

# 17



*45 years of excellence  
and counting ...*

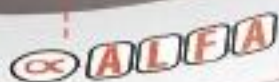
established in 1972



[www.alfatestusa.com](http://www.alfatestusa.com)

TESTING EQUIPMENT

G	General
B	Concrete
UTM	Universal Testing Machines
C	Cement
AG	Aggregate
T	Soil
A	Asphalt
RM	Rock Mechanics
M	Mining   Coal   Iron & Steel
GL	Lab Tools
ML	Mobile Laboratory



LABORATORY OVEN (G-030) -----  
EN 932:5 • ASTM C 127 • BS-1377



0-000-4480 - Powder Coated Zirconium Oxide



© 2002 Blackwell Science Ltd, *Journal of Internal Medicine* 252: 105–112

**• SUPPLIED WITH**

- 300-gram plastic storage bag (edible) gloves can be ordered).
- Digital Thermometer & Indicator
- Overheat Thermometer.
- Pilot Lamp.

- **TECHNICAL SPECIFICATIONS**
  - Digital Transistor & Indicator fitted with over heat thermostat
  - Temp. max. : 300 °C / PID control
  - Alternative material : stainless steel
  - Exterior : Powder Coated or Stainless steel
  - Insulation with thick mineral wool
  - Forced convection airflow
  - Power Supply : 220-240 V / 50 Hz

2008 *Journal of Management Education* 32(10)





ALFA

LABORATORY OVEN (G-030)  
EN 932:5 • ASTM C 127 • BS-1377



G-030/250 (2 Doors - Horizontal)



G-030/120 - Stainless Steel Exterior

Code	Capacity	# of Doors	# of Shelves	# of Fans	External Dimensions (± 1 cm)	Internal Dimensions (± 1 cm)	Approximate Weight (kg)
G-030/120	120 Lt.	1	2	1	75 x 64 x 62 (h)	50 x 45 x 50 (h)	67
G-030/250	250 Lt.	1	2	2	69 x 70 x 127 (h)	50 x 45 x 100 (h)	90
G-030/250-2	250 Lt.	2	2	2	119 x 70 x 76 (h)	100 x 45 x 50 (h)	105
G-030/400	400 Lt.	1	2	3	98 x 82 x 126 (h)	68 x 56 x 107 (h)	122.5
G-030/600	600 Lt.	1	3	3	-	-	-
G-030/1000	1000 Lt.	2	3	4	-	-	-

Page Number



Section Color



Technical Specifications

ALFA Website





# CERTIFICATES



## ISO CERTIFICATE

## CE CERTIFICATE

ALFA has a fundamental commitment to ensuring that all customers receive the highest quality products and services. Our company holds a rigorous quality management system of EN ISO 9001:2008 certificate to ensure that the customer's requirements are always met.



The certificate confirms that each single step of the manufacturing process, from purchasing to the final process of assembling, testing and packing is elaborately and rigorously controlled to meet the international standards.

The ISO 9001 Quality Management System standard requires identifying and describing the processes using business metrics, the purpose of which is to better manage and control the business processes. Quality objectives form the center of system. Metrics are used to understand and communicate system's performance relative to the quality objectives.

ISO 9001 certification requires that ALFA periodically audit its quality processes. Regular process audits and as-needed audits, when done correctly, provide the objective feedback needed to correct any deviations from the quality path and keep ALFA focused on its goals.







WORLDWIDE

## COUNTRIES WE EXPORT TO



Afghanistan  
 Albania  
 Algeria  
 Angola  
 Argentina  
 Armenia  
 Australia  
 Azerbaijan  
 Bahrain  
 Bangladesh  
 Belarus  
 Bolivia  
 Bosnia and Herzegovina  
 Botswana  
 Bulgaria  
 Burkina Faso  
 Cambodia  
 Cameroon  
 Canada  
 Chechen Republic  
 Chile  
 China  
 Colombia  
 Congo  
 Costa Rica  
 Croatia  
 Cyprus  
 Czech Republic  
 Denmark  
 Djibouti

Dominican Republic  
 Ecuador  
 Egypt  
 England  
 Eritrea  
 Ethiopia  
 France  
 Gabon  
 Georgia  
 Germany  
 Ghana  
 Greece  
 Guinea  
 Hong Kong  
 India  
 Indonesia  
 Iran  
 Iraq  
 Ireland  
 Italy  
 Jordan  
 Kazakhstan  
 Kenya  
 Kiribati  
 Kosovo  
 Kuwait  
 Kyrgyzstan  
 Lebanon  
 Liberia  
 Libya

Macedonia  
 Malaysia  
 Mauritania  
 Mexico  
 Moldova  
 Mongolia  
 Montenegro  
 Morocco  
 Mozambique  
 Myanmar  
 Nakhchivan Republic  
 New Zealand  
 Niger  
 Nigeria  
 Norway  
 Oman  
 Pakistan  
 Palestine  
 Panama  
 Papua New Guinea  
 Paraguay  
 Peru  
 Philippines  
 Poland  
 Portugal  
 Qatar  
 Romania  
 Russian Federation  
 Saudi Arabia  
 Scotland

Senegal  
 Serbia  
 Seychelles  
 Singapore  
 Somalia  
 South Africa  
 South Sudan  
 Spain  
 Sri Lanka  
 Sudan  
 Sweden  
 Syria  
 Tajikistan  
 Tanzania  
 Thailand  
 Tunisia  
 Turkey  
 Turkmenistan  
 Uganda  
 Ukraine  
 United Arab Emirates  
 United States of America  
 Uzbekistan  
 Venezuela  
 Vietnam  
 Yemen  
 Zambia

# WHO WE ARE





## WHO WE ARE

Since its **establishment in 1972**, ALFA has been manufacturing testing equipment for concrete, cement, aggregates, soil, asphalt, rock, and steel. ALFA has been the leader in customer support, product quality, production excellence, and capacity, in the region and most of the world's countries. We applied **over 45 years** of experience in the material testing business and have been putting it in an achievement in every aspect of marketing, Research and Development, customer services, installations and after sale services.

Today, ALFA logo is known as, quality, assurance, integrity and reliability in the world market with professional attitude, work ethic and trust. It was both hard work and the experience throughout the years that developed our attitude.

With its guaranteed quality, customer support, fast delivery time and after sale support, ALFA has been exporting products to **more than 116 countries** all over the world.





REAL MANUFACTURER



## REAL MANUFACTURER

We have around 60 employees at our state-of-the-art facility and our experienced staff uses only the highest quality parts when they manufacture any of our high quality products. Unlike other companies, ALFA manufactures the majority of its products' lines, in this catalogue. ALFA uses the best parts, have experienced workers, engineers top on their class, and excellent quality control management.

For more than 45 years, ALFA's range of products and services has been broad and sophisticated. Its design and technology is orientated around practical deployment scenarios throughout the world. Continually growing innovative strength and an uncompromising commitment to quality safeguard the highest level of benefit to the customer in all product areas.

Everyone put the highest effort to manufacture, deliver and support the customers for our quality assurance, at their part. At ALFA, we take 100% responsibility of each and every step that taken to deliver the best and high quality products to our customers all around the World.







# RESEARCH AND DEVELOPMENT

## RESEARCH AND DEVELOPMENT

Research and Development plays a critical role in the innovation process. It's essentially an investment in technology and future capabilities which is transformed into new products, processes, and services.

In industry and technology sectors Research and Development is a crucial component of innovation and a key factor in developing new competitive advantages. ALFA has devoted itself to Research and Development and as a result constantly soars ahead of its competition.

The test material equipment market is constantly flourished, by the demand of the market, new technologies and international standards.

Therefore, extreme resources have been invested in our computerized Research and Development facilities. ALFA has been recognizing the new challenges and offers advanced solutions for testing materials in laboratories and on site.

To maintain the high quality standards with which its products have to comply, ALFA pays great attention to in-house control of key technologies. The products offered by ALFA are designed, manufactured and assembled completely in house at ALFA plant in a CAD environment with extensive use of CNC machining and modern factory equipment.





PRODUCTION, DELIVERY,  
CUSTOMER SERVICE



## ■ PRODUCTION AND DELIVERY

One of our primary goals is to ensure and deliver the highest quality products with lowest possible cost to our customers.

With constantly monitoring the market and technology, ALFA expended the production line to more than 600 products.

A very important benefit doing business with ALFA is the fact that we keep stock to dispatch, making sure to assure the shortest delivery time.

## ■ CUSTOMER SERVICE AND AFTER-SALE SUPPORT

ALFA is a key player in the industry supporting clients before and after the sale, including:

- Meeting customer requirements to deliver the product and its accessories on time,
- Working with customers on-site to maximize their return on investment,
- Providing technical assistance and fast installation by our professional technicians,
- Quick replacement due to stock capacity,
- Although our products don't require much repair due to its high quality components, However, in need of any repair, our experienced technicians are available for help and travel.
- Laboratory setup consultation if needed,
- Architectural design assistance for the laboratory,



# EXHIBITION



## EXHIBITION

### Customer contact:

Exhibitions provide excellent venues for initiating contacts with new customers and developing new trade leads. Equally important they enable us to maintain and renew contacts with our existing valued customers.

### Product and Service Launch Platforms:

Live presentations and demonstrations of our products and services speak for themselves, accelerating the selling process and generating new leads.

### Marketing Communications:

Exhibitions focus media attention to our company and to our products. Public relations efforts can be focused to raise the profile of our company image and brand name.

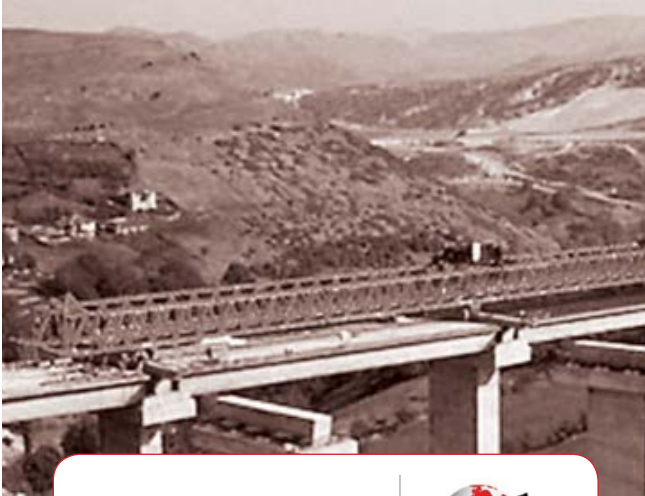






## REFERENCES

## REFERENCES


**ENKA**

**■ ENKA-BECHTEL JV**

- Project : Gerede-Ankara and Ankara Peripheral Motorway
- Location : Ankara - TURKEY
- Year : 1992


**■ UNIVERSIDAD NACIONAL DE ASUNCIÓN**

- Project : Universidad Nacional de Asunción
- Location : Asunción - PARAGUAY
- Year : 2015


**ODEBRECHT**
**TAV**  
 Tepe Akfen  
 Construction

**■ ODEBRECHT - TAV - CCC JV**

- Project : New Tripoli International Airport
- Location : Tripoli - LIBYA
- Year : 2008


**MAKYOL**

**CENGİZ**  
 HOLDING

**■ MAKYOL - CENGİZ JV**

- Project : Erbil International Airport
- Location : Erbil, KRG - IRAQ
- Year : 2004

## REFERENCES



### ■ NUROL

- Project : Baghdad Sadr City Stadium
- Location : Baghdad - IRAQ
- Year : 2012



### ■ RENAISSANCE HOLDING

- Project : Sulfuric Acid Plant
- Location : Turkmenabad - TURKMENISTAN
- Year : 2016



### ■ ESCUELA MILITAR DE INGENIERIA

- Project : Escuela Militar de Ingenieria
- Location : Cochabamba - BOLIVIA
- Year : 2015

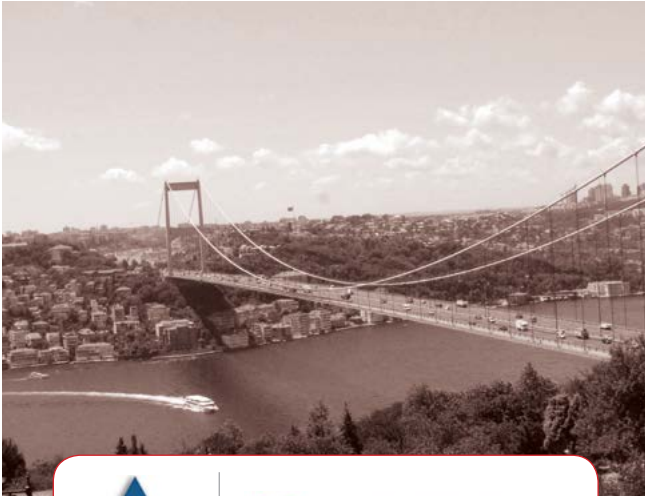


### ■ YÜKSEL

- Project : Kora-Shaqlawa-Qandeel Highway
- Location : KRG - IRAQ
- Year : 2010



## REFERENCES



### ■ IMPREGILO - STFA JV

- Project : FSM Bridge
- Location : FSM Bridge in Istanbul, connecting Europe and Asia
- Year : 1988



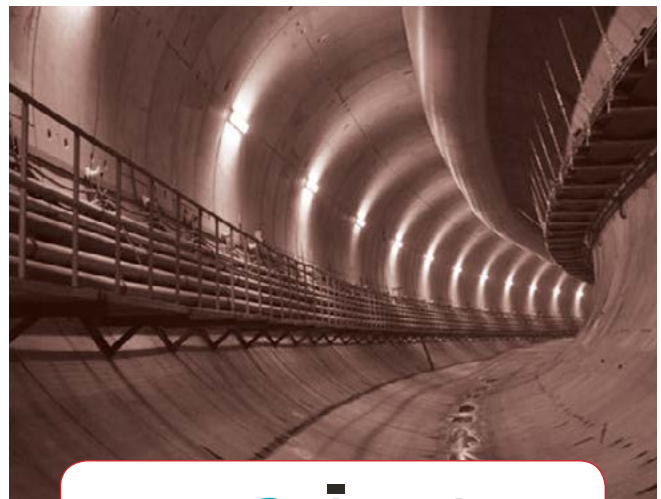
### ■ KUANTA CONSTRUCTION

- Project : Mafia Airport
- Location : Mafia Island - TANZANIA
- Year : 2012



### ■ OHL

- Project : Railway between Annaba and Ramdane Djamel
- Location : ALGERIA
- Year : 2009



### ■ DOĞUŞ

- Project : Sofia Metro Project
- Location : Sofia - BULGARIA
- Year : 2009

## REFERENCES



### ■ CHINA INTERNATIONAL WATER & ELECTRIC CORP.

- Project : Trinidad - San Ignacio de Moxos Road
- Location : BOLIVIA
- Year : 2016



