

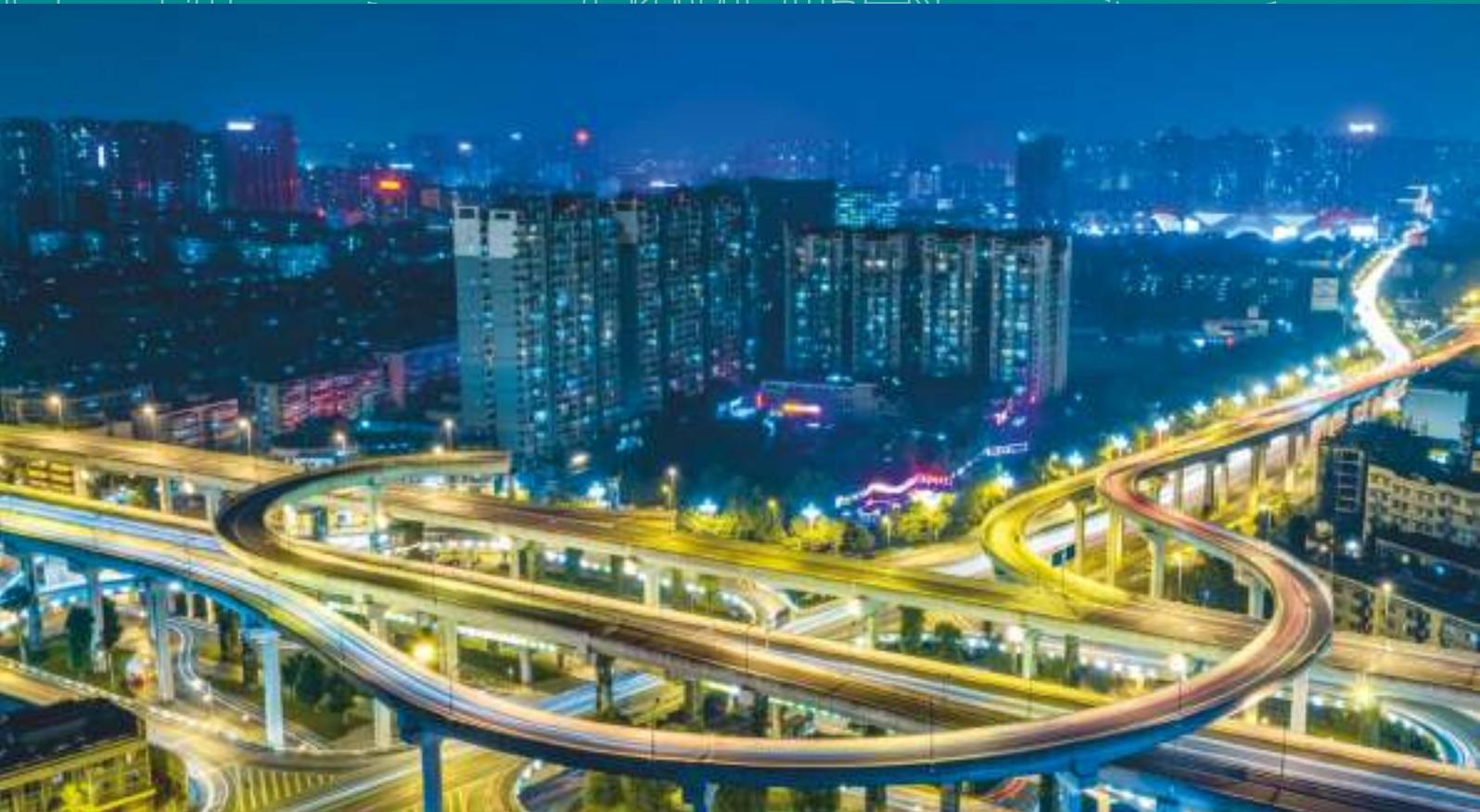
**CHIR - AYU**

**CONTROLS**

The Civil Engineering Testing Partner

# **BUILDING MATERIALS TESTING EQUIPMENT**

Concrete, Cement, Mortar, Steel, Aggregates, Bitumen, Asphalt





# Compression Testing Machine

## Automatic Pace rate controlled

### WIZARD AUTO

Basic Automatic Machine

- The load rate is controlled by closed loop P.I.D. system
- Real time display of load and Stress
- Two frame control: Via manual lever
- Wide graphic display (128 x 80 pixel)
- Internal memory
- RS232 for data download in ASCII format



