



ACME-701

### ACME-701 PLASTIC LIMIT SET

IS: 2720 (Part VII), ASTM D 427, BS : 1377 AASHO 190

Moisture contents at which soil has smallest plasticity is called plastic 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 3 mm diameter.

Specifications : The complete set consists of one each :-

1. Glass plate 20cm x 15cm having ground ends and one side frosted.
2. Brass or stainless steel rod 3 mm diameter x 150 mm long'
3. Flexible spatula.
4. Set of 6 moisture containers
5. Porcelain basin 150 mm diameter
6. Plastic wash bottle 500 ml.

### ACME-702 SHRINKAGE LIMIT SET

IS: 2720 (Part VII), ASTM D 427, BS : 1377, AASHO T 92

Shrinkage Limit is the maximum water content at which a reduction in water content

does not cause an appreciable reduction in volume of the soil mass' At shrinkage limit on further reduction in water, air enters into the voids of soils and thus keeps the volume constant. The apparatus can be used to determine shrinkage limit and to calculate other shrinkage factors like shrinkage ratio, shrinkage index and volumetric shrinkage.

Specifications: Set consists of one each -

1. Porcelain evaporating Dish
2. Shrinkage Dish
3. Glass Cup
4. Perspex plate with three metal prongs
5. Perspex plate plain
6. Flexible spatula
7. Glass cylinder 25ml x 0.5 ml, supplied without mercury



ACME-702



ACME-703

### ACME-703 CONE PENETROMETER

IS : 2720 (PART V)

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

specifications: It consists of a cone fixed to a movable bearing rod. Arrangement is provided to clamp the rod at any desired position. A graduated scale is fixed to the bracket. Complete with cup 50 mm diameter and 50 mm high. Net weight approx. 6kg.



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Soil

## **ACME-704 HIGH SPEED STIRRER IS: 2720 (Part IV)**

This is for mechanical analysis and also other laboratory applications for stirring speed approximately 4000 rpm under load. A dispersion cup is supported on a rest on the stand of the stirrer and has a removable baffle. For operation on 230 - 250 volts A.C. supplied without dispersion cup or baffle.

Accessories : 1) Dispersion cup  
2) Baffle



ACME-704

## **ACME-705 LIQUID LIMIT DEVICE IS: 2720 (Part V), IS: 9259, BS: 137, AS: 89.**

Casagrande method in mechanical form is known as Liquid Limit Method and has been in use for soil mechanics for a number of years. The Liquid Limit data of soils is useful to correlate mechanical properties of soil, such as compressibility and lower shear strength.

Liquid Limit is the water content at which soil passes from zero strength to an Infinitesimal strength, hence the true value of liquid limit cannot be determined. 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 1.25 cm 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 (17.6 gms/sq.cm). At this water content soil just passes from liquid state to plastic state.



ACME-705

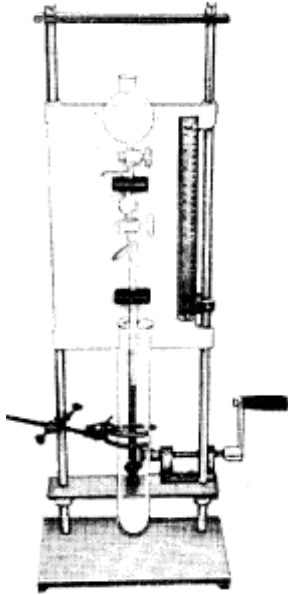
## **ACME-706 LIQUID LIMIT DEVICE (MOTORISED)**

Same as above but fitted with a motor geared down to give approximately 120 rpm Suitable for operation on 230 volts, single phase, 50 cycles, A.C. supply.

Spares : casagrande grooving tool. ASTM grooving tools. Height block, 1 cm high.



ACME-706



ACME-707

## ACME-707 GRAIN SIZE ANALYSIS (PIPETTE METHOD) IS: 2720 (Part IV) and BS : 1377

This is for the determination of the sub sieve particle distribution in a soil sample by mechanical analysis. An analysis of this kind expresses quantitatively the proportions by weight of the various sizes of particles present in the soil. It is recommended as a standard procedure to use dispersion agent to avoid flocculation.

**Specifications :** The apparatus consists of a sliding panel which moves up and down by means of a screw allowing Anderson pipette fixed to it to be raised or lowered vertically. A 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. Supplied complete with Anderson pipette 10ml capacity made from glass, and a sedimentation tube also of glass of 500 ml capacity and 50 Nos. Test forms.

### Accessories & spares:

- 1) sedimentation pipette (Anderson pipette) 25 ml.
- 2) Sedimentation tube 1000 ml.
- 3) Sedimentation pipette 10 ml.
- 4) Sedimentation tube 500 ml.
- 5) Test forms Pad of 50.

## ACME-708 PLUMMET BALANCE

Conventionally particle size distribution analysis is carried out using pipette and hydrometer methods.

Whereas in hydrometer method it is possible to determine particle sizes in the range 75 microns, the method involves computation and it is time consuming. The pipette method can be used for determining only the percentage of specific sizes less than 0.02, 0.006 and 0.002 mm as a percentage of total soil sample. The plummet balance method to determine sub sieve particle size for the entire range is very rapid and only manipulation of height of the balance, so that plummet sinks to the right depth is required. The percentage of soil in suspension is directly indicated by a pointer over a graduated scale.

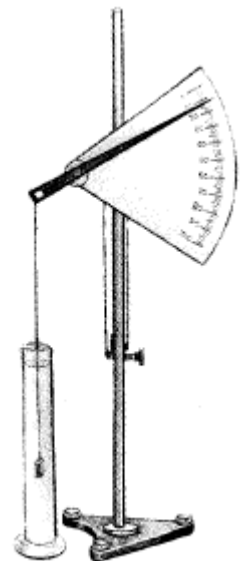
**Specifications :** A vertical rod is mounted on a sturdy base having leveling screws. A pointer with steel pivots turns in jewel bearing and moves over a graduated scale. Scale graduations are marked 0 - 100%

To the other end of the pointer a plummet is hanged. Rack and pinion arrangement is provided on the vertical rod for: adjusting the height.

Supplied with a chart showing relationship between "K" and temperature of suspension

of soils of varying specific gravity from 2.4 to 2.8 to help in solving Stokes' equation.

Supplied complete with one perspex plummet one measuring jar and one rider weight for zero adjustment and one rider weight for adjusting the pointer to 100%.



ACME-708



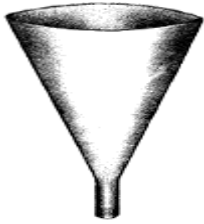
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Soil



ACME-709

### ACME-709 Marsh Cone

This cone is used to find out Viscosity of Bentinite slurry and like material. The Marsh Cone is 6 inch in diameter at the top and 12 inch long, and tapers to join a tube 2 inch long and 3/16 inch inside dia. The capacity of the funnel is 1500 cc. Time in seconds required to flow out 1 000 cc of slurry from cone is measured as funnel viscosity of the material.

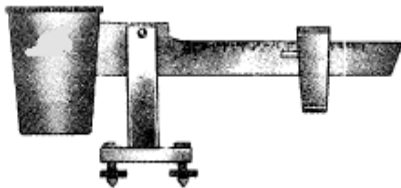
### ACME-710 SOIL HYDROMETER

IS: 2720 (Part IV), IS : 3104

Used for grain size analysis of soils where more than 10% of the material will pass through 75 microns IS sieve. Manufactured from clear transparent glass having uniform clarity throughout the upper end on which density scale is engraved. The scale range is 0.995 to 1 .030 density (gms/cc) at 27°C. Smallest division on the scale is 0.0005.



ACME-710



ACME-711

### ACME-711 MUD BALANCE

Designed to find out specific gravities of Semi Liquids like mud and other liquids having densities in the range of 0.8 to 2.5. It has a Stainless Steel beam calibrated in specific gravities from 0.8 to 2.5. A stainless steel cup with lid and over flow vent is fitted on one side of the beam. A counter weight with cursor slides over the graduated scale. The beam has a knife edge at centre which rests in a fulcrum fitted in the stand. Leveling screws and spirit level are fitted to the stand.

### ACME-712 SAND POURING CYLINDER

IS: 2720 (Part XXVIII) – 1966

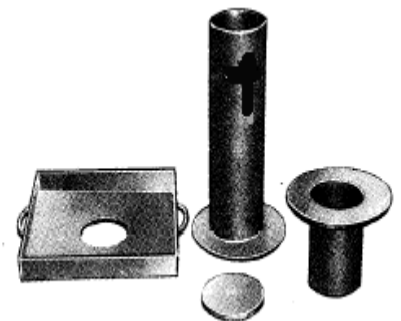
This apparatus is used for the in place determination, of the dry density of compact, fine and medium grained soils and for layers not exceeding 50 cm thickness.

Specifications : The complete apparatus consists one each of :  
Small Sand Pouring cylinder, 3 liter capacity, fitted with conical funnel and shutter.

Cylinder calibrating container, internal diameter 10 cm and internal depth 15 cm, fitted with a flange. Metal tray 30 cm. square and 4 cm deep with a 10 cm diameter hole in the centre.

Accessories : Metal tray 30 cm square and 4 cm deep without hole.

Test forms pad of 50.



ACME-712



ACME-713

### **ACME-713 CORE CUTTER IS 2720 (part XXIX)-1996**

This is used for determination of in situ dry density of natural or compacted fine grained soil, free from aggregates. A cylindrical cutter is used to extract a sample of the soil with the help of a dolly and rammer. From the weight, density and the moisture, the dry density of the soil is readily calculated.

**Specifications :** It consists one each of : Cylindrical core cutter made of steel, 127.3 mm long and 100 mm internal diameter. Steel Dolly, 25 mm high with a lip to enable it to be located on top of the core cutter. Rammer with detachable steel rod. **Spares, Optional Extra and Accessories :** 1) Cylindrical core cutter 100 mm ID x 175 mm long.

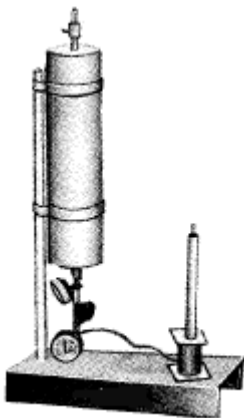
- 2) Cylindrical core cutter 100 mm ID x175 mm long.
- 3) Cylindrical core cutter 100 mm ID. x 175 mm long.
- 4) Dolly
- 5) Test form pad of 50.

### **ACME-714 HARVARD MINIATURE COMPACTOR**

This is for determining the moisture density relation of soils. In this apparatus, small quantity sample is compacted under kneading action of the spring loaded tamper set either at 10 kg or 20 kg. As the sample required is very small, a number of tests can be carried out, each time taking a fresh sample. The time required for compaction is very much less. The mould can be interchangeably used with Miniature Field permeameter where permeability tests can be conducted at high pressures.