### ■ DORCE

- Project : Basra Housing Complex
- Location : Basra - IRAQ
- Year : 2013



### ■ iGA ISTANBUL GRAND AIRPORT : CMLKK JV

- Project : Istanbul Grand Airport
- Location : Istanbul - TURKEY
- Year : 2017

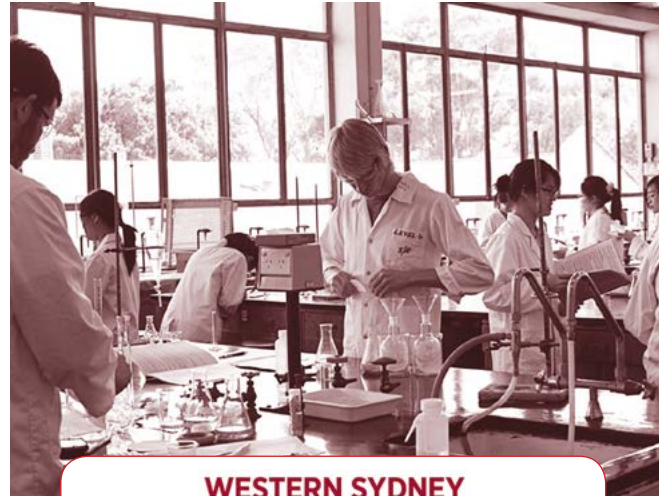
## REFERENCES



**77 CONSTRUCTION**  
USACORP

### 77 CONSTRUCTION

- Project : Cas Apron Expansion - Bagram Airfield, Afghanistan
- Location : Bagram Airfield - AFGHANISTAN
- Year : 2010



**WESTERN SYDNEY**  
UNIVERSITY



### WESTERN SYDNEY UNIVERSITY

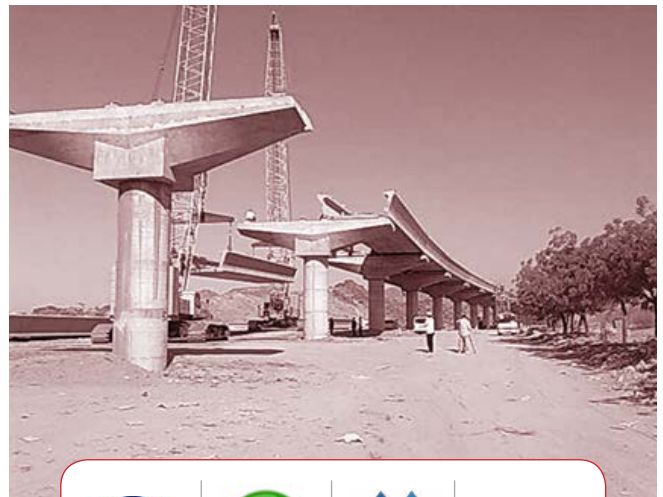
- Project : Civil Engineering Laboratory
- Location : Sydney - AUSTRALIA
- Year : 2016



**ENKA**

### ENKA

- Project : Ramstore
- Location : Moscow - RUSSIAN FEDERATION
- Year : 2004



**ALSTOM**

### AL RAJHI ALLIANCE

- Project : Makka - Almadina Railway
- Location : Between Makka and Almadina - SAUDI ARABIA
- Year : 2009



## REFERENCES



### ■ RENAISSANCE HOLDING

- Project : Sheraton Four Points Hotel
- Location : Ikot Ekpene - NIGERIA
- Year : 2015



### ■ ISOLUX CORSÁN

- Project : Hidroelectrica Miguillas
- Location : BOLIVIA
- Year : 2016



### ■ SALINI IMPREGILO - KOLIN JV

- Project : South Al Mutlaa Housing Project
- Location : Kuwait City - KUWAIT
- Year : 2017



### ■ INSTITUTE OF DESIGN - MINISTRY OF DEFENCE

- Project : Construction Quality Inspection & Science Research Lab.
- Location : VIETNAM
- Year : 2016

## REFERENCES



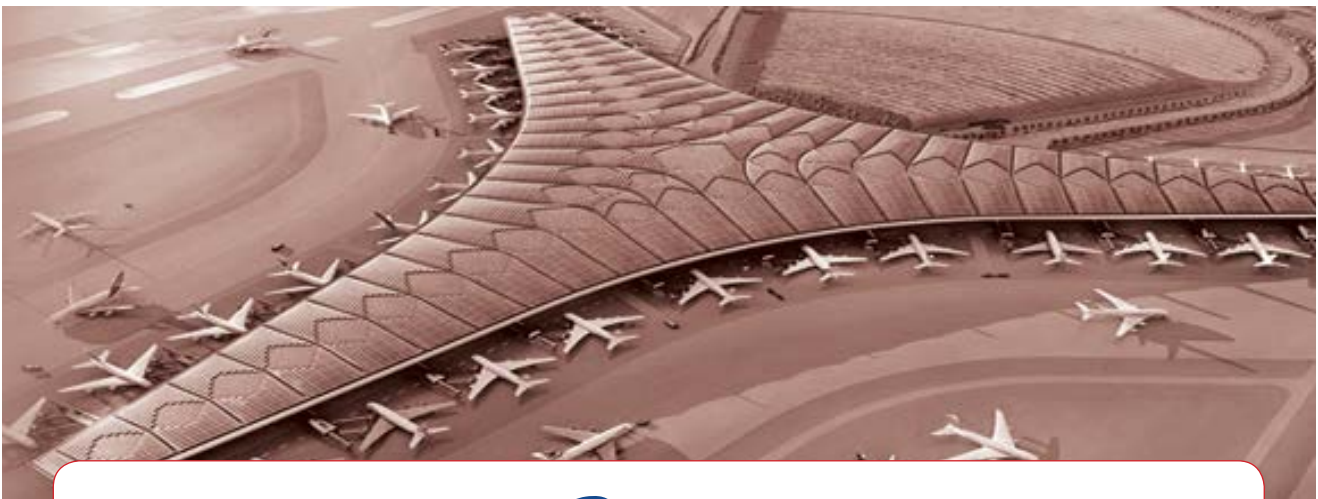
## ■ AYHANLAR HOLDING

- Project : Formula 1 Istanbul Racing Circuit
- Location : Istanbul - TURKEY
- Year : 2005



## ■ ACCIONA - ODEBRECHT JV

- Project : Metro de Quito
- Location : Quito - ECUADOR
- Year : 2016



## ■ LIMAK

- Project : Kuwait International Airport
- Location : Kuwait City - KUWAIT
- Year : 2017



## REFERENCES



### ■ MASS GROUP HOLDING

- Project : Al-Shamal Cement Factory
- Location : Atbara - SUDAN
- Year : 2007



### ■ BASF

- Project : Laboratory Expansion
- Location : THAILAND
- Year : 2016



### ■ AL BAWANI CONSTRUCTION

- Project : ARABSAT Satellite Headquarters Building
- Location : Riyadh - SAUDI ARABIA
- Year : 2017



### ■ CARDNO AUSTRALIA

- Project : Toowoomba Second Range Crossing Project
- Location : Queensland - AUSTRALIA
- Year : 2016



## REFERENCES



**RÖNESANS HOLDING**

### ■ RENAISSANCE HOLDING

- Project : Al Sunbula Stadium
- Location : Al Diwaniyah - IRAQ
- Year : 2015



**JOSE CARTELLONE CONSTRUCCIONES CIVILES S.A.**

### ■ JOSÉ CARTELLONE CONSTRUCCIONES CIVILES S.A.

- Project : Muyupampa-Ipati Tramo II
- Location : BOLIVIA
- Year : 2016



**NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE**

### ■ NANYANG TECHNOLOGICAL UNIVERSITY

- Project : Civil Engineering Laboratory
- Location : SINGAPORE
- Year : 2016



**ENKA**

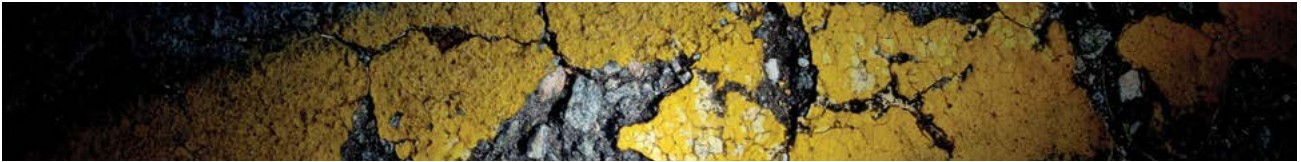
### ■ ENKA

- Project : Donbass Arena - FC Shakhtar Donetsk Stadium
- Location : Donetsk - UKRAINE
- Year : 2006

## CONTENTS

**GENERAL****28 - 51****CONCRETE****52 - 117****UNIVERSAL TESTING****118 - 129****CEMENT****130 - 153****AGGREGATE****154 - 177****SOIL****178 - 225**





**ASPHALT**

**226 - 275**



**ROCK MECHANICS**

**276 - 281**



**MINING | COAL | IRON 282 - 305**



**LAB TOOLS**

**306 - 335**



**MOBILE LAB**

**336 - 339**

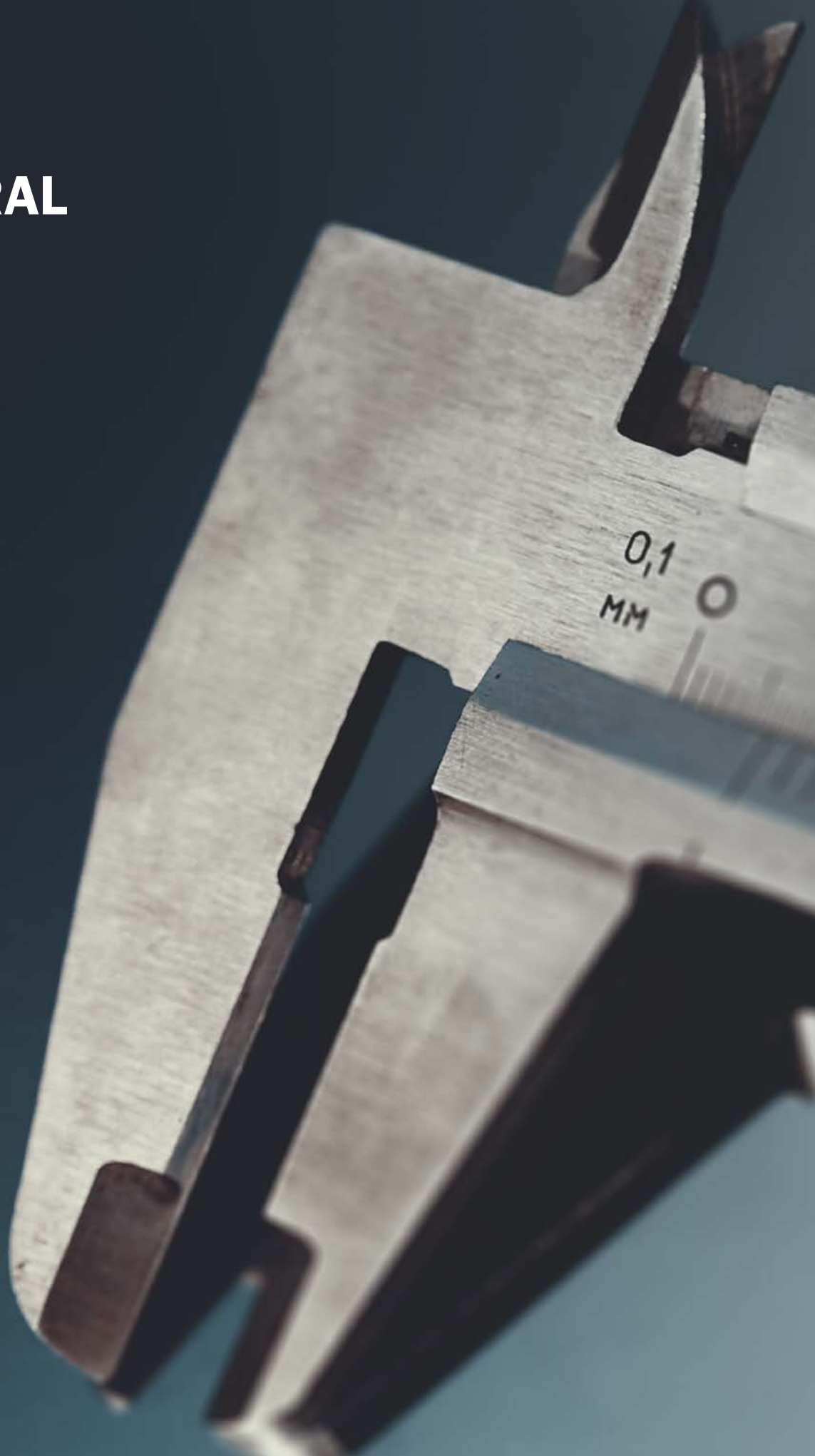


**INDEX**

**340 - 365**



# GENERAL



## INDEX

## GENERAL

Item	Code	Page
Laboratory Oven	G-030	31
Climatic Chamber	G-035/CC	34
Freeze and Thaw Cabinet	G-035/FT	34
UV Weather and Aging Cabinet	G-035/UV	34
Muffle Furnace	G-050	35
Water Distillation Unit	G-045	36
Microwave Oven	G-030/MW	36
Water Bath	G-040	37
Electromagnetic Sieve Shaker	G-041	38
Electromechanical Sieve Shaker	G-041/DA	38
Sieve	SV	39
Hydrometer Set	T-251	42
High-Capacity Screen Shaker	G-043	43
Electronic Balance	ET	44
Electronic Balance	HT	44
Platform Scale	EB	45
Density Basket	G-100/WB	46
Cradle	G-100/C	46
Specific Gravity Pycnometer	G-103	46
Sand Absorption Cone and Tamper	AG-200	46
Specific Gravity Frame	G-100	47
Sample Splitter	G-080	48
Large-Capacity Sample Splitter	G-081	49
Calibration Weights	CW	50
Dial Indicator	DI	50
Load Cell	LC	51
Load Ring	LR	51





## LABORATORY OVEN (G-030)

ASTM C127 • EN 932-5 • BS 1377

- Used for drying, conditioning and moisture content determination.
- Full width opening is provided, allowing easy access to all parts of the oven.
- The ovens are highly efficient in heating-up time and maintaining constant temperature, in accordance with the relevant standards.
- Equipped with a digital thermostat and an indicator with range of ambient to 200°C (392°F). The maximum temperature is regulated with the Proportional Integral Derivative (PID) control and goes to a maximum set value.
- All models are fitted with overheat safety thermostat to prevent accidental over-temperature and to provide a safe working environment.
- Internal chamber is made of stainless steel and the exterior surface is powder coated (available in stainless steel). Mineral wool is used in between the internal chamber and the outer cabinet for insulation.
- All models are equipped with exhaust hole for humidity discharge and fast cooling.
- Equipped with air circulating fan(s), mounted on the back wall, providing forced airflow convection for uniformity of heat.
- Wire grid shelves are supplied; allowing homogenous air flow that helps maintaining constant temperature throughout the oven. The shelves have alternative positions available within the chamber.