### PILOT PRO

Premium Automatic Computer Controlled Machine

- The load rate is controlled by closed loop P.I.D. system
- Real time display of load and stress
- Three frame control: Via manual lever
- Simplified control by touch screen display
- Compatible with Data manager software for computer control



## Automatic Load & Displacement/Strain Controlled Machine

### AUTOMAX PRO-M

Hydraulic Control Console

- Automatic determination of E-Modulus and Displacement control test for FRC
- 6 Channels: 2 load sensors, 2 load or displacement/strain sensors, 2 displacement/strain sensors
- Frame control: 4 Nos.
- Dual control: Display or PC
- Capacity: Compression up to 5000 kN, tensile up to 500 kN
- 7" touch screen graphical display
- Internal storage capacity up to 16 GB SD card
- USB port for test data storage
- Ethernet port for PC / Internet /network communication



### AUTOMAX ULTIMATE

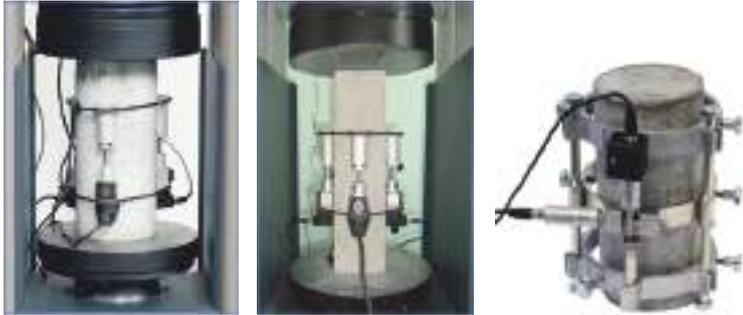
Computerized Control Console

- Automatic determination of E-Modulus and Displacement control test for FRC
- 10 Channels: 4 channels for load sensors
- 6 channels to measure strain value with transducer
- 4 channels for strain measurement with strain gauges, LDT, Clip gauges
- Frame control: 4 Nos.
- Third and fourth frame option, active frame selection by software
- Real time display of stress/time, stress/axial strain, stress/lateral strain diagram
- User defined test cycles and step programmable sequence



# Elastic Modulus and Poisson Ratio Accessories

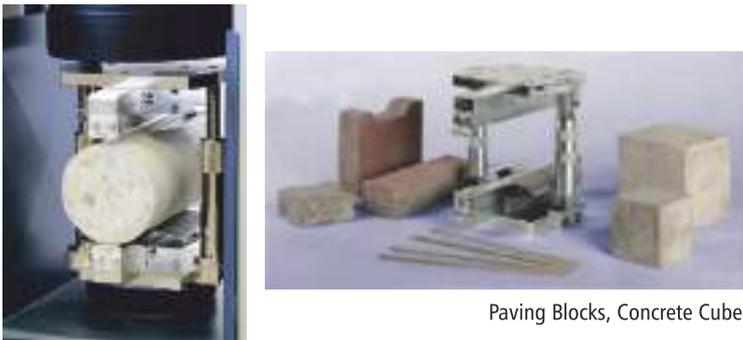
Compressometer-Extensometer for Cylindrical & 40x40x 160 mm samples



Strain Gauges



Splitting (Indirect Tensile)



Concrete Cylinders

Paving Blocks, Concrete Cubes

Compression on Cement / Mortar



# Displacement Controlled Test on FRC Samples



Measurement of Beam Deflection and Toughness - ASTM C1609



Energy Absorption Test on Slabs (Square Panel) test- EN 14488-5

Round Panel Test  
ASTM C1550



CMOD Test-EN 14651

Datamanager Software



For standard failures test

- For compression, indirect tensile, 3- and 4-points flexural tests on different types of specimens

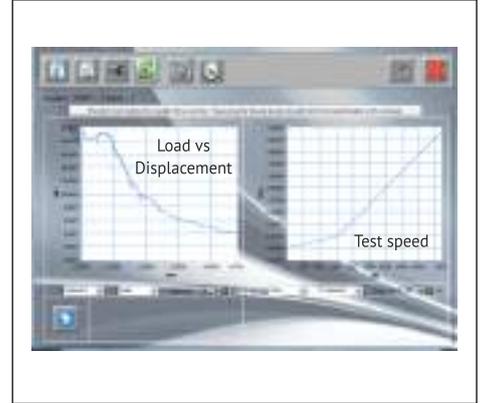
E-Module Software



For Elastic modulus and Poisson ratio determination

- Free unlimited programmable load/stress cycles
- Real time monitoring of test data
- Automatic verification of sample positioning and sensors functionality
- Automatic calculation of Elastic Modulus and Poisson's Ratio values

