, 49.

Used to determine grade of bitumen. The penetration tests determine consistency of Bitumen for the purpose of grading. Depth in units 1/10 of millimetres to which a standard needle having a standard weight will penetrate vertically in a duration of five seconds at a temperature of 25\*c determines penetration for gradation.

### **MICRO- 97 Automatic Standard Penetrometer:-**

Same as above but supplied with transistorized timer and electro-magnet incorporated in the clutch mechanism to accurately control penetration time to exact five seconds.

### **MICRO-98 Ductility Testing Apparatus:-** As per IS: 1028-1958, ASTM: D 113, IP 32,55.

In flexible pavement construction , bitumen binders are used. It is important that Bitumenous material forms ductile thin film around the aggregates, which serves as a Binders. The blinder material not of sufficient ductility renders pervious pavement surface and leads to development of cracks. Therefore it is important to carry out the ductility tests on bituminous material. Ductility is defined as a distance in cms to which a standard briquette of bitumen can be stretched before the thread breaks. The briquette is stretched at a rate of 50 mm/minute +/-2.5 mm per minute at a temperature of 27\*c +/- 0.5\*c.

### **MICRO-99 Stripping Value Apparatus:-**

For determining stripping value of bituminous mixes having aggregate size 1.0mm to 75 Microns.

### **MICRO-100 Benkelman Beam:-**

This equipment developed by U.S. Bureau of public Roads and is used to measure deflections of flexible pavement. The light weight instrument is supplied in two parts for assembling on site with easy hand tools. 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. Supplied with a dial gauge 0.01 x 25mm. This is a light weight dismantlable instrument can easy to carry.

### **MICRO-101 Centrifuge Extractor (Hand Operated):-** ASTM: D2172, AASHTO: T-58, T-164.

This instruments used to determination and checking of bitumen percentage in bituminous mix, the mix is added with a solvent and dissolved bitumen is removed by centrifugal action. It consists of a removable aluminium rotor bowl, Capacity 1500gms, with a cap and tightening nut. The bowl assembly is mounted on a vertical shaft which produces from a cast housing. The shaft and the bowl is rotated fast manually by enclosed gears in the cast body and handle. Solvent is introduced during the test through the holes in the cap of the housing. A drain is provided to collect dissolved bitumen coming out of the rotating bowl and getting collected in the housing.

### **MICRO-102 Centrifuge Extractor (Motorised):-**

Same as above but shaft is rotated by an electric motor and gear. Care is taken to prevent solvent entering into the rotor of electrical motor. Operates on 230 Volts A.C. single phase.

### **MICRO-103 Marshall Stability Test Apparatus:-** ASTM: D 1559-T-62

Originally developed by Bruce Marshall, a highway engineer in U.S.A. later on standardised by ASTM. Generally the test is applicable to hot mix design using bitumen and aggregates upto a maximum size of 25mm.

In this method, the resistance to plastic deformation of cylindrical specimen of bituminous mixer is measured when the same loaded at periphery at 5cm per min. This test procedure is used in designing and evaluating bituminous paving mixes. The test procedure is extensively used in routine test programmes for paving job. There are two major of the Marshall method of designing mixes namely .a) Density- Voids Analysis b) Stability- Flow Test. The Marshall stability of mix is defined as a maximum load carried by a compacted specimen at a standard test Temp. of 0-60\*c. The flow value is deformation the marshall test specimen under goes during the loading upto the maximum load, in 0.25 mm units. In the test and attempt is made to determine optimum blinder content for the type of aggregate mix and traffic intensity.

**The Apparatus Consists of:-**

- A loading unit motorised, Capacity 5000kgf with two telescopic pillars and an adjustable cross head . limit Switches are fitted inside to control upward or downward movement of the pillars. On-off reversing switch and indicator lamps are on the front side while a hand wheel to manually move the pillars is on the right. The load frame has fixed speed of 5.08cm, per minute. Operated on 230Volts A.C.
- 1 No. Proving Ring with our Calibration capacity 25kN.
- 1 No. Dial Gauge 0.01 x 25mm make Ashai.
- 1 No. Compaction Pedal with Specimen mould holder.
- 1 Nos. Compaction Rammer 4.5 kg weight and free fall 45.7cm.
- 1 No. Breaking head assembly with provision to fix flow meter.
- 1 Nos. Specimen Mould 10.16 cm I.D. x 7.6cm height with base plate and collar.