### GENERAL

## LABORATORY OVEN (G-030)

ASTM C127 • EN 932-5 • BS 1377



G-030/120 - Powder Coated Exterior



G-030/250 - Powder Coated Exterior

### EQUIPPED WITH

- Digital Thermostat & Indicator (PID)
- Safety Overheat Thermostat
- Air Circulation Fan providing airflow

### SUPPLIED WITH

- Wire Grid Shelves: 2 ea (Additional shelves can be ordered)

### TECHNICAL SPECIFICATIONS

- Maximum Temperature : 200 °C (392 °F) (PID control)
- Interior chamber : Stainless Steel
- Exterior : Powder Coated or Stainless Steel
- Insulation : Thick mineral wool
- Airflow : Forced convection
- Power Supply : 220 - 240 V / 50 - 60 Hz

## SPECIMEN DRYING

## GENERAL

## LABORATORY OVEN (G-030)

ASTM C127 • EN 932-5 • BS 1377



G-030/250-2 (2 Doors - Horizontal)



G-030/120 - Stainless Steel Exterior

Code	Capacity	# of Doors	# of Shelf Position	# of Shelves Supplied	# of Fans	External Cabinet Dimensions (W x L x H)	Internal Chamber Dimensions (W x D x H)
G-030/125	125 lt	1	3	2	1	62 x 64.5 x 75 (h) cm	50 x 50 x 50 (h) cm
G-030/250	250 lt (Vertical)	1	5	2	1	64 x 64.5 x 125 (h) cm	50 x 50 x 100 (h) cm
G-030/250-2	250 lt (Bench-Type)	2	3	2	2	66 x 113 x 80 (h) cm	100 x 50 x 50 (h) cm
G-030/400	400 lt	1	5	2	2	72 x 65 x 165 (h) cm	60 x 50 x 136 (h) cm
G-030/600	600 lt	1	5	2	2	76 x 90.5 x 177 (h) cm	63 x 64 x 163 (h) cm
G-030/700	700 lt	1	5	2	2	76 x 78 x 199 (h) cm	60 x 65 x 180 (h) cm



### GENERAL

#### CLIMATIC CHAMBER (G-035)

- The climatic chamber is used to test the effects of specified environmental conditions (by controlling temperature and/or humidity values) on different materials such as aggregates, tiles, and concrete. It may also be used to cure concrete and mortar specimens.

#### EQUIPPED WITH

- Touch Screen Data Acquisition System
- Internal glass door to retain moisture (Available only in G-035/CC models)

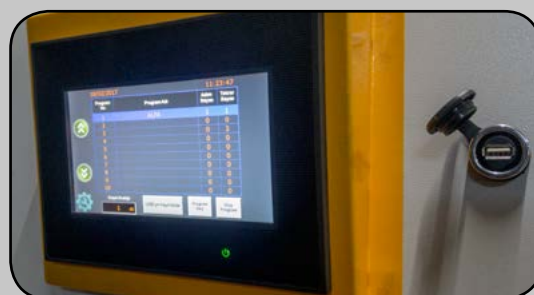
#### SUPPLIED WITH

- Wire Grid Shelves: 5 ea (Additional shelves can be ordered)



#### TECHNICAL SPECIFICATIONS

- Digital Thermostat & Indicator Fitted With overheat thermostat
- Interior chamber : Stainless Steel
- Exterior : Powder Coated or Stainless Steel
- Power Supply : 220 - 240 V / 50 - 60 Hz



Code	Item	Capacity	Temperature Range	Humidity Range
G-035/FT/250	Freeze and Thaw Cabinet	250 lt	-10 °C to +60 °C	N/A
G-035/CC/125	Climatic Chamber	125 lt	-10 °C to +60 °C	20% - 95%
G-035/CC/250	Climatic Chamber	250 lt	-10 °C to +60 °C	20% - 95%
G-035/CC/400	Climatic Chamber	400 lt	-10 °C to +60 °C	20% - 95%
G-035/UV	UV Weathering/Aging Cabinet	250 lt	N/A	N/A

## MUFFLE FURNACE (G-050)

- Used to test specimens at high temperatures. Its main attribute is that it separates the object to be heated from all by products of combustion from the heat source.
- Equipped with Proportion Integral Derivative (PID) temperature control unit.
- Insulation is completely made of high grade ceramic fiber with low thermal mass for fast heating cycles
- The front loading to the furnace provides easy access
- Equipped with safety door switch that shuts off the control circuits when the door is opened
- Exhaust pipe in the rear wall used to discharge the by-products of the combustion process.
- It is highly recommended to use the furnaces at temperatures above 600 °C



## TECHNICAL SPECIFICATIONS

- Temperature control by PID
- 220 - 240 V / 50 - 60 Hz

Code	Max Temperature	Capacity	Controller
G-050/10-03	1000 °C	3 lt	PID
G-050/11-06	1100 °C	6 lt	PID
G-050/11-08	1100 °C	8 lt	PID
G-050/11-10	1100 °C	10 lt	PID
G-050/12-05	1200 °C	5 lt	PID
G-050/12-05-P	1200 °C	5 lt	Programmable
G-050/12-12	1200 °C	12 lt	PID

### GENERAL

#### ■ WATER DISTILLATION UNIT (G-045)

- Used to distill water for laboratory purposes
- The inner chamber is made of stainless steel



Code	Capacity	Power Supply
G-045/04	4 lt/h	220 - 240 V / 50 - 60 Hz
G-045/08	8 lt/h	380 V / 50 - 60 Hz

#### ■ MICROWAVE OVEN (G-030/MW)

- Used to heat/dry the materials by electromagnetic radiation causing the polarized molecules to rotate and build up thermal energy.
- Provides efficient and quick heat.



#### ● TECHNICAL SPECIFICATIONS

- Heat/dry using electromagnetic radiation.
- 220 - 240 V / 50 - 60 Hz



## WATER BATH (G-040)

- Used to cure specimens at constant temperature.
- Exterior is made of powder coated steel and the interior tank and the cover are stainless steel.
- Supplied with perforated rack which ensures uniform temperature distribution around the specimen.
- Equipped with digital thermoregulator with a range of ambient to 82°C (180°F) and a pilot light heat indicator.
- The tank is insulated from the outer cabinet with thick mineral wool to reduce thermal loss and to help maintain constant temperature throughout the tank.
- Available in 6 different models as shown in the table below.



Water Bath (G-040/60)



Water Bath (G-040/30)

### EQUIPPED WITH

- Digital Thermostat & Indicator

### SUPPLIED WITH

- Stainless Steel Cover & Base Rack

### TECHNICAL SPECIFICATIONS

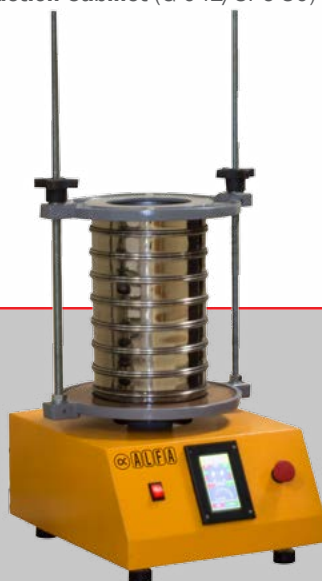
- Interior Stainless Steel
- 220 - 240 V / 50 - 60 Hz

Code	Capacity	Circulation	Cooling
G-040/30	30 lt	○	○
G-040/30/CI	30 lt	●	○
G-040/30/CC	30 lt	●	●
G-040/60	60 lt	○	○
G-040/60/CI	60 lt	●	○
G-040/60/CC	60 lt	●	●

### GENERAL

## ELECTROMAGNETIC SIEVE SHAKER (G-041)

- Operated by electromagnetic motor which provides a perfect and standardized sieving to ensure accurate results and eliminate personal errors involved in sieving.
- Accepts up to eight full height sieves.
- The shaker is available in three sizes:
  - (G-041/20) shaker that can be used for (20 cm) sieves
  - (G-041/30) shaker that can be used for (20 cm) & (30 cm) sieves
  - (G-041/45) shaker that can be used for (20 cm), (30 cm) & (45 cm) sieves
- Built-in timer (60 min) is incorporated to set the duration time.
- Sieves, pan and cover should be ordered separately
- Noise Reduction Cabinet** (G-041/SPC-30) can be ordered separately



### EQUIPPED WITH

- Touch Screen Controlling having frequency adjustment and digital timer

### TECHNICAL SPECIFICATIONS

- Quiet Operation
- Adjustable amplitude
- 220 - 240 V / 50 - 60 Hz

Code	Used for
G-041/20	Ø 200 mm (8")
G-041/30	Ø 200 mm (8") • Ø 300 mm (12")
G-041/45	Ø 200 mm (8") • Ø 300 mm (12") • Ø 450 mm (18")

## PARTICLE SIZE ANALYSIS

## GENERAL

## ELECTROMECHANICAL SIEVE SHAKER (G-041/DA)

- Performs efficient sieving by having double-action (Swinging & Vibration motions)
- The machine is capable of applying both motions at the same time (or one of the two)
- Equipped with built-in timer
- Suitable for dry sieving only.



### TECHNICAL SPECIFICATIONS

- 220 - 240 V / 50 - 60 Hz

Code	Used for
G-041/DA-20	Ø 200 mm
G-041/DA-30	Ø 200 mm • Ø 300 mm
G-041/DA-45	Ø 200 mm • Ø 300 mm • Ø 450 mm

## SIEVE (SV)

ISO 3310-1 • ASTM E11 • ASTM E232

- All Sieves are made of stainless steel woven wire or perforated plate and a frame that meet international standards.
- The sieve aperture is clearly labelled on each sieve.
- Sieves having the same diameter are designed to perfectly and easily nest on each other.
- The sieves are available in two diameters (200 mm) and (300 mm)



### ORDERING INFORMATION

Code	Item Name	Can be ordered as a Set
SV-20/P	Pan (Receiver) - Ø 200 mm	SV-20/PC
SV-20/C	Cover (Lid) - Ø 200 mm	
SV-30/P	Pan (Receiver) - Ø 300 mm	SV-30/PC
SV-30/C	Pan (Receiver) - Ø 300 mm	
SV-20/WS/APP	Wet Washing Sieve Apparatus - Ø 200 mm	•
SV-30/WS/APP	Wet Washing Sieve Apparatus - Ø 300 mm	•



### GENERAL

#### SIEVE (SV)

ISO 3310-1 • ASTM E11 • ASTM E232

Aperture	Ø 200 mm (Woven Wire)	Ø 200 mm (Perforated Plate)	Ø 300 mm (Woven Wire)	Ø 300 mm (Perforated Plate)
90.00 mm (3 1/2")	SV-20/W/90000	SV-20/P/90000	SV-30/W/90000	SV-30/P/90000
80.00 mm	SV-20/W/80000	SV-20/P/80000	SV-30/W/80000	SV-30/P/80000
75.00 mm (3")	SV-20/W/75000	SV-20/P/75000	SV-30/W/75000	SV-30/P/75000
63.00 mm (2 1/2")	SV-20/W/63000	SV-20/P/63000	SV-30/W/63000	SV-30/P/63000
56.00 mm	SV-20/W/56000	SV-20/P/56000	SV-30/W/56000	SV-30/P/56000
53.00 mm (2.12")	SV-20/W/53000	SV-20/P/53000	SV-30/W/53000	SV-30/P/53000
50.00 mm (2")	SV-20/W/50000	SV-20/P/50000	SV-30/W/50000	SV-30/P/50000
45.00 mm (1 3/4")	SV-20/W/45000	SV-20/P/45000	SV-30/W/45000	SV-30/P/45000
40.00 mm	SV-20/W/40000	SV-20/P/40000	SV-30/W/40000	SV-30/P/40000
37.50 mm (1 1/2")	SV-20/W/37500	SV-20/P/37500	SV-30/W/37500	SV-30/P/37500
31.50 mm (1 1/4")	SV-20/W/31500	SV-20/P/31500	SV-30/W/31500	SV-30/P/31500
28.00 mm	SV-20/W/28000	SV-20/P/28000	SV-30/W/28000	SV-30/P/28000
26.50 mm (1.06")	SV-20/W/26500	SV-20/P/26500	SV-30/W/26500	SV-30/P/26500
25.00 mm (1")	SV-20/W/25000	SV-20/P/25000	SV-30/W/25000	SV-30/P/25000
22.40 mm (7/8")	SV-20/W/22400	SV-20/P/22400	SV-30/W/22400	SV-30/P/22400
20.00 mm	SV-20/W/20000	SV-20/P/20000	SV-30/W/20000	SV-30/P/20000
19.00 mm (3/4")	SV-20/W/19000	SV-20/P/19000	SV-30/W/19000	SV-30/P/19000
18.00 mm	N/A	SV-20/P/18000	N/A	SV-30/P/18000
16.00 mm (5/8")	SV-20/W/16000	SV-20/P/16000	SV-30/W/16000	SV-30/P/16000
14.00 mm	SV-20/W/14000	SV-20/P/14000	SV-30/W/14000	SV-30/P/14000
13.20 mm (.530")	SV-20/W/13200	SV-20/P/13200	SV-30/W/13200	SV-30/P/13200
12.50 mm (1/2")	SV-20/W/12500	SV-20/P/12500	SV-30/W/12500	SV-30/P/12500
11.20 mm (7/16")	SV-20/W/11200	SV-20/P/11200	SV-30/W/11200	SV-30/P/11200
10.00 mm	SV-20/W/10000	SV-20/P/10000	SV-30/W/10000	SV-30/P/10000
9.50 mm (3/8")	SV-20/W/09500	SV-20/P/09500	SV-30/W/09500	SV-30/P/09500
9.00 mm	N/A	SV-20/P/09000	N/A	SV-30/P/09000
8.00 mm (5/16")	SV-20/W/08000	SV-20/P/08000	SV-30/W/08000	SV-30/P/08000
7.10 mm	N/A	SV-20/P/07100	N/A	SV-30/P/07100
6.70 mm (.265")	SV-20/W/06700	SV-20/P/06700	SV-30/W/06700	SV-30/P/06700
6.30 mm (1/4")	SV-20/W/06300	SV-20/P/06300	SV-30/W/06300	SV-30/P/06300
5.60 mm (No.3 1/2)	SV-20/W/05600	SV-20/P/05600	SV-30/W/05600	SV-30/P/05600
5.00 mm	SV-20/W/05000	SV-20/P/05000	SV-30/W/05000	SV-30/P/05000
4.75 mm (No.4)	SV-20/W/04750	SV-20/P/04750	SV-30/W/04750	SV-30/P/04750
4.00 mm (No.5)	SV-20/W/04000	SV-20/P/04000	SV-30/W/04000	SV-30/P/04000
3.35 mm (No.6)	SV-20/W/03350	N/A	SV-30/W/03350	N/A
3.15 mm	SV-20/W/03150	N/A	SV-30/W/03150	N/A
2.80 mm	SV-20/W/02800	N/A	SV-30/W/02800	N/A
2.50 mm	SV-20/W/02500	N/A	SV-30/W/02500	N/A
2.36 mm (No.8)	SV-20/W/02360	N/A	SV-30/W/02360	N/A

