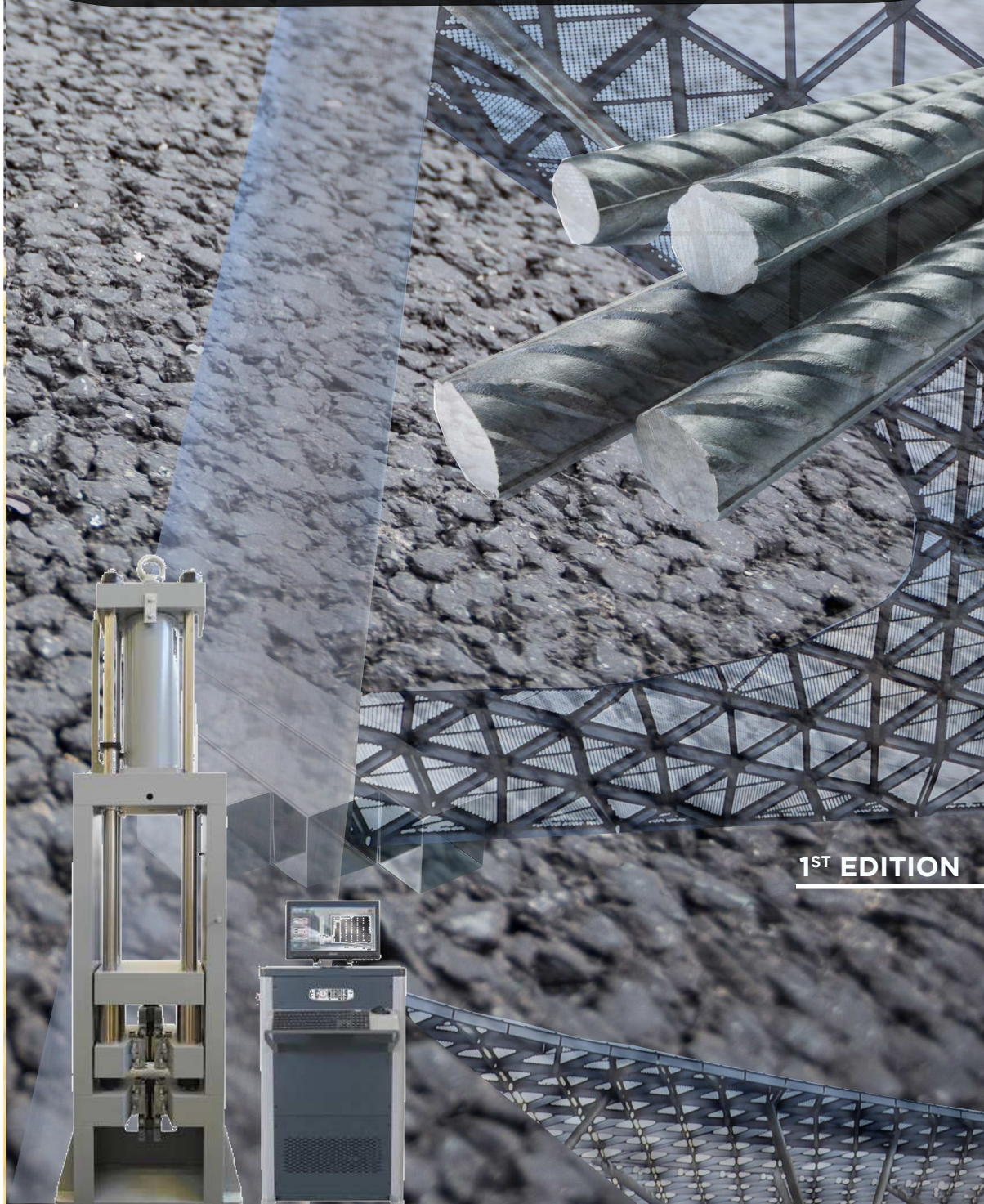




North South University

LABORATORY EQUIPMENT

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING



1ST EDITION

LABORATORY EQUIPMENT

DEPARTMENT OF
CIVIL & ENVIRONMENTAL ENGINEERING

1st Edition

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LABORATORY EQUIPMENT

DEPARTMENT OF
CIVIL & ENVIRONMENTAL ENGINEERING

1st Edition

Structural Engineering Laboratory

Engineering Materials Laboratory

Transportation Engineering Laboratory

Geotechnical Engineering Laboratory

Water Resource Engineering Laboratory

Surveying Laboratory

Environmental Laboratory

“Without laboratories
men of science
are soldiers without arms.”

-Louis Pasteur

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1

Universal Testing Machine (UTM) with all accessories

Brand: Controls
Cat. No. 70-C0820/C
Origin: Italy

Main Feature

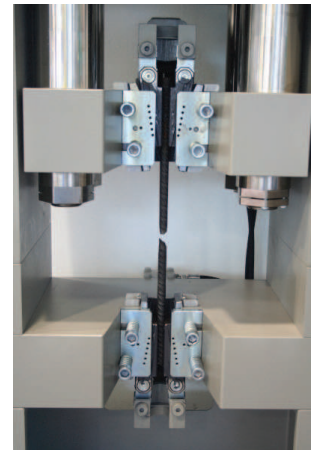
- 1000 kN capacity in tension and 2000 kN in compression
- Completely automatic test cycle at a press of a button up to the printout of the test certificate
- Strain gauge load cell incorporated in the piston, providing accurate load measurement
- Rapid vertical displacement of mobile frame by remote control
- Hydraulic gripping system controlled by remote control
- Three sets of grippers for round re-bars up to 40 mm dia. and flats up to 70x35 mm
- Front loading of specimens for quick and easy operation
- Display of stress/strain diagram in real time
- Printout of stress/strain diagram and test results
- Optional second frame facility to control an additional frame up to 5000 kN capacity for concrete testing

Machine frame, cylinder assembly, load cell

- Steel base with rigid frame housing the lower grippers
- Piston/Cylinder assembly mounted on the top of the rigid frame. Load cell incorporated in the piston.
- Mobile frame consisting of four high tensile strength columns, upper crosshead directly connected to the piston, intermediate crosshead with compression platen and lower crosshead housing the upper grippers.

Control console

- The lower section houses the hydraulic assembly which include: Hydraulic pump, Proportional valve, Hydraulic valves, Heat exchanger to control the oil temperature and the Oil tank.



Grippers

Three sets of standard grippers supplied with the machine, for rounds and flats, plus two sets of grip liners to provide maximum bearing and holding surface for specimens of all sizes.

Safety features

- Pressure switch, which automatically stops the machine when the oil pressure goes over the maximum permitted level.
- Max travel limit switch to stop the mobile frame at its upper position.
- Software feature which stops the machine when the maximum load is reached.

Hardware

The upper section of the control console houses the electronic card for the control of all functions, having the following specifications:

- A/D converter resolution 1/20000
- No. 4 outputs for electrovalves
- Analogical output for load and strain control: 12 bit
- Load cell input



2

Software

The machine can be used either in the manual or in the automatic mode to perform:

- Tensile test on steel reinforcing bars conforming to EN 10002 and ASTM A370
- Tensile tests in general, flexural (transverse) and bending test on steel conforming to ASTM E290, UNI 564.
- Flexural tests on concrete beams conforming to EN 12390-5
- Compression tests on concrete specimens conforming to EN 12390-3

Standard outfit

The machine is supplied complete with:

- No. 3 sets of grips for round specimens up to 40 mm dia. and flat specimens up to 70 mm wide and 35 mm thick and two sets of grip liners.
- No. 1 set of foundation bolts, 1 service spanner, instruction manual, PC and colour graphic printer

TECHNICAL SPECIFICATIONS:

Max. test load

- In tension: 1000 kN
- In compression: 2000 kN

Measurement load ranges

- Automatic changeover of scale sensitivity, minimum reading value 100 N

Tensile test

- Max. distance between grips: 700 mm
- Gripping system: Hydraulic with remote control
- Max. round dia.: 40 mm
- Max. plate specimens size: 70x35 mm

Test speed: 0-83 mm/min

Crosshead adjustment speed: 500 mm/min

Max. piston stroke: 610 mm

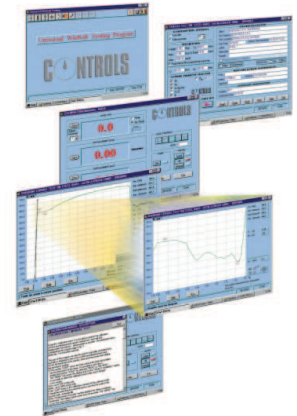
Distance between columns: 330 mm

Dimensions

- Testing frame (piston fully out): 955x635x3960 mm
- Control console: 800x900x1550 mm

Weights and shipping cubage

- Testing frame: 2900 kg approx.
- Control console: 200 kg approx.
- Total gross weight: 4000 kg approx.



Extensometers

Universal Extensometer (for 50 to 200 mm dia bar)

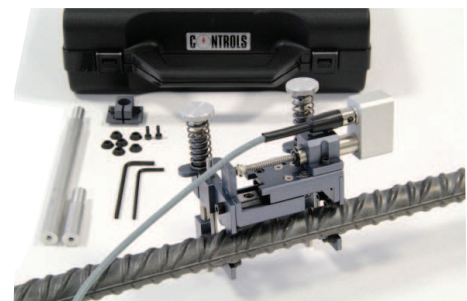
Brand: Controls

Cat No. 70-C0954/C

Origin: Italy

Description:

Used to measure the elongation of steel re-bars, round and wire steel specimens. Ideal for use with Electromechanical universal tester and Automatic computerized 1000/2000kN testing machines for steel and concrete. Both models feature a base of measurement from 50 to 200 mm. They have to be removed before sample failure.



Electronic version 70-C0954/C1

- Measuring base: 50 to 200 mm
- Linearity: better than $\pm 1\%$
- Max travel: 10 mm
- Weight approx. (both models): 1 kg

Coaxial Extensometer

Brand: Controls
Origin: Italy

DESCRIPTION

Extensometers used for measuring the extension of specimens in traction, particularly in the case of steel and brittle materials, are only able to detect strain during the first stage of the test, or rather, while the brittle materials conserve their elasticity as they have to be disconnected before failure. This simple and economic system fully satisfy these requirements because:

- it is applied directly to the specimen
- it remains connected until breakage
- it measures extensions with high precision of both elastic and plastic stage and with the appropriate simple adjustment, it is connectable to almost all testing machines
- it avoid markings on the test piece

The extensometers are basically made from three separate aluminium tubular sections, joined telescopically to one another. The middle section, delimited by the larger diameter, determines the measuring base, which, as is well known, must be 5 times the diameter of the specimen (in the case of breaking point measurements). The two end sections consist of two mechanisms for gripping the specimen. One carries the electrical extensometer, the other an anvil.

Description

Models	70-C0961/A1	70-C0961/B1	70-C0961/C1	70-C0961/D1
Measuring range dia.				
Min/Max mm	5/11.5	11/18	17.5/26	26/36
Measuring base (1)	5 x d	5 x d	5 x d	5 x d
Transducer travel	30 mm	50 mm	50 mm	100 mm
Weight approx. kg	0.1	0.2	0.3	0.5



B

Digital Load Calibration Device for UTM

Digimax plus tester

Brand: Controls
Origin: Italy
Cat. No.: 82-P0801/E

Main Features

- High resolution: 256,000 points (less than 0.05% of full scale)
- Large graphic display: 240x128 pixel
- Language selection: English, French, Spanish, German and Italian
- Large permanent memory: up to 960 readings
- Two RS 232 serial ports for PC and printer

- Remote control
- MS EXCEL Template available for producing calibration certificates conforming to EN/ASTM standards

GENERAL DESCRIPTION

The system, connected to any strain gauge load cell, provides data for the force verification of the testing machine. Data can be printed by a standard serial printer as, for example, our model 82-P0172 with serial cable 82-P0172/1 or unloaded to PC for processing and, by the relevant MS Excel template 82-P0804/E4 for producing the test certificate conforming to the standard in use as, for example, EN 12390-4 or ASTM C39 for concrete compression testers.

TECHNICAL SPECIFICATION

- Microprocessor based
- Clock calendar chip
- Large permanent memory to store data and test results
- Two RS 232 serial port for PC and printer
- Transducers, 256,000 points resolution
- Graphic display 240x128 pixel
- Dimensions: 250x220x150 mm
- Weight approx.: 2 kg

Hard Plastic Carrying Case

Code: 82-P0800/C
Manufacturer: Controls
Origin: Italy
Standards: ASTM & EN

Description:

- Hard plastic carrying case for 82-P0801/E tester and serial printer
- 2 year manufacturer's warranty
- Protective Case 45-19 with foam insert
- External dimensions: 570 x 470 x 230mm (WxDxH)
- Internal dimensions: 490 x 398 x 200mm (WxDxH)(Including lid)
- Premium ABS composite resin
- Injection moulded case
- High tensile axles on handles and hinges
- Rubberised polyurethane handle grip
- Double pivot latches
- Handles and latches recessed within case perimeters
- Automatic pressure purge/valve
- Water proof & dust proof
- Scratch resistant textured surface
- 3 x handle(Grip size: 95mm)
- 8mm lock point for pad locks
- Colour: Black
- Weight: 7.3 kg



Load cell 1000KN

Brand: Controls
Origin: Italy
Cat No: 82-E0100/100

Description

These high performance cells have been specially designed to meet the stringent requirement of EN ISO and ASTM standards, for calibration of compression testing machines. The cells have to be connected to a suitable Digital tester as, for example, our model 82-P0801/E Digimax Plus.

The Load cells connected to the Digital tester, can be supplied complete with Official or Traceable calibration certificate which, as specified, concern either the cell or the digital tester.

Technical Specification

- Accuracy: Class 1 EN ISO 376
- Linearity: $\leq \pm 0.05\%$ F.S.
- Hysteresis: $\leq \pm 0.05\%$ F.S.
- Repeatability $0^\circ -120^\circ -240^\circ$: $\leq \pm 0.145\%$ F.S.
- Reversibility: $\leq \pm 0.240\%$ F.S.
- Zero: $\leq \pm 0.030\%$ F.S.
- Zero balance: $\leq \pm 1\%$ F.S.
- Supply voltage: 10 V
- Material: stainless steel
- Connector type: MIL-C-5015 7 poles male

Force Calibration Verification MS Excel Spread Sheet

Code: 82-P0804/E4

Manufacturer: Controls

Origin: Italy

Standards: ASTM & EN

Description:

- MS EXCEL Template available for producing calibration certificates conforming to EN/ASTM standards
- MS EXCEL Template for force calibration verification

1.C

Digital Slide Calipers (Range: 0-200mm & 0-300mm)

Main Features

- Four-way measurement capability for multiple applications: outside diameter (OD), inside diameter (ID), depth, and step
- Digital, single-value readout LCD display in metric units for readability
- Position memory for retaining measurements
- Function control buttons on the face, for ease of use: Origin, On/Off, and Zero/ABS (Absolute Scale)
- Can measure up to 200m & 300mm



1.D

Flexure/Bending/Beam Testing Apparatus with Bearing & Roller arrangement for beam up to 10 feet length

Brand: BLE

Origin: Bangladesh

Description:

The bending flexural test provides values for the modulus of elasticity in bending, flexural stress, flexural strain and the flexural stress-strain response of the material. The main advantage of a three-point flexural test is the ease of the specimen preparation and testing. However, this method has also some disadvantages: the results of the testing method are sensitive to specimen and loading geometry and strain rate.

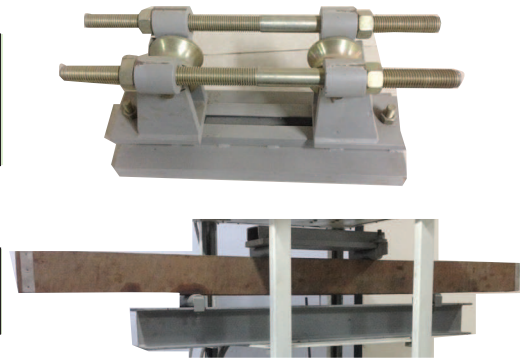


Testing method:

The test method for conducting the test usually involves a specified test fixture on a universal testing machine. Details of the test preparation, conditioning, and conduct affect the test results. The sample is placed on two supporting pins a set distance apart.

Accessories:

- a) Bending test attachment
- b) Transverse test attachment



1.E

Johnson Shear Tool & Cutter with all accessories and Specimens (EN and ASTM standard) for double shear load test arrangement.

Brand: BLE
Origin: Bangladesh

Description:

In direct shear test, the shearing stress is considered as uniformly distributed over the entire cross section. The shear force is applied by a suitable test rig, two different cases of shearing may arise; i.e., single shear and double shear. In single shear shearing occurs across a single surface and in double shear shearing occurs across two surfaces. Knowledge of shear failure is important while designing any structures or machine components. Shear force causes the surface to go out of the alignment with each other and thus the material fails.



2 Rockwell Hardness Tester with all accessories (EN and ASTM standard)

Brand: Laryee
Origin: China
Model: HR-150DT

Description:

Rockwell hardness test is a simple instrument to test the hardness value of hard metals, carburized steels, quenched steels, hard cast irons, mild steels, Al-alloys, Cu-alloys and malleable irons according to Rockwell Principle according to ISO 6508 and ASTM E18. It measures the depth difference between the primary and testing load and convert the depth difference to the hardness value. These machines can be operated semi-automatically. They are essential testing instruments for quality testing section, university and college, research institution and industrial laboratory.

Model HR-150DT is Rockwell test with scales A-B-C (60/100/150kgf) with dial indicator and motor control loading.

Model HRM45DT is superficial Rockwell test scales N & T (15/30/45kgf) with dial indicator and motor control loading. Model XHR-150 can do the test plastic hardness according to ISO 2039-2 and ASTM D785. It tests scales including HRR, HRL, HRM, HRE, HRK with dial indicator and motor control loading.



Specification:

Model	HR-150DT
Preliminary test force	98N (10Kgf)
Total test force	588N(60Kgf), 980N(100Kgf), 1470N(150Kgf)
Total test force dwell time	2-60S
Hardness indication	Dial
Max height of specimens	175mm
Max width of specimens	165mm
Dimension (D x W x H) (mm)	520×215×700
Net weight	80kg
Power supply	AC220V 50/60HZ
Standard Accessories	Diamond Rockwell indenter(1), Ø1.5875mm hardness ball indenter(1), Standard Rockwell hardness block (3), Testing table (big, medium, "V") (total 3), Weight block(A, B, C), Lever

3

Pendulum Impact Tester (EN and ASTM standard)

Brand: Fuel Instruments & Engineers Pvt. Ltd.

Origin: India

Model: IT-30 (D)

Description:

The pendulum Impact Tester, Model IT-30 is designed for conducting Izod, Charpy test. The test methods confirm to BS: 131: Part 4-1972 (Amended 15 Aug. 1993) BSEN: 10045-2: 1993

The Pendulum is mounted on antifriction bearings. It has two starting positions, the upper one for Charpy & the lower one for Izod testing. On release, the pendulum swings down to brake the specimen and the energy absorbed in doing so is measured as the difference between the height of drop before rupture of the test specimen and is read from the maximum pointer position on the dial scale. There are two strikers and one combined support available for fitting in to the pendulum and on to the base of the machine for the Izod, Charpy test respectively, Changing from one striker to another is achieved simply by fixing the new striker into its position.