**MICRO-104 Automatic Bituminous Compactor:- As Per ASTM D-1559**

This new 'EXCEL' App. automatically simulates hand compaction as specified in ASTM Test D-1559 (Resistance to Plastic flow of Bituminous Mixes) and develops a uniformity in the test procedure. Supplied complete with operating frame, standard compaction hammer assembly, motor and controls, and compaction pedestal. The New EXCEL automatic bituminous compactor will accommodate one standard bituminous mould at a time. The moulds are held in position by a quick clamping device so that they are easily inserted and removed from the apparatus. The apparatus features a new design in the lift and release mechanism to develop uniformity in the height of the drop of the hammer. The basic design of the hammer is the same as that used for the hand compaction procedure. The hammer is free to rotate on the guide shaft for a full 360\* to eliminate friction in the drop. The unit is supplied with an automatic counter which can be preset for 50 or other specific number hammer drops after which it will automatically be shut off. Powered by a ½ Hp motor , The new EXCEL Automatic bituminous Compactor is available for 220Volts, 50 Hz AC operation. The compactor is supply with the standard base pedestal which consists of a 300mm x 300mm x 25mm thick steel plate mounted on an 20mm x 200mm oak block as required by ASTM specification

**MICRO-105 Bituminous / Asphalt Mixer:- As Per ASTM D-1559.**

The mixers are suitable for mechanical mixing of hot-mix bituminous mixtures. It is designed according to the description in specification of the State of California Test method 304B. And or uniform mixing of Bituminous and Asphalt mixing. The stainless steel mixing bowl has the capacity of 5 liters. The pedal also of a stainless steel, can have both planetary and revolving motion for uniform mixing. In operation the paddle is rotated at two speeds i.e. low and high r.p.m to agitate and mix the mixture vigorously with the aid of the spring steel baffles also inserted in the bowl.

**AGGREGATE**

**MICRO-106 Thickness Gauge:- As per IS: 2386**

Used for determination of flakiness index of aggregate.

**MICRO-107 Length Gauge:- As per IS: 2386**

Used for determination of elongation index of aggregate.

**MICRO-108 Cylindrical Measure: As per IS: 2386( Part-III)**

Used for determination of bulk density or unit weight of aggregates. Consist of 3 measure one each 3 liter capacity, 15 liter capacity, 30 liter capacity.

**MICRO-109 Density Basket: As per IS: 2386 (Part-III)**

For determination of density test of aggregate. Size 20cm dia x 20cm ht.

**MICRO-110 Riffle Sample Divider:- As per IS: 1607- 1960**

Used for sampling aggregates, ores, refractory material, pigments, powdered coal, soap, cement etc. Having 14 no. chutes of 13mm width and is complete with two receivers.

**MICRO-111 Aggregate Crushing Value Apparatus :- As per IS 9376, 2386(PART-IV)**

For measuring of resistance of aggregate to crushing. Consisting of M.S. Cylindrical Container 150mm dia x 130mm high with base plate 220mm sqyare x 6mm thick. A Plinger of 148mm dia x 110mm high. Supplied with Tamping Rod & Metal Measure.

**MICRO-112 Aggregate Impact Tester with Blow Counter:- As per IS 2386(PART-IV)**

For determination of the aggregate impact value. The instruments consists of a circular base with two vertical guides. The hammer of weight 13.75kg can be raised to fall freely down the vertical guides. The height of fall can be adjusted through 380mm. The hammer is provided with a locking arrangement. The hammer falls freely to the base and is removable for emptying. Supplied complete with metal measure 75mm dia x 50mm ht. and tamping rod 230mm long x 10 mm dia.

**MICRO-113 DORRY ABRASION TESTING MACHINE:- As Per BS: 812**

For Testing aggregates for resistance to abrasion. It consists of a disc rotating about a connected to a reduction gear box coupied to a motor. The disc rotates at 28-30 r.p.m. under the rotating disc is a tray with an outlet to facilitate the removal of sand. Two conical hoppers are mounted on a bracket fixed to the circular tray. An arrangement is made for start and stop the flow of sand. Two holes are provided for mounting two specimens simultaneously. Two containers with weights are supplied to keep the specimens pressed against the rotating disc. Suitable for operation on 220 volts, 50 cycles A.C. supply.