## SIEVE (SV)

ISO 3310-1 • ASTM E11 • ASTM E232

Aperture	Ø 200 mm (Woven Wire)	Ø 200 mm (Perforated Plate)	Ø 300 mm (Woven Wire)	Ø 300 mm (Perforated Plate)
2.00 mm (No.10)	SV-20/W/02000	N/A	SV-30/W/02000	N/A
1.70 mm (No.12)	SV-20/W/01700	N/A	SV-30/W/01700	N/A
1.60 mm	SV-20/W/01600	N/A	SV-30/W/01600	N/A
1.40 mm (No.14)	SV-20/W/01400	N/A	SV-30/W/01400	N/A
1.25 mm	SV-20/W/01250	N/A	SV-30/W/01250	N/A
1.18 mm (No.16)	SV-20/W/01180	N/A	SV-30/W/01180	N/A
1.00 mm (No.18)	SV-20/W/01000	N/A	SV-30/W/01000	N/A
0.850 mm (No.20)	SV-20/W/00850	N/A	SV-30/W/00850	N/A
0.800 mm	SV-20/W/00800	N/A	SV-30/W/00800	N/A
0.710 mm (No.25)	SV-20/W/00710	N/A	SV-30/W/00710	N/A
0.630 mm	SV-20/W/00630	N/A	SV-30/W/00630	N/A
0.600 mm (No.30)	SV-20/W/00600	N/A	SV-30/W/00600	N/A
0.500 mm (No.35)	SV-20/W/00500	N/A	SV-30/W/00500	N/A
0.425 mm (No.40)	SV-20/W/00425	N/A	SV-30/W/00425	N/A
0.400 mm	SV-20/W/00400	N/A	SV-30/W/00400	N/A
0.355 mm (No.45)	SV-20/W/00355	N/A	SV-30/W/00355	N/A
0.315 mm	SV-20/W/00315	N/A	SV-30/W/00315	N/A
0.300 mm (No.50)	SV-20/W/00300	N/A	SV-30/W/00300	N/A
0.250 mm (No.60)	SV-20/W/00250	N/A	SV-30/W/00250	N/A
0.212 mm (No.70)	SV-20/W/00212	N/A	SV-30/W/00212	N/A
0.200 mm	SV-20/W/00200	N/A	SV-30/W/00200	N/A
0.180 mm (No.80)	SV-20/W/00180	N/A	SV-30/W/00180	N/A
0.160 mm	SV-20/W/00160	N/A	SV-30/W/00160	N/A
0.150 mm (No.100)	SV-20/W/00150	N/A	SV-30/W/00150	N/A
0.125 mm (No.120)	SV-20/W/00125	N/A	SV-30/W/00125	N/A
0.106 mm (No.140)	SV-20/W/00106	N/A	SV-30/W/00106	N/A
0.100 mm	SV-20/W/00100	N/A	SV-30/W/00100	N/A
0.090 mm (No.170)	SV-20/W/00090	N/A	SV-30/W/00090	N/A
0.080 mm	SV-20/W/00080	N/A	SV-30/W/00080	N/A
0.075 mm (No.200)	SV-20/W/00075	N/A	SV-30/W/00075	N/A
0.063 mm (No.230)	SV-20/W/00053	N/A	SV-30/W/00053	N/A
0.053 mm (No.270)	SV-20/W/00053	N/A	SV-30/W/00053	N/A
0.050 mm	SV-20/W/00050	N/A	SV-30/W/00050	N/A
0.045 mm (No.325)	SV-20/W/00045	N/A	SV-30/W/00045	N/A
0.040 mm	SV-20/W/00040	N/A	SV-30/W/00040	N/A
0.038 mm (No.400)	SV-20/W/00038	N/A	SV-30/W/00038	N/A
Wet Washing Sieve 0.075 mm (No.200)	SV-20/WS/00063	N/A	N/A	N/A
Wet Washing Sieve 0.063 mm (No.230)	SV-20/WS/00063	N/A	N/A	N/A

### GENERAL

#### HYDROMETER SET (T-251)

ASTM D422

- Used to determine the distribution of particle sizes smaller than 75  $\mu\text{m}$
- Set comprises of:
  - High-Speed stirrer (not less than 10,000 rpm) T-251/HSS
  - Temperature-controlled water bath with water circulating unit T-251/WB
  - Sedimentation cylinder (6 ea) T-251/SC
  - Soil Hydrometer (151H: 0.995 - 1.038 g/ml) T-251/151H
  - Sodium Hexametaphosphate (1 kg) CHE-11
  - Glass beaker (250 ml) GCB/0250
- 220 - 240 V / 50 - 60 Hz



#### SUPPLIED WITH

- High-Speed stirrer (not less than 10,000 rpm) T-251/HSS
- Temperature-controlled water bath with water circulating unit T-251/WB
- Sedimentation cylinder (6 ea) T-251/SC
- Soil Hydrometer (151H: 0.995 - 1.038 g/ml) T-251/151H
- Sodium Hexametaphosphate (1 kg) CHE-11
- Glass beaker (250 ml) GCB/0250
- Sodium Hexametaphosphate CHE-11

#### TECHNICAL SPECIFICATIONS

- 220 - 240 V / 50 - 60 Hz



## HIGH-CAPACITY SCREEN SHAKER with HYDRAULIC CLAMPING (G-043/H)

### EQUIPPED WITH

- Hydraulic Clamping System

### TECHNICAL SPECIFICATIONS

- Holds up to 5 trays and 1 dust pan
- Tray Dimensions: 457 x 660 mm
- Capacity: 1 cu ft ~ 30 Liters
- 220 - 240 V / 50 - 60 Hz
- Screen trays should be ordered separately



### TRAYS ORDERING INFORMATION

Code	Aperture
G-043/P/90000	90.00 mm (3 1/2")
G-043/P/80000	80.00 mm
G-043/P/75000	75.00 mm (3")
G-043/P/63000	63.00 mm (2 1/2")
G-043/P/56000	56.00 mm
G-043/P/53000	53.00 mm (2.12")
G-043/P/50000	50.00 mm (2")
G-043/P/45000	45.00 mm (1 3/4")
G-043/P/40000	40.00 mm
G-043/P/37500	37.50 mm (1 1/2")
G-043/P/31500	31.50 mm (1 1/4")
G-043/P/28000	28.00 mm
G-043/P/26500	26.50 mm (1.06")
G-043/P/25000	25.00 mm (1")
G-043/P/22400	22.40 mm (7/8")
G-043/P/20000	20.00 mm
G-043/P/19000	19.00 mm (3/4")

Code	Aperture
G-043/P/18000	18.00 mm
G-043/P/16000	16.00 mm (5/8")
G-043/P/14000	14.00 mm
G-043/P/13200	13.20 mm (.530")
G-043/P/12500	12.50 mm (1/2")
G-043/P/11200	11.20 mm (7/16")
G-043/P/10000	10.00 mm
G-043/P/09500	9.50 mm (3/8")
G-043/P/09000	9.00 mm
G-043/P/08000	8.00 mm (5/16")
G-043/P/07100	7.10 mm
G-043/P/06700	6.70 mm (.265")
G-043/P/06300	6.30 mm (1/4")
G-043/P/05600	5.60 mm (No.3 1/2)
G-043/P/05000	5.00 mm
G-043/P/04750	4.75 mm (No.4)
G-043/P/04000	4.00 mm (No.5)

### GENERAL

### ELECTRONIC BALANCE

Code	Capacity	Readability	Under-Weighing Mechanism	Battery-Operated
ET-30K	30 kg	0.5 g	●	●
ET-15K	15 kg	0.2 g	●	●
ET-06K	6 kg	0.1 g	●	●
ET-03K	3 kg	0.05 g	●	●
ET-600	600 g	0.01 g	○	●
HT-30K	30 kg	0.1 g	●	●
HT-15K	15 kg	0.1 g	●	●
HT-05K	5 kg	0.01 g	●	●
HT-03K	3 kg	0.01 g	●	●
HT-01K	1 kg	0.01 g	○	●
HT-600	600 g	0.001 g (1 mg)	○	●
HT-410	410 g	0.001 g (1 mg)	○	●
HT-220	220 g	0.01 mg (up to 60 g) 0.1 mg (between 60 - 220 g)	○	○
HT-210	210 g	0.001 g (1 mg)	○	○
MB-210	210 g	0.001 g (1 mg)	○	○
MB-110	110 g	0.001 g (1 mg)	○	○
MB-050	50 g	0.001 g (1 mg)	○	○
EB-300	300 kg	10 g	○	○
EB-150	150 kg	10 g	○	○
EB-060	60 kg	10 g	○	○

## ELECTRONIC BALANCE

- The balance has capacity ranges from 50 g to 30 kg; having different readabilities depending on the type and the purpose of it
- Supplied with batteries allowing the balance to be used in laboratory and in field



### TECHNICAL SPECIFICATIONS

- Battery & Mains Operated
- Used both in labs and insitu
- Taring Facility
- 220 - 240 V / 50 - 60 Hz

## PLATFORM SCALE (EB)

- Heavy-Duty frame.
- Available in 3 different capacities (60 kg / 150 kg / 300 kg)



### TECHNICAL SPECIFICATIONS

- Strong and robust
- Push button taring facility
- 220 - 240 V / 50 - 60 Hz



### GENERAL

#### DENSITY BASKET (G-100/WB)

- Stainless steel wire basket Ø 200 mm having wire mesh (3.35 mm - No.6)



#### CRADLE (G-100/C)

- Made of stainless steel



#### SPECIFIC GRAVITY PYCNOMETER (G-103)

BS 177-3 • BS 812

- Cone discharge diameter : 10 mm



#### SAND ABSORPTION CONE and TAMPER (AG-200)

EN 1097-6 • EN 12274-3

- See page 172 for more details



**SPECIFIC GRAVITY  
DETERMINATION****GENERAL****SPECIFIC GRAVITY FRAME (G-100)****ASTM C127**

- The frame can be used to determine the specific gravity of solid materials (concrete, aggregate .. etc)
- The system consists of a highly rigid frame, incorporating a moving platform on its lower part, a water tank and a density basket (Stainless steel wire basket Ø 200 mm (3.35 mm - No.6) wire mesh).
- The balance should be ordered separately.

**SUPPLIED WITH**

- Moving Platform (G-100/MP)
- Water Tank (G-100/WT)
- Wire Basket (G-100/WB)

**TECHNICAL SPECIFICATIONS**

- Wire Basket Ø 200 mm (3.35 mm (No.6) wire mesh)



### GENERAL

#### **SAMPLE SPLITTER (G-080)**

ASTM C136 • EN 933-3 • AASHTO T27

- Designed to halve/divide aggregates, soils, sands and gravel into two representative halves.
- Made of powder coated enameled steel.



#### **SUPPLIED WITH**

- 3 Collecting Pans

Code	Chute Width (mm)	Number of Chutes
G-080/07	7	12
G-080/09	9	12
G-080/12	12.5	12
G-080/15	15	12
G-080/19	19	10
G-080/25	25	10
G-080/30	30	10
G-080/37	37.5	8
G-080/45	45	8
G-080/50	50	8
G-080/62	62.5	8
G-080/75	75	8



## **LARGE-CAPACITY SAMPLE SPLITTER (G-081)**

ASTM C136 • EN 933-3 • AASHTO T27

- Used to halve/divide large amount of aggregates, soils, sands and gravel into two representative portions.
- The width of each adjustable chute is 1/2"
- Equipped with lever and release hoppers.
- Made of heavy-duty steel.



### **SUPPLIED WITH**

- Collecting Pans (2 ea)

### **TECHNICAL SPECIFICATIONS**

- Adjustable chutes having a thickness of 1/2"

### GENERAL

#### CALIBRATION WEIGHTS (CW)

- M1 class, Cast Iron
- Ordered individually

Code	Weight
CW-25K	25 kg
CW-20K	20 kg
CW-10K	10 kg
CW-05K	5 kg
CW-02K	2 kg
CW-01K	1 kg
CW-0500	500 g
CW-0100	100 g
CW-0050	50 g
CW-0020	20 g
CW-0010	10 g
CW-0005	5 g
CW-0001	1 g

0.01

#### CALIBRATION WEIGHT SET (CW/SET)

- M1 class, Stainless Steel
- Ordered as a set (Total of 2110 g)

Weight	Quantity
1000 g	x 1
500 g	x 1
200 g	x 2
100 g	x 1
50 g	x 1
20 g	x 2
10 g	x 1
5 g	x 1
2 g	x 2
1 g	x 1



#### DIAL INDICATOR (DI)

Code	DI/D-12/0.001	DI/D-25/0.01	DI/M-10/0.01	DI/M-12/0.002	DI/M-30/0.01	DI/M-50/0.01
Travel	12.70 mm	25.00 mm	10.00 mm	12.70 mm	30.00 mm	50.00 mm
Graduation	0.001	0.01	0.01	0.002	0.01	0.01
Type	Digital	Digital	Mechanical	Mechanical	Mechanical	Mechanical



## LOAD MEASUREMENTS

## GENERAL

## LOAD CELL (LC)

### SUPPLIED WITH

- Digital Load Indicator
- **Factory Calibration Report**



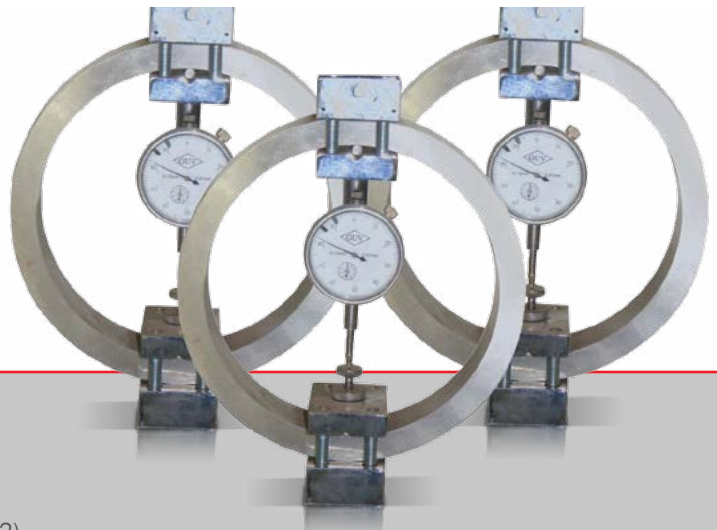
Code	LC/0005	LC/0025	LC/0050	LC/0250	LC/0500	LC/2000	LC/3000
Capacity	5 kN	25 kN	50 kN	250 kN	500 kN	2000 kN	3000 kN