Specification:

Model	IT-30 (D)
Maximum capacity	300J
Minimum Scale Graduation	0.5J
Display	Digital
Overall Size (Approx.)	1.32m x 0.45 m x 1.05 m (H)
Net Weight (Approx.)	375 kg

4.A

Slender Column Tester (EN and ASTM standard)

Brand: BLE

Origin: Bangladesh

Description:

Whenever a structural member is designed, it is necessary that it satisfies specific strength, deflection and stability requirements. Typically strength is used to determine failure, while assuming that the member will always be in static equilibrium. However, when certain structural members are subjected to compressive loads, they may either fail due to the compressive stress exceeding the yield strength or they may fail due to lateral deflection. In the latter case, the structural member experiences a sudden change in its configuration. Further load will cause significant and somewhat unpredictable deformations, possibly leading to complete loss of the member's load-carrying capacity. If the deformations that follow buckling are not catastrophic the member will continue to carry the load that caused it to buckle. If the buckled member is part of a larger assemblage of components such as a building, any load applied to the structure beyond that which caused the member to buckle will be redistributed within the structure.



Specifications:

- a) Accessories for different end conditions
- b) 3-5mm, 6-6mm, 3-8mm H.T. wire of different length
- c) Weights (4-50g, 4-100g, 2-¼kg, 4-½kg, 2-1kg, 2-1.5kg, 2-2.5kg, 2-5kg)

Iron cutting tools (motorized)

Origin: China

Description:

Iron cutting tools usually consists of protective cover, triangular belt, belt pulley, electric motor, power switch, adjusting screw, bearing, cutting knife and so on. It is efficient to cut ordinary carbon steel, cold and hot round steel, screw thread steel, flat steel, angle steel and square steel on building construction. The machine has compact structure, high efficiency, small volume, light weight, high safety, high strength. It also can save power, time and labor. It is convenient to use, maintain and move, can be operated flexibly.



Balance (1000kg)

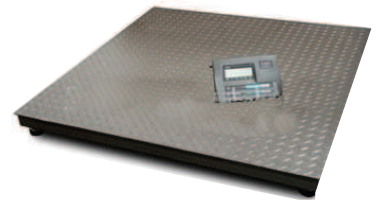
Brand: JM

Origin: China

Model: TCS-1000

Specification:

1. High accuracy load cell capacity; these scales come with large LCD display and two power sources that are rechargeable battery and AC adaptor selectable.
2. These scales are durable in quality and come with firm body and have holistic base for convenience to use.
3. Auto zero tracking
4. Have overloading protective device.



Resolution

Model	Capacity(Kg)	Devision(Kg)	precision	Specification(mm)(length x width)
TCS-1000	1000	0.5	OIML III	1000*1000

5

Motorized Trolley

Brand: BLE

Origin: Bangladesh

Description:

Four wheeler Motorized Trolley can move horizontally and vertical-ly. Mainly it can uplift instruments or materials at a certain height, and also it drives horizontally with its wheels by hand pushing.



Engineering Materials Laboratory

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1

Vicat Apparatus with Accessories

Manufacturer/Brand: ELE International

Origin: UK

Standards: ASTM and EN

Description:

Determination of setting time and soundness of cement requires the use of a neat cement paste of standard consistence. The Vicat method is usually specified as the test used to determine the water content which will produce the desired consistence.

Technical Information

The Concrete Mortar Penetrometer is used for field and laboratory evaluations of the initial set of concrete mortars. The test involves inserting the penetrometer shaft to a depth of 25.4 mm at constant rate and time interval. The resistance in lbf/in² is shown on the penetrometer's direct-reading scale.

Mold	Hard rubber; 70 mm base diam. x 60 mm top diam. x 40 mm h.
ASTM C91	Yes
ASTM C187	Yes
ASTM C191	Yes
AASHTO T129	Yes
AASHTO T131	Yes
Description	Vicat Apparatus

Technical Specifications

Plunger	Reversible; 10 mm diam. at one end and 1 mm diam. needle at other end; combined weight 300 grams.
Needle	Steel; mounted in plunger; 1 mm diam. x 50 mm long.
Scale	Graduated in millimeters.
Mold	Hard rubber; 70 mm base diam. x 60 mm top diam. x 40 mm h.
Weight	Net 4 lbs. (1.8 kg).



Vicat Frame complete with consistency plunger, 10mm diameter. Requires one initial & final set needle to make up test weight to 300g

Code: Product No. 38-2010

Description:

It is used for Consistency, Setting Time, Workability and Flow, Cement Setting Time. Complete with consistency plunger, 10 mm diameter. Requires one initial or final set needle to make up test weight to 300g.

Technical Specifications

Description	Vicat Frame (less Needle Sets and Moulds)
Weight, kg	1.3
EN 196-3	Yes
EN 13454-2	Yes
ASTM C187	Yes
ASTM C191	Yes



Comprising 1 x EN Initial Set Needle 1.13 mm diameter and 1 x EN Final Set Needle 1.13 mm diameter with special footing.

Code: Product No: 38-2110

Description:

- It is used for Consistency, Setting Time, Workability and Flow.
- 1.13mm diameter and 1.13mm diameter with special footing.



Technical Specifications

Description	EN Initial and Final Set Needle
Weight, kg	0.018
ASTM C187	Yes
ASTM C191	Yes

ASTM Initial Set Needle. 1 mm diameter

Code: Product No: 38-2620

Description:

It is used for Setting Time, Consistency, Setting Time, Workability and Flow, Setting Time

Technical Specifications

Description	ASTM Initial Set Needle
ASTM C187	Yes
ASTM C191	Yes

Vicat Mould manufactured from brass and supplied complete with a ring and glass base plate

Code: Product No: 38-2200

Description:

- It is used for Consistency, Setting Time, Workability and Flow.
- Accessory: manufactured from brass and supplied complete with a ring and glass base plate.
- The Brass Vicat Apparatus Conical Mold is used with the Modified Vicat Apparatus for Consistency and Set Time. The brass mold is 76mm dia. x 40mm high.

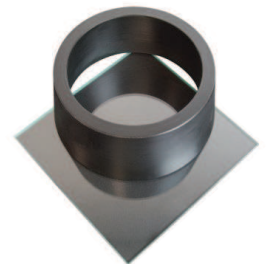


EN Vicat Mould manufactured from a hard rubber compound and supplied complete with a glass base plate

Code: Product No: 38-2300

Description:

- Vicat Apparatus Conical Mold, Plastic.
- Manufactured from a hard rubber compound and supplied complete with a glass base plate.
- It is used for Consistency, Setting Time, Workability and Flow



Technical Specifications

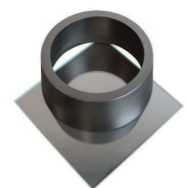
Description	EN Vicat Mould
EN 196-3	Yes

ASTM Vicat Mould manufactured from non-absorbent plastic and supplied complete with a glass base plate

Code: Product No: 38-2660

Description:

- Vicat Apparatus Conical Mold, Plastic.
- Manufactured from non-absorbent plastic and supplied complete with a glass base plate.
- It is used for Consistency, Setting Time, Workability and Flow.



Technical Specifications

Description	ASTM Vicat Mould
ASTM C187	Yes
ASTM C191	Yes

2

Blaine apparatus with accessories

Code: EL38-1000

Manufacturer/Brand: ELE

Origin: UKStandards:

EN 196-6, EN 459-2, EN 13286-44, BS 4359-2, ASTM C204, AASHTO T153

Description:

The Blaine Air Permeability Apparatus determines the fineness of Portland cement in terms of specific surface area expressed as the total surface area in square centimeters per gram of mortar or cement. The Blaine works by drawing a definite quantity of air through of bed of cement exhibiting a definitive porosity value. The number and size of the pores in a prepared bed of definite porosity is a function of the size of the particles and determines the rate of airflow through the bed. This procedure is outlined in ASTM C204, Method A and AASHTO T153. The Blaine Air Permeability Apparatus consists of: calibrated U-tube manometer, ground glass joint, stainless steel test cell and plunger, rubber aspirator bulb and perforated disc. Includes an 8 oz (226.8g) bottle of red manometer fluid, filter paper, wood block for holding test cell during filling and a funnel. Mounted on finished wood panel with rubber-footed base.



Specifications

Description	Blaine Air Permeability Apparatus
EN 196-6	Yes
EN 459-2	Yes
EN 13286-44	Yes
BS 4359-2	Yes
ASTM C204	Yes
AASHTO T153	Yes
Cell	Stainless steel; 12.70 ±0.10 mm i.d.
Disk	0.9 ±0.1 mm thick with 30-40 one mm diam. holes.
Plunger	Stainless steel.
Manometer	U-tube glass with ground joint, stop cock and rubber bulb assembly.
Filter Paper	12.70 mm diam.
Fluid	Pure Mineral Oil.
Weight	Net 7 lbs. (3.2 kg).

Manometer Liquid (Dibutylphthalate). 500 ml bottle

Code: Product no.EL38-0620

Technical Specifications

Description	Manometer Liquid
EN 196-21	Yes
ASTM C204	Yes

Reference Cement. 10 g sachet

Code: Product no.EL38-0645

Specifications

Description	Reference Cement
ASTM C204	Yes
AASHTO T153	Yes

Filter Papers. 12.7 mm diameter. Box of 100

Code: Product no.EL38-0650

Specifications

Description	Filter Papers
Diameter	12.7mm diameter
ASTM C204	Yes



Spare: Manometer U- tube

Code: Product no.EL38-1000/10

Specifications

Description	Manometer U-Tube
ASTM C204	Yes

Spare: Blaine Air Permeability Cell

Code: Product no.EL38-1000/15

Description:

Stainless steel with a perforated disc and plunger.

Specifications

Description	Blaine Air Permeability Cell
ASTM C204	Yes



3

Mould 2"cube

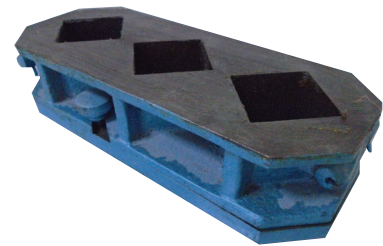
Manufacturer/Brand: BLE

Origin: Bangladesh

Standards: ASTM

Description:

1. 50X50X50mm Cement Mortar Mould .
2. Three gang mould made from high quality steel.
3. Cement mortar compression mould.



4

Slump cone with base plate

Manufacturer/Brand: Bangladesh

Origin: Bangladesh

Standards: EN 12350-2, ASTM C143, AASHTO T119

Description:

Concrete Slump Test Set is used for the determination of the consistency, the medium and high workability of fresh concrete. The concrete slump test set consists of slump cone, slump cone funnel, 600 mm long x 16 mm diameter tamping rod which is hemispherical at both ends, base plate, rubber mallet and steel rule.

- 4A) Slump Cone complying with EN 12350-2, ASTM C143 and AASHTO T119
- 4B) Tamping Rod- Steel, 600 mm long x 16 mm dia, hemispherical at both ends
- 4C) Steel Rule
- 4D) Base Plate
- 4E) Slump Cone Funnel



5

Tilting Drum Mixer

Code: CN 930

Manufacturer/Brand: Impact Test Equipment Ltd.

Origin: EU

Description:

Tilting drum concrete mixer mixes the ingredients while forward rotating, and discharges while reversing the concrete mixer drum. Tilting drum concrete mixer is often used to blend plastic and semi dry concrete. With the advantages of low noise, stable operation, convenient movement, high working efficiency, high quality and high productivity, tilting drum type concrete mixer is especially suitable for the construction of roads, bridges, water and electric engineering.



Specifications

- Double insulated 370 Watt, 230v electric motor.
- 90 litre mix capacity.
- Safety NVR (no volt release) switch.
- Robust drive mechanism for long term use.
- Smooth tipping action.
- Durable & robust - ideal for professional use.
- Includes robust stand

6

Cylinder & Cube Mould, Measuring Cylinder, Beaker & other Accessories

Cylinder Mould. 100 mm diameter x 200 mm long, complete with base plate

Origin: Bangladesh

Description:

Molds are constructed of plated steel for rust resistance and are dimensionally stable under severe use. Molds are split along one side with 2 quick-acting clamps welded to mold. When open, mold springs apart slightly to allow specimen removal. Include detachable base plate.

1. Dimension : 100*200mm
2. Material: Steel
3. Weight: 9kgs
4. Wall thickness(mm): 5mm



Cylinder Mould. 150 mm diameter x 300 mm long, complete with base plate and locking ring.

Origin: Bangladesh

Description:

Molds are constructed of plated steel for rust resistance and are dimensionally stable under severe use. Molds are split along one side with 2 quick-acting clamps welded to mold. When open, mold springs apart slightly to allow specimen removal. Include detachable base plate.

1. Dimension : 150*300mm
2. Material: Steel
3. Weight: 16 kgs
4. Wall thickness(mm): 8 mm

150 mm Cube Mould. 4-part with clamp attached base plate. Cube Moulds

Origin: China

Description:

- Concrete cube mould
- It is used to prepare cube samples of concrete to do compression test.
- The Cube mould is designed for material lab, it is suitable to all kinds of concrete sample molding.

Specifications

- Inner size: 150mm×150mm×150mm
- Net weight: 16kg
- Feature: Good performance, high precision and easy to operate.
- Material: Cast-iron body with base plate. clamp lug with slot, easy to disassemble and assemble.
- The mould is cleaned and polished



Measuring Cylinder, 250ml capacity. Soda glass, spouted

Code: BS 604.
Origin: Germany

Description:

Measuring cylinders are for holding measuring varying amounts of liquids. Cylinder is a measure of the volume of liquid instruments. It is a vertically long cylindrical shape along one side mouth for easy pouring. The lower part of wide-leg to maintain stability. Cylindrical wall engraved with the volume range for the user to read the volume. Maximum measurable volume from a few milliliters to several liters.

- Class A & High quality inert 3.3 borosilicate glass
- Heavy Duty Reusable
- High quality



Graduated Beaker, 250ml capacity, Borosilicate glass, squat form with spout

Origin: Germany

Description:

- Silica content is more than 99.99%
- high temperature resistance and corrosion resisting
- no bubble and no processing trade
- long time to use



Trowel, gauging with steel blade 200mm long, complies with BS4550

Code: BS4550
Origin: China

Description:

- 200mm Carbon Steel Blade Wooden Handle
- Through Tang
- Handle CO2 Welded to blade for strength and durability,
- Broad Heel

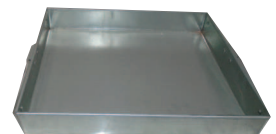


Sample Tray, Heavy-duty, galvanized steel, nesting 610mm X 610mm X 63mm

Origin: Bangladesh

Description:

Fabricated steel drip tray with handles - made to last. 610mm X 610mm X 63mm Deep with handle.



Technical Specifications

Item Weight	6 Kg
Size	610mm x 610mm x 50mm deep

Tamping Rod for tamping specimens to ASTM requirements

Standard: ASTM C 138, ASTM C 143, ASTM C 173, ASTM C 31

Description:

The Graduated Tamping Rod, 24" x 5/8" with Scale is a round, straight steel rod for use with concrete cylinder molds, slump cones, and unit weight tests. Measures 5/8" diameter by 24" length. Both ends are rounded to a hemispherical tip.



Compacting Bar for tamping specimens to EN requirements

Description:

This is used for compacting concrete into cube moulds. This rod is made of steel bar with handle.

Technical Specifications

Dimensions	Diameter 16mm
Cross Section shape	Square 25mm
Length	380 mm long



Wire brush

Origin: China

Description:

Stiff scratch brush, with 4 rows machine punched into wooden handle for durability.



Mould Oil

7

Capping of Cylinder, Melting Pot with Accessories

Cylinder Capping Frame comprising a vertical support, mounted on a steel base designed to accommodate both sizes of capping plates. Supplied complete with 100 mm and 150 mm capping plates.

Origin: Bangladesh

Description:

When testing concrete cylinder specimens it is essential that the two ends are perfectly flat. This range of equipment allows the ends of the various sizes of concrete cylinders or cores to be capped using the sulphur capping compound.

Universal cylinder capping frame for 75mm, 100mm and 150 mm dia. cylinders. Comprising a vertical support mounted on a steel base and capping plates for the above specimen dimensions. Compatible capping plate for 160 mm dia. The frame comprises vertical supports mounted on a steel base. Supplied complete with base plates for 75, 100 and 150 mm dia. cylinder specimens.



Melting Pot

Model: EL34-6122/01

Origin: India

Description:

Used to melt the capping compound. The temperature is set and maintained at the desired value. Adjustable electronic thermo regulator and pilot lamp fully isolated conforming to CE requirement.

Specification

Capacity:	5l approx.
Temperature range:	from +30 to 150°C
Power:	700 W
Dimensions:	internal 200 mm dia. 160 mm depth external 285 mm dia. x 275 mm high
Weight approx.:	2.7 kg
Voltage:	220 - 240 V AC, 50 - 60 Hz, 1 ph



Rubber pad with capping plate 4 set of 6" + 6 set of 4"

Origin: Bangladesh

Description:

When testing concrete cylinder specimens it is essential that the two ends are perfectly flat. This range of equipment allows the ends of the various sizes of concrete cylinders or cores to be capped using the sulphur or rubber capping compound.



8

Concrete NDT Testing Schmidt Hammer with Accessories

Code: 58-C0181/N

Manufacturer/Brand: Controls

Origin: Italy

Standards: EN 12504-2 | ASTM C805

Description:

The concrete test hammer is used to evaluate the surface hardness of hardened concrete in order to evaluate the strength in various parts of the structure.



Technical Information

- Impact energy: 2.207 Nm
- Measurement range: 10 to 70 N/mm²
- Aluminium case, complete with carrying case, grinding stone and instruction manual
- Case dimension: 190x100x350 mm
- Weight approx.: 1.5 kg

9

Concrete Vibrator Poker, Electric

Origin: China

Standards: EN and ASTM

Description:

- Settle concrete quickly and remove air bubbles
- Lightweight, low-noise hand tool
- Lock-on button for extended use
- Up to 25 minutes of continuous use under load
- Easy to manoeuvre 1.5m hose/poker



10

Buoyancy Balance with accessories

Buoyancy Balance

Code: Cat No. 11-D0630/6, 11-D0612/B

Manufacturer/Brand: Controls

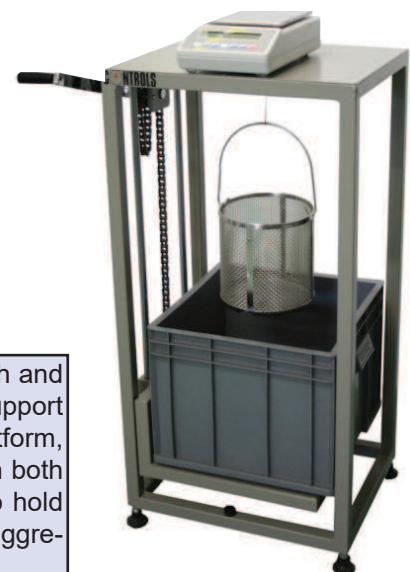
Origin: Italy

Standards: BS 812:2 | EN 12390-7 | ASTM C127 | AASHTO T85

Description:

Used with a suitable electronic balance for specific gravity determination of fresh and hardened concrete and aggregates. A purpose built robust frame designed to support the electronic balance. The lower part of the frame incorporates a moving platform, which carries the water container allowing the test specimens to be weighted in both air and water. The frame has to be completed with the 11-D0612/A1 cradle, to hold concrete cubes or cylinders, or with the suitable Density basket for use with aggregates.