D-Control Software



For Displacement Controlled Tests

- 8 pre-set testing procedures according to Standards (EN 14651, 14488-3, 14488-5, UNI 11039-2, ASTM C1550, C1609, C947, UNE 83515)
- Customizable test procedure allowing desired loading history
- Possibility to change in real time the test parameters



Make your Compression Machine a Connected Part of your Laboratory Infrastructure

SEAMLESS DEVICE INTEGRATION

Ability to take inputs from several measuring systems and devices (balances, calipers, bar code readers) to further increase efficiency and eliminate transposing errors.



TEST RESULTS EXPORT

Direct and easy availability of all test results in different format for raw data exporting to Laboratory Information Management System/corporate ERP.



### Concrete/Rock Specimen Grinding Machine

- Automatic grinding machine for cubes, cylinders, blocks, cores and rock specimens
- Grinding wheel dia: 330 mm
- Max vertical daylight: 350 mm
- Min vertical daylight: 145 mm
- Max specimen size: 200 mm cubes and 160 x 320 mm cylinders
- N° of grinding segments: 10
- Grinding wheel speed: 1400 r.p.m.
- Automatic cross feed in both directions

### Water Permeability apparatus DIN 1048, EN 12390-8

- Determination of the depth of penetration of water under pressure in the cube and cylinder
- Graduated burettes fitted without any addition
- Model available for 3 samples or 6 samples

### Cutting Saw

- Universal saw, suitable for Rock, Concrete, Asphalt & irregular rock samples
- Blade dia.: 300 to 450 mm
- Comes with water pump for cooling the blade and double filtering system

## Creep Test ASTM C512



**TAIWAN CAPSTONE**



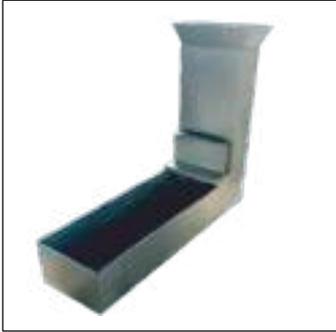
### Capping Gypsum

- Most efficient capping materials
- Gypsum is a faster, safer, easier and cheaper method compared to sulfur, neoprene pad capping or grinding machine
- Different grade capping gypsum for different strengths of concrete
- Available grade : S-350, S-420, S-560, S-630 and S-700 Kgf/Cm2
- Provides an ideal test surface with complete flatness perpendicularity and horizontality



- Measuring shrinkage of concrete cylinder under load at different time interval
- Available in Analogue or Digital system with data logger
- Accuracy: Class 1 starting from 1% full scale

# Self Compacting Concrete Testing Apparatus



**L-BOX**

- IS 1199-6, EN 12350-10
- The Apparatus consist of an L- Shaped box and is supplied with filling hopper
- Length –700 or 800 MM
- Width -200 MM
- High -H1-600 MM
- High –H2 –150 mm Construction
- Material: MS or Stainless steel



**J Ring Apparatus**

- EN 12350-12 | ASTM C1611-09, ASTM C1621/1621M-06



**V-Funnel**

- EN 12350-9: 2010 IS 1199:PART 6,
- Used to evaluate the flow time of freshly mixed self-compacting concrete.
- The test set consists of a stainless steel funnel placed vertically on a supporting stand.
- The discharge orifice is equipped with a lid, which can be momentarily opened.
- Material: MS or Stainless steel



**Acrylic Mini Slump Cone**

- Dimensions : 38 mm Height with at the top diameters of 19 mm and 57 mm at the bottom.
- Acrylic Base plate 400 x 300 x 10 mm



**Marsh Cone Apparatus**  
Marsh Funnel Test set including

- Orifice size : 05mm, 10mm, 12.5mm.
- Marsh Funnel : 152mm dia, 275 mm height and Stand



**Slump**

- IS:1191
- Bottom
- Top diameter: 10cm
- Height: 30cm
- Tamping rod: 16 mm in diameter, 60 cm long
- Material: MS or Stainless steel

## Plastic Mould Manufactured one piece from robust plastic



**Cube Mould**

- Size : 100mm (0.57kg) & 150mm (1.4kg)



**Cylinder Mould**

- Size : 100 x 200mm (1kg) & 150 x 300mm (1.9kg)