## LOAD RING (LR)

- Made from steel
- Used for load measurements

### SUPPLIED WITH

- Dial Gauge 12.7 mm / 0.002 mm (DI/M-12/0.002)
- **Factory Calibration Report**



Code	LR-0005	LR-0010	LR-0030	LR-0050
Capacity	5 kN	10 kN	30 kN	50 kN



# CONCRETE

## INDEX

## CONCRETE

Item	Code	Page
Compression Tester	B-001	55
Compression Tester	B-004	55
Thermal Printer	B-003/TP	74
Compressometer	B-003/CM	74
Splitting Tensile Apparatus	B-003/ST	74
Flexural Frame	B-001/FF	76
Flexural Apparatus for Concrete Beams	B-003/BFA	76
Flexural Testing Machine	B-003/LCD	77
Slab Testing Machine	B-007	78
Concrete Pipe Testing Machine	B-008	79
Capping Pad	B-016	80
Capping Retainer	B-016/CR	80
Cylinder Capping Set	B-015	80
Automatic Grinding Machine	B-199	81
Universal Cutting Machine	B-062	82
Coring Machine	B-061	83
Core Bits	B-061/X	83
Drum-Type Mixer	B-121	84
Pan-Type Mixer	B-120	85
Cube Mould	B-011	86
Cylinder Mould	B-010	86
Beam Mould	B-017	86



## INDEX

## CONCRETE

Item	Code	Page
Vibrating Table	B-125	87
Poker Vibrator	B-128	87
Curing Tank	B-140	88
Plastic, Curing Tank	B-140/P	88
Metal, Curing Tank	B-140/M	89
Concrete Flow Table (700 x 700 mm)	B-024/EN	90
Concrete Flow Table (Ø 762 mm)	B-024/ASTM	90
Slump Set	B-020	91
SCC Slump Flow Cone Test Set	B-021	92
U-Shape Box Apparatus	B-029	92
Sieve Segregation Test Set	B-023	93
Concrete Bleeding Test Set	B-028	93
V-Funnel Apparatus	B-025	94
L-Box Apparatus	B-026	94
J-Ring Apparatus	B-027	95
Waltz Container	B-132	96
K-Slump Tester	B-031	96
Kelly Ball Penetration Apparatus	B-022	96
Vebe Consistometer	B-130	97
Compacting Factor Apparatus	B-185	98
Air Entrainment Meter	B-320/B	99
Concrete Penetrometer	B-135	100
Concrete Pocket Penetrometer - Pen-Type	B-304	101
Concrete Initial Set Penetrometer - Dial Model	B-308	101
Pull-Off Tester	B-105	102
Pull-Out Tester	B-106	103
Concrete Water Impermeability Tester	B-245	104
Crack Detection Microscope	B-250	105
Rebar Detector (Bosch)	B-050/B	105
Ultrasonic Pulse Velocity Tester	B-048/M	106
Ultrasonic Pulse Velocity Tester (Proceq)	B-048/P	107
Rebar Detector (Proceq)	B-050/P+	108
Cover Meter (Proceq)	B-050/P650	109
Digital Concrete Test Hammer (Proceq)	B-110/D/P	110
Concrete Test Hammer	B-110	111
Testing Anvil	B-117	111
Rapid Chloride Permeability Tester	B-500	112
Half-Cell Corrosion Mapping Device	B-505	113
Concrete Bulk Resistivity Tester	B-510	114
Concrete Surface Resistivity Tester	B-515	115
Wireless Concrete Resistivity Tester	B-520	116
Rebar Corrosion Rate Tester	B-525	117





## COMPRESSION TESTER (B-001 / B-004)

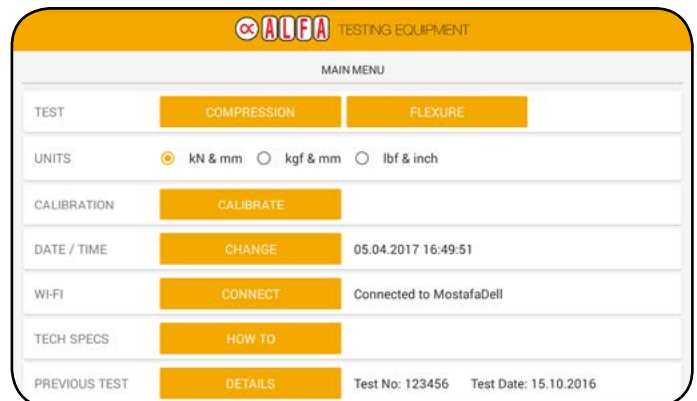
ASTM C39 • EN 12390-4

- Used to test the compression strength of concrete cubes/cylinders of different sizes.
- ALFA is the first company in the world to manufacture Computer-Controlled Compression Testers.
- The rigid design provides stability and strength for a better using experience.
- The load frame, either monoblock or 4-column fabricated construction, carries the ball-seated upper platen which adjusts itself to apply homogeneous loading on the specimen.
- The lower platen is located on the loading piston which protected against debris by a cover.
- The ball seating and the lower platen assemblies are supplied in a way to match the capacity of the machine and the specimens to be tested, ensuring accurate alignment and stable repeatable testing.
- All different models have been designed with reference to the International Standards (ASTM C39 and EN 12390-4), ensured that the machines can easily meet the standards and, where applicable, can be supplied with relevant certification for calibration accuracy and other parameters.
- Supplied complete with spacer discs (Additional spacer discs can be ordered separately).



## NEW TOUCH-SCREEN SERIES

- Following the latest technologies, our R&D team have recently introduced new touch screen controllers.



## COMPONENTS

**Rexroth**  
Bosch Group

**OMRON**

**HAWE**  
HYDRAULIK

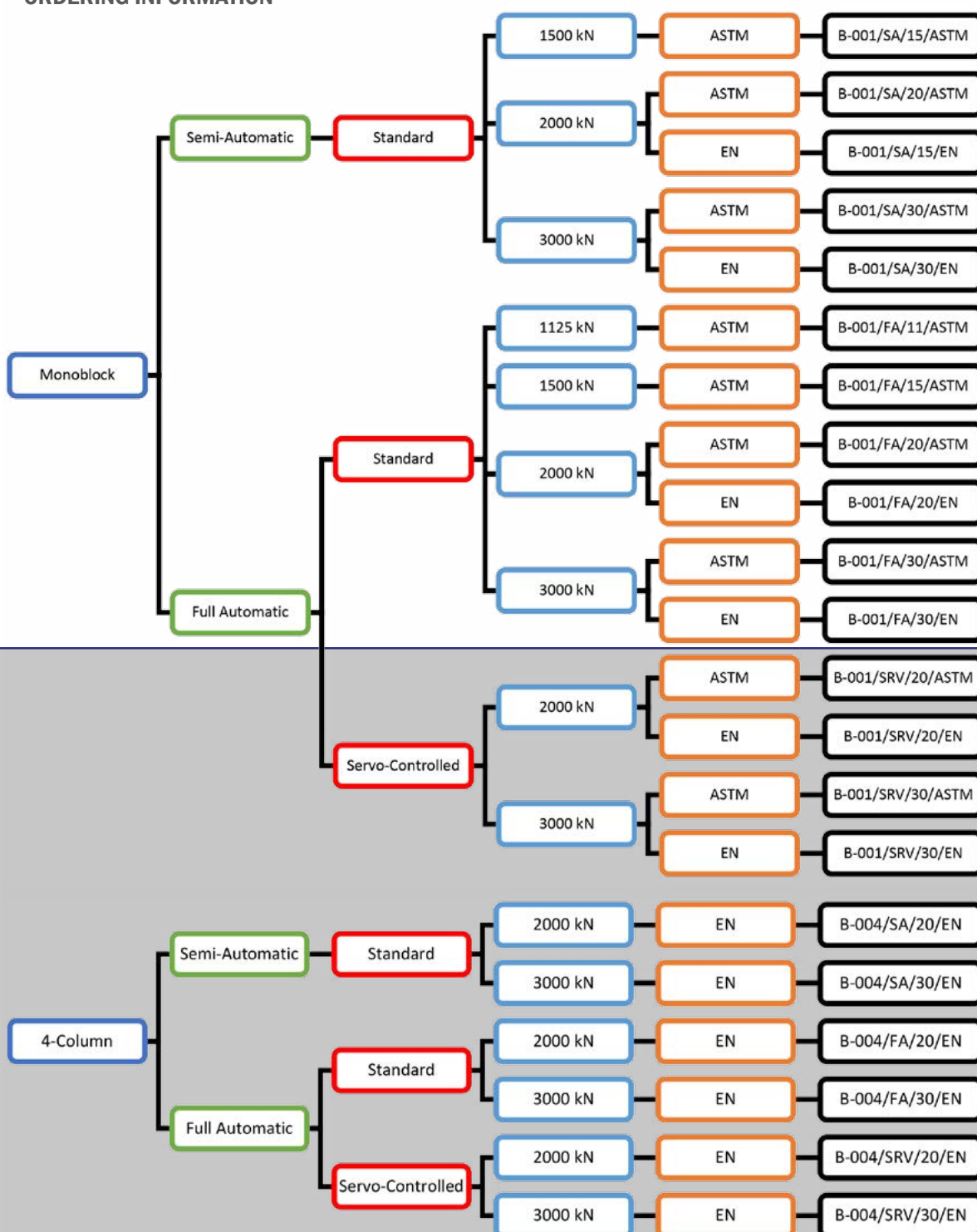
**YASKAWA**

### CONCRETE

#### ■ COMPRESSION TESTER (B-001 / B-004)

ASTM C39 • EN 12390-4

#### ● ORDERING INFORMATION





## COMPRESSIVE STRENGTH

## CONCRETE

## COMPRESSION TESTER (B-001 / B-004)

ASTM C39 • EN 12390-4

Code	Capacity	Standard	Control	Frame	Readout Unit
B-001/11/FA/ASTM	1125 kN	ASTM C39	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/15/FA/ASTM	1500 kN	ASTM C39	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/15/SA/ASTM	1500 kN	ASTM C39	Semi Automatic	Monoblock	Digital Load Indicator
B-001/20/FA/ASTM	2000 kN	ASTM C39	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/20/SA/ASTM	2000 kN	ASTM C39	Semi Automatic	Monoblock	Digital Load Indicator
B-001/20/SRV/ASTM	2000 kN	ASTM C39	Servo-Controlled, Full Automatic	Monoblock	LCD Graphical Indicator
B-001/30/FA/ASTM	3000 kN	ASTM C39	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/30/SA/ASTM	3000 kN	ASTM C39	Semi Automatic	Monoblock	Digital Load Indicator
B-001/30/SRV/ASTM	3000 kN	ASTM C39	Servo-Controlled, Full Automatic	Monoblock	LCD Graphical Indicator
B-001/20/FA/EN	2000 kN	EN 12390-4	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/20/SA/EN	2000 kN	EN 12390-4	Semi Automatic	Monoblock	Digital Load Indicator
B-001/20/SRV/EN	2000 kN	EN 12390-4	Servo-Controlled, Full Automatic	Monoblock	LCD Graphical Indicator
B-001/30/FA/EN	3000 kN	EN 12390-4	Full Automatic	Monoblock	LCD Graphical Indicator
B-001/30/SA/EN	3000 kN	EN 12390-4	Semi Automatic	Monoblock	Digital Load Indicator
B-001/30/SRV/EN	3000 kN	EN 12390-4	Servo-Controlled, Full Automatic	Monoblock	LCD Graphical Indicator
B-004/20/SA/EN	2000 kN	EN 12390-4	Semi Automatic	4-Column	Digital Load Indicator
B-004/20/SRV/EN	2000 kN	EN 12390-4	Servo-Controlled, Full Automatic	4-Column	LCD Graphical Indicator
B-004/20/FA/EN	2000 kN	EN 12390-4	Full Automatic	4-Column	LCD Graphical Indicator
B-004/30/SA/EN	3000 kN	EN 12390-4	Semi Automatic	4-Column	Digital Load Indicator
B-004/30/SRV/EN	3000 kN	EN 12390-4	Servo-Controlled, Full Automatic	4-Column	LCD Graphical Indicator
B-004/30/FA/EN	3000 kN	EN 12390-4	Full Automatic	4-Column	LCD Graphical Indicator