- Overall dimensions: 400 x 650 x 1000 mm
- Weight approx. 25.5 kg



Technical Information

Capacity: 6kg x 0.1 g supplied with frame, water tank and suspension hook. For 220 – 240 V AC, 50 – 60 Hz, 1 ph.

Wire Basket with handle for BS 812 Relative Density

Code: Cat No. 41-D0612/6
Manufacturer/Brand: Controls
Origin: Italy
Standards: BS, ASTM & AASTHO

Description:

Density basket 200 mm dia. x 190 mm high, stainless steel with 1.70 mm mesh opening.

Pycnometer, Sand Absorption cone & tamper

Manufacturer/Brand: Controls
Origin: Italy
Standards: EN 1097-6 | ASTM C127



Sand Absorption Cone made of brass to the dimensions given in BS 812, ASTM C128 and AASHTO T84.

Code: Cat No. 48-D0440
Manufacturer/Brand: Controls
Origin: Italy
Standards: BS, ASTM & AASTHO

Description:

Used for determining the specific gravity and absorption of fine aggregates. Made from steel protected against corrosion.

Technical Information

Weight approx.: 250 g

Tamping Rod for use with cone. Tamping face is 25 mm diameter and complies with BS 812, ASTM C128 and AASHTO T84

Code: Cat No. 48-D0440
Manufacturer/Brand: Controls
Origin: Italy
Standards: BS, ASTM & AASTHO

Description:

Tamper manufactured according to specifications. This item is also used for determining the specific gravity and absorption of fine aggregates.

Technical Information

Weight approx.: 250 g

Bulk Density Measures, 3 liter capacity

Manufacturer/Brand: Local
Origin: Bangladesh
Standards: BS, ASTM & AASTHO

Description:

The angularity or absence of rounding of the particle of an aggregate is a property which is of importance because it affects the ease of handling of a mixture of aggregate and binder, for example, the workability of concrete, or the stability of mixtures that depends on the interlocking of the particles. The bulk density and voids in between aggregates can be ascertained using this equipment.

Technical Information

Manufactured from heavy gauge steel these bulk density measures comply with the requirement of either BS 812 or ASTM C-29. Other than the 3 liter size, all measure incorporate carrying handles as standard. The top rim is smooth and plane and parallel to the bottom conforming to the standards.

Pycnometer, capacity 1000ml/1kg, glass jar complete with non-corrodible cone and rubber seal

Code: Cat No. 48-D0441
 Manufacturer/Brand: Controls
 Origin: Italy
 Standards: BS, ASTM & AASTHO

Description:

Glass jar supplied complete with non corrodible cone and rubber seal. Capacity 1000ml/1 kg.

Technical Information

Weight approx.: 500 g

11

Crack Detection Microscope with Accessories

Code: CN 735
 Manufacturer/Brand: Impact Test Equipment Ltd.
 Origin: EU
 Standards: ASTM and EN

Description:

Portable microscope for measuring cracks in concrete and other materials. Crack Detection Microscope operates via an adjustable light source provided by high power batteries.

Technical Information

- Integral illumination
- Rotating eyepiece
- Focus adjustment
- Range 0 to 4mm
- Divisions - 0.2mm
- Sub-divisions -0.02mm
- Magnification: x40
- Power: 105V battery for light source
- Dimensions: Microscope: 130mm high x 80mm x 35mm
- Case: 160mm x110mm x 50mm
- Weight: 650g including case



12

Dual Frame Compression Machine

AUTOMAX, Super- Automatic Compact-Line compression tester, 2000 kN capacity for blocks, cubes up to 200 mm and cylinders up to dia. 160x320 mm. 230 V, 50-60 Hz, 1 ph

Code: C47D02
 Manufacturer/Brand: Controls
 Origin: Italy
 Standards: EN 12390-4

Description:

Frame: Four column high stiffness welded frame tested for stability to EN 12390-4. Heavy duty spherical seat in lubricating oil bath, allowing initial free alignment at the initial contact with the specimen and automatic jamming up to the end of test.

Compression platens: Traceable certificate of surface hardness available on request.

Automax fully computerized Super-Automatic power and control system: Dual stage pump, centrifugal for fast approach and multi-piston for loading, DC motor, ES Energy Saving technology electronic valves for automatic loading/unloading and frame selection via display /software

Hardware: 132,000 points effective resolution, three channels, touch screen graphic display 240x128 pixel, sampling rate 50/sec, large storing capacity on USB pen drive, test data downloadable to PC, Ethernet port, real time management software (optional, see accessories 82-SW/DM DATAMANAGER)



20

Firmware: Simultaneous display of load-specific load, actual load rate and load/time graph; LAN connection to PC; advanced memory management; multi coefficient calibration. Recording facility of up to 10 test profiles for each channel including type of test (e.g. compression, flexural, indirect tensile), specimen size and shape, load rate, standard in use and other general information. Each one of the recorded test profile can be recalled automatically to save time.

Safety features: Max. pressure valve to avoid machine overloading; piston travel limit switch; emergency stop button; front door and rear transparent fragment guard.



Main Feature:

- Four column high stiffness welded frame tested for stability
- Heavy duty spherical seat in lubricating oil bath
- Automatic control of test execution conforming to Standards
- Automatic performance of the complete test cycle with closed-loop digital feedback
- Automatic loading and unloading by electronic valves
- Fully computerized system
- Dual user interface display and PC
- Accuracy Class 1 (EN) and Class A (ASTM) starting from 10% of full scale (from 1% on request)
- Compatible with the new intuitive easy to use DATA MANAGER Software
- Reduced power consumption and silent operation by ES Energy Saving Technologies
- Double stage hydraulic pump with rapid approach: high throughput of tests (up to 40/hour)
- Soft platen-to-specimen contact and smooth load rate from the ramp start
- Double frame control as standard with optional control of additional third frame: active frame selection via console display or software
- Optional internal graphic printer including Load-Time plot
- Remote verification of settings and performances for malfunctions debugging
- Storage of up to 10 test profiles for each channel for quick start

Technical Information

Model 50-	C47D0250-C10B/PR
Capacity kN	2000
Max vertical daylight, mm*	350
Horizontal daylight, mm	350
Max. piston travel*, mm	50
Platen dimensions	310 x 510 x 50 mm.
Platen surface hardness	55.5 HRC (600 HV)
Platens flatness toll.	0.05 mm
Overall dimensions, mm	930x605x1530
Weight approx., kg	790

300 KN Capacity Hydraulic frame for compression tests on cement, mortar, resin and other materials

Code: 65L18Z10

Manufacturer/Brand: Controls

Origin: Italy

Standards: ASTM C109 | ASTM C349 | ASTM C348 | EN 196-1

Description:

Four columns robust frame with single or double test chamber. Simple effect ram with electrical limit switch. Single test chamber model 65-L17Z10 incorporate compression bearing plates with spherical seat for portion of prisms 40x40x160 mm broken in flexure conforming to EN 196-1. All the other models, single or double test chambers, are fitted with 165 mm dia. round compression plates and have to be completed with the suitable accessory. All frames are fitted with precision load cell for load measurement. The 40x40 mm platens of models 65-L17Z10 can be supplied complete with Surface hardness certificate.

Connection to control consoles The 15 kN load pistons of the double test chamber model 65-L28Z10 and single chamber model 65-L58Z10 connected to Pilot and Automax Control consoles, require the 65 L1400/X5 pressure regulator which.

Machine/Frames precision Class. EN 12390-4, ASTM E74 All frames, when connected to a suitable control console, can be calibrated to Class 1 starting from 10% of load scale as specified in the specification table. By special calibration procedure, it is possible to obtain Class 1 starting from 3 to 300 kN (calibration code 50-C0050/CAL) and starting from 0.75 to 15 kN (calibration code 50-C0050/CAL5).

Safety features:

Model 65-L17Z10 include a cylindrical transparent fragment guard. All the other models can be completed with the relevant protection. See accessories. All models are fitted with ram travel limit switch.

Technical Information

Models 65-	L18Z10
Max. Load kN	300
Ram travel mm	50
Vert. span mm	200
Horiz. span mm	220
Platen dim. mm Dia.	165
Overall dim. mm l x g x h	567x405x1621
Weight approx kg	160
Class 1 measuring Range from kN:	30 to 300
Class 1 measuring range from kN:*	3 to 300



Compression device to test portions of 40 x 40 X 160mm mortar prism broken in flexure

Code: 50-C9032

Compression device to test 50mm (2") mortar cubes

Code: 50-C9030

Manufacturer/Brand: Controls

Origin: Italy

Standards: ASTM C109 | EN 196

Description:

Robust frame fitted with an upper platen with spherical seat that moves vertically sustained by a spring. The apparatus can be placed and centered directly on the lower machine platen. The 50-C9030 conforming to EN 196 are designed to test portions of 40x40x160 prisms broken in flexure, while the 50-C9032, conforming to ASTM C109, fitted with compression platens 75 mm dia., and a vertical daylight of 53 mm is used to test 50mm/2" cubes and other little samples as, for example microcores. The total height of both 50-C9030 and 50-C9032 apparatus is 195 mm. Vertical clearance of the compression machine has to be adjusted using suitable distance pieces accordingly.



DATAMANAGER PC software compatible with DIGIMAX, PILOT and AUTOMAX SMART line

Standard: EN 1338 | EN 1339 | EN 1340 | EN 12390-3 | ASTM C39 | EN 12390-6 | ASTM C496 | ASTM C109 | EN 12390-5 | ASTM C78 | ASTM C293 | ASTM C348 | EN 196-1
Manufacturer/Brand: Controls
Origin: Italy

Description:

- Advanced digital system with touch-screen display unit
- Compatible with the Data Manager software 82-SW/DM. See accessories
- Can be connected to any make of hydraulic operated testing frame
- Recording facility of up to 10 test profiles for each channel allowing quick and easy test start

82-SW/DM is new and smart DATAMANAGER software, very easy to use, complete with many functions, totally flexible and open to network communications. It's compatible with DIGIMAX, PILOT and AUTOMAX compression machines and SMART-Line control consoles. It allows real time acquisition and management of all test data and (only for AUTOMAX) remote control of the machine.



Distance Piece Dia 165mm x 20mm height

Code: 65-L1000/20
Manufacturer/Brand: Controls
Origin: Italy

Description:

Made of steel. Used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm. Distance piece dia. 165x20 mm. Weight 3,2 kg.

Distance Piece Dia 200mm x 50mm

Code: 50-C9082
Manufacturer/Brand: Controls
Origin: Italy

Description:

Made of steel. Used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm. Distance piece dia. 200x50 mm. Weight 12,3 kg



Distance Piece Dia 200mm x 68mm

Code: 50-C9083
Manufacturer/Brand: Controls
Origin: Italy

Description:

Made of steel. Used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm but in here, Distance piece dia. 200x68 mm. Weight 16,7 kg

Distance Piece Dia 200mm x 40mm

Code: 50-C9081
Manufacturer/Brand: Controls
Origin: Italy

Description:

Made of steel. Used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm but in here, Distance piece dia. 200x40 mm. Weight 10,7 kg.

Distance Piece Dia 200mm x 100mm

Code: 50-C9086
 Manufacturer/Brand: Controls
 Origin: Italy

Description:
 Made of steel. Used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm but in here, Distance piece dia. 200x100 mm. Weight 25 kg.

UPGRADING THE DIGIMAX, PILOT AND AUTOMAX SERIES

Code: 50-C10B/PR
 Manufacturer/Brand: Controls
 Origin: Italy

Description:
 Upgrading the DIGIMAX readout unit to incorporate a serial graphic printer in the front panel allowing also load/time plot at the end of test.

- Specifications:**
- Very silent printing
 - High speed: 50 mm/sec
 - High resolution: 203 dpi=8 dots/mm
 - Support test and graphic printing
 - Easier maintenance with self-diagnostic
 - Paper width: 57.5 mm
 - Paper Roll Pack of 10 Rolls



13

Digital Load Calibration Cell

Digital load cells have the capability to allow the signals from the strain gauges to be linearised before being presented as the final output. This is an advantage to the manufacturer in that the performance of the basic transducer design can assume a lesser importance. An analogue load cell, which might meet a given specification for non-linearity, can be tuned to meet a better specification as a digital device



Load Cell 2000 KN

Code: 82-E0100/200
 Manufacturer: Controls
 Origin: Italy
 Standards: ASTM E74 | EN ISO 376

Description:
 These high performance cells have been specially designed to meet the stringent requirement of EN ISO and ASTM standards, for calibration of compression testing machines. The Load cells connected to the Digital tester, can be supplied complete with Official or Traceable calibration certificate which, as specified, concern either the cell or the digital tester. Load cell 2000 kN capacity complete with carrying case.



Technical Information

Code 82-	Capacity KN	Diameter A mm	Diameter B mm	Dim. C	Weight,kg
E0100/200	2000	129	100	164	16

14

Los Angeles Abrasion Machine and Charges with Accessories

Los Angeles Abrasion Machine

Code: 48-D0500/G
 Manufacturer/Brand: Controls
 Origin: Italy
 Standards: EN 1097-2 | ASTM C131 | EN 12697-17 | EN 12697-43

Description:

The test covers the procedure for testing coarse aggregates for resistance to abrasion. The machine consists of a rolled steel drum having an inside dia. of 711 mm and internal length 508 mm. The drum is rotated by a speed reducer driven by an electric motor at a speed of between 31 and 33 r.p.m. The machine is equipped with an automatic counter, which can be preset to the required number of revolutions of the drum or the total working time.



Technical Specifications:

- High stiffness welded steel frame
- High resolution graphical display 128x80 pixels and 6 keys membrane keyboard
- 8 languages can be set
- 230 V, 50 Hz, 1 ph
- Power: 740 W
- Dimensions approx.: 1005x820x950 mm
- Weight approx.: 350 kg

Set of 12 Abrasive Charges ASTM/UNI

Code: 48-D0505
 Manufacturer/Brand: Controls
 Origin: Italy

Specifications

Description	12 ASTM Abrasive Charges
Weight, lbs	11.3
EN 1097-2	Yes
ASTM C131	Yes
ASTM C535	Yes
AASHTO T96	Yes



15

Drying Oven with LED Temperature Display

Code: 101-3A
 Manufacturer/Brand: Huanghua Faithful Instrument Co. Ltd
 Origin: China

Description:

- Applications of this equipment in industrial and mining enterprises, labs and scientific research institutions include drying, melting, baking and sterilization etc.
- Cold rolling steel electrostatic spraying exterior; Stainless steel or cold rolling steel corrosion-resistant inner chamber.
- Optional pointer meter or intelligent temperature controller with PID program and digital display, and with function of timing and over-temperature protection.
- Door with double-layer tempered glass for clearly observation.
- Door with silicon rubber seal ensures good seal ability.



Technical Specifications

Model	101-3A
Voltage	220V / 50Hz
Temperature Range(° C)	Room Tem. +20~250° C
Temperature Motion(° C)	± 1
Inner Chamber Size(mm)	750× 600× 500
Exterior Size(mm)	965× 706× 1065
Packing size(mm)	1160× 840× 1190
Power(KW)	4
Capacity (ltr.)	225
N. W. (Kg)	110
G. W. (Kg)	140

16

Motorized Sieve Shaker and Standard Sieves with Accessories

Code: 15-D0410
 Manufacturer/Brand: Controls
 Origin: Italy
 Standards: ASTM, BS and EN

Description:

Electromechanical sieve shaker

This new electro-mechanical shaker features efficient sieving action, heavy duty and simple design. The sieve column is held at the top by a rubber pad with spherical seat and rotates eccentrically at the bottom ensuring uniform shaking of the sample across the whole surface of the sieves. Upon each revolution, a simple mechanical mechanism imparts hits at the base of the sieve column so as to move the sample on the sieve surface for a very efficient sieving action. The front panel includes the mains switch, the emergency stop button and timer.

Technical Information:

Model	15-D0410
Sieve cap.	Up to 12, 200/203 mm or 10 300/315 mm dia. sieves
Power	200 W
Timer scale	30 min
Dimensions:(lxdxh)	660x500x1510 mm
Weight approx.	60 kg



203mm dia ASTM Sieve No. 200 (0.075mm)

Code: 15-D0146/2J

203mm dia ASTM Sieve No. 100 (0.150mm)

Code: 15-D0146/2J

203mm dia ASTM Sieve No. 50 (0.300mm)

Code: 15-D0138/2J

203mm dia ASTM Sieve No. 30(0.600mm)

Code: 15-D0134/2J

203mm dia ASTM Sieve No. 16 (1.18mm)

Code: 15-D0130/2J



203mm dia ASTM Sieve No. 100 (0.150mm)

Code: 15-D0126/2J

203mm dia ASTM Sieve No. 4 (4.75mm)

Code: 15-D0122/2J

203mm dia ASTM Sieve op 3/8" (9.5 mm)

Code: 15-D0117/2J

203mm dia ASTM Sieve op 1/2" (12.5mm)

Code: 15-D0115/2J

203mm dia ASTM Sieve op 3/4" (19.0mm)

Code: 15-D0112/2J

203mm dia ASTM Sieve op 1" (25.0mm)

Code: 15-D0110/2J

203mm dia ASTM Sieve op 1.5" (37.5mm)

Code: 15-D0107/2J

Lid and Receiver dia 203mm

Code: 15-D0151/2J

203mm dia ASTM Sieve op 12 (1.70mm)

Code: 15-D0128/2J

17

Balance

Digital Balance

Origin: China

Description:

Digital Electronic Balance

Technical Information

Capacity: 6 Kg
Overall Dimensions: 320X340X125 (h) mm
Weight: 3.8 kg

Large Scale Balance

Code: GALX 060500

Origin: China

Description:

- 150kg electronic digital industrial Platform weighing bench scale
- Rectangular Steel pipe welding Scale body
- Heavy duty powder coated finish
- Overload and side loading protection
- LED or LCD display
- With all bolts and screws for each unit

Technical Information

Capacity: 150 kg
Power Required: Voltage = 220 V
Frequency = 50 Hz



18

Core Drilling Machine (Petrol Engine Driven)

Code: STHZ - 20
 Manufacturer/Brand: Shanghai Civil & Road Ins. Co.
 Origin: China
 Standards: EN 12504-1

Description:

The core drilling machine which combines high speed cutting technology and thin walled diamond bits, is widely applied to drill and core in building works, Equipment installation projects and construction inspection projects.

Technical Information

- Max. Drilling diameter: $\Phi 200\text{mm}$;
- Max. Drilling depth: 400mm (up to 1500mm by using extension bar);
- Motor power: 3.3KW
- Principal axis speed: 800-1200 r.p.m
- Weight: 140Kg
- Power Required: Motor Power = 5.5 Hp
Power Source = Oil



Features:

Double posts structure, YAMAHA motor as the driving force; no need screw fixation; machine is mounted on 3 wheels for ease of movement; reliable and convenient in operation. The core drilling machine is able to drill and cut high strength concrete, with high efficiency, precise hole position, smooth wall of hole and cored specimen, small vibration and no damage to construction.