ACME-714



ACME-715

### **ACME-715 MINIATURE FIELD PERMEAMETER**

For determining the permeability characteristics of soils, solidified soils and rock cores, high pressure permeability studies can be carried out.

The complete outfit comprises :-

Mould 50 mm diameter x 100 mm high and collar, Top plate, Base plate with recess for porous stone and porous stone, Indicator pipette, 6 mm x 300 mm long, Reservoir tank fitted with 7 kg/cm gauge, valves, flow control regulator and foot pump.



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Soil

## COMPACTION

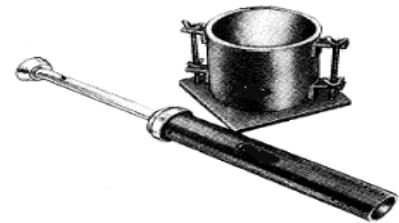
When Compaction of soil in the field is done using rolling machines, it is important to know O.M.C. and M.D.D. values. Standard Compaction test is used to determine in laboratory optimum Moisture contents (OMC) and Maximum Dry Density (M.D.D) of soils, which represents field samples.

Compacted soils have increasing use in embankment of dams, highways, railways etc. In recent years in order to meet current heavy traffic on runways and highways, heavy duty field compacting equipment has come into use and in view of reproducing greater densities, heavy compaction tests using heavy compaction apparatus have been developed.

### **ACME-716 STANDARD COMPACTION TEST**

**IS: 2720, (Part - VII)**

The apparatus consists one each of Compaction Mould Gun Metal, 100 mm ID x 127.3 mm height x 1000 cc. volume, complete with collar and base plate. Rammer 2.6 kg x 310 mm controlled fall.



**ACME-716**



**ACME-717**

### **ACME-717 HEAVY COMPACTION TEST**

**IS: 2720 (Part - VIII)**

Instrument consists one each of : Compaction Mould, gun metal, 150 mm ID x 127.3 mm height volume 2250 cc. complete with collar and base plate. Rammer 4.89 kg x 450 mm controlled fall for heavy compaction test according to IS 2720 (Part - VIII).

**Note : Instead of Gun-metal moulds, steel moulds are also available**



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Soil

## ACME-718 UNIVERSAL AUTOMATIC COMPACTOR

IS: 2720 (Part VII & VII).

Now-a-days almost every soil laboratory conducts compaction and penetration tests

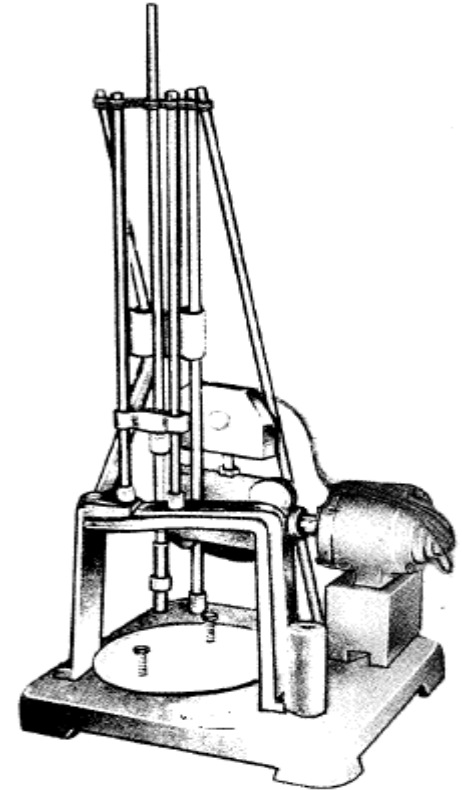
on soils. In both standard and heavy compaction tests the operator has to count the number of blows of the rammer on each layer of soil during compaction.

A mechanically cum electrically operated automatic compactor is therefore device to eliminate tedious hand compaction process. Which also considerably saves time. With the rammers provided two stroke lengths, available, the compactor can be used for normal compaction/heavy compaction as well as C.B.R. compaction.

**Specifications:** It is a motor driven mechanical compactor useful for soil compaction into 100 mm or 150 mm diameter moulds. Two sets of rammers are provided, one of 2.6 and arranged for 310 mm. drop and other 4.9 kg and arranged for 450 mm fall. For compaction soil into 150 mm diameter moulds, 100 mm face diameter rammers having weights 2.6 kg and 4.89 kg are used. Where as for 100 mm diameter 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 1/5th revolution per stroke. The equipment is suitable for operation on 230volts, 50 cycles, single phase, A.C. supply. Moulds are to be ordered separately.



ACME-718

## ACME-720 MINIATURE COMPACTION APPARATUS(ABBOTT TYPE)

IS: 2720 (Part - IX) 1971, 1978.

This is used for rapid determination of moisture content dry density relation using a constant weight of dry soil passing through 75 micrometer IS sieve.

**Specifications :** It consists of a metal cylindrical tube having 50 mm ID and 435 mm height, a detachable base plate and a cap are provided for this tube. 8 nos. 1.5 mm diameter holes equally spaced are drilled at a height of 100 mm from the base of the tube. A metal rammer 48 mm diameter x 48.5 mm in height is attached to a metallic rod with knob, so as to have a combined height of about 550 mm and a total weight of 2,6 kg. This rammer is adjusted for a free fall of 310 mm. The graduations in millimeters and centimeters are marked on this rod to coincide with zero (0) of the scale with the cap of the tube. Graduation are marked downward 0 to 8 cm with millimeter divisions.

The base plate has internal diameter of 50 mm with OD of 140 mm and height of 25 mm is supplied with flange and wing nuts for easily introducing soil sample and removing it.



ACME-720

## **ACME-721 RELATIVE DENSITY**

**IS: 2720 (part XIV)**

This equipment is used for the determination of the relative density of cohesion less free draining soils and meets the essential requirements of IS 2720 (Part - XIV).

**Specifications :** The equipment consists one each of :

Vibratory table, with a cushioned steel vibrating deck about 75 cm x 75 cm. It has a

frequency of approximately 3600 vibrations per minute under a 115 kg load. Amplitude is variable in between 0.05 and 0.65 mm in steps of 0.05 to 0.25 mm, 0.25 to 0.45 mm and 0.45 to 0.65 mm. Suitable for operation on 415 volts, three phase supply.

Cylindrical metal unit weight mould, 3000 ml capacity.

Guide Sleeve with clamp assembly.

Surcharge base plate for mould.

Handle for surcharge base Plate.

Surcharge weight. The total weight together with surcharge base plate and handle is

equivalent to 140 kg./sq.cm. for mould.

Cylindrical metal unit weight mould, 15000 ml capacity.

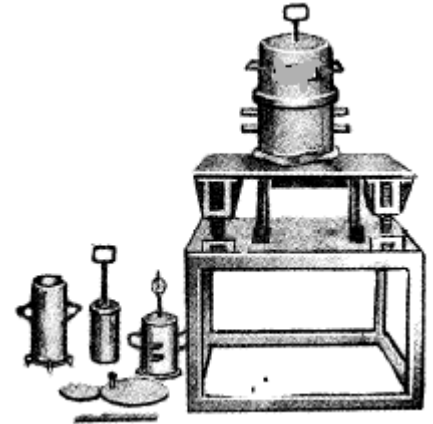
Surcharge base plate for guide sleeve.

Surcharge weight for cylindrical mould of 15000 ml. cap.

(Total weight together with the above mould & surcharge weight is equivalent to 140

kg./sq.cm-) Dial gauge holder & calibration bar 7.5 c 300 mm x 3 mm.

**Accessories :** Dial gauge 0.01 mm x 50 mm travel. Extension piece 25 mm for dial gauge.



**ACME-721**

## **ACME-722 MOISTURE TINS**

To determine moisture contents in soil and other material. These are made from aluminum or stainless steel. Sizes available are

- (a) 25 mm diameter
- (b) 50 mm diameter
- (c) 75 mm diameter
- (d) 80 mm diameter
- (e) 100 mm diameter





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Soil

## ACME-723 POCKET PENETROMETER

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

**Specifications :** It consists of a light weight barrel assembly with a polished and ground steel loading piston plunger. A direct reading scale is engraved on the piston barrel and indicates load in kg./sq.cm. A maximum load indicator ring is provided on the penetration plunger. The calibrated spring is heat treated and plated for rust resistance. The barrel diameter is 20 mm and the length 150 mm. Supplied in storage box.



ACME-723



ACME-724

## ACME-724 PYCNOMETER

Useful to determine specific gravity of clays, sand and gravel of size smaller than 10 mm.

**Specifications:** Comprises a 1 kg glass jar with brass cone, locking ring and rubber seal.

## ACME-725 PYCNOMETER BOTTLES

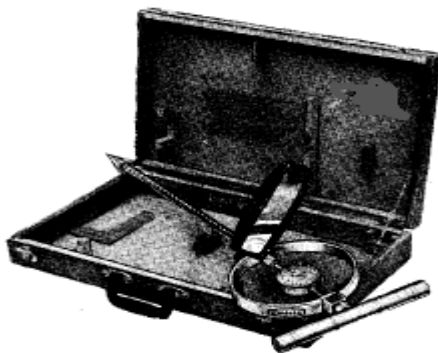
These bottles are used for relative density measurements, made from borosilicate glass with capillary bored stopper. Capacities available

- (a) 50 cc
- (b) 100 cc.

## ACME-726 VICKSBERG PENETROMETER (WITH OPTICAL VIEWER) (Also called Proving Ring Penetrometer)

This is for determining the bearing capacity of sub grades or for compaction control. It also used for rapidly determining the penetration resistance of soils in shallow exploration work.

**Specifications :** Consists of a sturdy handle under which is fixed a sensitive Proving Ring. An extension piece is fixed to the bottom of the Proving Ring and carries a detachable penetration cone at its tip. Proving ring capacity 100 kg (1 KN) and 0.002 mm dial gauge provided indicates the penetration load applied. An optical viewer is provided to facilitate reading the dial gauge by the operator. Simplified for single person operation. A calibration chart is provided for the proving ring. Instrument is complete in a wooden carrying case.



ACME-726



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Soil

## **ACME-727 NORTH DAKOTA CONE**

**IS: 2720 (Part - XXXII)**

This test is simpler and more rapid than the C.B.R. test and can be easily applied for insitu field test. This was developed by North Dakota Highway Deptt. for use with pavement design method similar to that associated with G.B.R. test.

**Specifications :** The instrument consists of a rod carrying a loading platform at the top and a hardened steel cone at the bottom. The rod is mounted vertically and slides freely up and down in the collars of the frame and can be locked in any position as required. The conical tip penetrates the soil through an aperture in the cast iron base. The loading platform carries a graduated plunger which enters one of the side supports and permits the reading of the penetration correct to 1 mm.

Supplied with set of weights consists 7 nos. 5 kg weights and one hardened steel cone.