CONCRETE



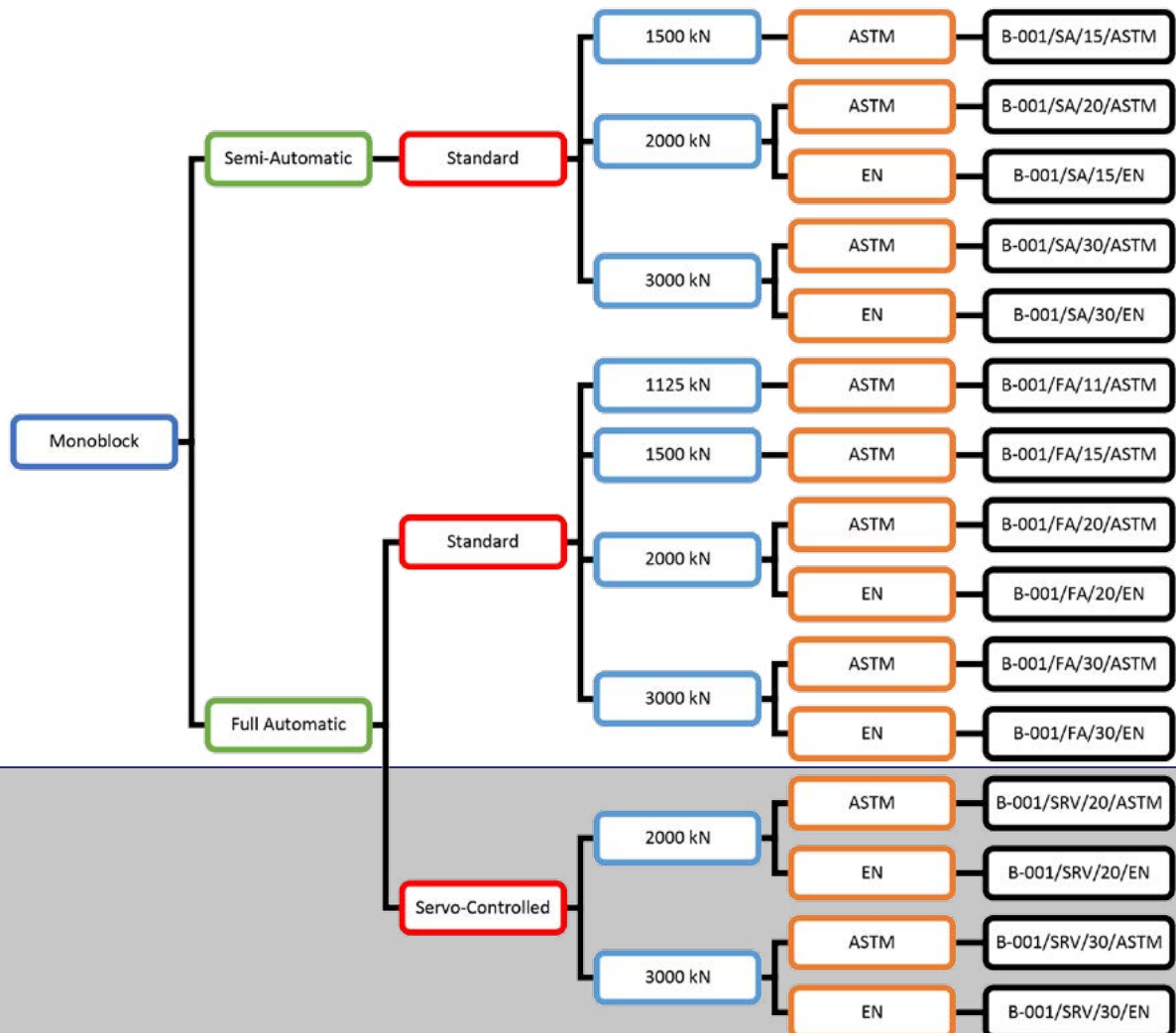
## COMPRESSIVE STRENGTH

## CONCRETE

## COMPRESSION TESTER - Monoblock (B-001)

ASTM C39 • EN 12390-4

### ORDERING INFORMATION

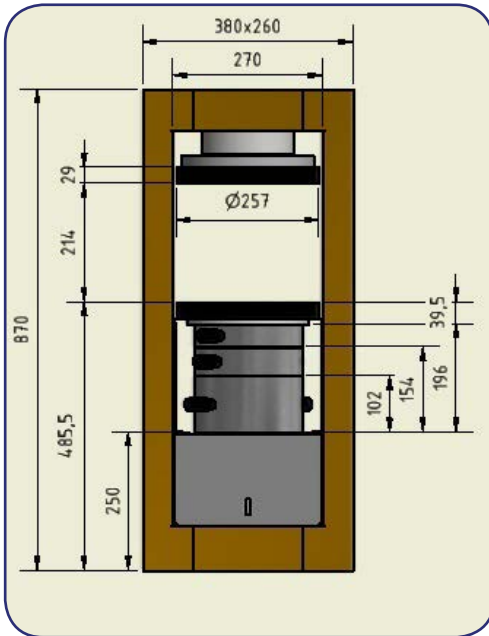


### FEATURES

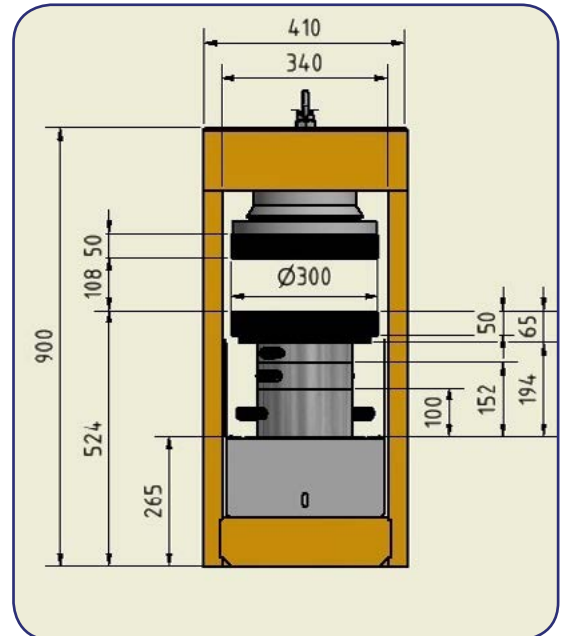
- Rigid monoblock structure
- Interlocked at the welding sections for higher stability and stiffness
- The rigid frame features welded box construction resulting in a monoblock unit that meets standards' rigidity requirements.
- All the monoblock frames are supplied standard with front safety guard door.
- By combining the stiffness of the frame with the accuracy of the control unit, one machine can perform tests on a variety of specimen types.

CONCRETE

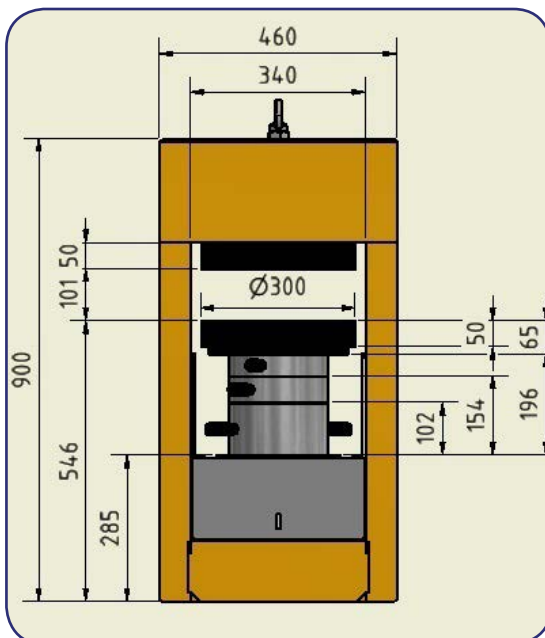
**COMPRESSION TESTER - Semi-Automatic / Monoblock (B-001/SA)**  
ASTM C39 • EN 12390-4



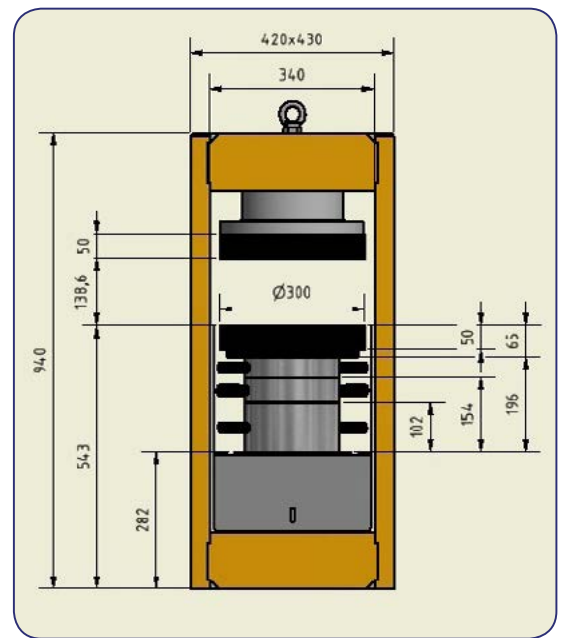
1500 kN Monoblock Frame Dimensions



2000 kN ASTM Monoblock Frame Dimensions



2000 kN EN Monoblock Frame Dimensions



3000 kN Monoblock Frame Dimensions



## COMPRESSIVE STRENGTH

## CONCRETE

## COMPRESSION TESTER - Semi-Automatic / Monoblock (B-001/SA)

ASTM C39 • EN 12390-4

### TECHNICAL SPECIFICATIONS

- 
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 4" X 8") (Ø 10 x 20 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz



### AVAILABLE OPTIONS for ASTM

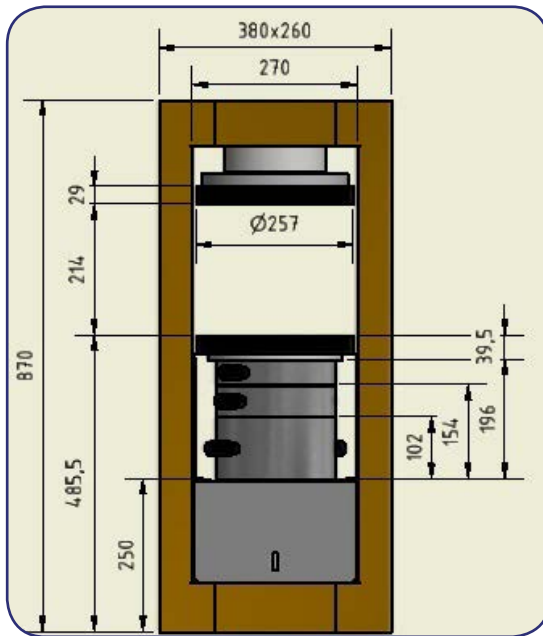
Code	Capacity	Standard
B-001/SA/15/ASTM	1500 kN	ASTM C39
B-001/SA/20/ASTM	2000 kN	ASTM C39
B-001/SA/30/ASTM	3000 kN	ASTM C39

### AVAILABLE OPTIONS for EN

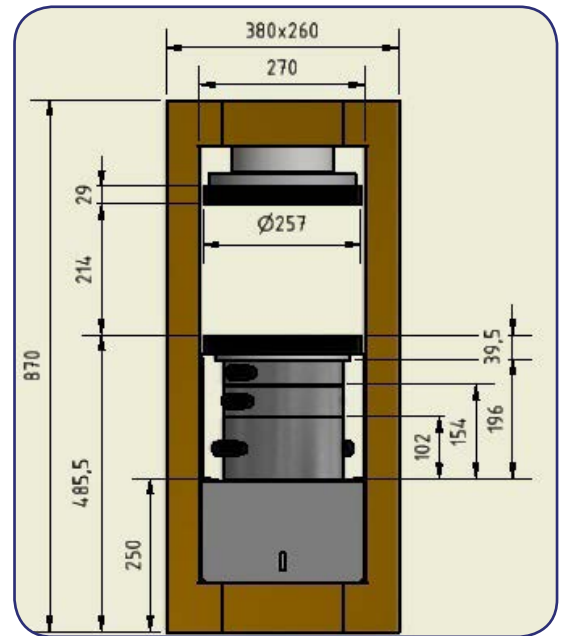
Code	Capacity	Standard
B-001/SA/20/EN	2000 kN	EN 12390-4
B-001/SA/30/EN	3000 kN	EN 12390-4

### CONCRETE

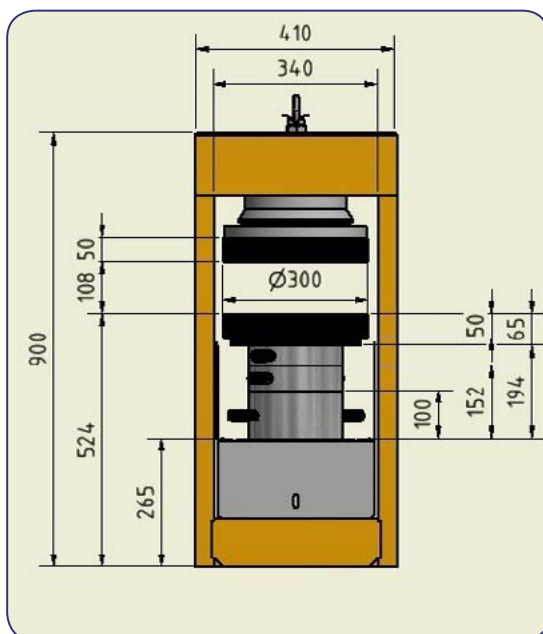
#### ■ COMPRESSION TESTER - Full Automatic / Monoblock (B-001/FA) ASTM C39 • EN 12390-4



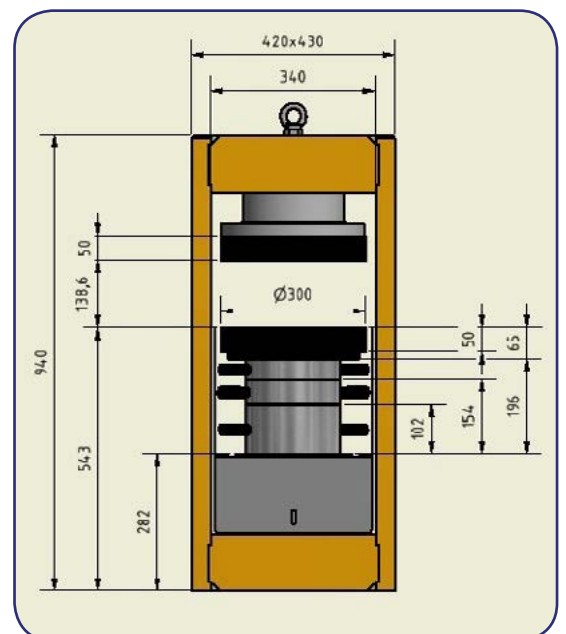
1125 kN Monoblock Frame Dimensions



1500 kN Monoblock Frame Dimensions



2000 kN Monoblock Frame Dimensions



3000 kN Monoblock Frame Dimensions

## COMPRESSION TESTER - Full Automatic / Monoblock (B-001/FA)

ASTM C39 • EN 12390-4

### TECHNICAL SPECIFICATIONS

- Full Automatic with Real Time LCD Graphical Data Acquisition Control System
- Automatic Load Rate
- Stops upon test completion and indicates max. load & stress
- Connectable to computer and/or thermal printer
- Unit selection available (kN, kgf, lbf)
- User-friendly calibration (password protected)
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 4" X 8") (Ø 10 x 20 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz



### AVAILABLE OPTIONS for ASTM

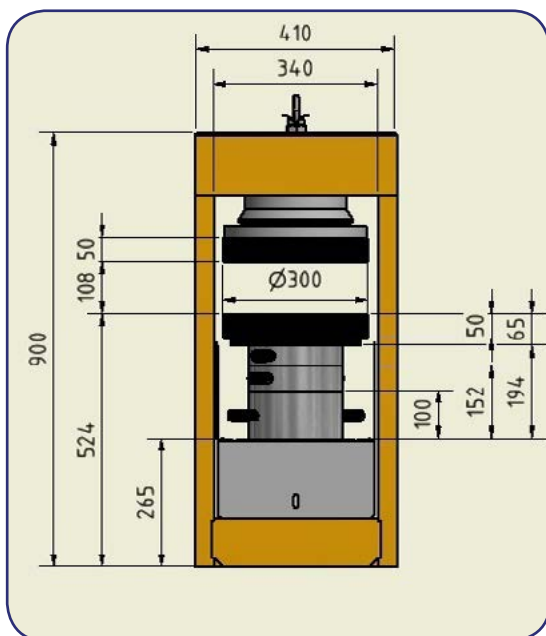
Code	Capacity	Standard
B-001/FA/11/ASTM	1125 kN	ASTM C39
B-001/FA/15/ASTM	1500 kN	ASTM C39
B-001/FA/20/ASTM	2000 kN	ASTM C39
B-001/FA/30/ASTM	3000 kN	ASTM C39