19

Specimen Cutting Machine with Diamond Blade

Code: STHQ - 15
 Manufacturer/Brand: Shanghai Civil & Road Ins. Co.
 Origin: China

Description:

- The cutting machine is suitable for various specimens with different sizes in lab of asphalt, Concrete and stone material as new cutting equipments
- Mainly used in central labs in construction projects, highway, communications and so on.
- The model is supplied complete with bearing parts with high precision sealing fabrication, also matched with diamond blades.
- Small size, easy to transportation

Technical Information

- Net Weight = 95 kg
- Speed Rating = 3000 r/min
- Power = 3KW – 380V
- Size of cutting specimen: $\phi 50$; $\phi 70$; $\phi 100$; $\phi 150\text{mm}$
- Max length of cutting specimen: 400mm



20

Water Measuring Jar (1000ml)

Origin: China

Description:

- 1000 mL capacity
- Measured in increments of 10 mL
- Made from high-quality borosilicate glass
- Single metric scale
- Has an easy-pour spout with large circular base
- Rated at 20°C



Tray

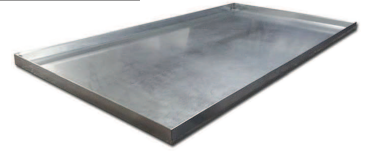
Origin: China

Description:

Galvanized Iron Pan used for mixing and drying laboratory samples of soils and aggregates.

Technical Information

- Wire-bound, rolled top edges
- Two drop handles
- Straight sides
- Safe use to maximum oven temperatures of 350°F (177°C)



Thermometer

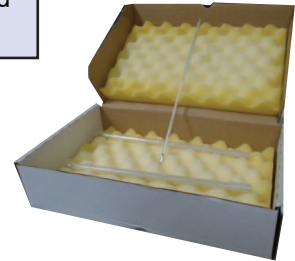
Origin: China

Description:

The ASTM #2C General Lab Thermometer, -5 to 300C has a strict manufacturing tolerance. Accuracy is assured by inspection and testing of samples from each production run. The thermometer is supplied with a statement of compliance to E 1 and E 77 requirements. The ASTM Thermometer is yellow-backed glass with permanent graduations, mercury-filled and individually packed in a cardboard tube.

Technical Information

- Length: 15.4 (390), in (mm)
- Immersion: 3 (76), in (mm)
- Range: -5 to 300° C
- Division: 1.0C



21

Gloves

Origin: Malaysia

Description:

Type	Full Finger
Size	7 to 11 Inch
Usage	Hospitals, Industrial Use, Labs, Household
Material	Rubber



Boot

Origin: China

Description:

Material	PVC safety boot with toe cap
Application	Industrial, Construction
Length	Full



Safety Goggles

Origin: China

Description:

Safe safety glasses / protective eyewear merges a comfortable lightweight frame with outstanding unisex style, protection and affordability. Designed for indoor or outdoor use. High wrap lens provides exceptional impact protection and an unobstructed view. Safe safety glasses / protective eyewear is a valuable choice for virtually any eye protection need. Wrap around design. Impact resistant. Comfortable frame. Meets ANSI Z87+ Standards. Conforms EN166 1B standards. Designed for laboratory, Blowtorch, Power Tool, Welding, Wood-working, etc



Helmets

Origin: China

Description:

Size	FREE-SIZE
Type	Construction Helmet
Ideal For	Men, Women
Shell Material	Polyethylene



Masks

Origin: China

Description:

- Organic vapors of low toxicity, anti-dust & mist mask.
- One size fits all users. Dual strap system adjusts easily for comfort.
- Single cartridge system can be replaced with different cartridges for acidic gases or other chemical vapors
- Interchangeable cartridge for multiple uses
- Super Soft Mask
- Single Cartridge & Dual Diaphragm Breather Valve Design



Specification:

Mask material: PVC
Cartridge material: Filter Cotton

22

Water Distiller System (5ltr./Hr)

Code: DZ - 5L111

Manufacturer/Brand: Huanghua Faithful Instrument Co. Ltd.

Origin: China

Description:

- Auto-Control Stainless Steel Water Still applies in making distilled water in laboratories of medical and health industry, chemical industry and scientific research units.
- It adopts 304 high quality stainless steel and manufactured in advanced technology.
- It has functions of water-deficient and power-off alarm and automatic make up water and heat again.
- It has power and heating indicator and water-deficient display.



Technical Information

Model	Supply voltage	Output L/h	Heating power	Rough weight	Net weight	Overall product dimension (cm)
DZ-5L111	220	5	4.5	9.5	6	33× 24× 73

23

Ottawa Sand (50lbs Bag as per ASTM C778)

Origin: UK

Standards: ASTM C778

Description:

Silica sand produced by processing material obtained by hydraulic mining of massive orthoquartzite situated in deposits near Ottawa, Illinois. The sand is composed almost entirely of naturally rounded grains of nearly pure quartz and is used in mortars for testing of hydraulic cement.

Technical Information

Sand is specially graded natural silica sand graded to retain 98% on a No. 100 (150 μ) sieve, 75% on a No. 50 (300 μ) 30% on a No. 40 (425 μ) and 2% on a No. 30 (600 μ). Specific gravity is 2.65. Packed in 50 lbs. (22.7kg) bags.



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1

Standard ASTM Sieves with Accessories

ASTM-E11/95
 Manufacturer: YF
 Origin: China

Description:

1. Finest quality mesh.
2. Double layer welded frame
3. Epoxy fillet technique is adopted recently to ensure smooth and uninterrupted flow of material through sieving medium.
4. Aperture size: perforated plate for aperture size bigger than 1.18 mm woven mesh for aperture size smaller than 1.18mm
5. Frame thickness: double layer, 0.5mm/layer.

Sand Sieve Specification:

0.075mm, 0.15mm, 0.6mm, 1.18mm, 2.6mm, 4.75mm, 9.5mm

Stone Sieve Specification:

2.36mm, 4.75mm, 9.5mm, 13.2mm, 16mm, 19mm, 26.5mm, 31.5mm, 37.5mm, 53mm, 63mm, 75mm, 90mm



2

Motorized Sieve Shaker

ASTM Standard
 Model: STSJ-4A
 Manufacturer: YF
 Origin: China

Description:

The high frequency Sieve Shaker is mainly used to grading analysis of Non cohesive grain soil materials.

Technical Specification

1. Vibration frequency: 42HZ
2. Vibration mode: Upper and down vibration
3. Vibration amplitude: 1.5 mm
4. Regular time: 0-60 min may choose
5. Vibrating motor power: AC220V, 25W
6. Choose standard analytical sieve specifications: 200*50mm (9 level) or 300*75mm (7level)



3

Aggregate Impact Value tester with Accessories

ASTM Standard
 Model: STJ-II
 Manufacturer: YF
 Origin: China

Description:

1. Impact hammer weight: 13.75kg \pm 0.05kg
2. Height of the fall: 380 \pm 5mm
3. Impact cup: 102 \pm 50mm
4. Size of metal tamping rod with circular section: dia.10X230mm, the other end is semicircle.
5. Size of metal cylinder: dia.75X50 \pm 1mm



4 Aggregate Crushing Value and Ten Percent Fineness tester with Accessories

ASTM Standard
 Model: STYS-2
 Manufacturer: YF
 Origin: China

Component	Dimensions	Nominal 150mm internal diameter of cylinder	Nominal 75mm internal diameter of cylinder
Cylinder	Internal Diameter	154±0.5 mm	78.0±0.5 mm
	Internal depth	125 to 140 mm	70.0 to 85.0
	Minimum wall thickness	16.0mm	8.0 mm
Plunger	Diameter of piston	152±0.5 mm	76.0±0.5mm
	Diameter of stem	>95 to <152mm	>45.0 to ≤76 mm
	Overall length of piston plus stem	100 to 115 mm	60.0 to 80.0mm
	Minimum depth of piston	not less than 25.30mm	Not less than 19.0mm
	Diameter of hole	20.0 + 0.1 mm	10.0±0.1mm
Baseplate	Minimum thickness	10 mm	10 mm
	Diameter	200 to 230 mm	110 to 115 mm



5 Cleveland Flash and Fire Point Tester set (open cup type)

ASTM D92 Standard
 Model: SYD-3536
 Manufacturer: YF
 Origin: China

Description:

Used to determine flash and fire points by the cleveland open-cup method. Consists of electric Heater with rheostat, flash point platform with Thermometer holder, test burner and flash cup. Utilizes a 1250W-10 amp, nickel-chromium heater with step less variable control for accurate, repeatable, rate-of-rise temperature settings per specifications. Heater is enclosed in a stainless steel housing with cooling vents. Thermometer position is adjustable and provides the ability to raise the thermometer out of the way to facilitate the placement and removal of the test cup. Test flame requires a gas supply and the test flame can be adjusted through the use of the built-in needle valve.



Technical Specification

Model	Cleveland Open Cup Flash Point Tester SYD-3536
Heating power of electric furnace	400W
Controlled silicon	for temperature adjustment
Continuous temperature	adjustment

6

Rice Density Tester set for theoretical maximum specific gravity and density of Hot Mix Asphalt (including vacuum pump)

ASTM D2041 Standard
 Model: STMD-3
 Manufacturer: YF
 Origin: China

Description:

This instrument is designed and made as per T 0711-2011 Standard Test Method for Theoretical Maximum Specific Gravity of Bituminous Mixtures (Vacuum process) in ASTM Standard Test Methods for Bitumen and Bituminous Mixtures for Highway Engineering. It is suitable to determine the theoretical maximum specific gravity of bituminous mixtures by vacuum process. It is used to design the ratio of bituminous mixtures, survey the road condition or calculate the void ratio and compactness of road construction. It is not available to determine the lacunose bituminous mixtures which water absorption over 3percent.



Technical Specification

1. Suction pressure range: 0-100KPa
2. Vibration loading: >10kg
3. Vibration frequency: 3HZ
4. Rated power: 200W

7

Rotational Viscosity (Brookfield) test apparatus set for asphalt materials

ASTM Standard
 Model: SNB-AIH
 Manufacturer: YF
 Origin: China

Description:

The viscometer is mainly applied to test the viscosity of asphalt, hot melt adhesive, a polyethylene wax, and etc, which is solid at room temperature, but become liquid substances when is heated at a high temperature. It can be used alone, the measurement data directly displayed on the LCD screen, without secondary computing; The optional purchased "data acquisition and analysis and mapping software" is for data collection and data analysis, process monitoring viscosity - temperature curve. High subdivision stepper motor, speed accurate and stable. LCD display with blue backlight, direct display viscosity, speed, torque percentage terms, chosen spindle number, maximum viscosity value and temperature value in the current rotational speed of the spindle. DV-2 series can also display shear rate and shear stress. Viscosity data shows a continuous change, it will alarm when the measurement beyond the measuring range.



Technical Specification

Model	SNB-AIH
Standard spindle	Spindles 21, 27, 28, 29
Measuring Range(mPa*s)	50~100M
Speed range (r.p.m.)	0.1~200
Measuring method	Manual, automatic
Accuracy	±1%(FS) Newton liquid
Return Capacity	±0.5% (relative error)
Sample capacity(ml)	10 ~ 20
Temperature Range(°C)	Room temperature +10 ~ 250
Temperature accuracy(°C)	±0.1
Power	220V 50Hz

8

Digital balance (1 g – 15 kg)

Brand: Motex
Origin: China

Technical Specification

- Counting & weighting; scale selectable.
- Two power sources: rechargeable battery an AC adaptor selectable.
- Auto zero tracking.
- Full tare subtraction.
- Automatic overload display.
- Back light display.
- Resolution: 1/2000 - 1/15000.
- High accuracy load cell.
- Large LCD display.
- Accumulation function.



Vacuum Air Extractor Device

ASTM Standard
Brand: YF
Origin: China

Description:

Used to test specific gravity of soil particle, suit for particle size which no less than 5mm, and the weight of 20mm particle size should be no less than 10% of total weight of soil sample. It consists of siphon pipe and siphon cylinder. It is used for testing soil vacuum saturation



Technical Specification

Vacuum Air Extractor Test Device

1. Vacuum pressure gauge:-0.1Mpa
2. Dia: 300mm x300 high.200*250mm

Tray 45x45x7.5cm

Origin: China

Description:

Galvanized Iron Pan used for mixing and drying laboratory samples of soils and aggregates.

Technical Specification

1. Wire-bound, rolled top edges
2. Two drop handles
3. Straight sides
4. Safe use to maximum oven temperatures of 350°F (177°C)



Digital Stop Watch

Brand: Q&Q
Origin: China

Description:

A stopwatch is a handheld timepiece designed to measure the amount of time elapsed from a particular time when it is activated to the time when the piece is deactivated.



Technical Specification

Brand	Q&Q
Case Material	Plastic
Display Type	Digital
Case Shape	Square
Model Number	HS43-002
Part Number	HS43-002
Warranty Type	Manufacturer
Movement	Quartz

Digital balance (0.1 g – 1000 g)

Brand: Furi
 Model Number: M-ACS-W
 Origin: China



Technical Specification

- Display type: LCD or LED seletable
- Display size: 115*35 mm
- Display digits: 6
- Scale type: Bench scale
- Scale platter size: 250*195
- Scale accessories: Adaptor (included), Stainless steel platter (included)
- Power: Rechargeable batteries and Adaptor
- Capacity 15kg / Division 1~2g
- Units: kg, g, lb, oz (default, can do other units)
- True division load cell
- Tare and zero function
- Auto off
- Auto backlight
- Auto hold while stable
- Low battery indication
- Green backlight
- Rechargeable battery
- Charging indication
- Gradienter
- High accuracy loadcell
- Large display

Digital balance (1 g – 15 Kg)



Technical Specification

Display type:	LCD
Backlight:	Green(default), Red, Blue selectable
Display size:	65*24(mm)
Display digits:	5 and a half digits
Digits height:	15mm
Scale summary	
Scale body size:	230*180*35(mm)
Scale accessories:	Stainless steel load tray (separate sale), Adaptor (separate sale)
Scale net weight:	648g
Power:	6*AA batteries or Adaptor 9V/100mA

Standard Tool Box/Bag

Model: 1PK-810B
 Manufacturer: Proskit
 Origin: Taiwan

Technical Specification

1PK-036S	Long nose plier 135mm
1PK-037S	Diagonal cutting plier 110mm
1PK-125T	Fine tip straight tweezer
9S002A/B/C	3pcs Soldering aid tools
1PK-H026	Adjustable wrench 6"
1PK-SC109A	Quick heat ceramic
1PK-SC109B	soldering iron 110V or 220V
19412	Screwdriver handle
89402A	Pro-soft s/d 5.0x75mm
89402B	Pro-soft s/d #1x75mm
8PK-031B	Desoldering wick
8PK-313A/B	Crimping tool (inch) or (metric)
8PK-366N-G	Desoldering pump
908-609	IC extractor
9H003	3 Prong holder
9H005	IC insert tool
9S001	Solder core 63%, SN
9S003	Parts tube
9S004	Heat sink
9SD030-2	8pcs bits pack
9Z-007A	Carrying zipper bag



Hot Air Oven with Digital Temperature Controller

Model: STHX-1A
 Manufacturer: YF
 Origin: China

Description:

These ovens have been specially designed for the testing laboratories. The interior is made from chromeplated steel and the exterior is robustly constructed in enameled steel insulated with 40 to 50 mm thick mineral wool. Temperature control by precision digital thermoregulator.

Technical Specification

Size	450×450×350mm
Temperature control range	50~300°C
Temperature control accuracy	±°C
Heater	2 group
Working voltage	AC220V , AC380V



9 Ring and Ball Apparatus (full set with hot plate, thermometer, beaker etc.)

Code: BM450
 British Standard: BS2000-58
 Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Description:

Used for determining the softening point of bituminous materials. The sample is cast in shouldered rings and heated at a controlled rate under the weight of a steel ball. The softening point is the temperature at which the bitumen disks soften and sag downward a specified distance. The apparatus consists of a support frame, 2 tapered rings, 2 ball centering guides, 2 steel balls and a heat resistant glass beaker.



Magnetic Stirrer / Hotplate

Code: MH230

Manufacturer: Bibby Scientific (Stuart)

Origin: UK

Description:

The hotplate has an innovative LED temperature indicator scale and can also be used in conjunction with the SCT1 digital contact thermometer to accurately control sample temperature.

Model UC152 has a glass ceramic top which has excellent chemical resistance. The surface is easy to clean and the thermal properties allow very high plate temperatures while ensuring the edges stay cooler, reducing the chance of accidental burns. Model US152 has a robust aluminium/silicon alloy top plate for excellent heat transmission. The top plate has a thin ceramic coating for added chemical resistance.



Technical Specification

Model	UC152
Plate Material	Glass ceramic
Plate Dimensions, mm	150 x 150
Heated Area, mm	120 x 120
Heater Power, Watt	500
Max plate temp, °C	450
Stirrer Speed, rpm	100 - 2000
Maximum Stirring Capacity, L *	15
Dimensions (w x d x h), mm	172 x 248 x 122
Net weight, kg	2.9
Electrical supply	230V, 50Hz, 550W

600ML Capacity Glass Beaker

Code: GP016

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

Short form, graduated with spouts and strengthened rim with flare trimmed back that offer optimum balance between thermal shock resistance and mechanical strength.

Technical Specification

Capacity (English)	20.28 oz.
Label Type	White marking
Scale	Dual white metric scale
Type	Beaker
Material	Borosilicate Glass
Certifications/Compliance	ASTM E960
Diameter (Metric)	Outer 9cm
For Use With (Application)	For optimum balance between thermal shock resistance and mechanical strength
Graduation Range	50 to 500mL
Height (Metric)	12.4cm
Capacity (Metric)	600mL





Ring and Ball spare Ball (Pack of 10)

Code: BM450/5
 British Standard BS2000-58
 Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Description:

Steel ball diameter 9.5 mm

Digital Thermometer -50 to +1370C X 1C

Code: TH050
 British Standard
 Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Description:

This hand held digital thermometer measures temperature with a resolution of 1°C over the entire range of -50 to +1370°C.

Technical Specification

Range	-50 to +1370 degrees C
Resolution	1 degree C
Accuracy 1 deg C	+/-1% +/- 1 digit
Battery	9 volt MN1604/PP3
Battery Life	200 hours
Display	12.7mm LCD
Dimensions	36 x 80 x 147mm
Weight	210g



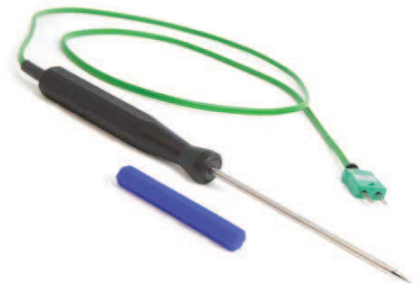
Needle Probe 3mm x 100mm

Code: TH070
 British Standard
 Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Description:

'K Heavy Duty Needle Probe
 3mm diameter x 100mm long stainless steel probe with hex handle

- Range: -75 to 250°C
- Resolution: Dependant on indicator
- Accuracy: BS EN 60584-1:2013 ±1.5°C or better



10

Moisture Can (500g capacity)

Code: MH 570

Description:

Lever lid tin, half liter capacity



11

Wire Brush with scraper

Code: MH029

Description:

Stiff scratch brush, with 4 rows machine punched into wooden handle for durability. Metal scraper included at the tip of the scratch brush.