**ACME-727**

## **RAPID MOISTURE METER**

For quick determination of moisture content of materials in powder form viz. soil, sand, coal, pottery slip, cement etc. Calcium Carbide when comes in contact with moisture acetylene gas is generated. This principle is used in Rapid Moisture Meter. A weighed quantity of sample is mixed with fixed quantity of Calcium Carbide reagent and the whole mixture is thoroughly shaken in a vessel to which a pressure gauge is fixed. The acetylene gas produced develops pressure and pressure gauge is calibrated to read percentage moisture. The instrument indicates moisture on wet weight basis easily convertible to dry weight basis.



**ACME-728**

## **ACME-728 RAPID MOISTURE METER 0-25%**

**Specifications :** The unit consists of a pressure vessel with clamp for sealing cap rubber sealing gasket, pressure gauge calibrated in percentage moisture content 0- 25% x 1% 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.

## **ACME-729 RAPID MOISTURE METER 0.50%**

Same as above but pressure gauge calibrated 0- 50% x 1%

**Spares :** Carbide reagent, in bottles of 400 gms each.



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Soil

## **ACME-730 CONSOLIDATION APPARATUS IS: 2720 (Part-XV), BS 1377, ASDTM D2435.**

Consolidation test is unidimensional test considered extremely important in soil mechanics. Sample taken from adjacent areas of a single site show differential settlement even when tested using same techniques. Soil of similar strength may show varying consolidation. Samples are very carefully prepared and vertical settlement of the specimen in saturated or drained conditions carefully recorded when known load is applied.

**specifications :** The standard out fit comprises of the following items.

Loading unit, maximum capacity 20 kg/cm sq having a loading yoke connected to a lever arm with a counter balancing adjustment and having a lever ratio of 1:10, the whole assembly being mounted on a sturdy steel frame stand. The loading unit is so designed that it can be used for consolidation cells of different diameters as well as different diameter floating ring type consolidation cells.

Fixed ring type of consolidometer (Odeometer) cell assembly for testing 60mm diameter x 20mm thick specimen comprising: -

Fixed ring for specimens 60mm diameter x 20mm thick with guide ring.

Top and Bottom Porous stones for 60 mm diameter specimen.

Perforated Press re pad,

Channeled base with water inlet and Gasket.

Flanged water Jacket, water reservoir with plastic tube and p inch cock.

Set of weights to give a pressure of 10 kg/cm Sq on 60mm diameter specimen, comprising:

7 Nos. 0.05 kg/sq.cm., 5 Nos. 0.1 kg/sq.cm., 6 Nos. 0.2 kg/sq.cm, 6 Nos. 0.5 kg/sq.cm., and 5 Nos. 1.0 kg/sq. cm.

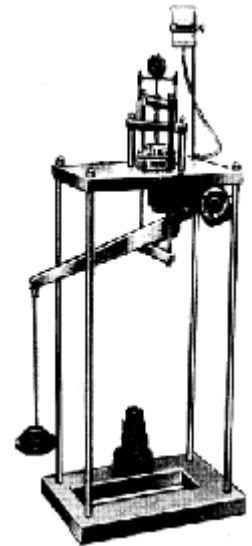
Supplied complete as above but without dial gauge.

Accessories: Dial Gauge 0.002mm x 10mm. Extension piece,40 mm long. Test forms pad of 50 for "Consolidation Test Plot" Test forms pad of 50 for One Dimensional Consolidation.

Optional Extras : Varying head stand pipe, 50 cm long with mm. scale.

Fixed ring type of consolidometer (Odeometer) cell assembly for 50mm. diameter x 20mm

thick specimens complete with fixed ring and guide ring, pair of porous stones,



ACME-730



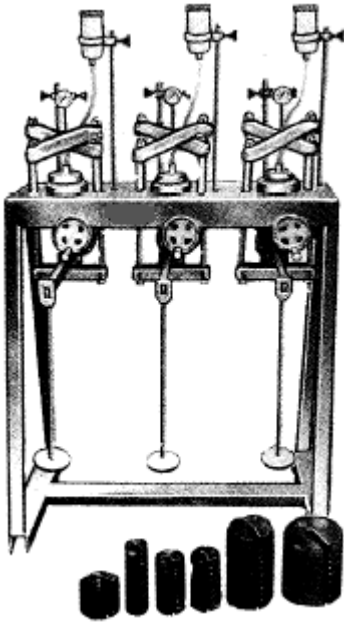
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Soil



ACME-731

## ***ACME-731 CONSOLIDATION APPARATUS (THREE GANG)***

**Consists of 3 consolidation test assemblies mounted on a single frame. Complete with 3 sets of consolidometer cell assembly for 60mm diameter samples and three sets of weights each giving 10 kg/sq.cm. on each sample.**

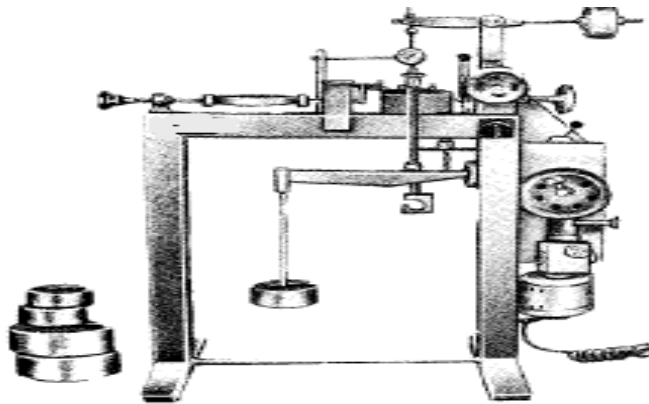
## ***ACME-732 CONSOLIDATION APPARATUS (SIX GANG MODEL)***

**Same as above but six units mounted on a single frame.**

**Note : Electronic Consolidation Apparatus can also be supplied. In place of a dial gauge, a very sensitive LVDT transducer with a digital displacement meter is provided. Suitable for operation on 230 volt AC provided for pouring the capping compound. Two spacers are also provided, Complete with cylinder carrier and ladle for molten compound.**

### **DIRECT SHEAR**

Information of Shear values plays an important role in the design of sub-structures in determining bearing capacity of soils, design of retaining walls, instability calculation of earth slopes etc. Various Shear Apparatus available and Direct Shear Apparatus is one of them. In Direct Shear test specimen contained in a box is subjected to a constant normal load and increasing horizontal load is applied to the upper section of the specimen. Shear force and load are directly measured.



**ACME-733 DIRECT SHEAR APPARATUS (HAND OPERATED)  
IS : 2720 (Part-VIII), ASTM D - 3080.**

For determining the direct shear strength of soils on specimen size 60 mm x 60 mm x 25 mm.

**Specifications :** The apparatus comprises of the following:

**Loading Unit:** Supplied with load yoke with direct and lever system for applying load. Normal stress capacity 8 kg/sq.cm. Load is applied either directly or through a counter Balance detachable lever. Provision is made for the load to be applied either through a steel ball recessed in the loading pad or direct through a boss on the pre calibrated loading yoke. The loading unit is 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/cm sq through lever as follows:**

To give kg/cm sq.	Qty.
0.05	04 Nos.
0.1	01 No.
0.2	01 No.
0.5	03 Nos.
1.0	01 No.

**Complete set as above but without proving ring.**

**Essential Accessories : High sensitivity compression proving ring cap 200 kg One consolidation dial gauge 0.01 mm x 25mm and one strain dial gauge 0.01 mm x 25mm.**

**Optional extras : Additional set of weights to give a normal stress of 5 kg/cm<sup>2</sup>.**

**Soil Sampler for 60mm x 60mm specimen and test from pad of 50.**

**spares : Porous stone for 60mm x 60mm size sample available in pairs.**

### ***ACME-734 DIRECT SHEAR (MOTORISED SINGLE SPEED)***

Same as above but electrically operated to give a single constant rate of strain of 1 -25mm/min. Suitable for 230V Ac.

Weight 175 kg approx.

### ***ACME-735 DIRECT SHEAR APPARATUS (MOTORISED SIX SPEEDS)***

Same as above but having 6 rates of strain 1 .25, 0.25, 0.05, 0.01 , 0.002 & 0.0004mm/ min. Works on 230 V

### ***ACME-736 DIRECT SHEAR APPARATUS (MOTORISED 12 SPEEDS)***

Same as above but unit is electrically operated to give the following 12 rates of strains. 1.25, 0.625, 0.25, 0.125, 0.05, 0.025, 0.01, 0.005, 0.002, 0.001, 0.0004, and 0.0002mm/ min.

The apparatus is suitable for operation on 230 volts single phase A.C. Supply.

### ***SAMPLING AUGERS***

Augers are used to collect disturbed soil samples at reasonable depths for laboratory tests. Augers are available in two types and each in different sizes. Blade type (posthole type) and Helical type (Screw type). Each auger outfit consists one each of Auger head, one meter long rod, Tee piece and handle. Depths of excavating can be increased by using -additional extension rods.

#### ***ACME-737 POSTHOLE TYPE***

- (a) 75 mm,
- (b) 100mm &
- (c) 150mm

#### ***ACME-738 SCREW TYPE***

- (a) 75 mm,
- (b) 38mm,
- (c) 50mm,
- (d) 75mm,
- (e) 100mm,
- (f) 150mm,
- (g) 200mm,
- (h) 250mm &
- (i) 300mm dia.



**Extras : Extension rod 1 meter length with threading at both ends and couplings. Set of two spanners and Tee piece.**

## SAMPLING TUBES

For collecting undisturbed samples of 38mm diameter for Triaxial Shear strength and Unconfined Compressive strength either straight from the field or from a sample of larger diameter. The wall thickness is maintained approximately 1.6mm with an are a ratio approximately 17 per cent. Both relieved and unrelieved sampling tubes are available. In the relieved type of tube, the internal diameter is relieved by about 0-5mm (inside clearance 2/3") beyond approx. 19mm length from the cutting edge of the tube. This is most suitable for highly cohesive soils. In the unrelieved type, the internal diameter is uniform through out. This type is most suitable for soils of low cohesion. These 38mm diameter tubes are available in different lengths.

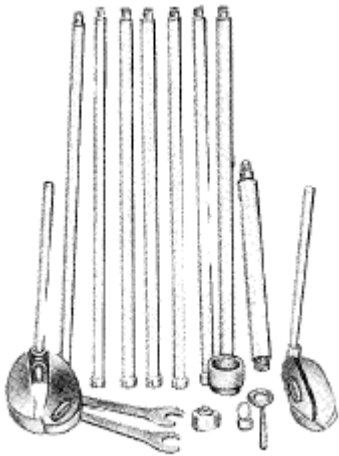
### **ACME-739 UNRELIEVED**

(a) 150mm (b) 200mm (c) 225mm (d) 300 mm long.