**Beam Mould**

- Size : 100 x 100 x 500mm (2kg) & 150 x 150 x 600mm (2.6kg)



**Three Gang Mould**

- As per EN 196-1
- Size: 40x40x160 mm
- Made from Alloy steel or from Plastic

# Cement Testing Apparatus



**ISI Marked**  
CM/L -7100081291

**ISI Marked**  
CM/L -7100090191

## Automatic Vicat Apparatus

- Automatic determination of initial and final setting time
- Large size 4.3" touch screen color display
- Lan port direct connection to PC
- Conform to both EN and ASTM/ASTHO
- Customize test procedure
- Integrated graphic printer for printing numerical test data & setting time plot
- Practical in water testing accessory (Optional)

## Automatic Mortar Mixer

- Bowl capacity 5 liter
- Planetary speeds 62 & 125 RPM or user defined
- Beater speed 140 & 285 RPM or user defined
- Blade/Planetary speeds adjustable from 30/13 to 380/165 RPM, depending on the mix consistency
- Conforming to CE requirement for safety

## Standard Vicat Apparatus

- IS: 5513, IS-4031(PART 5), IS 4031 (PART 4)
- To determining the normal consistency, standard consistency and time of setting of cement and lime in accordance with IS, ASTM, BS and AASHTO specifications
- Supplied complete with Initial needle, Final needle, 10 mm Plunger, Mould, Glass plate, weight

## Blain Apparatus

- IS: 1727, 4031, 4825
- Automatic or Manual
- Used to determine the particle size of Portland cement, limes and similar fine powders

# Air Entrainment Meters

**ISI Marked**  
CM/L -7100086608

**ISI Marked**  
CM/L -7100081392



- Determination of air content of compacted fresh concrete
- Capacity: 5 l, 7 l, 8 l
- Conforming to AASHTO T152, ASTM C231, EN 12350-7

## Vibrating Machine: 70.7mm Mould

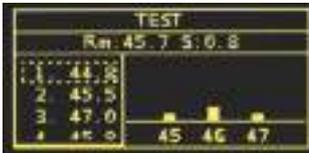
- Conforming to IS: 4031, IS:10080, EN 196-1 413-2, EN 13454-2
- Vibrating a frequency of 12,000 ± 400 cycles per minute

## Le Chatelier Apparatus

Used for determining the expansion of cement. The mold consists of a spring tensioned split cylinder 30 mm internal diameter, 30 mm high with two indicator stems which measure 165 mm from the points of the center line of the cylinder and O ring

# Non Destructive Testing (NDT)

## Digital concrete test hammer



- Impact energy : 2.207 Nm
- Measuring range : 10 to 130 N/mm<sup>2</sup>
- Automatic conversion of rebound index to equivalent compressive strength in N/mm<sup>2</sup>, kg/cm<sup>2</sup> or p.s.i.
- Automatic impact angle correction by internal triaxial inclinometer
- Saving, displaying and downloading data to PC via USB port
- Complete with traceable certificate of calibration



## Concrete test hammer

- Impact energy : 2.207 Nm
- Measurement range : 10 to 70 N/mm<sup>2</sup>
- Aluminum body, complete with carrying case, grinding stone and instruction manual.



## Calibration anvil

- Use for the periodical calibration of the concrete test Hammer and made from special Alloy steel.
- Complete with traceable certificate of calibration

## Ultrasonic Pulse velocity tester

- Digital calibration
- Connectable to oscilloscope
- Transit time measurement from 0.1 to 1999.9 microseconds
- Pulse rate 1,2,5,8 per second.
- Transmitter output 1200 V
- Frequency range 20 to 150 kHz



## Cor Map Apparatus (Half cell method)

- High impedance voltmeter
- Electrode extension
- Reference electrode including copper sulphate reservoir
- Container of copper sulphate (cap 250 ml)
- Wetting agent reservoir (cap 125 ml)
- Dispensing sponge



## Bartracker Cover Meter

- Rebar location, orientation detection
- Depth of cover measurement
- Orthogonal mode for bar diameter determination
- Cover thickness measurement in mm or inch
- Large graphic display with backlight
- Users selectable bar range sizes & numbers
- RS 232 output to PC
- Data logging
- Adjustable beep volume & earphone socket
- Edits MS Excel link software