**MICRO-114 LOS ANGELES ABRASION TESTING MACHINE:- As per IS:2386 (Part IV)**

Used for testing crushed rock, crushed slag, crushed and crushed gravel for resistance to abrasion. It consists of a hollow cylinder mounted horizontally on a study frame on ball bearings. There is an opening which can be closed with a dust tight cover to facilitate charging and discharging of drum with the material under test. A detachable shelf which extends throughout the inside length of the drum which catches the abrasive charge and does not allow it to fall on the cover. The drum is rotated by an electric motor through a heavy reduction gear at a speed of 30-33 r.p.m. A revolution counter is fitted to the frame. A tray is supplied for collection of the material. Complete with abrasive charge consisting of a set of twelve hardened steel balls, approx. 48 mm dia. Suitable on 440 volts, 3 phase, 50 cycles, A.C. supply.

**MATERIAL TESTING**

**MICRO-115 CORE DRILLING/CUTTING MACHINE WITH GREAVES ENGINE**

Suitable to Cut/Drill cores of Concrete, Rocks, Stones, Tiles or the similar material. The machine is suitable for core samples of size upto 150 mm diameter, with the help of thin walled Diamond Bits. The machine has sturdy base with pillar support in which rack and pinion is provided for adjustment in height and penetration assembly. The levelling screw are provided at the base. For gripping the sample in position suitable grips are provided. fitted with GREAVES Engine and with cooling arrangement with water. The frame is fitted with wheels for ease of transportation.

**MICRO-116 SPRING TESTING MACHINE (Electric Cum Hand Operated)**

The Machine enable load deflection tests of tension and compression springs to be carried out accurately and quickly. The cabinet contains the hydraulic unit the hand wheel of the pump and the release valve handle are

outside the cabinet for easy operation This compact base carrier two fixed upright and four horizontal plates. The first and the third plates with two small uprights from an adjustable frame. The second and the fourth plates are fixed. A square threaded wheel arrangements provided for adjusting the height of the springs. A Bourdon type gauge is fixed for direct load measurement. One fixed for direct load measurements. One fixed upright is graduated to denote the deflections or tensions of the springs for direct readings. A thimble with on arrow mark is provided to facilitate the readings. The machine is capable of accomdating 8" length ½ dia. Rod upto 4" dia, springs for tension, 6"length ½" dia, rod, 4" springs for compression. Scale graduations are made upto 15 cms.

**GENERAL**

**MICRO-201 ENAMEL TRAYS/ G.I. TRAYS**

Enamel & G.I. trays are available in different sizes as under:-

Size:- 8" x 10" (200mm x 250mm)

10"x 12" (250mm x 300mm)

12"x 15" (300mm x 375mm)

12"x 18" (300mm x 450mm)

18"x 24" (450mm x 600mm)

24"x 24" (600mm x 600mm)

**MICRO-202 MEASURING TAPES (FREEMANS)**

Measuring Tapes are available in all standard sizes of FREEMANS Make in Steel, Fibre and Metallic Wire. Sizes available 3, 5, 10, 15, 30 & 50 meters.

**MICRO-203 MEASURING INSTRUMENTS**

Vernier Callipers and Micrometer screw gauges available in manually and Digital.

**MICRO-204 MEASURING JARS**

Measuring jars are available in Ord. Glass, Borosilicate Glass, and Borosil Glass in capacity of 50, 100, 250, 500, 1000, and 2000 ml. also available in Plastic.

**MICRO-205 THERMOMETERS**

Glass Thermometers are available in Mercury and Alcohol Range 50\*, 110\*, 250\*, 360\* and 400\* C available.

**MICRO-206 DIAL THERMOMETERS**

It Is useful for measuring of temp. of Soil, Bitumen or any hot material. As the temp. rises Bi-metal element expands and activates a pointer fixed on the dial to read temp. Size 100mm dia Temp. up to 400\* C available.

**MICRO-207 HOT AIR OVEN (UNIVERSAL)**

(Three side heating elements) Standard Double wall fabrication. Inner Chamber made of richly anodized Aluminium or highly polished Stainless Sheet(S.S.) sheet. Exterior fabricated out of thick mild steel duly finished in stoved enamel off – white paint or pastel mat finish colour combinations. The gap between the wall is filled with special grade glass wool for heat insulation. Inner chamber is ribbed for placing shelves. Provided with two or three removable shelves. Nichrome wire heating elements provided on three sides attain quick and uniform heating in range of 50\* C to 250\*C controlled by capillary type thermostat. L- shaped thermometer is built-in type. Control panel is provided with selector switch of high or low rates of power, thermostat control knob and indicators for mains & thermostat. Supplied with cord and plug. Suitable to operate on 220 V AC 50 Hz single phase.