### **ACME-740 RELIEVED**

(a) 150mm (b) 200mm (c) 225mm (d) 300mm long

### **ACME-741 SAMPLING OUTFIT (HEAVY DUTY)**



ACME-741

Undisturbed samples of soil at different depths can be collected using these sampling tubes. The kit includes all necessary implements for boring, collection and sealing with wax. The operation may be carried out either using a tripod stand or without it. The equipment is supplied in a canvas carrying bag.

#### **Specifications :**

150 mm Auger blade type, complete with handle, 'T' piece and 1 meter long rod  
1 No

Extension rod 1 meter long and 37.5mm diameter .....5  
Nos.

Jarring link (Large) for driving samplers 50mm, 100mm or 150mm diameter. This can be connected to the sampler or to the extension rod.

One eye hook, one wax container, one Methylated spirit stove, One wax ladle, and one pair of spanners complete in carrying case.

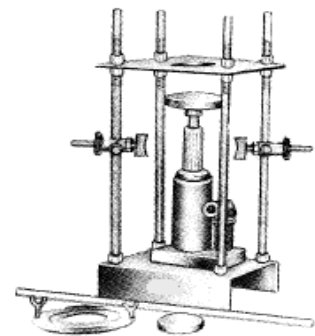
**Accessories :** Samplers for undisturbed sampling are available in different sizes. These are used with sampling outfit. Each sampler is 45cm long and is supplied complete with two end caps, cutting nose, driving head with air outlet valve and 3 Nos. C- spanners. Samplers are available in 50mm diameter, 100mm diameter & 150mm dia.

### **ACME-742 EXTRACTOR FRAME HYDRAULIC**

This Extractor Frame is used for taking out soil samples compacted or undisturbed, from 100mm diameter and 150mm diameter cylinder such as core cutters, Proctor moulds, C.B.R. moulds etc.

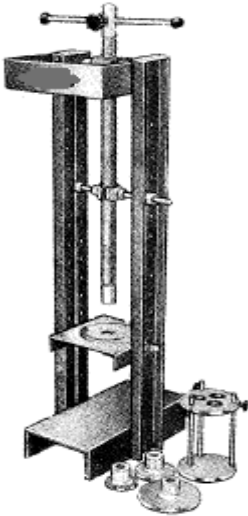
**Specifications :** It consists of a 5 Ton capacity hand operated, hydraulic jack mounted on a suitable frame. Two plungers, one for 100mm diameter and the other of 150mm diameter moulds are supplied. One thrust plate for 150mm diameter and one for 100mm diameter specimens are also supplied. Height of thrust plate is adjustable.

**Accessories :** Set of Plunger adaptors and thrust plates for 38mm, 50mm and 75mm diameter specimen.



ACME-742

### **ACME-743 EXTRACTOR FRAME UNIVERSAL (HAND OPERATED)**



ACME-743

Designed to extract specimens from almost every type of sampling tube and mould used in soil engineering laboratory or in the field. It can be mounted vertically or horizontally as desired. It has an unique feature that three 38mm diameter samples can be collected into three 38 diameter tubes from one 100mm diameter sample.

**Specifications :** Comprises of a frame designed for screw jack operation, one each of the adaptor plates and plunger adaptors for 38mm, 75mm, diameter, 100mm diameter, 150mm diameter specimens and a stand to obtain simultaneously three 38mm diameter samples from one 100mm diameter sample. The adaptor plate which slides along the slotted supports can be clamed at any desired position by means of locking nuts. Besides this, the tube or mould can be held in position by raising the tube guides and held in position with locking screws. The lead screw movement can be stopped at any predetermined position by tightening the lead screw locking collar. Plunger adaptor for 200 mm diameter samples.

Adaptor plate with 200mm diameter hole and device to extract B number 38mm diameter samples.

### **ACME-744 DAMES AND MOORE SAMPLER**

Highly useful for sampling soils. The sample collects into rings inside the sampler. These rings along with the specimen can be directly placed in a consolidometer cell assembly, thereby reducing the number of operations to extract the sample from a sampler, trimming to size and transferring into the ring etc. The possible disturbance in these operations is eliminated.

**Specifications :** The area ratio for this sampler is 81 percent and it meets with the specifications of sub-surface Exploration and Sampling of Soils for Civil Engineering Purposes by M.J. Hvorslev. Consist of a split tube accommodating ten thin brass rings 60mm x 25.4mm long. A shoe with hardened cutting edge is screwed at one end. A driving head with ball check valve is fitted at the other end. The flaps mounted inside the cutting shoe prevent the cohesion less soil falling down while lifting the sampler.

**Spares :** Body consisting of split pipe threaded at both the ends and Shoe.

**Head Assembly:** Set of 10 rings 60mm O.D. and 25.4mm long.

### **ACME-745 PISTON SAMPLER**

Useful for collecting undisturbed samples from soft to stiff clay and sand.

Till the desired depth is reached the bottom of piston is kept flushed with the cutting edge of the sampler and on reaching desired depth only the sampling tube is forced into the soil keeping piston fixed in ground and then collecting the sample in the tube. The under pressure developed in the sampler while the sample tube advances, holds the collected sample.

**Specifications :** The outfit consists of Sampling tube, 55mm O.D., 580mm effective length. Piston, one piston connecting rod 1 meter, long and a drive head with check valve and adaptor for 'A' drill rod.



## **PERMEABILITY**

In soil mechanics Permeability is one of the important Engineering properties as it governs rate of settlement of saturated compressible soil layer and rate of flow of equifer.

Permeability is that property of soil which permits flow of water through its interconnecting voids. The instrument to measure permeability is called permeameter. The results are used for pump ing ground water, for foundation sites excavations, design of dams etc. Tests can be performed on remolded or undisturbed samples using constant head or falling head method.

### **ACME-746 PERMEABILITY APPARATUS**

**IS: 2720 (Part XBII) – 1966**

The apparatus is used for the laboratory determination of permeability of soil is using a constant or a variable head. This test is recommended for soils with coefficient 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.

**Specifications :** The equipment comprises one each :

Gun metal mould, 100 mm ID x 127.3 mm high x 1000 ml volume.

Gun metal mould extension collar, 100 mm diameter 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.

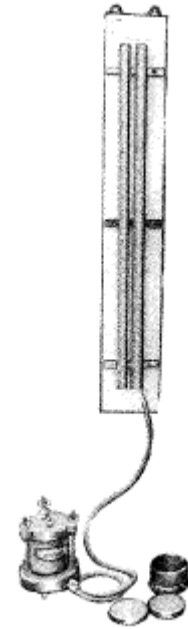
Gun metal drainage cap (Top plate with a recess for a porous stone and fitted with an inlet valve and an air release valve).

Gun metal dummy plate to serve as a false bot tom during compaction"

Porous stone for drainage cap.

Porous stone for base plate

Set of glass stand pipes approximately 6 mm dia., 10 mm diameter and 20 mm diameter mounted on a wooden board. Each glass tube is longer than 1 meter and has a serrated end at the bottom. To read water head 2 Nos. meter scales are fixed between the tubes.



**ACME-746**

### **ACME-747 UNIUERSAL OR COMBINATION PERMEAMETER**

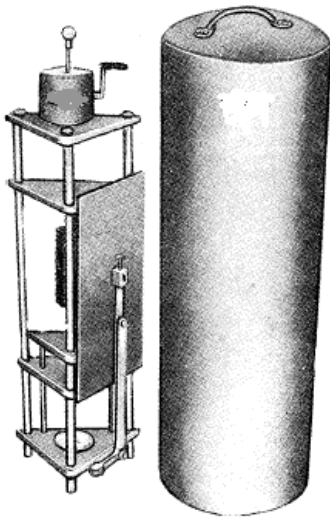
**Specifications :** Same as above but instead of a set of three glass stand pipes a stand with nine glass tubes of 6 mm, 10mm, 20mm, 25mm,40mm, 50mm,60mm, 70mm and 75mm bore. 75mm bore tube is provided with overflow arrangement for constant head tests. The remaining tubes are used for falling head test.

**Optional :** Overhead tank made of steel, approximately 37.5 cm diameter x 1 meter high. It is provided with an inlet port at the top and size outlets at bottom with cocks and air inlet and water filling tube on top. An arrangement is provided to indicate the wa ter level. An extra metallic tube having approximately 5mm/6mm ID and 1 meter long is also supplied for using over head tank for constant head test -  
Rammer 2.6k9 x 310mm controlled fall and Rammer 4.89k9 x 450mm controlled fall.

**Spares :** Pair of top and bottom Porous stones for permeameter mould.

## **UNCONFINED COMPRESSION TEST**

Many a times it is essential to know unconfined compressive strength of soils saturated or nearly saturated. These results give an idea of the bearing capacities. Unconfined samples are unidirectional loaded gradually till failure in this test.



**ACME-748**

### **ACME-748 UNCONFINED COMPRESSION TEST APPARATUS (SPRING TYPE Autographic)**

**IS: 2720 (part X), IS: (part-V), ASTM D 2166, ASSHO T 208, B 5: 1377**

Spring type unconfined Compression Testing Apparatus can be used either in a laboratory or in field. This apparatus is as per the design of Building Research Station, U.K.

#### Specifications :

Consists of a spring operated load frame with arrangements for loading 38mm x 76mm samples, one set of four load springs of stiffness 0.2kN, 0.4kN, 0.8kN and 1.6kN/mm, a calibrated mask and one set of 50 charts, in a metal carrying case.

#### Spares & Accessories :

Charts. set of 50

Calibrated mask.

Spring set comprising one each of stiffness 2 N/mm, 4 N/mm, 8 N/mm and 16 N/mm

Coning tool for 38mm sample (female)

Coning tool for 38mm sample (male)

Tripod stand wooden, for using the instrument in field.

### **ACME-749 UNCONFINED COMPRESSION TESTER PROVING RING TYPE (HAND OPERATED)**

**IS: 2720 (Part-XI), AASTHO T 208.**

This is a 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.

Specifications : 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 diameter samples. Supplied without proving ring, dial gauge.

### **ACME-750 MOTORISED UNCONFINED COMPRESSION TESTER PROVING RING TYPE**

Same as above but having only one rate of strain 1.25mm/min.

### **ACME-751 MOTORISED UNCONFINED COMPRESSION TESTER PROVING RING TYPE**

This is similar to above but with the following rates of strains: 1.5 mm/min, 2.0mm/min and 3.0mm/min.



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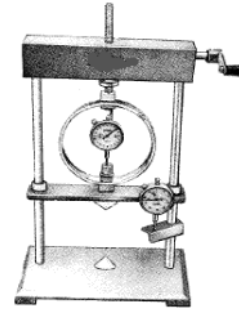
Soil

## **ACME-752 UNCONFINED COMPRESSION TESTER PROVING RING TYPE**

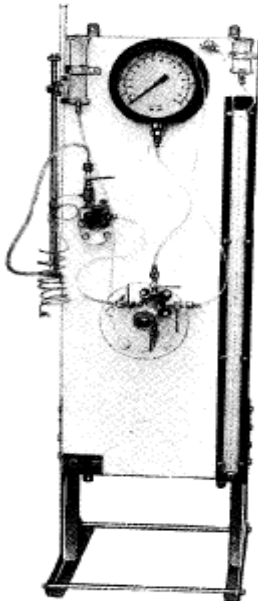
Built according to the design developed by Prof. SC. Goyal and Prof. Alam Singh at the Soil Engg. Lab. University of Jodhpur.