12

Glass Thermometer 10 to 300C X 2

Code: TH119

Standard: ASTM E 77, ASTM E1

Description:

The thermometer is supplied with a statement of compliance to E 1 and E 77 requirements. The ASTM Thermometer is yellow-backed glass with permanent graduations, mercury-filled and individually packed in a cardboard tube.

Length: 15.4 (390), in (mm)

Immersion: 3 (76), in (mm)

Range: -5 to 300C

Division: 1.0C



13

Asphalt Digital Thermometer 1 deg C

Code: TH050

British Standard

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

This hand held digital thermometer measures temperature with a resolution of 1°C over the entire range of -50 to +1370°C.

Both the side mounted on/off switch and the thermocouple probe sockets positioned at the top of the instrument are conveniently located for ease of use. This enables a wide variety of probes to be used depending on your personal requirements. The thermometer is battery powered featuring a large, easy to read LCD display with open circuit and low battery indication. Supplied complete with protective wallet.



Technical Specification

Range	-50 to +1370 degrees C
Resolution	1 degree C
Accuracy 1 deg C	+/-1% +/- 1 digit
Battery	9 volt MN1604/PP3
Battery Life	200 hours
Display	12.7mm LCD
Dimensions	36 x 80 x 147mm
Weight	210g

Probe HD 300mm+1m cable

Code: TH067
British Standard
Manufacturer: Impact Test Equipment Ltd
Origin: UK

Description:

K' Asphalt Probe
6.35mm diameter xx300mm long complete with T Bar Handle
Range: -75 to 250°C (probe tip only)
Resolution: Dependant on indicator
Accuracy: To BS EN 60584-1:2013 or Better



14

Particle Size Density (specific gravity) and water absorption measuring equipment

ASTM C128
Brand: Maxim,
Model: AG3, 6
Origin: BD

Description:

- 1 no. Semi-self indicating balance, capacity 5 kg, accuracy 0.5 gm, provision is made in this balance to suspend density basket under material pan. Balance is supplied with necessary set of weights. This balance is mounted on an angle iron frame stand.
- 1 no. Density basket.
- 1 no. Air tight container of capacity similar to that of density basket.
- 1 no. Water tight container to suspend density basket'
- 1 no. Gi- tray of area not less than 650 cm sq.
- 1 no absorbent cloths 75 cm x 45 cm.

Technical Specification

- Weight: 800
- Power: Hydraulic, 0.75kW
- Voltage: 380v
- Material: Steel



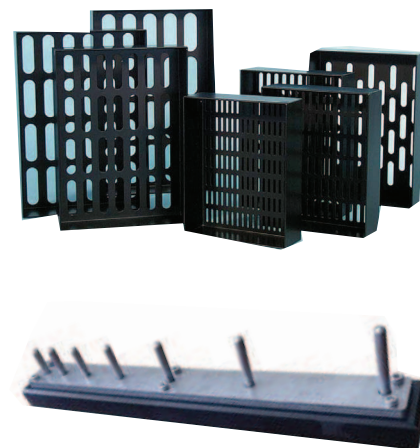
15

Standard Flakiness Index and Elongation Tester Set for Aggregates Along with Standard Accessories (set of 7 Sieve)

BS 812-105.1, BS 812-105.2
Brand: Maxim
Origin: BD

Description:

- The Flakiness sieves are dimensions of each sieve comply with the relevant international standard, manufactured from heavy gauge steel sheet and coated with electrostatic paint. The accuracy of the slot size is better than 0.1 mm. Flakiness Index Sieve Set consists of 7 sieves. For sample preparation 6.3, 10, 14, 20, 28, 37.5, 50 and 63 mm aperture sizes test sieves.
- The Length Gauge is used for determining the elongation index of aggregates. The particle is elongated when its length is more than 1.8 times the midsize of the sieve fraction. The aggregate to be classified is separated into six sieve fractions from 6.3 to 50 mm and each fraction is examined separately



16

Penetration for Asphalt (full set)

Brand: Matest,
Model: B056, B058 and B058-01
Origin: Italy

Description:

Provides water at the required temperature of $25 \pm 0, 1^\circ\text{C}$. The unit consists of a stainless steel water bath 10 litres capacity with wool insulation, immersion heater with digital thermostat, motor pump with connections, cooling coil device, current water operated, to maintain a constant temperature of the bath when room temperature is slightly higher. The bituminous sample is immersed into the water bath, and placed on the penetrometer only at the time of the test, by eventually using the transfer dish (accessory mod. B057-03).

Water bath dish with incorporated thermostatic coil, to be connected to the bath mod. B058. It keeps the temperature of the bitumen sample directly on the penetrometer, by avoiding to transfer it. Dimensions: $\varnothing 151 \times 90$ mm



17

Motorized Marshall Test Apparatus (full set including compaction hammer, water bath, asphalt mixer etc.)

ASTM D6926

Brand: Maxim and Matest,
Model: AS17, AS6, AS4, AS5, AS7-9, SB2, E095, B028-03, E095-03
Origin: BD and Italy.

Description:

The Marshall stability and flow test provides the performance prediction measure for the Marshall mix design method. The stability portion of the test measures the maximum load supported by the test specimen at a loading rate of 50.8 mm/minute. Load is applied to the specimen till failure, and the maximum load is designated as stability. During the loading, an attached dial gauge measures the specimen's plastic flow (deformation) due to the loading. The flow value is recorded in 0.25 mm (0.01 inch) increments at the same time when the maximum load is recorded. The important steps involved in Marshall mix design are summarized next.

CBR loading machine motorized, 50 kN ASTM version - 1,27 mm/min. Load is applied through a screw jack driven by an electric motor at a constant penetration rate of 1,27 mm/min achieved by a built in gear box and "assured also under load". Upper beam can be adjusted in height. Foreseen of fast approach device of the base plate and electric end of stroke switches of the load plate to save the machine from wrong manipulations.

Technical Specification

The S211KIT CBR machine comprises:
S211-10 CBR motorized frame
S212-01 CBR penetration piston
S370-10 Load ring 50 kN capacity
S376 Dial gauge 10 x 0,01 mm
S212-03 Dial gauge holder
Power supply: 230 V 1ph 50 Hz 750 W
Dimensions: 430x380x1180 mm
Weight: 98 Kg



Water Bath

Used to maintain in water Marshall specimens at constant temperature of $60\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and asphalt specimens at $37,8^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

Marshall Compactor

Supplied complete with compaction hammer 6" diameter, wooden pedestal capped with steel plate and mould clamp device, support/hammer guide.

Dimensions: 320x320x1700mm

Weight: 70 kg approx.

Marshall Compaction Mould, 4" Ø

Inside diameter 101.6 mm (4")

Steel manufactured, plated against corrosion.

Weight: 3100 g

Consisting of:

B030N MOULD BODY only. Weight: 1300 g

B030-01N FILLING COLLAR only. Weight: 850 g

B030-08 BASE PLATE only. Weight: 950 g



18

Evaporation dish

Origin: India

Description:

Evaporating dishes with lip and spout, glazed inside and out except the rim.



Screw gauge

Origin: China

Description:

- Accuracy:0.01mm
- Micrometer Type:Outside Micrometers
- Display Type:Analog
- DIY Supplies:Metalworking
- Model Number:103-137
- Range:0-25mm
- Accuracy:0.01mm
- Material:Carbide Alloy
- Package:Plastic box
- Weight:0.26kg



Slide calipers, 6"

Origin: China

Description:

- Measurement Range:0-300mm
- Caliper Type:Vernier Calipers
- DIY Supplies:Metalworking
- Accuracy:0.02mm
- Model Number:530-119
- Material:Stainless Steel
- Type:Vernier Caliper
- Material:Stainless Steel
- Measurement Range:0-300mm/12"
- Surface:Chrome
- Inch/Metric:Yes
- Resolution:0.001"/0.02mm
- Accuracy:±0.04mm



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1

One Dimensional Consolidation test equipments

Code: SL250
British Standard: BS1377-5
Manufacturer: Impact Test Equipment Ltd
Origin: UK

Description:

The Impact Front Loading Oedometer is manufactured from rigid cast aluminium and designed for bench mounting. Beam Ratios-9:1, 10:1, 11:1. A self-aligning bearing between the yoke and the lever ensures vertical and concentric loading of the sample. A built-in screw jack is provided to take the weight of the beam when a new weight is added to prevent shock loading. A counter weight is also provided to counteract the weight of the beam on the sample.

50MM fixed Ring Consolidation Cell

Code: SL255

Description:

Impact's Fixed Ring Consolidation Cells consist of the following parts:

- Anodized Aluminium Base with Acrylic Cylinder
- Stainless Steel Pressure Pad
- Upper Bauxalite Stone
- Lower Bauxalite Stone
- Stainless Steel Cutting Ring

50MM Calibration Disc

Code: SL256

Description:

The calibration disc is solid metal. It is fitted inside the cell instead of a soil sample. The weights are then hung on the Oedometer and any beam deflection is measured and this is used as a correction factor.

Dial Gauge 12MM Travel X 0.00MM Anticlockwise

Code: MH121

Description:

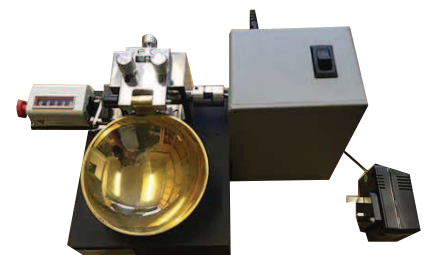
- 57mm diameter dial
- anti-clockwise rotation

50 KG Weight Set

Code: MH121

Description:

4 x 10kg, 1 x 5kg, 2 x 2kg and 1 x 1kg



2

Determination of Liquid Limit using Casagrande method

Code: SL211, SL215, SL199
British Standard: BS1377-2
Manufacturer: Impact Test Equipment Ltd
Origin: UK

Description:

The motorised Casagrande apparatus comprises of a carriage with cam mechanism that a motor operates at 120 drops per minute, a standard smooth brass bowl, drop counter and hard rubber base to BS 1377.

- 220-240V 50Hz 1ph
- Weight 4.5kg



Determination of Shrinkage Limit for (ASTM Standards) able to determine shrinkage ratio, volumetric shrinkage and linear shrinkage.

Code: SL225, SL226, SL227

Standard: ASTM D4943

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

The plastic limit is defined as the lowest moisture content of a soil that will permit a sample to be rolled into threads of 3 mm diameter without the threads breaking. When the water content of a fine-grained soil is reduced below the plastic limit, shrinkage of the soil mass continues until the shrinkage limit is reached. Shrinkage can be significant in clays but less so in silts and sands. The equipment listed enables the engineer to determine a number of important parameters, including shrinkage ratio, volumetric shrinkage and linear shrinkage. Shrinkage Prong Plate is made of acrylic plastic fitted with three prongs, nominal 76 mm square and 2.4 mm thick. Shrinkage Dish is round with flat bottom, and constructed of Monel metal. It is used to form soil pats for Shrinkage Limit Tests. Linear Shrinkage Mould to produce specimens 140mm long x 12.5mm radius to BS 1377:2.



3

Maximum and Minimum Density of sand Equipments

Manufacturer: Impact Test Equipment Ltd

Origin: UK



4

Combination permeameter for permeability testing equipments

Code: SL305

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

Designed to determine the coefficient of permeability by the constant or falling head method for the laminar flow of water through granular soils. The chamber is one piece acrylic to enable the sample to be viewed during the test. The sample length is 2 times the diameter. A spring is positioned in the top plate to apply 5-10 lbs force against the top stone or screen to prevent soil density changes during the test. The end caps & clamping ring are manufactured from anodised aluminium. The chamber is equipped with valves, porous stones & tubing to connect to the water source, vacuum & manometer tubes. The manometer tube, scale & permeameter base are attached to a platform creating a compact & portable unit. An adjustable constant head reservoir mounts on the upright scale & can be easily removed. All tubing & connections are included.

Permeability cells

weight approx.: 6.5 kg

Stand:

Dimensions: 1150x200x50 mm. Weight approx.: 3 kg



5

Standard Equipment for Performing Unconfined Compression Test Equipments

Code: SL080

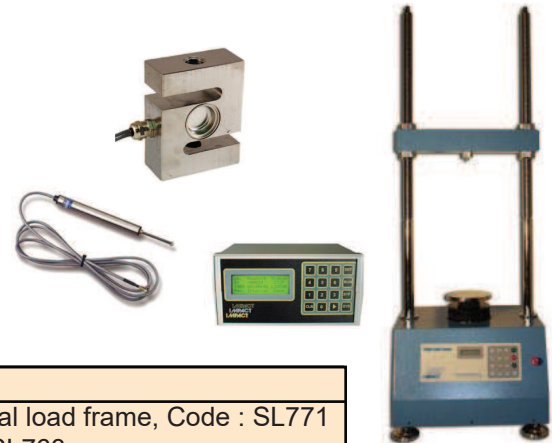
British Standard: BS1377-4, BS1377-7, BS1377-9

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

50 kN load frames (motorized) are suitable for a wide range of tests on different kind of materials. This is a variable speed load frame for CBR. Marshall. Unconfined, Undrained Triaxial and many other tests. There are 2 pre-set speeds and also a variable speed control for maximum flexibility.



Specification:

Test/Application	Short description
Unconfined compression - digital version	<ol style="list-style-type: none"> 1. 2 nos. Z Beam Adapter for Triaxial load frame, Code : SL771 2. Z Beam load cell 10KN, Code : SL763 3. Transducer 25mm Travel+Din, Code : SL722 4. Bracket for LSCT Code : SI727 5. Unconfined compression assembly, Code : SL084 6. 4 channel datalogger single, Code : SL702 7. Cable serial for all data logger, Code : SL715

6

Standard equipment for Hydrometer Analysis equipments

Code: AG230

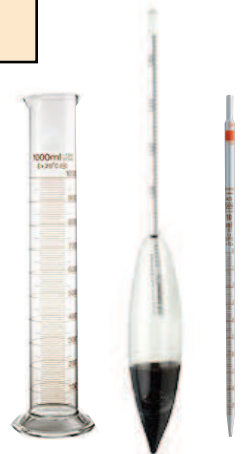
British Standard: BS812-121

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

Used for determining the particle size distribution of very fine materials such as silt and clay. Length = 190mm, Divided in 0.002°SG



Specification:

Test/Application	Short description
Hydrometer Analysis	<ol style="list-style-type: none"> 1. ASTM 151H Soil Hydrometer, range : 0.995 to 1.038, 280mm, Code : SL295 2. Measuring Glass Cylinder 1000ML, Code : GP246 3. Andreasen pipette lower 10ml capacity, Code : SL291 4. 1000ml rubber bung, Code : MH035 5. High speed stirrer, Code : SL298 6. Glass thermometer range 0 to 50C, Code : TH110 7. Sodium Hexametaphosphate, 1kg, Code : CH140 8. Timer Stopwatch, LCD display, Code : MH562



7

Soil Color Charts

Code: SL054

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

The Munsell Soil Color Charts is an affordable way to evaluate the type of soil that is present within a given area. The book is set up to allow users to make soil color evaluations in the field quickly and easily. The soil classification system that has been developed around the Munsell color system is an established and accepted process to assign a soil type. Through the use of the Munsell Soil Color Charts, practitioners from a wide range of professions can share reliable and consistent information about the color of soils at a particular site with colleagues anywhere around the world.



8

Standard Testing equipment for Direct Shear test

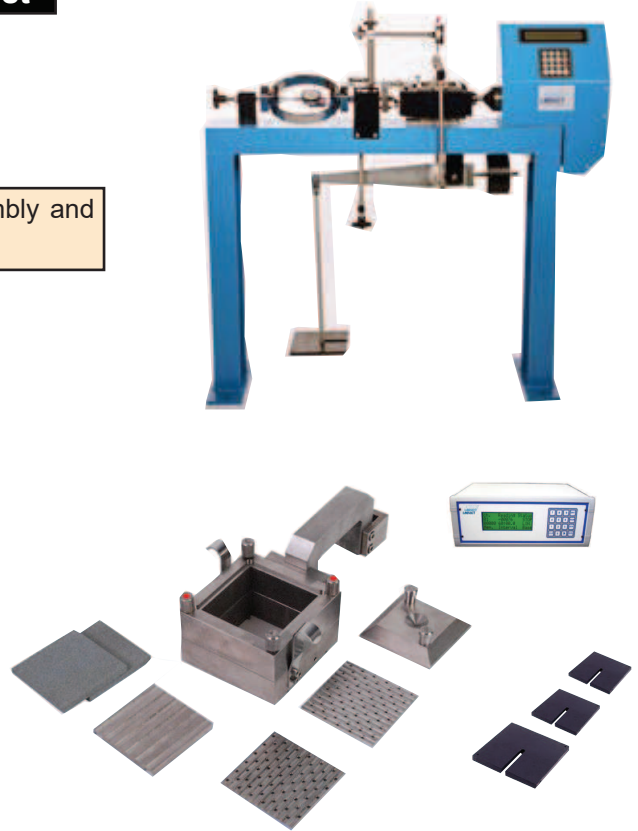
Code: SL372
 British Standard: BS1377-7
 Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Description:

Digital direct shear box, floor mounted with carriage assembly and load hanger with 10:1 lever loading device.

Specification:

1. Z Beam adaptor for shearbox apparatus, Code : SL775
2. 5KN Z Beam load cell, 5 kn capacity, Code : SL762
3. 25mm strain/displacement transducer, Code : SL722
4. 10mm strain/displacement transducer, Code : SL721
5. 2 nos. Bracket for strain transducer instead of dial gauge ,Code : SL727
6. 8 channel data logger with RS232 communications and USB port BS1377-7 Code : SL699
7. 7M serial cable for datalogger, Code : SL715
- Software for Shearbox tests, Code : SL791
9. 60MM square shearbox, Code : SL377
10. 60MM square cutter, Code : SL396
11. 60MM square extrusion tool, Code : SL398
12. 50KG weight set, Code : SL390



9

Standard testing equipment for determination of Specific Gravity

Manufacturer: Impact Test Equipment Ltd
 Origin: UK

Specification:

Test/Application	Short description
Determination of Specific Gravity	<ol style="list-style-type: none"> 1. 250mm vacuum dessicator, glass with perforated zinc disc Code : GP102 2. 100mm glass funnel, Code : GP177 3. Vacuum filter pump, 100mm long with gauge, Code : MH376



10

Determination of Field Density by Sand Cone Method

Manufacturer: YF
 Origin: China

Specification:

Test/Application	Short description
Field Density by Sand Cone	<ol style="list-style-type: none"> 1. Sand Cone Test Sets 2. Soil Auger 3. Steel Ruler, 100cm



11

Standard Proctor Compaction Test

Manufacturer: YF

Origin: China

Specification:

1. Standard portable light compactor (manual)
2. Steel Ruler
3. Moisture sprayer : 2L
4. Tray 45X45X7.5cm
5. Multifunctional sample extruder
6. Small Scoop
7. Stainless Steel Bowl
8. 500ml graduated cylinder
9. Aluminum box for moisture content



12

Standard equipment for Sieve Analysis

Manufacturer: YF

Model: STSJ-4A

Origin: China

DISCRIPTION:

The high frequency Sieve Shaker is mainly used to grading analysis of Non-cohesive grain soil materials.