### AVAILABLE OPTIONS for EN

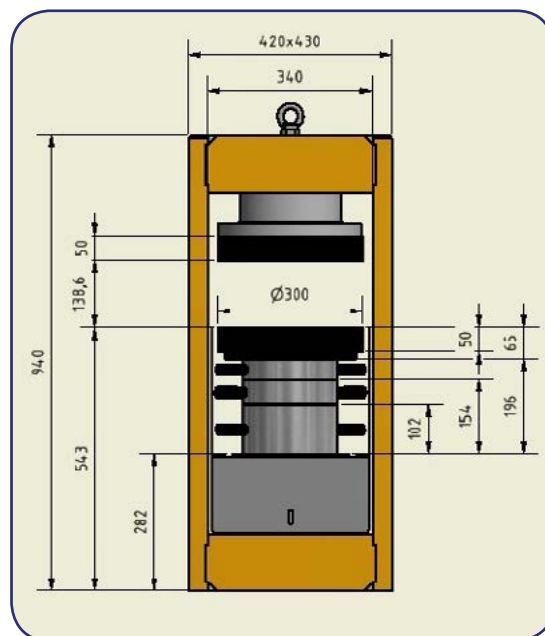
Code	Capacity	Standard
B-001/FA/20/EN	2000 kN	EN 12390-4
B-001/FA/30/EN	3000 kN	EN 12390-4

### CONCRETE

#### ■ COMPRESSION TESTER - Servo-Controlled / Monoblock (B-001/SRV) ASTM C39 • EN 12390-4



2000 kN Monoblock Frame Dimensions



3000 kN Monoblock Frame Dimensions





## COMPRESSION TESTER - Servo-Controlled / Monoblock (B-001/SRV)

ASTM C39 • EN 12390-4

### TECHNICAL SPECIFICATIONS

- Full Automatic, Servo-Controlled Hydraulic System with Real Time LCD Graphical Data Acquisition Control System
- Automatic Load Rate
- Stops upon test completion and indicates max. load & stress
- Connectable to computer and/or thermal printer
- Unit selection available (kN, kgf, lbf)
- User-friendly calibration (password protected)
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 4" X 8") (Ø 10 x 20 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz



### AVAILABLE OPTIONS for ASTM

Code	Capacity	Standard
B-001/SRV/20/ASTM	2000 kN	ASTM C39
B-001/SRV/30/ASTM	3000 kN	ASTM C39

### AVAILABLE OPTIONS for EN

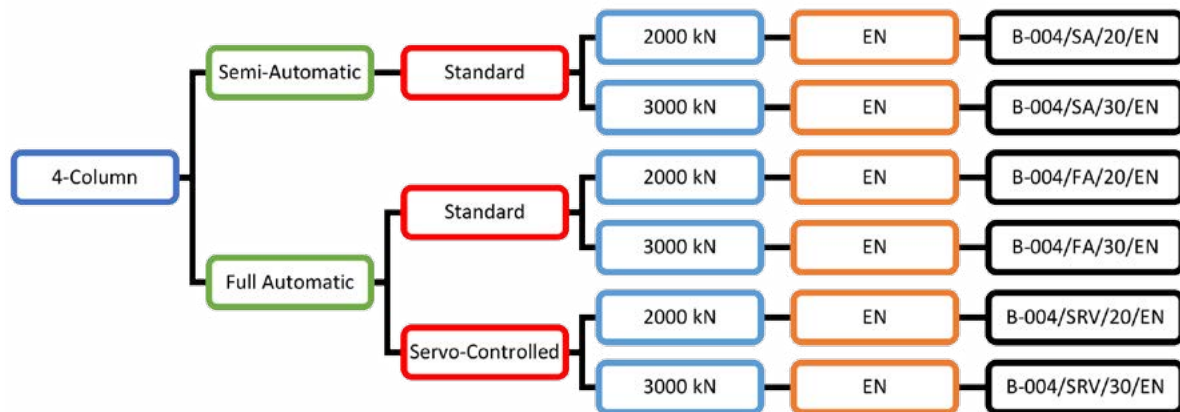
Code	Capacity	Standard
B-001/SRV/20/EN	2000 kN	EN 12390-4
B-001/SRV/30/EN	3000 kN	EN 12390-4



## COMPRESSION TESTER - 4-Column (B-004)

EN 12390-4

### ORDERING INFORMATION

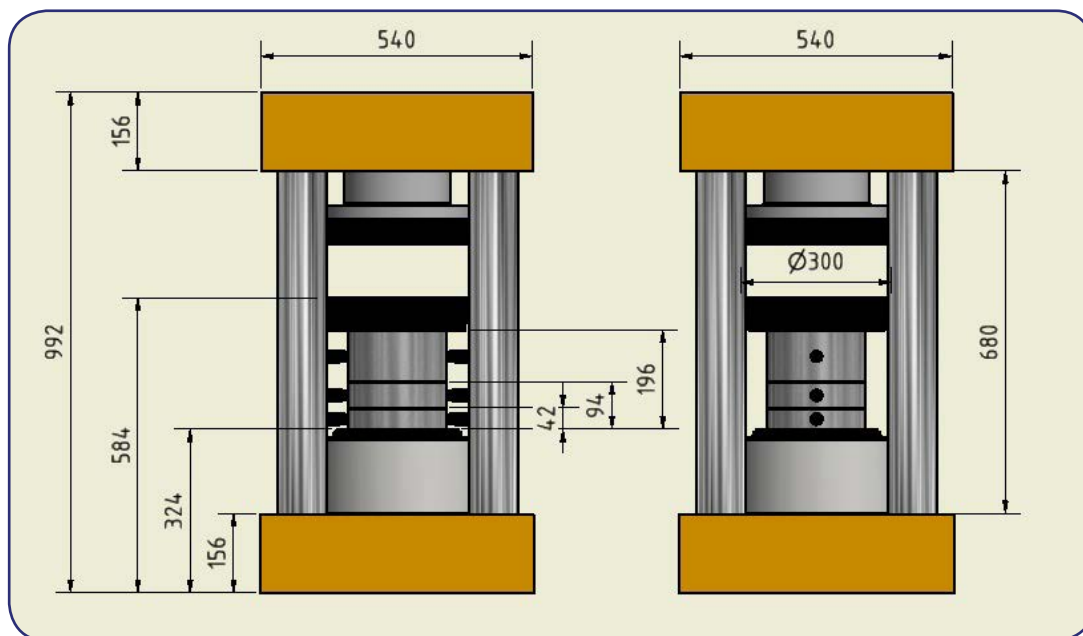


### FEATURES

- 4-Column structure
- Prestressed columns provides high rigidity
- The rigid frame features prestressed columns construction resulting in a single unit that meets standards' rigidity requirements.
- All the 4-Column frames are supplied standard with front safety guard door.
- By combining the stiffness of the frame with the accuracy of the control unit, one machine can perform tests on a variety of specimen types.

CONCRETE

**COMPRESSION TESTER - Semi-Automatic / 4-Column (B-004/SA)**  
EN 12390-4



4-Column Frame Dimensions





## ■ **COMPRESSION TESTER - Semi-Automatic / 4-Column (B-004/SA)** EN 12390-4

### ● **TECHNICAL SPECIFICATIONS**

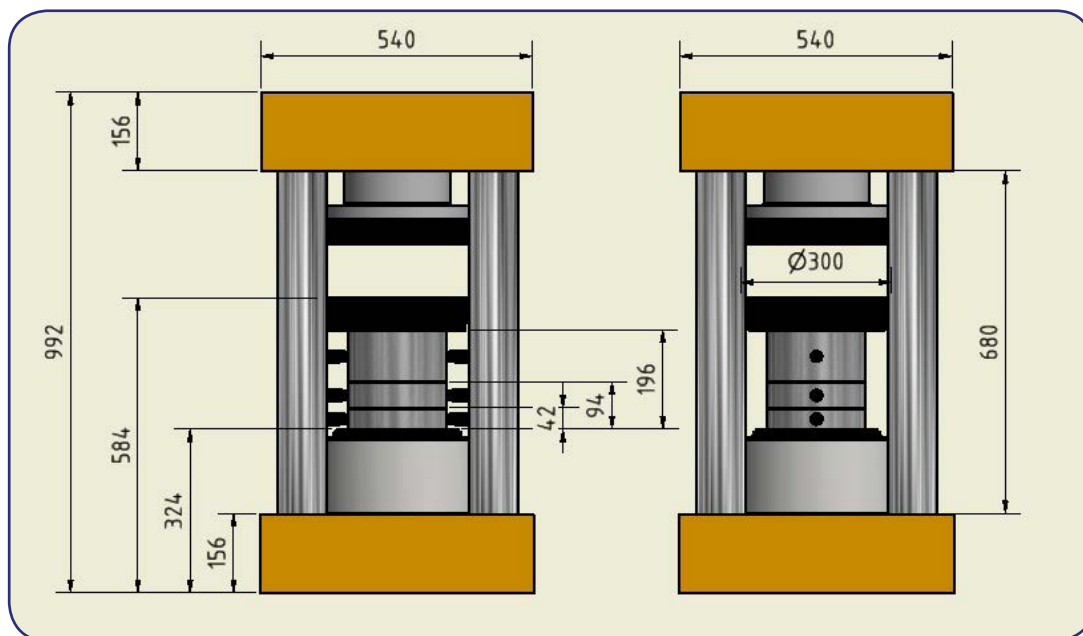
- Rigid 4-column frame
- EN Stability
- Semi Automatic with Digital Load Indicator
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz

### ● **AVAILABLE OPTIONS for EN**

Code	Capacity	Standard
B-004/SA/20/EN	2000 kN	EN 12390-4
B-004/SA/30/EN	3000 kN	EN 12390-4

CONCRETE

**COMPRESSION TESTER - Full Automatic / 4-Column (B-004/SA)**  
EN 12390-4



4-Column Frame Dimensions



## ■ COMPRESSION TESTER - Full Automatic / 4-Column (B-004/SA) EN 12390-4

### ● TECHNICAL SPECIFICATIONS

- Rigid 4-column frame
- Full Automatic with Real Time LCD Graphical Data Acquisition Control System
- Automatic Load Rate
- Stops upon test completion and indicates max. load & stress
- Connectable to computer and/or thermal printer
- Unit selection available (kN, kgf, lbf)
- User-friendly calibration (password protected)
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 4" X 8") (Ø 10 x 20 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz

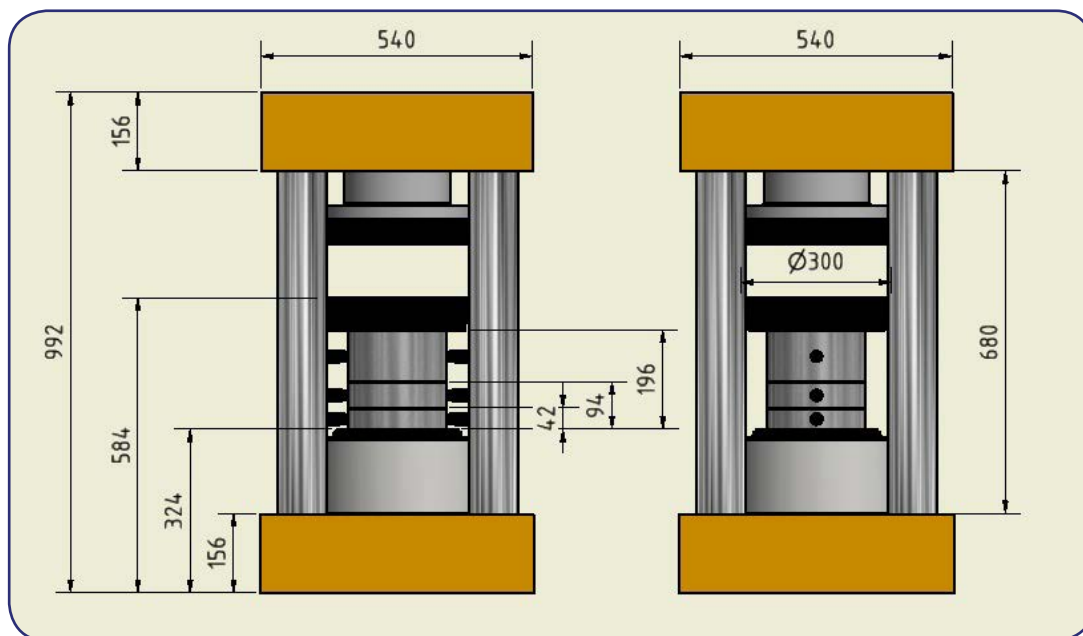


### ● AVAILABLE OPTIONS for EN

Code	Capacity	Standard
B-004/FA/20/EN	2000 kN	EN 12390-4
B-004/FA/30/EN	3000 kN	EN 12390-4

CONCRETE

■ **COMPRESSION TESTER - Servo-Controlled / 4-Column (B-004/SA)**  
EN 12390-4



4-Column Frame Dimensions





## ■ COMPRESSION TESTER - Servo-Controlled / 4-Column (B-004/SA) EN 12390-4

### ● TECHNICAL SPECIFICATIONS

- Rigid 4-column frame
- Full Automatic , Servo-Controlled Hydraulic System with Real Time LCD Graphical Data Acquisition Control System
- Automatic Load Rate
- Stops upon test completion and indicates max. load & stress
- Connectable to computer and/or thermal printer
- Unit selection available (kN, kgf, lbf)
- User-friendly calibration (password protected)
- Limit switch installed to prevent piston over-travelling
- Equipped with safety front guard
- Supplied with distance pieces to test:
  - Cubes (15 x 15 cm)
  - Cylinders (Ø 4" X 8") (Ø 10 x 20 cm)
  - Cylinders (Ø 6" X 12") (Ø 15 x 30 cm)
- 220 - 240 V / 50 - 60 Hz