Specifications : Capacity 50 kg. Specimen size 38mm diameter x 76mm long, strain measurement is done on a scale fixed to one of the pillars. Scale graduated mm.

Complete with conical seating a male coning tool and one proving ring 50kg.cap. with cha(,specimen 40mm diameter x 80mm long can also be



ACME-752



ACME-753

## **ACME-753 PORE PRESSURE APPARATUS (10Kg/cm<sup>2</sup>)**

This apparatus is used for measuring pore water pressure and pore air pressure in soils. This is as per the principals outlined in the book."Measurement of soil properties in Triaxial tests" by A.W. Bishop and D.J. Henkel. This is used as an accessory for Triaxial test apparatus.

Specifications : The apparatus consists of a panel for wall mounting on which are fitted - 1 .0 to 10 kg/cm<sup>2</sup> x 0.1kg/cm<sup>2</sup> a pressure gauge, Bourdon tube type 20cm dia. Manometer : Glass U -tube manometer for measuring low positive pore pressures negative pore pressures and checking zero error of pressure gauge. It is provided with a mercury trap (Mercury supplied at extra cost. Null indicator made out of clear transparent perspex with mercury trap and cursor to indicate the mercury level.

Burette : 50ml Burette for measuring the volume change in the soil specimen. Pressure pump fitted with four sleeve packed valves, Operated by means of a hand wheel on the end of the piston rod which is threaded through the pump cap and gives a smooth, fine adjustment of pressure. Copper coil and water reservoir The unit is tested against leaks upto 10 kg/cm sq.

## **ACME-754 PORE PRESSURE APPARATUS (20Kg/cm<sup>2</sup>)**

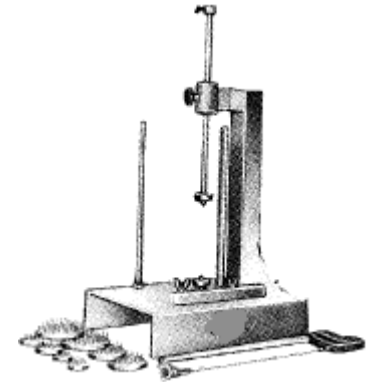
Same as above, but fitted with pressure gauge 0-20 kg/cm<sup>2</sup> xo.2kg/cm<sup>2</sup>.

Spare: Polythene tube 3mm bore x 5 mm. O.D.

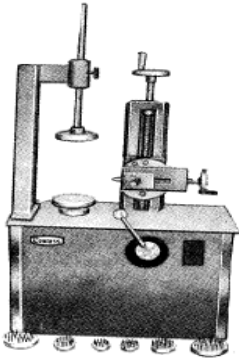
## **ACME-755 SOIL TRIMMER (HAND OPERATED)**

For trimming various diameter specimen for tri-axial and unconfined compression tests.

**Specifications:** . The lower specimen grip is mounted on a disc which rotates freely. The soil sample is mounted on the lower specimen grip and the upper grip is firmly seated on top of the specimen. The vertical guide can be adjusted to control the depth of cut. While trimming the lower disc is rotated by hand. Supplied complete with a wire saw, trimming knife, pairs of gripper plates for 38mm diameter, 50mm diameter, 75mm diameter and 100mm diameter specimen.



**ACME-755**



**ACME-756**

## **ACME-756 SOIL TRIMMER (MOTORISED)**

This is for trimming tri-axial and unconfined test specimen of different diameters.

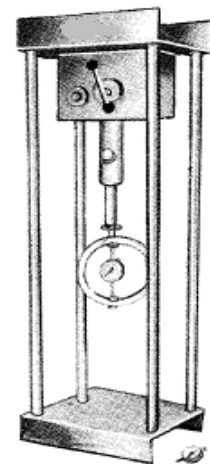
**Specifications :** It consists of a base with a knife support. The platform supporting the specimen ring rotates at a slow speed of approx. 25 rpm by a fractional HP motor with reduction gear housed in a cabinet. The hardened steel trimming knife mounted on a support, can be adjusted horizontally as well as vertically to permit trimming of the specimen to the exact size of the ring. A guide supplied prevents over cutting. Complete with 38mm, 50mm, 75mm and 100mm diameter specimen rings.

## **CALIFORNIA BEARING RATIO TEST**

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. Test can be made on all types of soils including sand, gravel, crushed stone etc. (Passing through 20mm IS Sieve). C.B.R. test is used extensively for selection of materials and control of sub-grades.

The procedure of test is very simple. A 50mm diameter penetration piston is forced in the test soil and loads required for the penetration to penetrate different depths are recorded by means of a proving ring fixed to the penetration piston assembly and a dial gauge.

Both Laboratory C.B.R. and field C.B.R. apparatus are available.



**ACME-757 CALIFORNIA BEARING RATIO APPARATUS (HAND OPERATED)**  
**IS: 2720 (Part -XVI)**

**Specifications :** The equipment consists one each of the following:

**Load frame, Hand operated, Capacity 5000kg with high and low rates of travel of the lead screw Mould made from Gun-metal/Brass, 150mm internal diameter x 175mm high, with perforated base plate and extension collar 50mm high.**

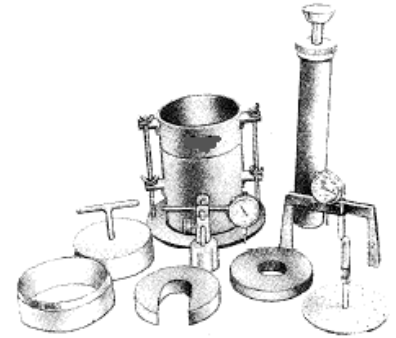
**Penetration piston, face diameter 50mm with adjustable bracket for penetration dial gauge. Circular metal space disc, 148mm diameter x 47.7mm high. with detachable handle. Annular metal weight, 2.5 kg, 147mm diameter with 53mm diameter central hole. Slotted metal weight, 2.5kg. 147 mm diameter with 53 diameter slot. Perforated plate made of Gun-metal/Brass 148mm diameter with adjustable stem and lock nut and a metal tripod for dial gauge.**

**Cutting collar**

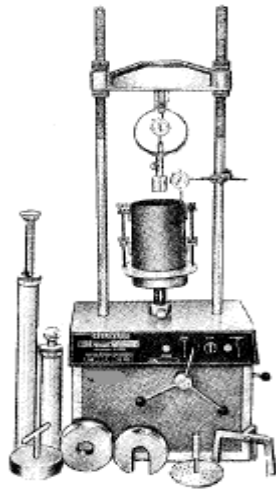
**Rammer 2.6 kg weight with drop of 310 mm**

**Rammer 4.89 kg with drop of 450 mm.**

**Supplied without proving ring and dial gauge**



**ACME-757**



**ACME-758**

**ACME-758 CALIFORNIA BEARING RATIO APPARATUS (MOTORISED)**  
**IS: 2720 (Part -XVI)**

**Similar to above but supplied with Bench mounting type 5000kgf capacity Load frame motorized in place of load frame hand operated. The lead screw of the load frame has a single constant rate of travel of 1.25mm/minute.**

**Accessories for Laboratory C.B.R. Apparatus :**

**High sensitivity Proving ring 3000kg capacity with calibration chart and carrying case.**

**Dial gauges, 2 Nos 0.01mm x 25mm.**

**Annular metal weight 5 kg 147mm diameter with 53mm dia. central hole.**

**Slotted metal weight 5kg 147mm diameter with 53mm diameter slot**



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Soil

## ACME-759 CALIFORNIA BEARING RATIO TEST (FIELD TYPE)

IS: 2720 (Part - XXXII) 1969

In recent years it has become important to know C.B.R. Values in -situ. It is useful in determining the load carrying capacity in the field when in-place density and water contents are such that the degree of saturation is 80% or greater, when material is cohesion less and coarse grained, such that it is not effected by changes in water contents and when the material has been in-place for considerable time. The loading is effected by means of a mechanical load frame which can be fixed to the under side of a truck.

### Specifications :

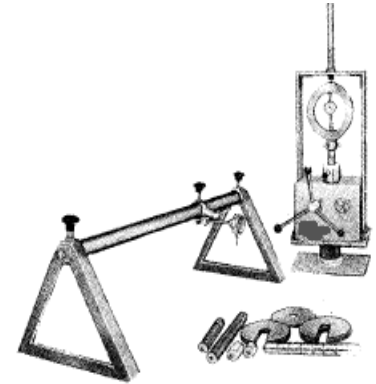
Mechanical screw loading jack, 10000 kg capacity with U-bracket and swivel head. Penetration piston, 50mm dia. threaded at the upper end.

Extension rods set consisting of 2 lengths 5cm. 2 lengths 10cm., 1 length 30cm., 1 length 50cm, and 1 length 100cm., used as spacers between the proving ring and penetration piston. The lengths are machined from steel tubing.

Connector set, has eight connectors for coupling the penetration piston and proving ring assembly either directly or through extension pieces.

Dial gauge support of seamless pipe construction. It stands 30cm high and 45cm wide at the base. Provided with a quick release screw type clamp capable of sliding and locking anywhere along 2 meter length of the bridge. Supplied with annular metal weight 5 kg, 250mm diameter with 53mm diameter central hole, Slotted metal weight 5 kg, 215mm to 250mm diameter with 53mm diameter slot, 2 Nos. Slotted metal weights, 10 kg, 215mm to 250 mm diameter with 53 mm diameter slot 2 Nos.

Accessories: Dial gauge 0.01mm x 25mm. High sensitivity Proving Ring 5000 kg capacity with calibration chart and carrying case.



ACME-759

## LOAD FRAMES

Load Frames are used to apply load on the test specimen. The capacity and speed depends on the requirement of a particular test.

Load Frames are used in C.B.R. Triaxial, Unconfined Compression Test etc.

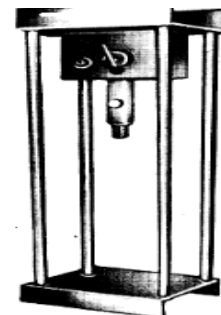
Multitech Load Frames are available in various models. The rate of loading is constant in electrically operated Load Frames and Load Frames with multi strains are also available.

## ACME-760 LOAD FRAME CAPACITY 5000 KG (HAND OPERATED)

### Specifications :

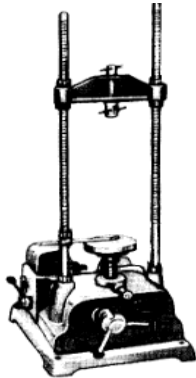
The Unit is designed for a maximum load of 5000kg and consists of a two speed screw jack mounted in a frame with identical top and base channel pieces so that the unit can be placed either way up and the device can be used for loading from above or from below whichever is convenient.