Specification:

1. Standard Sieves with brass frame diameter 203mm,
2. Motorized Sieve Shaker
3. Vibration frequency: 42HZ
4. Vibration mode: Upper and down vibration
5. Vibration amplitude: 1.5 mm
6. Regular time: 0-60 min may choose



13

Standard Heavy Duty Penetration Test Apparatus

Manufacturer: Impact Test Equipment Ltd

Origin: UK

Description:

Penetrometers are used to establish the thickness of different stratifications when investigating the suitability of a site for bridge, road and other construction works. In general if the ground is not too compact, penetration tests with the lightweight penetrometer can be carried out.



14

Field Identification Test

Manufacturer: YF

Origin: China

Specification:

Test/Application	Short description
Field Identification Test	<ol style="list-style-type: none"> 1. Hammer (Wooden) 2. Spatula narrow end 3. Spatula- Wide end 4. Beaker-500ml 5. Heat Insulated Gloves 6. Aprons 7. Protective eye goggles



15

Digital Display Constant Temperature Convection Oven

Manufacturer: YF

Model: STHX-1A

Origin: China

Description:

1. Temperature range: 50-300°C
2. Accuracy: $\pm 1^\circ\text{C}$
3. Heater: 2 groups
4. Perspective window to look inside
5. Working voltage: AC220V, AC380V
6. Inner Size: STHX-1A 450×450×350mm 76L



16

Electronic Balance

Origin: China

Capacity: 0.01kg-30kg



Electronic Balance

Origin: China

Capacity: 0.01g-600g



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1(a)

Hydraulics Bench

Model: HYB-A
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

Fluid mechanics has many applications in various fields, such as naval engineering, aircraft engineering, or the study of blood circulation, and has also many applications in everyday life. The proposed laboratory includes a hydraulic bench full of didactic modules, a number of stand-alone systems that can be used to study the properties of the fluids, the pressure losses, the meta centric height, the cavitations, the Venturi effect, the Bernoulli's theorem, the Reynolds number, the series-parallel pumps, etc. and a wind tunnel. The hydraulics bench consists of a molded plastic sump tank which supports GRP bench top incorporating a flow channel and volumetric measurement. In this type of machine, hydraulic fluid is transmitted throughout the machine to various hydraulic motors and hydraulic cylinders and becomes pressurized according to the resistance present. The fluid is controlled directly or automatically by control valves and distributed through hoses and tubes.



Structural Specifications

- Steel frame.
- Screws, nuts, plates and all the metallic elements in stainless steel.
- Diagram in the front panel with distribution of the elements similar to the real one.
- Quick connections for adaptation to feed hydraulics source
- Mobile hydraulic bench, made in fibreglass reinforced polyester, and mounted on wheels for its mobility.
- Centrifugal pump, 0.37 KW, 30-80 l/min at 20.1-12.8 m., single phase 220V/50Hz or 110V/60Hz.
- Runner made of stainless steel.
- Sump tank capacity: 165 L.
- Small channel: 8 L.
- Flow measurement: volumetric tank, gauged from 0 to 7 L. for low flow values and from 0 to 40 L. for high flow values.
- Control valve for regulating the flow.
- Open channel to place the test module..

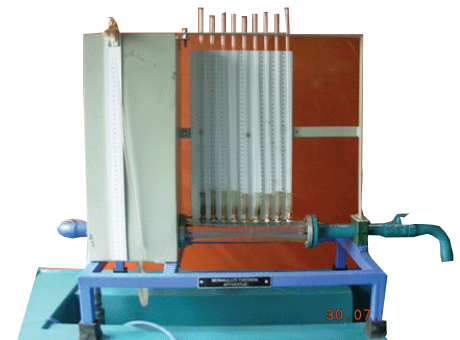
1(b)

Bernoulli's Apparatus

Model: HYB-05
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

In fluid dynamics, Bernoulli's principle states that an increase in the speed of a fluid occurs simultaneously with a decrease in pressure or a decrease in the fluid's potential energy. The principle is named after Daniel Bernoulli who published it in his book Hydrodynamica in 1738. Bernoulli's apparatus consists essentially of a two dimensional rectangular section convergent & Divergent duct designed to fit between constant head inlet tank and variable head outlet tank. A nine tube static pressure manometer bank is attached to the convergent divergent duct. The differential head across the test section can be varied from zero up to a maximum of 450mm. The test section, which is manufactured from acrylic sheet. The convergent divergent duct is symmetrical about the center line with a flat horizontal upper surface into which the nine static pressure tapings are drilled.



1(c)

Venturimeter

Model: HYB-02

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A venturimeter is a device used for measuring the rate of flow of a fluid flowing through a pipe. Venturi meters are flow measurement instruments which use a converging section of pipe to give an increase in the flow velocity and a corresponding pressure drop from which the flow rate can be deduced. They have been in common use for many years, especially in the water supply industry. Here we have considered two cross section, first at the inlet and the second one is at the throat. The difference in the pressure heads of these two sections is used to calculate the rate of flow through venturimeter. At the section 1 (i.e. at the inlet) the pressure of the fluid is maximum and the velocity is minimum. And at the section 2 (at the throat) the velocity of the fluid is maximum and the pressure is minimum. The pressure difference at the two sections can be seen in the manometer attached at both the section. This pressure difference is used to calculate the rate flow of a fluid flowing through a pipe.



1(d)

Orifice

Model: HYB-04

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

An orifice plate is a device used for measuring flow rate, for reducing pressure or for restricting. Either a volumetric or mass flow rate may be determined, depending on the calculation associated with the orifice plate. It uses the same principle as a Venturi nozzle, namely Bernoulli's principle which states that there is a relationship between the pressure of the fluid and the velocity of the fluid. When the velocity increases, the pressure decreases and vice versa.



Mouthpiece

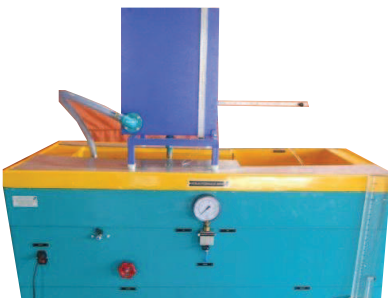
Model: HYB-04

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A mouthpiece is a short tube of length not more than two to three times its diameter, which is fitted to a tank for measuring discharge of the flow from the tank. By fitting the mouthpiece, the discharge through an orifice of the tank can be increased. Mouthpieces are classified on the basis of their shape, position and discharge conditions. The discharge through an orifice may be increased by fitting a sufficient length of pipe to the outside of the orifice. Such a pipe, which is attached externally to an orifice, is known as an external mouthpiece.



1(e)

V-Notch Weir

Model: HYB-06
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

V-notch weir is a weir where the physical barrier is significantly higher than the water level except for a specific notch (often). Actually a weir is a barrier across the horizontal width of a river that alters the flow characteristics of the water and usually results in a change in the vertical height of the river level. There are many designs of weir, but commonly water flows freely over the top of the weir crest before cascading down to a lower level. Weirs allow hydrologists and engineer a simple method of measuring the volumetric flow rate in small to medium-sized streams/ rivers or in industrial discharge locations.



1(f)

Set of Piezometer's

Model: HYB-A
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

A piezometer is either a device used to measure liquid pressure in a system by measuring the height to which a column of the liquid rises against gravity, or a device which measures the pressure (more precisely, the piezometric head) of groundwater at a specific point. A piezometer is designed to measure static pressures, and thus differs from a pitot tube by not being pointed into the fluid flow.



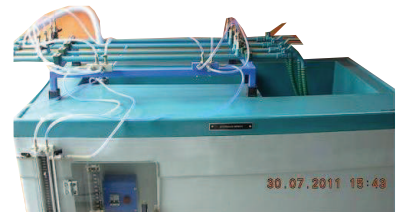
1(g)

Fluid friction apparatus/Friction Loss

Model: HYB-03
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

Fluid friction occurs in liquids and gases. Fluid friction is the force that resists motion either within the fluid itself or of another medium moving through the fluid. There is internal friction, which is a result of the interactions between molecules of the fluid, and there is external friction, which refers to how a fluid interacts with other matter.



1(h)

Pitot Tube

Model: HYB-A
Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)
Origin: India

Description:

A Pitot tube, also known as Pitot probe, is a pressure measurement instrument used to measure fluid flow velocity. The pitot tube is used to measure the local flow velocity at a given point in the flow stream and not the average flow velocity in the pipe or conduit..



1(i)

Clear Tube, Tube Clamps

Model: HYB-A

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A tube is a soft squeezable container which can be used for thick liquids such as adhesive, caulking, ointment, and tooth-paste. Basically, a tube is a cylindrical, hollow piece with a round or oval profile, made of plastic, paperboard, or aluminum.



1(j)

Stopwatch

Model: HYB-A

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A stopwatch is a handheld timepiece designed to measure the amount of time elapsed from a particular time when it is activated to the time when the piece is deactivated.



1(k)

Water Pump

Model: HYB-A

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid.



1(l)

Point gauge

Model: HYB-A

Brand: Eternal Engineering Equipment Pvt. Ltd (EEE)

Origin: India

Description:

A gauge or gage, in science and engineering, is a device used to make measurements or in order to display certain information.



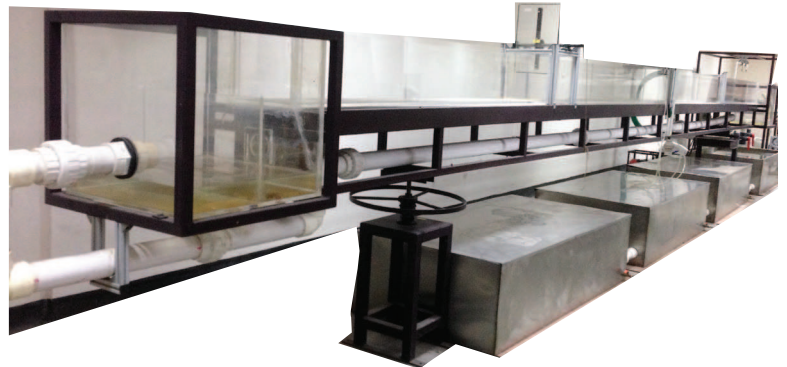
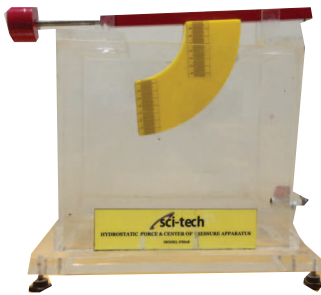
2

Center of Pressure Apparatus

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

The center of pressure is the point where the total sum of a pressure field acts on a body, causing a force to act through that point.



3(a)

10 m / 30 ft Tilting Flume

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A flume is a human-made channel for water in the form of an open declined gravity chute whose walls are raised above the surrounding terrain, in contrast to a trench or ditch.

The first is a state-of-the-art, self-contained, recirculating, tilting flume with a working section length 10.0 m (32.8 ft), width 0.60 m (2.0 ft), and depth 0.50 m (1.65 ft). The flume slope can be adjusted electronically up to 5% allowing replicating slopes typical in steep streams. The flume length guarantees that fully developed flow conditions are present during experimental runs. A pump powered by a 3 HP motor is used to recirculate flow with maximum discharge of 170 lit/sec (2700 gallons per minute) from a water tank with capacity of 6,800 lit (1,800 gallon). The floor of this flume has a 0.91 m (3.0 ft) long, and 0.30 m (1.0 ft) wide removable aperture, which is located 2.00 m (6.5 ft) upstream of the flume exit section.

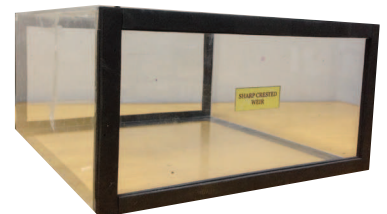
3(b)

Sharp Crested Weir

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

The Sharp Crested Weir represents a full width sharp crested weir in free or drowned mode with forward or reverse flow. Sharp crested weirs are often used as measuring devices - particularly for measuring small flows. The Sharp Crested Weir applies only to full width weirs and the discharge coefficient assume smooth vertical, plane, parallel channel sides. The most common discharge measuring structures for micro-hydropower installations are sharp-crested weirs. They are among the most accurate discharge measuring devices for field application.



3(c)

Broad Crested Weir

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

This is the simplest device for flow measurement. It is more suitable for large discharges. A broad-crested weir is a flat-crested structure, where the water passes over a crest that covers much or all of the channel width.



3(d)

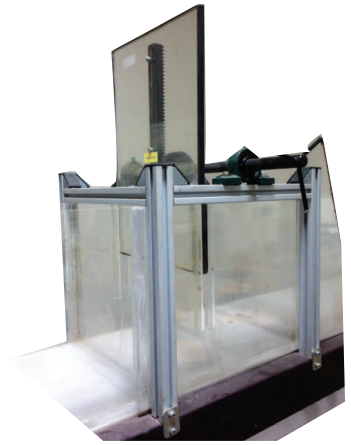
Sluice Gate

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

A sliding gate or other device for controlling the flow of water, especially one in a lock gate. Sluice gates commonly control water levels and flow rates in rivers and canals. They are also used in wastewater treatment plants and to recover minerals in mining operations, and in watermills.



3(e)

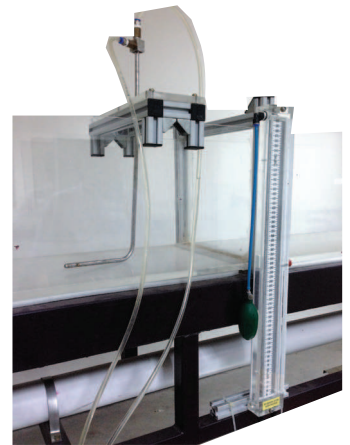
Piezometer

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

A piezometer is either a device used to measure liquid pressure in a system by measuring the height to which a column of the liquid rises against gravity, or a device which measures the pressure of groundwater at a specific point. A piezometer is designed to measure static pressures, and thus differs from a pitot tube by not being pointed into the fluid flow.



3(f)

Venturi Flume

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

A venturi flume is a critical-flow open flume with a constricted flow which causes a drop in the hydraulic grade line, creating a critical depth. It is used in flow measurement of very large flow rates, usually given in millions of cubic units. A venturi meter would normally measure in millimeters, whereas a venturi flume measures in meters.



3(g)

Parshall Flume

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

The Parshall flume, an open channel flow metering device, was developed to measure the flow of surface waters and irrigation flows. Parshall Flumes are a class of short throated flumes. The Parshall flume is an economical and accurate way of measuring the flow of water in open channels and non-full pipes. The most recognized and commonly used flume today, the Parshall flume is a fixed hydraulic structure. It is used to measure volumetric flow rate in industrial discharges, municipal sewer lines, and influent/effluent flows in wastewater treatment plants. The Parshall flume accelerates flow through a contraction of both the parallel sidewalls and a drop in the floor at the flume throat. Under free-flow conditions the depth of water at specified location upstream of the flume throat can be converted to a rate of flow. Some states specify the use of Parshall flumes, by law, for certain situations (commonly water rights). The design of the Parshall flume is standardized under ASTM D1941, ISO 9826:1992, and JIS B7553-1993.



3(h)

Culvert

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

Culverts are commonly used both as cross-drains for ditch relief and to pass water under a road at natural drainage and stream crossings. A culvert may be a bridge-like structure designed to allow vehicle or pedestrian traffic to cross over the waterway while allowing adequate passage for the water. Culverts come in many sizes and shapes including round, elliptical, flat-bottomed, pear-shaped, and box-like constructions. The culvert type and shape selection is based on a number of factors including requirements for hydraulic performance, limitation on upstream water surface elevation, and roadway embankment height.



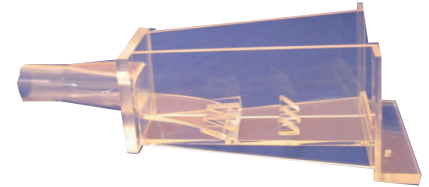
3(i)

Hydraulic Jump Basin

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A hydraulic jump is a phenomenon in the science of hydraulics which is frequently observed in open channel flow such as rivers and spillways. When liquid at high velocity discharges into a zone of lower velocity, a rather abrupt rise occurs in the liquid surface. The rapidly flowing liquid is abruptly slowed and increases in height, converting some of the flow's initial kinetic energy into an increase in potential energy, with some energy irreversibly lost through turbulence to heat. In an open channel flow, this manifests as the fast flow rapidly slowing and piling up on top of itself similar to how a shockwave forms. Hydraulic jump basins are type of irrigation structures which are constructed downstream of chutes, gates and spillways to dissipate excess kinetic energy. The dimensions of such structure depend on the jump length and the sequent depth of the jump.



3(j)

Water Pump (3-hp)

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid.



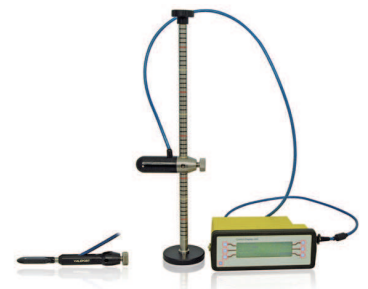
3(k)

Current Meter

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A current meter is oceanographic device for flow measurement by mechanical (rotor current meter), tilt (Tilt Current Meter), acoustical (ADCP) or electrical means. Current meters are mostly based on counting the rotations of a propeller and are thus rotor current meters. A mid-20th-century realization is the Ekman current meter which drops balls into a container to count the number of rotations. In physics, one distinguishes different reference frames depending on where the observer is located, this is the basics for the Lagrangian and Eulerian specification of the flow field in fluid dynamics: The observer can be either in the Moving frame (as for a Lagrangian drifter) or in a resting frame.



3(l)

Digital Discharge meter (or electromagnetic flow meter)

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

The magnetic flow meter requires a conducting fluid, for example, water that contains ions, and an electrical insulating pipe surface, for example, a rubber-lined steel tube. If the magnetic field direction were constant, electrochemical and other effects at the electrodes would make the potential difference difficult to distinguish from the fluid flow induced potential difference. To mitigate this in modern magnetic flow meters, the magnetic field is constantly reversed, cancelling out the electrochemical potential difference, which does not change direction with the magnetic field.



4(a)

Hydrologic system bed – to test hydrological cycle components

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

A fundamental characteristic of the hydrologic cycle is that it has no beginning and it has no end. It can be studied by starting at any of the following processes: evaporation, condensation, precipitation, interception, infiltration, percolation, transpiration, runoff, and storage. Runoff: it is the water flowing over the land making its way towards rivers, lakes, oceans etc. as surface or subsurface flow. Surface runoff: it is the running water over the land and which ultimately discharge water to the sea. Sub surface run off: The water getting infiltrated into pervious soil mass, making its way towards rivers and lakes can be termed as sub surface run off. Precipitation: It is the fall of moisture from atmosphere to the earth's surface in any form. Example: rain, hail, snow, sleet, glaze, drizzle, snowflakes.