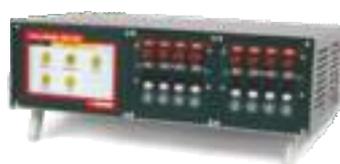
## Automatic Motorised Pull-off Tester

- PID closed-loop control of the load rate
- Max. load capacity: 16 kN
- Load measurement with high accuracy strain gauge load cell
- Effective resolution: +/- 262000 divisions, corresponding to 0.0001 kN (0.1N)
- Accuracy: Class 1 starting from 1 % of the full scale
- Graphic display of actual load, load rate, peak value, strength



## RCPT (Rapid Chloride Ion Penetration Test) :

- Model with 4 or 8 Cell : independent channels
- Wide touch screen colour display
- Programmable test duration and adjustable measuring rate starting from 1 minute
- Unlimited data storage on SD card
- Measurement of test temperature during the whole test



## Crack width microscope

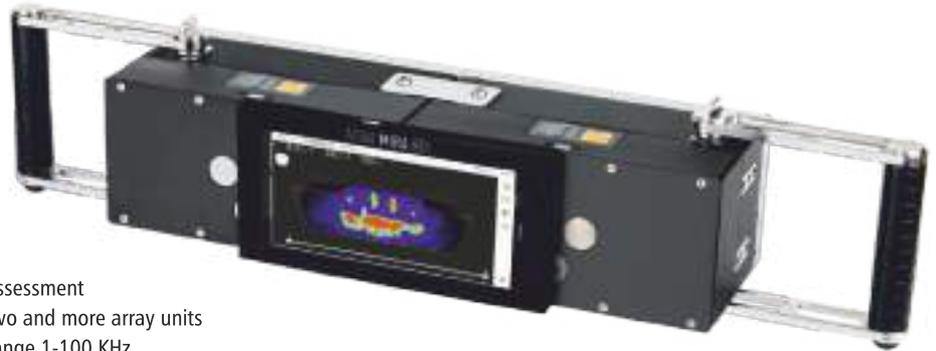
- Magnification: 40x
- Measuring range: 4 mm
- Subdivision: 0.02 mm
- Battery operated
- Dimensions: 150 X 80 X 45 mm
- Weight approx.: 550 gm



# Non Destructive Testing (NDT)

## A1040 MIRA 3D PRO The High-End Ultrasonic tomograph

- True3D Tomography: Three dimensional FMC / TFM in each instrument position in real time
- A-DPC Transducers: Unbeatable penetration depth & sensitivity by the novel low-noise sensor technology
- Open crack sizing: unique function for quantitative crack assessment
- Extendable aperture: arbitrary aperture configuration by two and more array units
- Variable Operation Frequency within specified frequency range 1-100 KHz



## A1040 MIRA 3D Ultimate Ultrasonic Tomograph

- Low- frequency ultrasonic tomography system suitable for manual and automated assessment of concrete structure.
- Real time 3D imaging
- Data Acquisition in three dimensional full matrix capture mode
- GPU Based image reconstruction by 3D total focusing method
- Active Dry- Point Contact transducers with integrated pulser received circuit and parallel DAQ
- Deep penetration mode with enhanced transmitter burst energy
- Versatile 2D & 3D imaging modes by INTROVIEW PRO software
- Remote unit control via Tablet- PC or LLL



## A1220 MONOLITH 3D Ultrasonic pulse velocity tester & flaw detection

- A compact handheld ultrasonic pulse velocity and pulse echo tester is designed for ultrasonic thickness measurements and flaw detection of concrete and reinforced concrete constructions and rocks.
- Shear wave and nominal frequency 50 kHz allows carrying out thickness measurement of the concrete objects up to 3 000 mm and reinforced concrete objects up to 600 mm.
- Transducer of shear waves with dry-point contact and ceramic wear resistant tips.



## A1410 PULSAR Ultrasonic pulse velocity tester

- Compliance with DIN EN 12504-4, BS 1881:Part 203:1986, ASTM C597-16, IS 516 (Part 5/Sec 1):2018
- Couplant-free on-site quality assessment of concrete structures with up to 2.5 meters.
- Dry-point-contact transducer arrays with wear resistant wear proof ceramic tips.
- Measurement results in Wave-Form and Digital form
- SonReb Method implemented in Android App
- Accurate crack evaluation
- Data transfer to smartphone via Bluetooth
- Certified reference rod with traceable calibration certificate included



# Universal Testing Machine



## UTM-AUTO Series

600kN, 1000kN

- Automatic Universal Testing Machine PID Closed Loop System
- Class 1 Range from 1 % to 100% of Full Scale
- Front Open Hydraulic Grips / Mechanical Grips
- High Accuracy with load Cell
- High Stiffness Rugged four column frame
- 1 Channel for Load, 2 Channel for Displacement