This is a floor model



ACME-760

**ACME-761 BENCH MOUNTING TYPE LOAD FRAME  
 CAPACITY 5000 KGF, (MOTORISED) SINGLE SPEED**



ACME-761

**Specifications :** This is a portable load frame which can easily be kept on Laboratory bench. Thus it is very convenient to the user to conduct tests. A motorized screw jack is fixed at the base to which are fixed two vertical pillars which can be easily dismantled.

A circular platen of 150mm diameter is fixed to the lead screw and loading and unloading is effected by upward/downward movement of the lead screw using a forward/reverse switch. The cross head is adjustable at any desired height and carries an adaptor for Proving Ring. An adjustable dial gauge bracket is provided on one of the pillars. The rate of strain is constant 1.25mm/min.

Operates on 230 Volts AC.

**ACME-762 LOAD FRAME 5000 KGF. (MOTORISED) WITH 3 SPEEDS**

**Specifications:**

Same as above but provided with 3 rates strains 1.25 mm/min, 1.5 mm/min, & 2.5 mm/min.

**ACME-MSLF763 LOAD FRAME 5000 KGF. (MOTORISED) 10 SPEEDS**

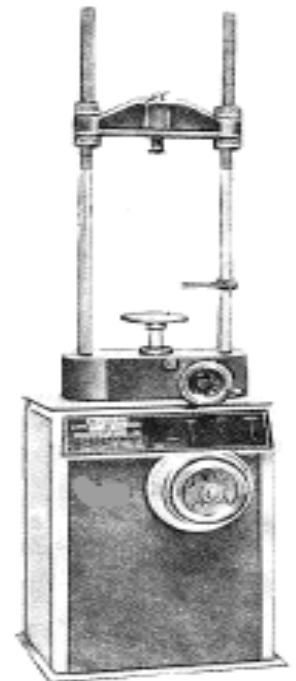
**Specifications :** It consists of a cabinet which houses the electrical motor, reduction gear and the turret gear box. The loading is done by the upward movement of the lower platen of approx. 198 mm diameter which is firmly fixed to the lead screw. When the lever is set in the neutral position, it isolates the lead screw from the rest of the drive mechanism and the lead screw can be manually moved up or down by operating the handle. The various rates of strain that can be obtained are as follows:

POSITION OF STRAIN SETTING LEVER	POSITION OF TURRET SETTING LEVER				
	1	2	3	4	5
A	0.05	0.02	0.01	0.005	0.002 in/min
B	0.025	0.01	0.005	0.0025	0.001 in/min

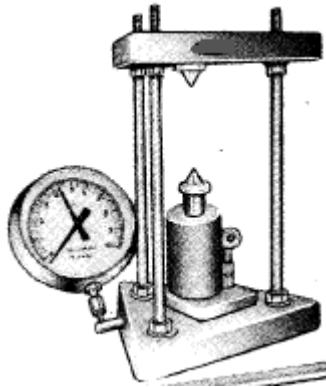
On the unit are fixed a mains switch, a jewel lamp and a forward reverse switch. A relay is fitted inside the cabinet so that in case of a power failure the unit will not restart on its own on resumption of power, unless the switches are operated.

The adjustable cross head can be set at any required height over the two pillars and secured in position by tightening the nuts. It carries a hexagonal proving ring adaptor. A bracket for strain dial gauge (dial gauge to be ordered extra) is attached to one of the pillars of the load frame.

The base with the two pillars and adjustable cross head is detachable and the whole upper portion above the level of the top plate of the cabinet can be fixed in its proper position with the help of the clamping screws.



ACME-763



ACME-764

**ACME-764 POINT LOAD INDEX TESTER**  
**IS: 8764, 1978**

Used for testing rock, aggregate and core samples as well as out crop specimen in their original shape. Very useful for rock classification. This is a portable instrument and is useful in the field also. Uni-axial compressive strength for rock specimen can also be predicted approximately.

**Specifications :** The instrument comprises of :- A three pillar type load frame on the base of which at the centre is fixed a 10 Tone capacity hydraulic jack with a conical platen at the top of jack. The other conical platen is fixed to the top plate of the frame at its centre. The distance between two conical platens is adjustable by vertical movement of the upper plate of the load frame. Loading jack with integral hand operated pump and a pressure gauge 0 - 2500k9x25k9.

**Optional :** Pressure gauge 0 - 10000kg x 50 kg.

**ACME-765 BRAZILIAN TEST APPARATUS**

The instrument is useful for testing specimen from 50mm diameter to 100mm diameter and of thickness of half the diameter.

The specimen is held in circular jaws, this is primarily similar to a compression

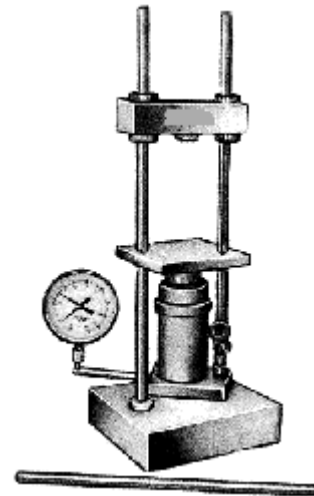
Machine and consists of a small load frame having sturdy base with two vertical threaded rods and an adjustable cross head. The hydraulic jack is fitted at the centre of the base of the load frame. The jack of the load frame is self retracting and two plain platens are supplied.

A pressure gauge capacity 0-200 KN x 2 KN is fixed at the base of jack. A maximum pointer is also provided on the gauge, a pair of semi-circular platens for 50mm diameter samples also provided. This instrument can be used in field also

**Optional Extras:**

Pairs of jaws for sample diameter

(a) 60mm (b) 70mm (c) 80mm (d) 90mm & (e) 100mm.



ACME-765





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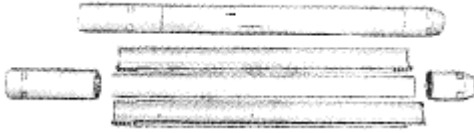
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Soil

## **ACME-766 SPLIT SPOON SAMPLER WITH LINER**



**ACME-766**

**Specifications :** Same as above but the diameter is increased to accommodate a brass liner. Complete with brass liner.

**Spares :** Body, shoe & Head of split spoon sampler and Brass liner.

**Note :** The above outfits can also be supplied in FPS Units in conformity with ASTM

**D 1586-64T** (Penetration test and split barrel sampling of soils)

**Accessories :** Drive weight 65kg with chain. IS: 2131-1963 Drive pipe assembly with two end caps of mild steel to give a fall of 75cms for drive weight

## **STATIC CONE PENETROMETER**

Extensive use of static cone penetrometer was originally made in Holland where buildings are constructed in areas mostly reclaimed from the sea-bed. Research work has also been done in recent years to correlate Static Cone Test results with the Standard (Dynamic) Penetration test results, resulting in widely different correlation factors depending upon local geological history. The static Cone Penetration Test is also used for predetermining the length and estimating the load carrying capacities of piles passing through soft - compressible strata's and resting upon hard clays, sands or gravel. The Penetration resistance of the cone has nearly the same value as the load which can be carried by the actual pile per unit area of the pile tip. By using the additional friction jacket with the standard equipment, identification of various soil types penetrated is also possible.

In Static Cone Penetration Test, a truncated steel cone (60 degree angle @  $0.5 \text{ cm}^2$  base) is forced vertically into the soil by static thrust required to cause a bearing capacity failure of the soil immediately surrounding the point where measurements are required to be made. Such measurements made at suitable desired intervals, provide a continuous bearing capacity profile and hence a shear strength profile of the soils at the sounding location. The cone point is advanced with a two rod system. The outer casing provides structural strength and protects the inner rod from soil friction and buckling the protected inner rod advances the point during the thrust measurement which is achieved by pressure gauges. The friction jacket (to be ordered extra) helps in obtaining additional information like static soil friction (skin friction) against the steel sleeve.

Two types of mantle tubes each one meter long are available. The mantle tube with a uniform diameter of 36mm enables the determination of total cumulative skin friction of the soil in addition to the cone resistance. If however cone resistance is the main requirement and cumulative skin friction is not to be measured, then mantle tubes of non uniform diameter are to be used.

A judicious combination of both types of tubes would be the ideal one, the number of each depending upon local geological history.



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Soil

## **ACME-767 STATIC CONE PENETROMETER 3000 kg Capacity (HAND OPERATED) IS: 4968-(Part III)**

The drive is by means of a rack and pinion and is driven manually through a gearing arrangement. The gearbox rack and pinion are fixed on two upright pillars and the movement of the rack is guided by a bracket and two pillars. The loading is done hydraulically. Two pressure gauges 15cm dia. one of low capacity 0-60k9/sq.cm.in 0.5k9/cm. sq. divisions and other 0-160k9/cm sq. are provided to indicate the penetration resistance. Isolation valve is provided to automatically isolate the lower range gauge when it reaches the maximum capacity. The valve can be adjusted and locked at desired values between 20 to 60kg/cm sq. Provision is made to anchor the unit at site and there is provision for lateral shifting so that subsequent tests could be performed without having to shift the entire anchorage system.

The standard outfit is as under:

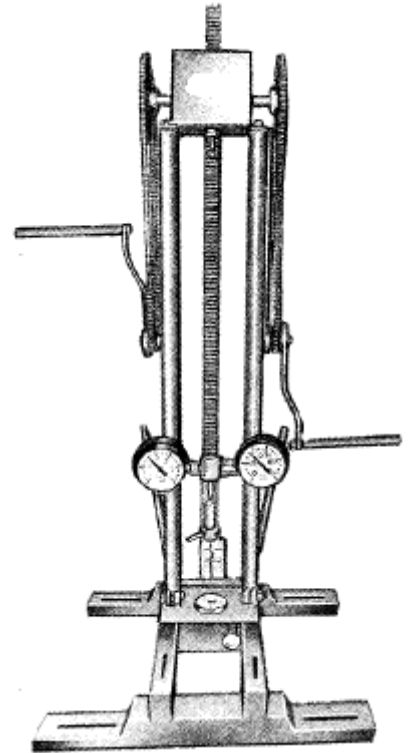
Penetration cone, steel 60' angle 10 sq cm base area with friction jacket -one  
Mantle tube, non uniform 36mm OD at the two ends and reduced diameter in  
between with sounding rod, working length 1 m..... Fifteen  
Load measuring head with automatic cut-off valve and oil can. One set  
Pressure Gauge 0 - 160 kg/cm sq..... One  
Pressure Gauge 0 - 60 kg/cm sq..... One  
Auger with bolt  
Auger driving handle  
T-rod  
Spanner

Note : Uniform diameter mantle tubes can be ordered at extra cost.

Optional Extras : Mantle tube 36mm uniform O.D. with sounding rod, working length 1 meter.