4(b)

Tensiometer

Make: SCI-Tech Engineering Pvt. Ltd

Origin: India

Description:

A tensiometer in soil science is a measuring instrument used to determine the metric water potential in the vadose zone. This device typically consists of a glass or plastic tube with a porous ceramic cup, and is filled with water. The top of the tube has either a built-in vacuum gauge or a rubber cap used with a portable puncture tensiometer instrument, which uses a hypodermic needle to measure the pressure inside the tensiometer. The tensiometer is buried in the soil, and a hand pump is used to pull a partial vacuum. As water is pulled out of the soil by plants and evaporation, the vacuum inside the tube increases. As water is added to the soil, the vacuum inside the tube pulls moisture from the soil and decreases. As the water in tensiometer is considered to be equilibrium with the soil water, the gauge reading of the tensiometer represents the metric potential of the soil. Such tensiometers are used in irrigation scheduling to help farmers and other irrigation managers to determine when to water. In conjunction with a water retention curve, tensiometers can be used to determine how much to water. With practice, a tensiometer can be a useful tool for these purposes.



4(c)

Lysimeter

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A lysimeter is a measuring device which can be used to measure the amount of actual evapotranspiration which is released by plants (usually crops or trees). By recording the amount of precipitation that an area receives and the amount lost through the soil, the amount of water lost to evapotranspiration can be calculated. Lysimeters are of two types: weighing and non-weighing. A lysimeter is most accurate when vegetation is grown in a large soil tank which allows the rainfall input and water lost through the soil to be easily calculated. The amount of water lost by evapotranspiration can be worked out by calculating the difference between the weight before and after the precipitation input. For farm crops, a lysimeter can represent field conditions well since the device is installed and used outside the laboratory.



4(d)

Rain Gauge (Symon's)

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

A rain gauge (also known as an udometer, pluviometer, or an ombrometer) is an instrument used by meteorologists and hydrologists to gather and measure the amount of liquid precipitation over a set period of time. There are two types of rain-gauge, i.e., (1) Non-Recording Type Rain Gauge and (2) Recording Type Rain Gauge. 1. Non-Recording Type Rain-Gauge: It gives only total rainfall occurred during particular time period. Recording type rain-gauge gives hourly rainfall. Under non-recording type rain-gauges, one most commonly used in Symon's rain-gauge.



4(e)

Rain Gauge (Tipping Bucket)

Make: SCI-Tech Engineering Pvt. Ltd
Origin: India

Description:

The tipping bucket rain gauge consists of a funnel that collects and channels the precipitation into a small seesaw-like container. After a pre-set amount of precipitation falls, the lever tips, dumping the collected water and sending an electrical signal. An old-style recording device may consist of a pen mounted on an arm attached to a geared wheel that moves once with each signal sent from the collector. In this design, the wheel turns the pen arm moves either up or down leaving a trace on the graph and at the same time making a loud click. Each jump of the arm is sometimes referred to as a 'click' in reference to the noise. The chart is measured in 10-minute periods (vertical lines) and 0.4 mm (0.015 in) (horizontal lines) and rotates once every 24 hours and is powered by a clockwork motor that must be manually wound. The tipping bucket rain gauge is not as accurate as the standard rain gauge because the rainfall may stop before the lever has tipped. When the next period of rain begins it may take no more than one or two drops to tip the lever. This would then indicate that pre-set amount has fallen when in fact only a fraction of that amount has actually fallen. Tipping buckets also tend to underestimate the amount of rainfall, particularly in snowfall and heavy rainfall events. The advantage of the tipping bucket rain gauge is that the character of the rain (light, medium, or heavy) may be easily obtained. Rainfall character is decided by the total amount of rain that has fallen in a set period (usually 1 hour) and by counting the number of 'clicks' in a 10-minute period the observer can decide the character of the rain. Correction algorithms can be applied to the data as an accepted method of correcting the data for high level rainfall intensity amounts.



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1(i)

Total Station

Model: Nivo 5 C
Brand: Nikon
Manufacture & Origin: Japan

Description:

The Nikon Nivo 5.C Reflector less Total Station with 5-second accuracy instantly calculates measurements onsite with its built-in field software. The legendary Nikon high clarity optics provides clearer images in bright and low light conditions to record distances and angles with utmost precision. This total station also features Bluetooth capability for connecting to data collectors and a compact and lightweight design for easy transport. The Nivo 5.C's powerful and accurate EDM precisely measures objects up to 1,640 feet away without the need for a prism and approximately 16,404 feet using a single prism. The red laser pointer is also very useful for outdoor aiming and stakeout assistance. This field instrument features a detachable tribrach; tilt sensor and dual-axis compensator for stable angle measurements even on rough terrain.



Technical Specification

Manufacturer ID	HNA30500
Manufacturer	Nikon
Manufacturer Product URL	http://www.nikonpositioning.com/nivoc.aspx
Search-Lock-Measure	No
Capture-Sketch-Link	No
Tracking	Electronic Guide Light (EGL)
Plummet	Optical
Tilt Compensation	Dual Axis
One-Person Operation Capability	No
Dual Display	No
Color Display	Yes
Keypad	Function
Applications	Stakeout, Survey
Angular Accuracy	5"
Standard Deviation (Prism)	2 mm + 2 ppm
Standard Deviation (Reflectorless)	3 mm + 2 ppm
Range with Prism	16,500 ft (5000 m)
Input/Output	RS232C, USB
Bluetooth	Yes
Onboard Data Storage	Flash, USB
Onboard Data Storage Capacity	128 MB

- Survey Pro software onboard
- Windows CE touch-screen
- High quality Nikon optics
- 1", 2", 3" and 5" angle accuracies
- Prism and reflectorless measurements
- Easy-to-use 2nd face keypad
- Hot swappable batteries
- Compact, rugged, and lightweight
- Cable-free Bluetooth®
- Optional laser plummet

(ii)

Tripod Case

Description:

A tripod is a portable three-legged frame, used as a platform for supporting the weight and maintaining the stability of some other object. A tripod provides stability against downward forces and horizontal forces and movements about horizontal axes. The positioning of the three legs away from the vertical centre allows the tripod better leverage for resisting lateral forces.



2

Digital Theodolite

Model: NE 100
 Brand: Nikon
 Manufacture & Origin: Japan

Description:

Designed for general construction and survey applications, Nikon NE-100 Series electronic digital theodolites give you accurate measurements in an affordable, easy-to-use platform. Each of the four models has an ergonomic keypad with one-touch keys for all functions, and a large backlit LCD display helps you work productively in the field. You can instantly convert vertical angles to percent of grade, reset the horizontal angle to zero and lock the horizontal angle displayed on the LCD while you reposition or repeat a measurement. Angle accuracies differ between the models. The NE-100 offers 10" angle accuracy, while the NE-101 offers 7". NE-100 series theodolites feature five easy-to-use, one-touch keys: four to perform all common functions and a fifth to control the backlit LCD display and reticule illumination. NE-100 Series theodolites feature a built-in reticle illuminator and backlit LCD display that allow you to work inside buildings as well as in tunnels, mines and other environments with little or no light. These features also come in handy during low light conditions outdoors, such as near dawn or dusk.



Technical Specification

Manufacturer ID	NIKON-NE-100
Manufacturer	Nikon
Piezo Gearless Direct Drive Technology	No
Angular Accuracy	10"
Plummet	Optical
Magnification	30x
Interface	6 Function Buttons
Bluetooth	No
Keypad	Function
Touch screen	No
Color Display	No
Backlit Display	Yes
Dual Display	No
Battery Type	Alkaline
Number of Batteries	6
Battery Life	48 h
Environmental Standards	IP54

(ii)

Tripod Case

Description:

A tripod is a portable three-legged frame, used as a platform for supporting the weight and maintaining the stability of some other object. A tripod provides stability against downward forces and horizontal forces and movements about horizontal axes. The positioning of the three legs away from the vertical centre allows the tripod better leverage for resisting lateral forces.



3(i)

Plane Table

Manufacture & Origin: Bangladesh

Description:

The plane table surveying is the fast method of surveying. In this type of surveying plotting of the plan and field observations can be done simultaneously. In case of plane table surveying Geometrical conditions of site are manuscript in the map sheet using plane table and alidade after that topographic details are arranged on the map.a



4(i)

Digital Leveling Instrument

Model: SDL50

Brand: Sokkia

Manufacture & Origin: Japan

Description:

In less than 3 seconds and with the touch of a key, height difference and distance can be measured and the result is stored in internal memory. The SDL50 minimizes human error and maximizes the ease of leveling work, allowing increased productivity and performance.



Technical Specification

Height Accuracy (Electronic)	1.5mm (With Fiberglass RAB-Code Staves) Standard deviation for 1km double run leveling
Distance Accuracy (Electronic)	[<10m = +/-10mm] [10m to 50m = +/- .1%xD] [>50m = .2%xD]
Display resolution (Height)	.0001 / .001m
Measuring Range	1.6 to 100m
Magnification	28x
Compensator	Pendulum compensator with magnetic damping system
Data Storage	2000 points
Communications	RS-232C
Dust/Water Protection	IPX4
Operating Temperature	-20 to +50°C (-4 to +122°F)
Operating Time	More than 8.5 hours
Size	W158 x D257 x H182mm (W6.2 x D10.1 x H7.2in)
Weight	2.4kg (5.3lb)



4(ii)

Tripod Case

Description:

A tripod is a portable three-legged frame, used as a platform for supporting the weight and maintaining the stability of some other object. A tripod provides stability against downward forces and horizontal forces and movements about horizontal axes. The positioning of the three legs away from the vertical centre allows the tripod better leverage for resisting lateral forces.

5(i)

Automatic Leveling Instrument

Model: AX-2S

Brand: Nikon

Manufacture & Origin: Japan

- 20X Telescope
- Rugged Magnetic Compensator
- Compact / Weather Resistant
- Hard Carry Case
- 2mm Accuracy
- Construction / Education Surveying
- Optical Tooling



Description:

The telescope has a 30mm objective lens for clear, bright images in an erect and unrevised orientation. Built-in compensator automatically levels the line of sight over a wide compensation range of ± 16 inches with a setting accuracy of ± 0.5 inch. Minimum focusing distance of 0.75 meters/2.46 feet, standard deviation for a 1-km double-run level is just ± 2.5 mm. Horizontal tangent knobs have an unlimited range and can be operated with either hand; friction brake enables quick, easy setting. Water resistance allows use in light rain or dusty conditions; specially designed base plate for mounting on either flat- or domed-head tripods.

Nikon Automatic Levels are Compact and lightweight. This automatic level features a magnetic-dampened automatic compensator to level the line of sight; quality Nikon® optics for bright, sharp, detailed images; and rugged water-resistant construction. The horizontal tangent knobs on this Nikon Level can be operated with either hand and feature an unlimited range to ensure smooth, precise pointing and angular measurement. Carrying case, lens cap, plumb bob, adjustment tool, and vinyl dust cover included.

Technical Specification

Telescope - Tube length: 7.5" (190 mm); Image: Erect; Effective diameter of objective lens: 1.2" (30 mm); Magnification: 20x; Field of view: 1°30' (2.6' at 100'); Resolution power: 3.5"; Minimum focusing distance: 2.46' (.75 m); Stadia ratio: 1:100. Automatic compensator - Type: Wire-hung, air damper; Setting accuracy: ± 0.5 "; Range: $\pm 16'$. Level vial sensitivity - Circular level: 10'/2 mm. Standard deviation (1-km double-run leveling) - Without micrometer: ± 2.0 mm. Horizontal circle - Diameter of circle: 4.3" (110 mm); Minimum increment: 1°/1 g; Reading estimation: 0.1°/0.1 g. Weight - Instrument: 2.8 lbs.; Case: 2.7 lbs.



5(ii)

Tripod Case

Description:

A tripod is a portable three-legged frame, used as a platform for supporting the weight and maintaining the stability of some other object. A tripod provides stability against downward forces and horizontal forces and movements about horizontal axes. The positioning of the three legs away from the vertical centre allows the tripod better leverage for resisting lateral forces.



6

Spirit Level

Manufacture & Origin: China

Description:

A spirit level, bubble level or simply a level is an instrument designed to indicate whether a surface is horizontal (level) or vertical (plumb). Different types of spirit levels may be used by carpenters, stonemasons, bricklayers, other building trade's workers, surveyors, millwrights and other metalworkers, and in some photographic or video graphic work.

Technical Specification

material	aluminium level body+plastic spare part
Accuracy	1.0mm/m
thickness of aluminium	0.7mm, 0.8mm or 1.0mm
color	can be any color
length	30cm
magnet	without magnet
type	box beam

7

Plumbing Fork

Manufacture & Origin: Bangladesh

Description:

A plumbing fork is a U-shaped piece of metal or wooden frame. The end of one of its arm is pointed and the other arm is having an arrangement for hanging a plumb bob. The frame is constructed in such a way that the tip of the pointed arm and the plumb line lie in the same vertical line. At the time of use, the pointed arm is placed on the table and the other arm, with a plumb bob attached, is kept below the table. Plumbing fork with a plumb bob is used in large scale surveying for Centering of plane table and for Transferring of ground point.



8

Engineering Chain, 100 ft long with 100 Links

Manufacture & Origin: China

Description:

The chain is divided into 100 links, usually marked off into groups of 10 by brass rings or tags which simplify intermediate measurement. Each link is thus 7.92 inches long. A quarter chain, or 25 links, is known as a rod or pole. Ten chains make up a furlong and 80 chains equal a statute mile.

9(i)

Measuring Tape, 100 ft

Manufacture & Origin: China

Description:

A tape measure or measuring tape is a flexible ruler and used to measure distance. 100-foot/30m rewinding surveying tape measure with inches/feet on one side, metric on the other. Durable, enclosed ABS plastic case with rubber grips. Non-stretch, flexible, wear-resistant vinyl-coated fiberglass tape. Collapsible, locking 180-degree pivot hand reel and flexible expanding handle.



9 (ii)

Measuring Tape, 5m(steel)

Manufacture & Origin: China

Description:

A tape measure or measuring tape is a flexible ruler and used to measure distance. Stainless steel blade and spring for rust resistance. Stainless steel belt clip, hook and screws for rust resistance. Nylon blade coating to help protect the blade for long life. Compact case design. Double-sided blade print for vertical measurements. True-zero hooks for accurate inside & outside measurements.



9 (iii)

Measuring Tape, 15m(Cotton)

Manufacture & Origin: China

Description:

A tape measure or measuring tape is a flexible ruler and used to measure distance. 15m Cotton tape made of Cotton, These are cotton woven tapes, with copper wires inserted to make them non shrinkable. A paint coating on the surface makes these resistant to water. These are one of the oldest forms of measuring tapes and are still in demand for various applications.



10

Prismatic Compass with Stand

Manufacture & Origin: India

Description:

A prismatic compass is navigation and surveying instrument which is extensively used to find out the bearing of the traversing and included angles between them, waypoints (an endpoint of the closure) and direction. Prismatic Compass is a fully functional Prismatic Surveying Compass and yields reasonably accurate results. It comes with an aluminum tripod and canvas cases. The design of the Prismatic Compass allows the user to simultaneously view the object being sighted and its magnetic heading with approximately 1/2 degree resolution. The compass case and lid are solid brass with a black powder coating. Prismatic Compass is stamped on the large brass lid and can be removed to reveal the low-inertia aluminum compass dial. The prism can be flipped up for use as a front sight and concurrent view of the compass heading. A small cover can be swung into place to protect the prism. There are also two colored filters that can be placed in the optical path of the measurement to reduce glare. Mirror image stamped degree markings are found on the compass rose so that the compass heading reads properly when viewed through the prism. When taking a heading measurement, the magnetic heading appears clearly under the object being sighted. The compass can be threaded onto the lightweight surveyor's tripod with a ball and socket head using standard 3/4 inch x 24 threads. The compass measures 4 3/8 inches (11.1 cm) in diameter, 1 1/2 inches (3.8 cm) thick, and weighs one pound, 3 ounces (539 grams). Mounted on its tripod, the height of the compass can be adjusted from a minimum height of 12 1/2 inches (31.7 cm) tall to a maximum height of 21 inches (53.3 cm) tall. This compass is accurate with a resolution of approximately 1/2 a degree. Both the compass and tripod come with canvas cases. The compass case has a Velcro closure and the tripod case has a draw string.



11

Trough Compass

Manufacture & Origin: China

Description:

This trough compass, unlike the surveyor's and prismatic compasses, does not form a complete surveying instrument, since it only establishes the direction of magnetic north. It is used with either a plane table or a theodolite. The needle of this trough compass consists of a long (30 cm), narrow, magnetized bar of steel, pointed at both ends, with the usual agate bearing at its centre. It is mounted in a narrow rectangular box carrying a pivot at its centre. This box features with a tongue or lever, worked from a small stud or handle outside, which enables the needle to be lifted off and kept clear of the pivot when the instrument is not in use. At each end of the box, which is closed by a glass cover, is a block of metal, the top of which is at the same level as the tip of the needle, and on which is engraved a zero line, the magnetic meridian, and a very short graduated arc extending about 5 degrees on either side of the zero mark. It is used in navigation and surveying to assist in locating and describing stations and in orientating reconnaissance sketches.



12

Arrow

Manufacture & Origin: Bangladesh

Description:

Arrow is a metal pin used in surveying for marking taped measurements on the ground. Eternally strong Surveyor's Steel Arrows are made of 7/32" cold rolled steel.

13

Plum Bob

Manufacture & Origin: Bangladesh

Description:

A plumb bob, or plummet, is a weight, usually with a pointed tip on the bottom, suspended from a string and used as a vertical reference line, or plumb-line. It is essentially the vertical equivalent of a "water level".

- Machined brass with lacquer finish
- Replaceable, hardened steel tip
- Removable cap for easy, centered string installation



14

Hand GPS (with WASS capability)

Model: eTrex 10

Brand: Garmin

Manufacture & Origin: USA

- Worldwide basemap
- 2.2" monochrome display, easy to read in any light
- GPS and GLONASS satellites for faster positioning
- Paperless geocaching
- 25-hour battery life with 2 AA batteries

Technical Specification

Physical dimensions	2.1" x 4.0" x 1.3" (5.4 x 10.3 x 3.3 cm)
Weight	5 oz (141.7 g) with batteries
Water rating	IPX7
Battery	2 AA batteries (not included); NiMH or Lithium
Display type	transflective, monochrome
Display size	1.4" x 1.7" (3.6 x 4.3 cm); 2.2" diag (5.6 cm)
Display resolution	128 x 160 pixels
Battery life	25 hours
High-sensitivity receiver	Yes
Interface	USB
Basemap	Yes
Waypoints/favorites/locations	1000
Routes	50
Track log	10,000 points, 100 saved tracks
Area calculation	Yes
Geocaching-friendly	Yes (Paperless)
Sun and moon information	Yes
Garmin Connect™ compatible (online community where you analyze, categorize and share data)	

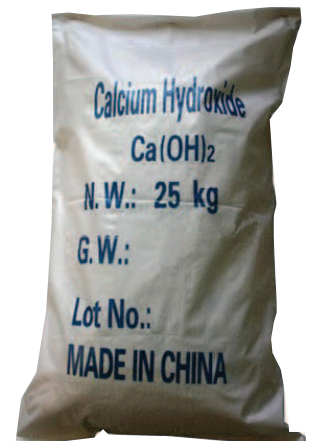


15

Lime (Kg)

Description:

Lime is a calcium-containing inorganic mineral in which carbonates, oxides, and hydroxides predominate. In the strict sense of the term, lime is calcium oxide or calcium hydroxide.