## HPU200 Series

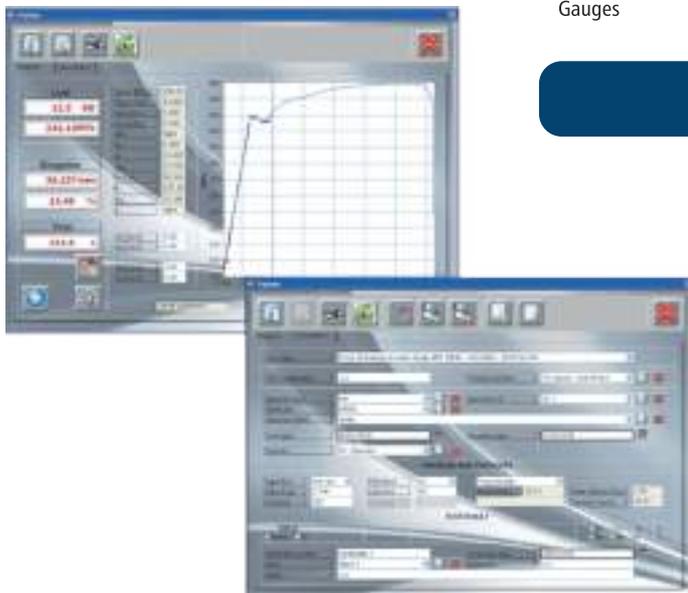
1000kN, 1200kN, 1500kN, 2000kN

- Automatic PC Controlled Universal Testing Machine
- PID Closed Loop Servo Controlled System
- Front Open Hydraulic Grips
- High Accuracy with load Cell
- High Stiffness Rugged four column frame
- Class 1 Range from 1 % to 100% of Full Scale
- Second Frame : up to 5000KN Compression
- Loading and Unloading cycles for E-modulus Test on Concrete
- 2 Channel for Load, 6 Channel for Displacement and 4 Channel for Strain Gauges

## ULTIMATE-T

1000kN

- Automatic PC Controlled Universal Testing Machine
- PID Closed Loop System
- Class 1 Range from 1 % to 100% of Full Scale
- Front Open Hydraulic /Mechanical Grips
- High Accuracy with load Cell
- High Stiffness Rugged four column frame
- Loading and Unloading cycles for E-modulus Test on Concrete
- 1 Channel for Load, 6 Channel for Displacement and 4 Channel for Strain Gauges

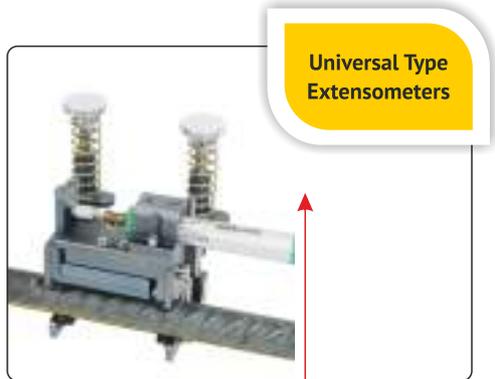
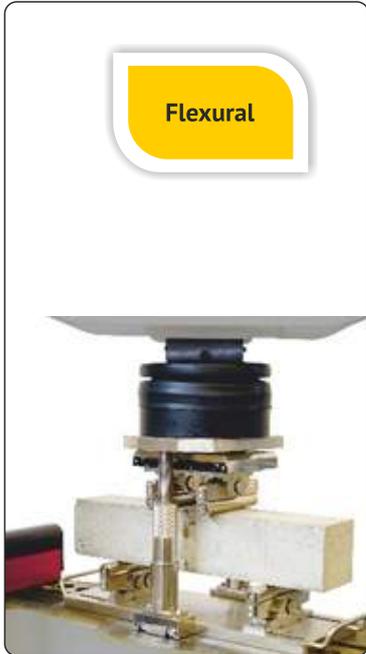


## UTS SOFTWARE

Control up to yield by:

- Stress (method B)
- Strain by using extensometer (method A1)
- Strain by using crosshead (method A2)
- Control after yield by grips' separation
- Simultaneous display of test parameters (multi-diagrams display available)
- Elaboration of tension test results in conformity to EN ISO 6892-1 (methods A1, A2, B) and EN 15630-1