### Spares & Accessories :

Steel cone, 60 degree, 10 sq.cm base area.  
Mantle tube 36mm uniform OD. working length 1 meter with sounding rod.  
Mantle tube 36mm O.D. at the ends and reduced diameter in between with sounding rod. Working length 1 meter.  
Pressure gauge 6 inch diameter 0-10 kg/cm sq. in 0.1 kg/cm sq divisions.  
Sampler to go with the above equipment.  
Friction jacket for Friction Ratio.



ACME-767

## **ACME-768 STATIC CONE PENETROMETER CAP. 98 KN (10000 KGF) (ENGINE DRIVEN)**

### **IS: 4968 (Part-III)**

The main unit consists of a petrol engine driven hydraulic pump for loading. A direction control valve is fitted between pumping unit and hydraulic ram. Greater depths and constant rate of penetration 1 to 2.5 cm/sec can be achieved using engine driven unit. The whole unit is mounted on a trolley with two tyres for ease of transportation.

### **Outfit consists of :**

Steel Penetration cone 60 having 10cm<sup>2</sup> base with friction jacket - 1 No

Mantle tubes uniform 38mm O.D. with sounding rod working length 1 meter - 30 Nos.

load measuring head with cut off valve & pressure gauge 0-600 x 5 kg/cm<sup>2</sup> pressure gauge 0- 100 x 1 kg/cm<sup>2</sup> and oil can- 1 set.

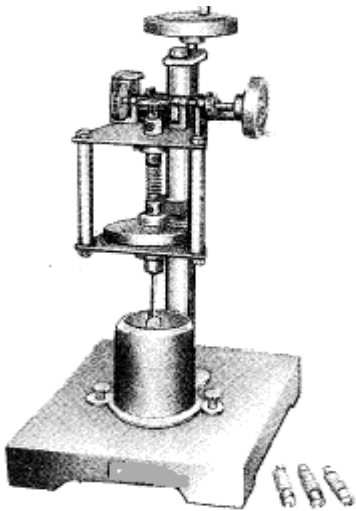
One set of accessories for fixing the penetrometer at site, set consists of 2 nos. Trusses, 6 Nos. 30 cm screw anchors, 6 nos. 20cm screw anchors, 6 nos. screw anchor rods with cone 4 nos. driving handles with extension pipes for screw anchors, 6 nos. clamping bolts & nuts, one extractor tube with connectors, one tool box and one tarpaulin cover.

## **VANE SHEAR**

Soft and sensitive soils where shear strength is less than 15 KN/m<sup>2</sup>, the results are dependent on operator's skill.

Even pushing the sample tubes in soil may cause some disturbance. Experience shows that carefully controlled compression tests result can be obtained by pushing a small vane in the soil and rotating it at a controlled rate and measuring the force, required for maximum resistance.

Vane Shear Test can be conducted in a laboratory or in the field.



**ACME-769**

## **ACME-769 LABORATORY VANE SHEAR APPARATUS (HAND OPERATED)** **IS: 2720 (Part XXX)-1908.**

**Specifications :** Consists of a torque head adjustable in height by means of a lead screw rotated by a drive wheel to enable the vane to be lowered into the specimen. Rotation of the vane is by means of a hand wheel which operates a worm gear arrangement turning the upper end of a calibrated torsion spring. Vane diameter, rod diameter vane size and vane height are as per IS specifications.

The Vane shaft is attached through the hollow upper shaft to a resettable pointer, which indicates the angle of torque on a dial graduated in degrees. The dial reading

multiplied by spring factor gives the torque. A container for soil sample is also supplied, and a sampling tube of 38 mm ID and 150 mm long can also be used as container.

Supplied with set of four springs, one each approx. 2 kg cm, 4 kg cm, 6 kg cm, and 8 kg cm carrying capacity. Complete as above in a wooden carrying case.



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Soil

## **ACME-770 LABORATORY VANE SHEAR (MOTORISED)**

Similar to above but electrically operated. Rate of rotation is 1160 rpm  
Suitable for operation on 230 volts, single phase, 50 cycles, AC

## **ACME-771 POCKET VANE SHEAR APPARATUS**

This is an accurate and portable instrument for the determination of in-situ shear strength of cohesive soils, either on-site or on undisturbed or remolded samples in the Laboratory.

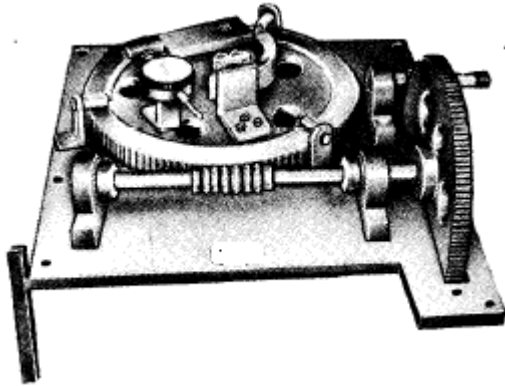
The instrument comprises of a torque head with a direct reading scale which is turned by hand. A non return pointer assists in readings. Vanes of either 19mm or 33mm diameter with rods are fixed to the underside of the torque head, and can be pushed well into the undisturbed material below or behind an excavated surface.

## **ACME-772 HAND VANE TESTER**

Complete with 19mm vane, range 0 to 120 kpa, 33mm vane, range 0 to 28 kpa, Spanners and carrying case.

Accessories : Extra rod 301mm long, Extra rod 1000 mm long.





ACME-773

**ACME-773 IN SITU VANE SHEAR TEST  
IS: 4434-1967.**

The apparatus is designed for conducting in situ vane shear test from bottom of a bore hole in saturated cohesive deposits for determining their in place shearing resistance.

**Specifications :**

The equipment consists of a torque applicator assembly mounted on a base. A gear wheel, which is marked in degrees, holds a torque ring and is geared to a crank. The torque ring is a split ring and deforms as torque is applied and the deformation is indicated by a dial gauge. A calibration Chart to convert dial gauge readings to torque force in kg cm. is supplied. A pointer is provided for registering the rotation of the vane. A detachable stand is provided to anchor the instrument. An attachment to securely hold the string of rods is provided. The equipment comprises of the following:

Torque applicator assembly capacity 2000kg cm with split proving ring and dial gauge 0.002mm x 5mm complete with stand.

Vane(with vane rod) 37.5mm diameter x 75mm high .....1 No

Vane(with vane rod) 50mm diameter x 100mm high .....1 No

Torque rod (Square cross section) 0.6mtr.long .....1 No

Rods, quick coupling type, 1 meter long..... 25 Nos.

Rods, quick coupling type, 1/2meter long.....10 Nos.

Dummy rod, corresponding to 37.5m m diameter vane .....1 No

Dummy rod, corresponding to 50mm diameter vane .....1 No

**Essential Accessories :**

Guide with ball bearing arrangement for alignment of the string of rods for use with 10cm casing pipe.

Guide with ball bearing arrangement for alignment of the string of rods for use with 1Scm casing pipe.

**Accessories:**

Vane (with vane rod) 65mm diameter x 130mm high.

Vane (with vane rod) 75mm diameter x 150mm high.

Vane (with vane rod)100mm diameter x 200mm high.

Dummy rod, corresponding to 65mm diameter vane.

Dummy rod, corresponding to 75mm diameter vane.

Dummy rod, corresponding to 100mm diameter vane.

**Note :** Drilling equipment including casing for bore hole and jacking arrangement which are required for performing the test do not form a part of the above outfit.



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Soil

## SIEVES

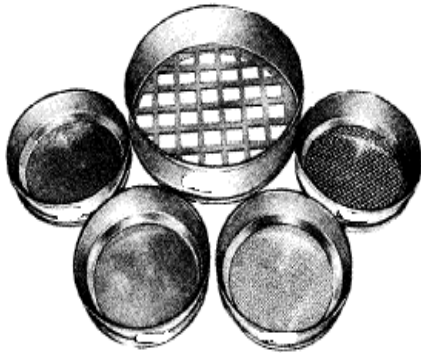
Test Sieves is a common laboratory requirement. Sieves are used to sieving of chemical powders, medical powders, aggregate, sand, soil and cement etc. These sieves are manufactured as per various standards like ISS, BSS, ASTM, DIN etc. In Civil Engineering it is a common practice to use sieves for gradation and particle size determination.

'Multitech' manufacturer's brass frame and GI Frame Sieves of diameter 200mm, 300mm and 450mm. Normally brass sieves are manufactured in 200cm diameter and frame is spun brass, joint less. The Sieve cloth used is standard SS or phosper bronz wire mesh.

The GI Frames sieves manufactured normally in sizes 300mm diameter or 450mm diameter have as steel perforated sheet having accurately punched square holes.

### ACME-774 BRASS FRAME SIEVES 20 cm Diameter and 8" Diameter

Sizes available are:(BS 410-1996)	(IS 460 Part-1, 1985)	(ASTM E 11-70) Microns	Aperture
-	4.75mm	4	4750
4	4.00mm	5	4000
5	3.35mm	6	3350
6	2.80mm	7	2800
7	2.36mm	8	2400
8	2.00mm	10	2000
10	1.70mm	12	1 680
12	1.40mm	14	1400
14	1.18mm	16	1200
16	1.00mm	18	1 000
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
00	25 microns.	-	25



ACME-774

Lid and receiver brass for 20cm or 8" diameter sieves- 300 mm diameter a and 450mm diameter GI Frame sieves are available in the following sizes (in mm)

\*Specifications and Design are subjected to change



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Soil

## **ACME-775 G.I. Frame Sieves 300mm Diameter**

### **MS-776 G.I. Frame Sieves 450mm Diameter**

Sizes available:

125,106,100,g0,g0,75,63,53,50,45,40,37.5,31, 5,26, 5,25, 22.4, 20, 19, 16, 19.2, 12.5, 11.2, 10, 9.5, 8, 6.7, 6.3, 5.6 and 4.75 mm.

Lid and receiver, GI for 300mm or 450mm diameter sieves

### **SIEVE SHAKERS**

This device can be used for ores, refractory materials, minerals, aggregates pigments, powdered coal, Soap, cement, roofing materials, plastic molding powders, and metal powders, in short wherever sieving is applied" In a soil laboratory this instrument has its own importance as it saves a considerable amount of time and labor, besides giving perfect sieving. Sieve Shakers are either Electrically operated or Hand Operated.