16

Paint (box)

Description:

Paint is any liquid, liquefiable, or mastic composition that, after application to a substrate in a thin layer, converts to a solid film. It is most commonly used to protect, color, or provide texture to objects. Paint can be made or purchased in many colors and in many different types, such as watercolor, synthetic, etc. Paint is typically stored, sold, and applied as a liquid, but most types dry into a solid.

17

Rope (Kg)

Manufacture & Origin: Bangladesh

Description:

A rope is a group of yarns, plies, fibers or strands that are twisted or braided together into a larger and stronger form. Ropes have tensile strength and so can be used for dragging and lifting, but are too flexible to provide compressive strength. As a result, they cannot be used for pushing or similar compressive applications. Rope is thicker and stronger than similarly constructed cord, string, and twine.



18

Alidade 18"

Manufacture & Origin: China

Description:

An alidade (archaic forms include alhidade, alhidad, alidad) or a turning board is a device that allows one to sight a distant object and use the line of sight to perform a task. This task can be, for example, to draw a line on a plane table in the direction of the object or to measure the angle to the object from some reference point. Angles measured can be horizontal, vertical or in any chosen plane. The alidade was originally a part of many types of scientific and astronomical instrument. At one time, some alidades, particularly those used on graduated circles as on astrolabes, were also called diopters. With modern technology, the name is applied to complete instruments such as the plane table alidade.



19

Optical Square

Manufacture & Origin: China

Description:

Optical Square used as a hand held tool for sighting both right angles and perpendicular points from off a base line. The optical square uses a pentaprism to reflect and refract a beam or sighting 90 degrees, it is used in pairs in surveying and in a singular block in metrology.

- Double penta prism for fast right angle sighting in either direction.
- Protective metal cover rotates to protect prism.
- Comes with a leather case.



20

Aluminum Ranging Pole, 3 meter long

Manufacture & Origin: China

Description:

A ranging rod is a surveying instrument used for marking the position of stations and for sightings of those stations as well as for ranging straight lines. Initially these were made of light, thin and straight bamboo or of well seasoned wood such as teak, pine or deodar. They were shod with iron at the bottom and surmounted with a flag about 25 cm square in size. Nowadays they are made of metallic materials only. The rods are usually 3 cm in diameter and 2 m or 3 m long, painted alternatively either red and white or black and white in lengths of 20 cm (i.e. one link length of metric chain). These colors are used so that the rod can be properly sighted in case of long distance or bad weather. Ranging rods of greater length, i.e., 4 m to 6 m, are called ranging poles and are used in case of very long survey lines. Another type of ranging rod is known as an offset rod, which has no flag at the top. It is used for measuring small offsets from the survey line when the work is of an ordinary nature.

- Alternating red and white
- Female 5/8 x 11 top thread
- Disassembles into 4' sections
- Includes carry bag
- Maximum 3m in lenth.



21

Hammer (Wooden)

Manufacture & Origin: China

Description:

A hammer is a tool or device that delivers a blow (a sudden impact) to an object. Most hammers are hand tools used to drive nails, fit parts, forge metal, and break apart objects. Hammers vary in shape, size, and structure, depending on their purposes.



22

Survey Bag

Manufacture & Origin: China

Description:

Survey bag is generally used to carry different types of surveying equipments.

- Poly ripstop / 600d poly material
- Padded ripstop bottom
- Removable padded shoulder strap
- 16 Pockets: 6 exterior, 10 interior
- 24" W x 10" D x 10" H



23

Spray Paint

Manufacture & Origin: Bangladesh

Description:

Spray paint is a type of paint that comes in a sealed pressurized container and is released in a Aerosol spray when depressing a valve button. Spray paint leaves a smooth, evenly coated surface, unlike many traditional rolled or brushed paints. Standard sized cans are lightweight, portable, cheap, and easy to store. Aerosol primer can be applied directly to bare metal and many plastics.



24

Umbrella (44")

Manufacture & Origin: China

Description:

An umbrella or parasol is a folding canopy supported by wooden or metal ribs, which is usually mounted on a wooden, metal, or plastic pole. It is designed to protect a person against rain or sunlight.



26

Umbrella (Standard Size)

Manufacture & Origin: China

Description:

An umbrella is a canopy device designed to protect from precipitation or sunlight. Where style and functionality meet in this corporate umbrella. Upgraded to fiberglass ribs for extra strength. Has auto open functionality.



26

Digital Camera

Brand: Sony

Model: W800

Manufacture: China

Origin: Japan

Description:

The lightweight, black Sony DSC-W800 Digital Camera is a compact point and shoot that features 20.1 megapixels inside the 1/2.3" Super HAD CCD sensor, and has a professional Sony 5x optical zoom lens with a 35mm equivalent focal length of 26-130mm. A bright 2.7" Clear Photo LCD 230k-dot monitor at the back allows you to clearly view your photos and high-quality 720p HD videos.

For more zoom, a 10x digital zoom function doubles the camera's reach and Sony's SteadyShot Image Stabilization with Active mode compensates for camera shake to help provide clearer images with minimal blur and low noise, even while you stroll around. For shooting at an even wider angle, try the 360° Sweep Panorama, which allows you to press the shutter button and sweep your camera around to gather in your entire landscape and take many high-resolution images and automatically combine them into one photograph.



27

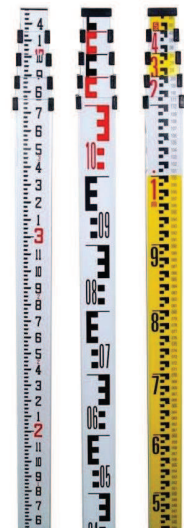
Leveling Staff

Description:

A level staff, also called leveling rod, is a graduated wooden or aluminum rod, used with a leveling instrument to determine the difference in height between points or heights of points above a datum surface.

Features:

- Clear view by wide surface graduation
- Standard staff for Surveyors
- Suitable for long distance measuring
- Robust structure and stainless bottom part



28

High Definition Handy Cam

Brand: Sony
 Model: HDRCX240E
 Manufacture: China
 Origin: Japan



Description:

The Sony HDR-CX240E Full HD Handycam Camcorder is a Full HD 1920 x 1080 camcorder designed for European Video standards, and features an 1/5.8" Exmor R CMOS sensor and a wide-angle Carl Zeiss Vario-Tessar zoom lens with 27x optical zoom plus 54x Clear Image digital zoom. The CX240E captures Full HD 1920x1080 video at 50p and 9.2MP still images. Steady Shot image stabilization with Active Mode delivers smooth video, and 3-Way-Shake-Canceling adds electronic roll stability for even smoother results.

Users can monitor and playback footage via the 2.7" Clear Photo LCD display with 230K dot resolution. Dual recording lets you simultaneously capture both high-quality AVCHD and web-optimized MP4 files. The Intelligent Auto mode analyzes your shot and automatically selects the appropriate settings from ten distinct scene modes, with 60 different possible combinations. A built-in USB 2.0 cable provides a connection to your computer for charging or file transfer and fits conveniently into the hand strap, so it's out of the way until you need it. A rechargeable lithium-ion battery pack, USB AC adapter, HDMI Micro cable, and a USB connection support cable come included.

29

First Aid Box

Manufacture & Origin: Bangladesh

Description:

A first aid box is a collection of supplies and equipment that is used to give medical treatment.

Features:

- Thermometer
- Small First Aid Box
- Eusol Lotion
- Crepe Bandage
- 100ml Peroxyl
- Iodine
- Galic Pot
- Methlyted Spirit
- Gauze Bandage
- Paracetamol 7 satchet
- Plaster small
- Surgical gloves
- Scissors
- Cotton wool 100gm



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1

Atomic Absorption (AA500)

Model: AA500
Manufacture: Pg Instruments

Description:

The instrument is available with a flame atomizer and graphite furnace. Three flame options are available namely – Air/Acetylene, N₂O/Acetylene and Air/LPG (Natural gas). Embedded PC system built into the instrument as standard on all configurations. Pre-installed UV-Win Pro software, user manuals, cook book and Windows 7 professional operating system. UV-Win Pro software provides full control of the instrument and auto-sampler with easy method change for each technique. Automatic 8 Hollow Cathode lamp turrets controlled and optimized by the AA-Win Pro software. Operating lamp current and warm-up lamp current can be individually controlled to eliminate drift commonly associated with lamp warming.



2

Gas Chromatography

Model: 450-GC
Manufacture: Bruker

Description:

The Bruker Corporation 450 GC is a powerful sample preparation and analysis tool for the Analytical Chemist.



3

UV- Vis Spectrophotom

Model: Evolution 201
Manufacture: Thermo Scientific

Description:

From ultra high-performance UV, Vis and NIR systems to the smallest spectrophotometers, our analytical solutions offer reliable data and the highest available performance specifications using superior optical features. If you are working in a regulated industry, need a wide range of sampling options, or need to process a large number of samples, you'll find our UV-Vis systems are easy to operate, and deliver results you can trust with a minimum of operator training. And for the most advanced applications, the newest additions to our molecular spectrophotometry portfolio redefine your range of capabilities by providing a previously impossible level of sensitivity, resolution, and scanning speed in the near infrared range.



4

Ion Chromatography

Model: ICS-1600
Manufacture: Thermo Scientific

Description:

Ion chromatography is a chromatography process that separates ions and polar molecules based on their affinity to the ion exchange. It works on almost any kind of charged molecule—including large proteins, small nucleotides, and amino acids.



5

Oven

Model: OGH 60
 Brand: Herathrem
 Manufacture: Thermo Scientific
 Origin: Germany

Description:

Perform routine applications simply and safely with Thermo Scientific Heratherm General Protocol Ovens, which provide an ideal heating and drying solution for research, clinical or industrial needs.



6

EC/TDS/NaCl Meter

Model: HI 2300
 Manufacture: Hanna Instruments

Description:

The Hanna HI-2300 measures conductivity, TDS (Total Dissolved Solids), percentage of NaCl and temperature. If required, the meter can be connected to a computer using the RS232 port and the optional Hanna software will allow data export, plotting, and printing. Replaceable Electrode- No need to replace the whole meter when the electrode needs replacing.



7

Hygro Thermometer

Model: RH-101
 Brand: Extech
 Manufacture: Extech Instruments

Description:

The Extech RH101 Combination Humidity meter plus Infrared Thermometer features a large backlit LCD with Primary and Secondary displays. Primary display is user selectable for IR or Humidity; Secondary always displays ambient temperature. Infrared thermometer has built-in laser pointer and an 8:1 distance to target ratio. Data Hold and MAX, Auto power off.



8

PH Meter

Model: HI 2211
 Manufacture: Hanna Instruments

Description:

Easy and intuitive to use the HI-2211 comes complete with a number of useful features which makes it particularly popular for frequent testing. Replaceable Electrode – No need to replace the whole meter when the electrode needs replacing



9

Prismatic Compass

Model: BRUTON 8099
 Origin: China

Description:

The Brunton 8099 Compass is an all-in-one professional compass that serves both as a base plate and mirrored sighting compass.



10

Clinometers

Model: PM- 5/1520
 Manufacture: SUUNTO

Description:

Suunto Height Meter PM-5/1520 is an instrument for measuring heights, especially heights of trees, with great accuracy and speed. The body of the instrument is corrosion-resistant anodized aluminium-alloy. The scale card runs on a special bearing in hermetically sealed plastic container filled with a liquid which guarantees that it runs freely and stops quickly. The liquid will not freeze, retains full damping properties in working conditions and eliminates irritating scale vibrations.



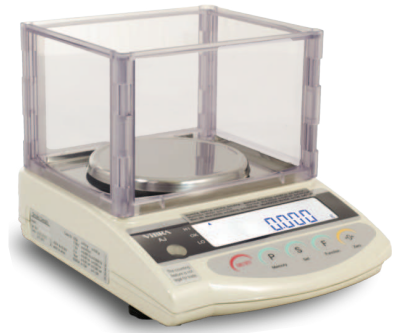
11

Analytical Balance

Brand: VIBRA

Description:

ViBRA provides the high-performance analytical and precision balances for professional laboratory use. With wide weighing range from 0.1mg to 31kg, ViBRA meets every weighing requirement in the laboratory. ViBRA HT series has achieved reliable analytical weighing with all of tuning-fork sensor advantages.



12

Top Loading Balance

Model: LN 2202R
 Brand: VIBRA
 Manufacture: Shinko Denshi Co. Ltd.
 Origin: Japan

Description:

The top loading balances are less precise by a factor of 10 and secondly, air currents around the pan can reduce that precision by as much as another factor of 3 or 4.



13

Muffle Furnace (1100C)

Model: K114
 Manufacture: Thermo Scientific
 Origin: Germany

Description:

A muffle furnace is a furnace in which the subject material is isolated from the fuel and all of the products of combustion, including gases and flying ash. Muffle Furnace are perfect for many applications in laboratory, it is an ideal instrument for materials annealing and sintering in your research. Max.temp. Up to 1700°C.



14

Refrigerator (Sharp)

Model: PlusmaCluster
 Brand: Sharp

Description:

At Sharp, products with a particularly high level of environmental performance are certified as Super Green Products (SGP). A high-performance heat-release system and a high-efficiency freezing process are among the improvements that enable the SJ-GF60A to consume 35% less energy than its predecessor model.



15

Research Microscope

Model: G-302
Origin: Tiwan

Description:

An optical microscope is often one of the central devices in a life-science research lab. It can be used for various applications which shed light on many scientific questions. Thereby the configuration and features of the microscope are crucial for its application coverage, ranging from bright field through fluorescence microscopy to live-cell imaging.



16

Stereoscope

Model: MS-60
Brand: SOKKIA
Origin: Japan

Description:

A stereoscope is a device for viewing a stereoscopic pair of separate images, depicting left-eye and right-eye views of the same scene, as a single three-dimensional image. Sokkia instrument is unmatched for precision and ease of use in viewing and interpreting aerial photographs. It has an optical path (distance between centers of stereo pairs) of 27cm and can be configured for magnification of 1.5X or 3X, 6X.



17

Survey Gyroscope

Brand: PRECISION 3.5
Model: VEN 100137097



18

Refrigerated Centrifuge

Model: Scanspeed 1236R
Origin: Denmark
Brand: LABOGENE

Description:

ScanSpeed, a range of centrifuges of distinction from LaboGene ApS, from simple separation to sequencing. Discover the ideal centrifuge and accessories for your every day needs and your research programs and accelerate your micro-volume separations with our range of compact and easy-to-use micro centrifuges.



19

Shaking Incubator

Model: SI-300
Origin: Korea

Description:

Shaking incubators are often used for cell culturing, cell aeration, and solubility studies. Eliminating the need of placing a separate shaker inside an incubator, the instruments incorporate oxygen and evenly distribute nutrients throughout the culture media. In addition to offering stable temperature conditions, the shaking incubators use an orbital agitation at variable speeds to affect the growth of cell cultures.



20

Distilled Water Plant

Model: W4000/Euro
 Manufacturer: Stuart Equipment Ltd
 Origin: UK

Description:

Boiler and high-efficiency condenser are both constructed of borosilicate glass to ensure the highest in distillate purity. Long-life chromium-plated metal heater is protected by twin safety thermostats. Condenser features screw thread connections and plastic 3/8" ID hose barb fittings to quickly and safely change tubing without worrying about breaking the glassware.



21

Electrothermal MM Series Micro-Kjeldahl Equipment

Model: 10068124
 Manufacturer: Electrothermal
 Origin: UK

Description:

The Electrothermal MM Series of products is designed for Kjeldahl digestion on a micro scale and is able to accommodate flasks between 18-50ml in size. These multibank units have a stainless steel housing which is designed to make them suitable for use with existing or specifically constructed stands. The lower part of the unit contains the control equipment. This is separated from the heating element by a stainless steel tray, and a well ventilated air space.



22

Laminar Air Flow

Model: NU-425-400 E
 Manufacturer: LAB GUARD, NUAIRE
 Origin: UK

Description:

The LABGARD ES Model NU-425 Laminar Flow Biological Safety Cabinet (LFBSC) is a bench/table top model. The LABGARD ES model NU-425 utilizes an Energy Saver DC ECM motor optimally determined forward curved fan for each model size/width to maximize both energy efficiency and filter loading capacity. The Energy Saver ECM motor is controlled via a solid-state DC motor controller that provides automatic compensation (constant volume control) for both filter loading and line voltage variances.



23

Stirrer with heater

Model: C-MAG HS7
 Manufacturer: IKA
 Origin: USA

Description:

Magnetic stirrer with heating and ceramic heating plate which is excellent chemical resistance.



24

Autoclave

Model: ES-215
 Manufacturer: TOMY
 Origin: Japan

Description:

A top-open lid, which can be operated easily with a single hand or foot, is provided with the SX autoclaves. To open the lid, the lid lock is released by stepping on the foot pedal located at the bottom while pressing the lid down. The lid can be opened with minimal effort owing to mechanical assistance.



25

Colony counter

Model: Galaxy 230
 Manufacturer: Rocker
 Origin: Taiwan

Description:

Galaxy 230's adjustable dish holder can accept most Petri-dishes in a wide range of diameters from 90 to 150 mm or 60 mm.



26

Dissolved oxygen meter

Model: HQ40D
 Manufacturer: HACH
 Origin: USA

Description:

Designed for your water quality applications measuring pH, Conductivity, TDS, Salinity, Dissolved Oxygen (DO), ORP and ISE, the Hach HQ40D portable multi meter is a two channels advanced handheld digital meter that takes the guesswork out of measurements.



27

Digital arsenic test kit

Model: WAG-WE10500
 Manufacturer: Wagtech
 Origin: UK

Description:

The Wagtech Arsenator® system is the lowest cost, most portable and accurate method for determining Arsenic in safe limits (WHO guide-lines 10 ppb/μg/l)



28

Sound level meter

Model: SL-4010
 Manufacturer: LUTRON
 Origin: Taiwan

Description:

- Frequency & time weighting meet IEC 61672 class 2.
- 35 to 130 dB, 3 ranges, Data hold.
- A frequency weighting, Fast time weighting.
- Size: 250 x 83 x 32 mm.



29

Ultrasonic Bath

Model: YJ 5120-1 (M.S.)
 Manufacturer: Citizen
 Origin: Japan

Description:

- Bigger tank with Special basket for cleaning.
- M.S. Powder coating Housing available for rugged conditions.
- S.S. 304 Housing available for rugged conditions.
- Digital LCD display for smooth working.
- Ideal for any kind of difficult cleaning objects.
- Heater & Timer function available.
- Water spout for drainage.
- Strong transducer for years of operations.
- S.S. 304 inside Cleaning Tank for all models.



CEE at NSU

North South University (NSU) is the first private university in Bangladesh, established in 1992. The Civil and Environmental Engineering Department (CEE) belongs to the School of Engineering and Physical Sciences. NSU has taken initiative to strengthen its engineering school, making it as a full fledged school with all basic engineering programs. As part of it, civil and environmental engineering department was opened in 2013. The main objective of the Department of Civil and Environmental Engineering (CEE) at NSU is to provide and equip students with the highest level of technical competencies, social responsibility, leadership and lifelong learning skills for successful careers in civil engineering.