Chamber Size inn mm/inch)	No. of Shelves
300 x 300 x 300 mm(12" x 12" x 12")	2
350 x 350 x 350 mm(14" x 14" x 14")	2
450 x 450 x 450 mm(18" x 18" x 18")	2
600 x 450 x 450 mm(24" x 18" x 18")	2
600 x 600 x 600 mm(24" x 24" x 24")	2

**MICRO-208 HOT PLATE (LABORATORY)**

Laboratory Hot Plates are available in round and rectangular shapes. Body is fabricated out of thick mild steel sheet duly finished in stoving enamel paint. The hot plate made of cast iron, nicely and precisely machined and smoothed duly finished in heat resistant black paint is firmly mounted on the body. Heavy duty heating elements are surely laid under the plate to operate on 220 V AC 50 Hz single phase. Temp. is controlled by a three heat rotary switch along with an indicator lamp for the mains and cord and plug.

- (a) HOT PLATE : (ROUND) Single 20 cm(8") dia.
- (b) HOT PLATE : (ROUND) Double 20cm(8") dia with two Plates.
- © HOT PLATE : (Rectangular) Diff. sizes are available as per requirement.

**MICRO-209 WATER BATH (SEROLOGICAL)**

Double Wall construction, inner being made out of highly polished thick stainless steel and outer made of thick mild steel sheet finished in stoving white enamel paint or staple mat colour combinations. The gap is filled with special glass wool for temp. insulation. The bath is provided with a drain cock to easily drain out the water and clean the chamber when required. A pyramidal shaped cover is provided. Immersion type heating elements are fitted at bottom. Temp. range 5\* C above ambient to 80\* C with accuracy +/- 0.5\* to 1\* C is controlled by capillary thermostat regulated by a graduated knob on the panel, which is also provided with pilot lamp etc. The equipment is workable on 220 V AC 50 Hz single phase.

**Working Chamber size in mm (S.S.)**

- (a) 300 x 175 x 175(12" x 7" x 7")
- (b) 300 x 250 x 175(12" x 10" x 7")
- © 375 x 300 x 175 (15" x 12" x 7")
- (d) 450 x 300 x 175(18" x 12" x 7")
- (e) 600 x 300 x 175 (24" x 12" x 7")

(Also available with Digital Temp. Controller)

**MICRO-210 WATER STILL (DISTILLATION PLANT) WALL HANGING**

Casted aluminium vessel is electrically operated for getting pyrogen – free distilled water automatically. Wall hanging space saving arrangement is provided. The condenser is seamless. Fitted with automatic ejection device which operates automatically when water vessel gets dried. The baffle cup and condenser are made of thick stainless steel sheet.

**MICRO-211 WATER STILL (DISTILLATION PLANT) STAINLESS STEEL**

Specifications as above but made of Stainless Steel Sheet. Wall Hanging.

OUTPUT CAPACITY (Approx.)

- Output 2/3 litres per hour.
- Output 3/4 litres per hour.
- Output 4/5 litres per hour.

**MICRO-212 LABORATORY STIRRER**

Heavy and stable cast iron base duly painted with mild steel chrome plated upright Rod. AC/DC motor with stainless steel string shaft and blades, variable speed control unit provided. 1/20 HP motor provided for smooth long time stirring. Height of stirrer and stirring space adjustable. To work on 220 V AC 50 Hz single phase.

**SURVEY, DRAWING & GEOGRAPHY INSTRUMENTS****MICRO-301 ABNEY LEVEL:-**

With Improved reflector arc divided to single degree. With and without slow motion arrangement. Size available in 125mm and 225 mm.

**MICRO-302 AMMONIA PRINTING MACHINE (CONTINUOUS TYPE)**

Fitted with one Fluorescent Blue Actinic Tube Cap. 140 watt with motor driven. The machine is also provided with a special blowing system to cool the cylinder and the tubes. Model available in Single Tube and Three Tube Model.

**MICRO-303 AMMONIA PRINTING MACHINE (NON-CONTINUOUS TYPE)**

Semi Drum type and is designed to save time lost in fixing rotating and taking out tracing from spring loaded machine cap. 40 watt with 5 Blue Tubes.

**MICRO-304 BRUNTON COMPASS**

For all topographical preliminary surface and under ground surveys with graduated circle made of gunmetal, engraved to 360\* with magnet needle. Complete in leather case with telescopic metal stand.

**MICRO-305 CLINOMETER COMPASS**

Size 75 mm with bar needle jewelled centre and anodized dial. Complete in leather sling case. It can be used as "Sight Compass" and also as a "Clinometer".