# Wide Range of Accessories for UTM And Extensometers



# Automatic Electromechanical Universal Testing Machine



**50kN | 100kN | 250kN**

- Universal automatic flexural and compression tester machine use for various displacement and load controlled tests
- Type of control: Load & Displacement
- Load rate: 1 to 9999 N/s
- Speed rate: 0.05 to 51 mm/min
- Max. ram travel: 100 mm
- Closed loop control
- Rapid approach and return functions ensure test time savings

## Wide Range of Accessories for Uniframe



Leutner

CBR

Indirect Tensile

Marshal

Uniaxial/UCS

SCB

# Bitumen Testing Apparatus



## Asphalt Binder Testing

### PIVOT: Automatic Penetrometer

- The entire test cycle (Rapid approach, Starting point determination, penetration and return to the initial position) is automatically performed by simply pressing the start button.
- Touch screen display
- Conforming to IS, ASTM & EN standard
- Real time display penetration/time curve displayed

## Automatic Ring & Ball

- Automatic Softening determination
- 7" touch screen color display
- Automatically applies the temperature gradient and detects the specimen position with light barriers, recording the softening point.
- PT100 probe holder and drip tray for specimen holder, complete with handle, improving beaker positioning operations.
- Possibility to perform user-defined tests with maximum temperature up to 250°C

## Ductimeter

- Ductility Testing Machines are used to determine the ductility of bituminous materials by measuring the elongation before breaking when two ends of briquette specimens are pulled apart at a specified speed and temperature.
- Includes a system for measuring forces up to 1200N with load cells
- Adjustable speed range from 5 to 100 mm/min
- Temperature range from 4 to 30°C

# Aging Testing Equipment



## RTFOT

- Temperature range: from +50 to +200°C (default 163°C) ± 0.5°C
- Air flow: adjustable from 0.1 to 10'000 ml/min
- Construction: full stainless steel, interior and exterior
- Automatic over-temperature switch
- 4.5" touch screen color display

## PAV, VDO

- Temperature range: 80° to 120°C, PID controlled to +/- 0.5°C
- Pressure monitored by transducer and controlled to 2.1 +/- 0.1 Mpa
- Platinum RTD temperature internal measurement to +/- 0.1° C
- Testing time: up to 99 hours
- 6" colour touch screen reclining display
- Over temperature limit switch
- Over pressure relief valve Over temperature limit switch
- Over pressure relief valve • Power: 1000 W

# Shear Strength of Consolidated/Unconsolidated Soils

Triaxial tests are performed to determine the stress-strain relationship of a soils subjected to differing strain levels and drainage conditions, simulating as closely as possible the site conditions and the effects of constructions, excavations, embankments and landslides.

## STATIC TRIAXIAL TESTING

### Standard triaxial equipment



#### ANALOGUE MEASUREMENTS

This simple and efficient **Triaxial System** with analogue measurements is the ideal solution to perform basic standard triaxial tests, such as effective and total stress, and is best suited to laboratories not requiring digital or automatic measurement.



#### BUILT-IN DATA ACQUISITION

Our simplest compact **solution for standard triaxial testing**, can be equipped with standard air/water pressure interface or automatic pressure / volume controllers.

The integrated data acquisition removes the need for external data acquisition and PC.



#### Oedometers, Front Loading

Robust dead-weight oedometer with either manual-analogue or automatic-electronic measurement of axial settlement using linear transducers and Geodatalog 8 for data acquisition and processing.

#### Shearmatic-EmS



- Maximum vertical force: 10 kN
- Maximum horizontal force: 10 kN
- Max horizontal travel: 23 mm - displacement trasducer: 25 mm
- Max Vertical travel: 12.8 mm - displacement trasducer: 10 mm
- Test speed: from 0.00001 to 15.00000 mm/min
- Maximum number of consolidation steps: 99
- Maximum number of shear cycles: 50
- Mple type and size: up to 100 mm square or round

### Fully automatic equipment



#### AUTOTRIAX<sup>EmS</sup>

##### FLEXIBLE FULLY AUTOMATIC TRIAXIAL TESTING SYSTEM

AUTOTRIAX EmS is a Flexible fully automatic PC controlled triaxial testing system that can automatically perform up to 6 entire and independent tests at the same time. It can be extend and expand in subsequent steps.