### **ACME-777 SIEVE SHAKER (HAND OPERATED)**

For 20cm diameter Sieves

This is a light, portable but sturdy sieve shaker suitable for bench mounting. The side to side movement to the carrier which can take upto 7 sieves of 150mm or 200mm diameter is through a train of gears

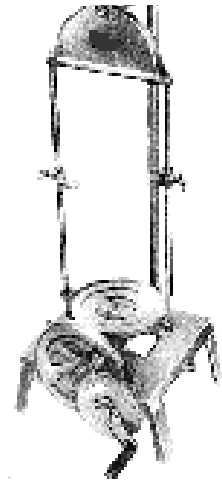
### **ACME-778 SIEVE SHAKER (HAND OPERATED)**

For 20cm & 30cm diameter Sieves

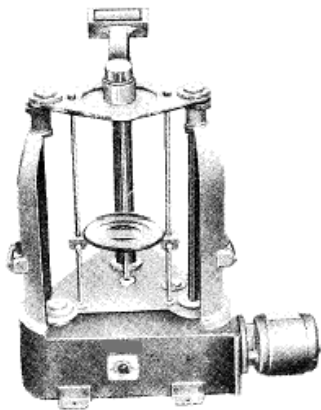
Same as above but carrier table and holder suitable to take 20 cm as well as 30cm diameter sieves.

### **ACME-779 SIEVE SHAKER (HAND OPERATED) For 20cm diameter Sieves**

Specification : This is similar to above sieve shaker but the gears are enclosed in a box on which the sieve carriage is mounted. In addition to the side rocking motion, there is also a taping action.



ACME-777



ACME-780

### **ACME-780 SIEVE SHAKER 'ROTAP'**

To make process of sieving simpler and quicker, 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 motorized. The shaker can accommodate upto 7 Nos. Sieves of diameter 150mm or 200mm.

Suitable operation on 230 Volts A.C. Single phase.



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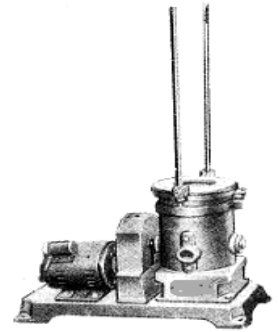
Soil

## **ACME-781 SIEVE SHAKER "GYRATORY"**

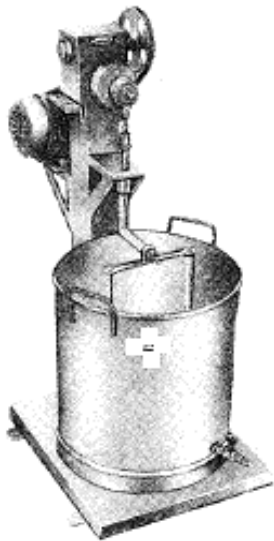
**Specifications :** Carries upto 7 sieves of 150mm or 200mm diameter. The shaker is driven by a 1/4 HP motor through a reduction gear immersed in oil. The sieve table does not rotate but is inclined from the vertical axis and the direction of inclination changes progressively in clockwise direction. If the stop-pin below the table is removed, the shaker can have a rotary motion. In addition to this gyratory motion of the table, there is an upward and downward movement ensuring that each square cm of the sieve is utilized. A pair of rods and a holder are supplied. The holder can be fixed on the top of the upper most sieve, and thus the sieve set is firmly held.

Suitable for operation from 230 volts, 50 cycles phase, A.C supply. Nett weight approx. 77 kg.

**Accessories :** Adaptor for 30 cm diameter sieves. Time switch 0 -60 minutes in 5 minutes graduation.



**ACME-781**



**ACME-783**

## **ACME-782 WET SIEVE SHAKER (YODAR TYPE, MOTOR DRIVEN)**

**For carrying out wet sieve analysis of materials.**

**Specifications :** Consists of a water reservoir and a holder for sieves, which can take upto 7 sieves of 150mm or 200mm diameter. Shaker is driven by a 1/4 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 for operation 230 volts, A.C.

## **ACME-783 WET SIEVE SHAKER (For 4 Sieve sets)**

**Similar to above but with a provision for mounting four sets of sieves at a time.**



## **ACME-784 PLATE BEARING TEST APPARATUS IS: 1888-1962.**

**This is for estimating the bearing capacity of shallow foundations in situ and for the design of flexible pavement. In the test procedure a steel plate is subjected to gradually increasing load and settlements of the plates recorded. Maximum bearing capacity is noted as that load at which the plate starts sinking rapidly.**

### **Specifications :**

**The basic outfit consists of :**

**50 Tone Hydraulic jack with separate pumping unit fixed to it a 0 -500 KN. x 0.5 KN.**

**Pressure gauge and flexible metal pipe 5 meter long- 1 No.**

**Special ball and socket arrangement between the jack and the bearing plate - 1 No.**

**Extension rod 12mm. diameter x 25cm. long for taking dial gauge readings - 16 Nos.**

**Magnetic base with female thread on top for holding extension rod 4 Nos.**

**Top end plate, 50mm, diameter with male thread for fitting onto the extension rods and**

**positioning the dial gauge plunger - 4 Nos.**

**Column 15cm. dia x 25cm long with flanges complete with four bolts and nuts - 2 Nos.**

**Column 15cm. dia x 50cm long with flanges complete with four bolts and nuts - 1 Nos.**

**Bridge support of welded steel angle construction, 5 meter span and stands approximately**

**30cm, high. Fitted with two quick release clamps for positioning and holding the dial bracket-2 Nos.**

**Plane MS Plate 60cms x 60cms. square x 25mm thick**

**Plane MS Plate 45cms x 45cms. square x 25mm thick**

**Plane MS Plate 30cms x 30cms. square x 25mm thick**

**Dial Gauge 0.01mm x 25mm. - 4 Nos.**

### **Accessories:**

**Plane M.S. Plate 75cm x 25mm thick**

**Plane MS Plate 50cm x 25mm thick**

**Grooved MS Plate 60cms x 60cms x 25mm. thick**

**Grooved MS Plate 45cms x 45cms x 25mm. thick**

**Grooved MS Plate 30cms x 30cms x 25mm. thick**

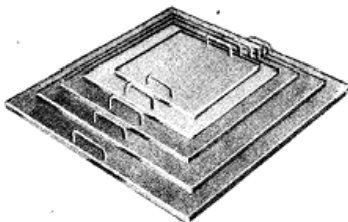
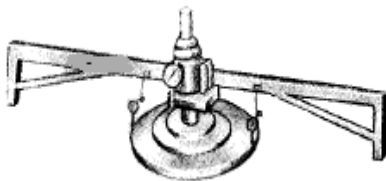
**Grooved MS Plate 75cms x 75cms x 25mm. thick**

### **Note :**

**1. When plates of size more than 30 cm sq. are used, in order to prevent deflections of the edge, a series of smaller plates are advised to be placed concentrically on the bottom plate.**

**2. Flexible rubber pipe 1 meter length can be supplied for the hydraulic jack in place of metal pipe at extra cost.**

**For site testing load trusses to meet the reaction of loading are available in different capacities as under.**



**ACME-784**



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Soil

## ***ACME-785 LOAD TRUSS 20 Tone Capacity***

### **Specifications:**

The Truss is of welded | - girder construction in two halves which can be bolted together when required. The lower chord, the cross-pieces for holding the truss down and the vertical thrust members are all of welded box type construction with two channels enclosing and welded to an I-girder. The anchorages are of a design tried out and perfected at CBRI, Roorkee. They consist of semi-cylindrical pieces each held down by 3 feet long steel spikes driven in through holes drilled in the semi cylinder.

The spikes enter the ground at about 60 degree to the horizontal, four from each side spaced along the length of the anchorage.

## ***ACME-786 LOAD TRUSS 30 Tone Capacity***

Similar to above but twelve anchorages and spikes instead of eight.

## ***ACME-787 LOAD TRUSS 50 Tone Capacity***

Similar to above but sixteen anchorages and spikes instead of eight.



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Soil

## ACME-788 COMPRESSION PROVING RINGS

Proving Rings are used for load measurements and are used in the outfits of a number of Soil/Cement & Bitumen Testing Equipments like Direct Shear Test Apparatus, Triaxial Shear Test Apparatus, C.B.R. Test, Unconfined Test, Marshall Test etc.

They are made out of special steel carefully forged to give maximum strength and machined to give highest sensitivity combined with stability to ensure long life and accuracy.

When compressive or tensile load is applied within the elastic range, the proving rings get temporarily deformed. This deformation is measured by a sensitive dial gauge fixed co-axially at the centre of the proving ring.

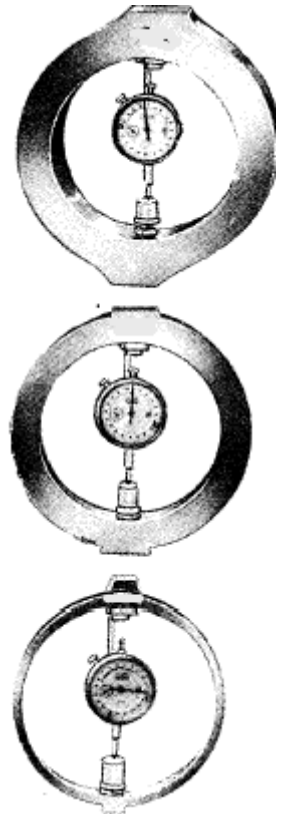
The dial gauge readings thus obtained versus load applied enable the operator to find out unknown load, just by noting the dial gauge reading for the unknown load. The Proving Rings have high elasticity and on removing load they regain their original shape provided they are loaded in their elastic limits.

A dial gauge and plunger anvil are mounted on brackets clamped to the ring body. The dial gauge is held perfectly rigid without the remotest chance of shifting due to inadvertent shocks or pressures exerted on it. The dial gauge plunger rests on an adjustable anvil.

Proving Rings, from 50kg to 100,000kg capacity provided with 1 1/2 inch B.S.F. female threads. Loading bosses and a loading ball nipple and steel ball are supplied with each ring. Rings of capacity over 25000kg (or 25 Tones) are not thus threaded. Each ring is individually calibrated and supplied with works calibration chart and a carrying case.

Calibration Charts from Standard Laboratories for the Proving Rings ordered are also available at extra cost. All Proving Rings are Integral type. Integral type Compressive Proving Rings of different capacities from 50 kgf to 200000 kgf are available.

(a) above capacity 50 to 500kg, (b) above cap.500 to 3000kg, (c) above cap. 3000 to 5000kg, (d) above capacity 5000 to 10000kg, (e) above capacity 10000 to 20000kg, (f) above capacity 20000 to 30000kg, (g) above capacity 30000 to 50000kg, (h) above capacity 50000 to 100000kg, (i) above capacity 100000 to 200000kg, (j) above capacity 200000 to 300000kg

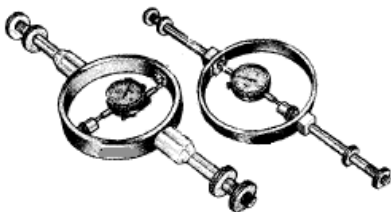


ACME-788

## ACME-789 TENSION COMPRESSION PROVING RING Available from 200kg to 10000 kg Capacities

Tension Compression Proving Rings are having standard 1/2" (BSF Threads) and for measuring tension, 2 Nos. tension rods having male threads at both ends are supplied.

For measuring loads in compression these tension rods are removed and the ring can be used in usual way. Works calibration Charts for tension and Compression are supplied with each ring.



ACME-789