**MICRO-306 DRAWING BOARD**

Made of best highly and seasoned pine wood with tangle joints and strong battons at back. Fitted with wooden screws to allow expansions and contraction of the wood due to atmospheric changes. Sizes available are:-

- 1000 x 1500 x 22mm (40"x 60")
- 825 x 1350 x 20mm (33"x 54")
- 700 x 1000 x 20mm (28"x 40")
- 575 x 810 x 15mm (23"x 32")
- 400 x 575 x 15mm (16"x 23")
- 300 x 450 x 15mm (12"x 18")

**MICRO-307 DUMPY LEVEL (ERRECT IMAGE)**

Size 228 mm (9") internal focussing fitted with horizontal circle graduated to read 6 minutes with vernier and can be quickly preset to zero degree. All moveable parts are made of Gun Metal and Brass, supplied in F.R.P. Box & Telescopic Aluminium Stand.

**MICRO-308 DUMPY LEVEL (Sup. Quality)**

Size 300 mm (12") Internal Focussing with compass having floating ring read 30 mins. with sliding prism, made of Full Brass supplied in highly polished wooden tripod stand.

**MICRO-309 DUMPY LEVEL (Trade Quality)**

Size 300 mm (12") Internal Focussing made of Brass & Aluminium Mix quality complete with wooden box and highly pushed wooden stand. (Also available in (9") with box and stand.)

**MICRO-310 TILTING LEVEL (I.O.P. LEVEL)**

Size 228 mm (9") Internal focussing, with opticals peep sight of alignment with the levelling staff. The tilting drum is provided with graduation to read 1 : 5000. Axis-set and foot screws are made of gun metal and brass, Complete with box and telescopic aluminium/wooden stand.

**MICRO-311 AUTO LEVEL (Made in JAPAN & Made in CHINA)**

These are Imported AUTO LEVELS. Excellent sealed structure for using in any weather, exclusive closed magnetic field, magnetically-damped compensator, friction braked rotation and endless horizontal drive, Prism for viewing circular vial. (Made in Japan & Made in China)

**MICRO-312 LAND MEASURING CHAIN**

Size available in 30 meter and 20 meter.

**MICRO-313 LEVELLING STAFF**

Confirming to I.S. specification, Telescopic type, supplied in canvass cover. Size available in 4 meter, 5 meter & 6 meter. Made of Aluminium.

**MICRO-314 NAUTICAL SEXTANT**

Made of Gun Metal/Brass frame, with circle of 20 cm, radius, from 0 to 130 degrees, direct reading upto 15 minutes upto 15 seconds, fitted with magnifying lenses and provided with slow motion tangent screw with two telescopes and with four intensity matching glasses. Packed in velvet line wooden case.

**MICRO-315 PLANE TABLE SET**

Size 750 mm x 600 mm x 20 mm Made of seasoned best Fire wood with teakwood battons at the back, having slots for Brass Screws and washer nuts for clamping. Complete with metallic head & disc. Brass.

**Accessories:-** Sight Vane (Alidade), Spirit Level, Magnetic Compass, Plumbing fork, Plumbob, Canvass Cover and highly polished wooden/Aluminium Stand.

**MICRO-316 PLANIMETER**

Improved sliding bar pattern for measuring areas direct from drawings, complete in a case. Size 710mm & 1140mm.

**MICRO-317 PRISMATIC COMPASS**

Made of Brass with aluminium floating circle graduated to read 30 minutes with sliding lenstic prism. An automatic lifter along with reflecting mirror is fitted on the sight vane complete in F.R.P/Leather Case with Aluminium/wooden stand having ball and socket head. Size available in 100mm, 125mm & 150mm dia.

**MICRO-318 SURVEY COMPASS**

Size 100mm dia Made of Brass with metal circle graduated to full degree with two bubbles and bar needle fitted with real agate stone to give very accurate bearings complete with Leather/F.R.P. case and stand having ball & socket head.

**MICRO-319 TANGENT CLINOMETER**

Fitted with rack & pinion arrangement with bubble & levelling screw in leather case.

**MICRO-320 TELESCOPIC ALIDADE**

Size 178mm (7") internal focussing with vertical circle graduated to read 30 minutes with vernier extendable case plate, extendable to 375mm complete with wooden box and accessories.

**MICRO-321 THEODOLITE (VERNIER TRANSIT THEODOLITE)**

Precision Direct Reading Vetrnier Transit Theodolite:- size 178mm (7"), Export quality fitted with optical plummet, and blue coated optics showing 'ÉRRECT IMAGE' circles and verniers are in pure silver with gun metal Axis, accessories in wooden box with telescopic aluminium stand. Accuracy 10/20 seconds.