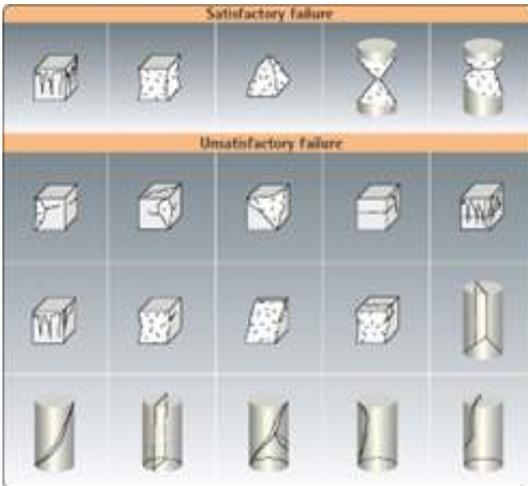
#### AUTOTRIAX<sup>Qube</sup>

##### ALL-IN-ONE FULLY AUTOMATIC TRIAXIAL TESTING SYSTEM

AUTOTRIAXQube is the all-in-one fully automatic triaxial testing system that integrates the many components of triaxial testing into one, single compact system. Designed to make triaxial testing easier than ever before.

# How to Choose Controls Compression Testing Machine? From standard failure to advanced tests

<ul style="list-style-type: none"> <li>▪ Compression test</li> <li>▪ Flexure test</li> <li>▪ Indirect tensile/splitting test</li> </ul>		<p>Standard failure tests: load is applied continuously up to specimen failure</p>	
<ul style="list-style-type: none"> <li>▪ Elastic modulus test</li> </ul>		<p>Cyclic tests: loading/unloading ramps are performed in order to measure specimen deformation</p>	
<ul style="list-style-type: none"> <li>▪ Displacement controlled tests</li> </ul>		<p>Used to investigate post peak behaviour (FRC, Shotcrete characterization)</p>	

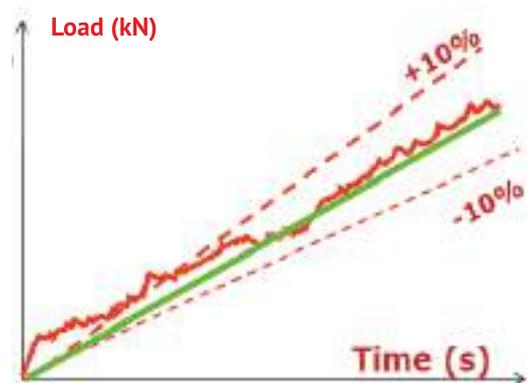


## Standards - Failure

The real sample compressive strength is achieved ONLY in case the Load Distribution over the sample surface is uniform producing therefore a SATISFACTORY FAILURE. If load distribution is not uniform, sample is overloaded on a small portion breaking before the real compressive strength is reached. Failure is in this case UNSATISFACTORY and failure load is lower. We offer a solution with a "Spherical Seat Geometry and High Stability Frame" to address non-uniform loading.

## Standards-Load Rate

- As other brittle materials, concrete shows a different behavior under high rates of loading than under a slow or static loading rate, in particular strength increases as rate of loading increases.
- This is mainly related to creep mechanism allowing strain increase in time and to microcracking appearance.
- The International Standards specify that during the test the load rate must be constant within a small allowable range (typically 10% of the preset value).



15 Years of Technical Leadership

# Testing Forward

## About us

Chir-Ayu Controls Pvt Ltd manufactures and distributes a complete range of Testing Equipment for the Construction industry such as Concrete, Cement, Soil, Asphalt and Steel confirming to EN, ASTM, Other International and Indian Standards. We also provide NABL Calibration Service under our brand FORCE MEASUREMENT as per ISO-17025.



## Our Mission

Creating values for everybody



## Our Vision

Provide latest technology & products to our clients. Improving productivity by satisfying quality control and research needs

## Our Valuable Customer

- IIT'S, NIT'S, BITS, VIT, VNIT, Thapar Institute, COE-Pune, BMS college of Engineering, Ramaiah Institute of Technology, Mahindra University, IITRAM, Nirma Institute, PDPU, NFSU
- NCCBM, CBRI, SERC, CRRI, CSMRS, CWPRS, AMPRI, NGRI
- Cement : Ultratech, Ramco, Shree Cement, ACC, ADANI, Dalmia, Orient
- Sika, MBCC, Pidilite, MYK Laticrete, Wacker, HIL, Mapie, Kerakoll
- IOCL, MRPL, HPCL, Hincol
- L&T, HG Infra, Cube Highway, Dilip Buildcon, Mega Engineering, NABL Labs