### ● AVAILABLE OPTIONS for EN

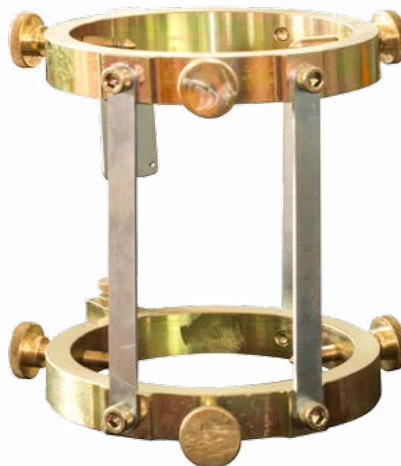
Code	Capacity	Standard
B-004/SRV/20/EN	2000 kN	EN 12390-4
B-004/SRV/30/EN	3000 kN	EN 12390-4

CONCRETE

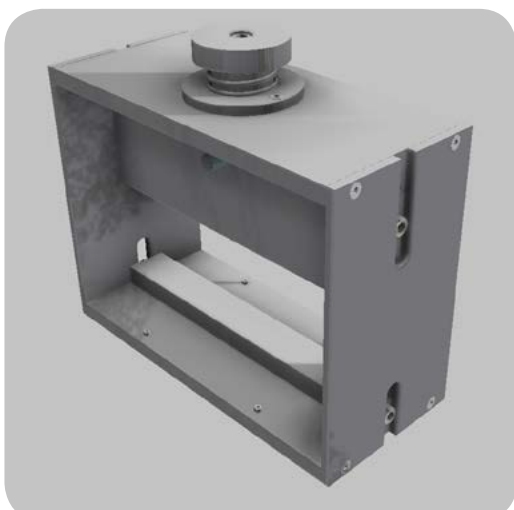
**THERMAL PRINTER (B-003/TP)**



**COMPRESSOMETER (B-003/CM)**



**SPLITTING TENSILE APPARATUS  
FOR CYLINDERS (B-003/ST-010)**

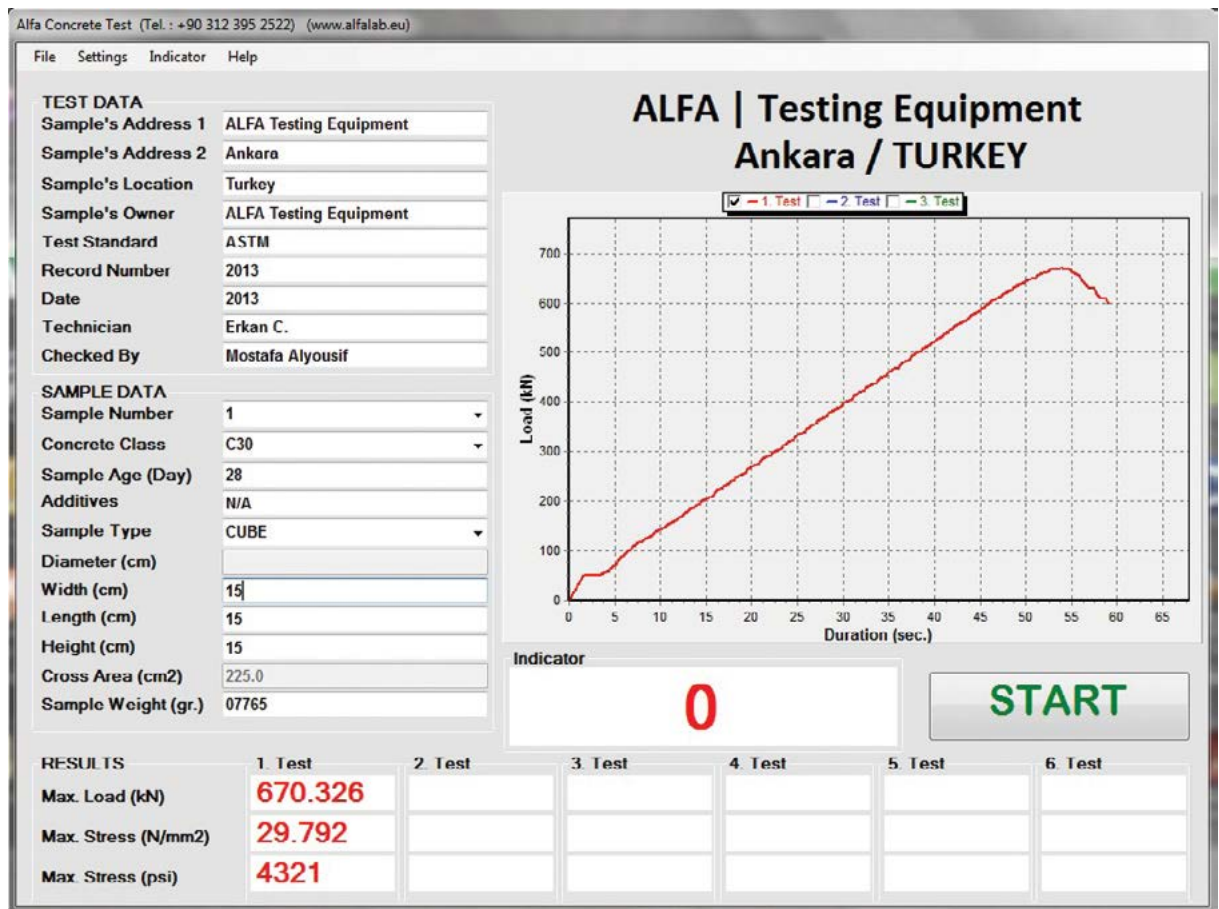


**SPLITTING TENSILE APPARATUS  
FOR CUBES (B-003/ST-011)**



## SOFTWARE for AUTOMATIC COMPRESSION TESTER (B-001/SW)

- The tests can be done and monitored with a computer by connecting it to the machine. Using the state-of-the-art software provided by ALFA with the machine will help performing and managing the tests in a very easy and fast way.
- By performing the tests via computer, the results can be saved and recalled when required. Reports can be generated automatically by the software and sent to printer.



### CONCRETE

#### FLEXURAL FRAME (B-001/FF)

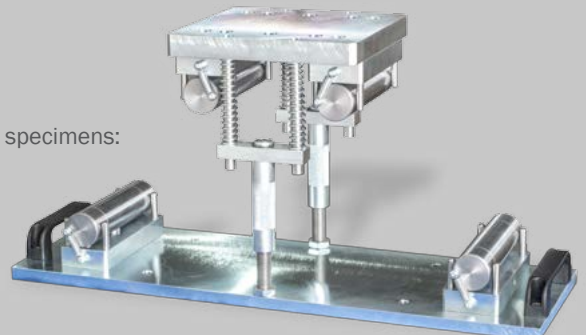


- Capacity: 200 kN
- Can be connected to compression tester (should be stated at the time of order).
- Used to perform 3-points or 4-points flexural tests on variety of concrete specimens.

#### FLEXURE APPARATUS for CONCRETE BEAMS (B-003/BFA)

##### TECHNICAL SPECIFICATIONS

- Made of galvanized steel
- Can perform 3-points or 4-points flexural tests on concrete beam specimens:
  - 100 x 100 x 400 mm
  - 100 x 100 x 500 mm
  - 150 x 150 x 600 mm
  - 150 x 150 x 750 mm





## FLEXURAL TESTING MACHINE (B-003/LCD)

- Used to test the flexural strength of the samples.
- The rigid design provides stability and strength to the machine for a better using experience.
- Equipped with an LCD unit that displays the data graphically of each test with the ability to save and recall the results of the tested materials.
- The Data Acquisition Control provides a real-time graphical view for the sample.
- Automatically determines the load rate in accordance with the international standards upon sample type.
- With the AUTO-STOP function, the machine will automatically stop upon finishing the test.



- Can be made with different capacities and designs to serve varied purposes and to cover wider range of test samples such as:
  - Curbstone (B-001/CS)
  - Tiles (with sizes up to 80 x 80 cm) (B-001/T)
  - Concrete Beams (B-001/CB)
- The capacity for the equipment is to be specified at the time of inquiry.
- The maximum size of sample is to be specified at the time of inquiry.

## CONCRETE

## ■ SLAB TESTING MACHINE (B-007)



## ● TECHNICAL SPECIFICATIONS

- Fully Automatic
- Graphical Data Acquisition Control System
- Two Pistons with Capacity of 100 kN each
- Flexure span is adjustable
- Flexure test for 3 or 4 points
- Hydraulic System
- Supplied with 2 deformation measurement systems

## CONCRETE PIPE TESTING MACHINE (B-008/PT)

- Supplied with a graphical LCD Data Acquisition Control System and an ability to store and report the results.
- The calibration for the equipment can be easily done on 5 pts.
- Pipe length and diameter should be specified at the time of inquiry.



Code	B-008/PT/0400	B-008/PT/1000
Capacity	400 kN 40 ton	1000 kN 100 ton
Pipe Diameter	Min. 300 mm Max. 1600 mm	Min. 300 mm Max. 2400 mm
Pipe Length	Min. 1000 mm Max. 2000 mm	Min. 1500 mm Max. 3000 mm

### CONCRETE

#### CAPPING PAD and CAPPING RETAINER (B-016) ASTM C1231

Code	Item	Hardness	Diameter
B-016/250	CAPPING PAD	50 Durometer	Ø 2"
B-016/260	CAPPING PAD	60 Durometer	Ø 2"
B-016/270	CAPPING PAD	70 Durometer	Ø 2"
B-016/350	CAPPING PAD	50 Durometer	Ø 3"
B-016/360	CAPPING PAD	60 Durometer	Ø 3"
B-016/370	CAPPING PAD	70 Durometer	Ø 3"
B-016/450	CAPPING PAD	50 Durometer	Ø 4"
B-016/460	CAPPING PAD	60 Durometer	Ø 4"
B-016/470	CAPPING PAD	70 Durometer	Ø 4"
B-016/650	CAPPING PAD	50 Durometer	Ø 6"
B-016/660	CAPPING PAD	60 Durometer	Ø 6"
B-016/670	CAPPING PAD	70 Durometer	Ø 6"
B-016/CR/4	CAPPING RETAINER (Set of 2)	N/A	Ø 4"
B-016/CR/6	CAPPING RETAINER (Set of 2)	N/A	Ø 6"



#### CYLINDER CAPPING SET (B-015) ASTM C31 • ASTM C192 • EN 12390-3 • AASHTO T23

- Consists of a melting pot and a Capping Apparatus.
- The melting pot is used to melt the capping compounds. The temperature of the pot is adjustable with the thermoregulator. Pilot lamp built-in the pot is used to indicate the heating status.
- The melting pot is made of double-walled frame.

#### SUPPLIED WITH

- Capping apparatus (Used for Ø 100 mm and Ø 150 mm cylinders)

#### TECHNICAL SPECIFICATIONS

- Melting pot (4.5 lt):
  - Thermostatically Controlled
  - Insulated double-wall
- 220 - 240 V / 50 - 60 Hz





## AUTOMATIC GRINDING MACHINE (B-199)

- Used to grind the end of cylinder and cube specimens for the laboratories and concrete batch plants who don't want to deal with capping compounds
- Can grind the following combinations simultaneously:
  - 3 x (Ø 100 x 200 mm / 4" x 8") cylinder specimens
  - 2 x (Ø 150 x 300 mm / 6" x 12") cylinder specimens
- Robust body
- Automatic moving platform
- Easy locking mechanism
- Equipped with:
  - Grinding wheel Ø 200 mm
  - Limit switches
  - Emergency stop
  - Transparent guard
  - Water inlet control



### EQUIPPED WITH

- Grinding wheel Ø 200 mm
- Limit switches
- Emergency stop
- Transparent guard
- Water inlet control

### TECHNICAL SPECIFICATIONS

- Robust body
- Automatic moving platform
- Easy locking mechanism
- Can grind the following combinations simultaneously:
  - 3 x (Ø 100 x 200 mm / 4" x 8") cylinder specimens
  - 2 x (Ø 150 x 300 mm / 6" x 12") cylinder specimens
- 220 - 240 V / 50 - 60 Hz

### CONCRETE

#### UNIVERSAL CUTTING MACHINE (B-062)

- Used to cut construction materials
- It is equipped with a disc holder
- Ideal for wet cutting
- Supplied with precision linear guide bar system with movable specimen trolley, and a disk with dust-proof cover.



Cutting Machine (B-062/S)

- Special custom-made cutting machines (B-062/SP) (with multiple saw discs, custom cutting length ... etc) are also available.



Cutting Machine (B-062/SP)

#### SUPPLIED WITH

- Cutting Blade

#### TECHNICAL SPECIFICATIONS

- 220 - 240 V / 50 - 60 Hz

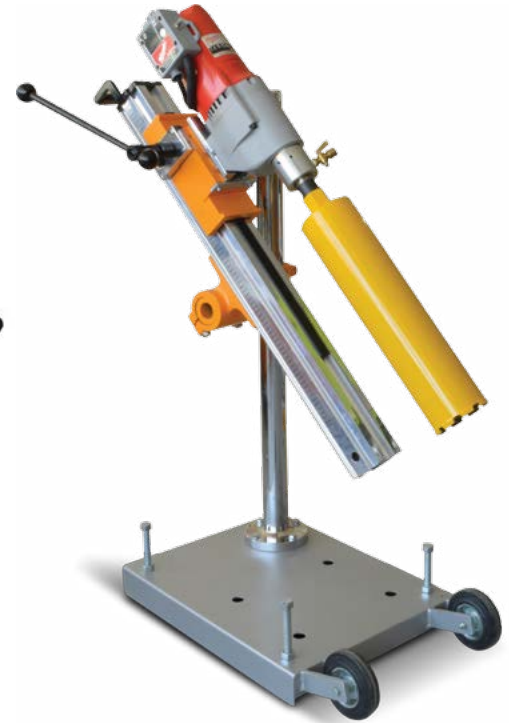
	B-062/S	B-062/M
Blade Diameter	Ø 350 mm	Ø 450 mm
Blade Model	B-062/CB350	B-062/CB450
Cutting Length	420 mm	420 mm
Max. Specimen Height	105 mm	155 mm

## CORING MACHINE (B-061)

- Used to take core samples from irregular rocks or to extrude the core from specimens for test purposes.
- Standard 1 1/4" thread
- Core Bits should be ordered separately



Coring Machine (B-061)



Rotatable Coring Machine (B-061/R)

### TECHNICAL SPECIFICATION:

- Power input : 2500 W
- Rated Speed : 450 rpm
- Max. drill : Ø 162 mm
- Water inlet
- B-061/R model can rotate from 0° to 89°
- Standard 1 1/4" thread for bits
- 220 - 240 V / 50 - 60 Hz

### CORE BITS (B-061/X)

Code	Dimensions
B-061/2	Ø 50 x 400 mm
B-061/3	Ø 75 x 400 mm
B-061/4	Ø 100 x 400 mm
B-061/6	Ø 150 x 400 mm



### CONCRETE

#### DRUM - TYPE MIXER (B-121)

- Used to create concrete mixes and specimens. The drum-type mixers provides efficient and homogeneous mixtures.
- Equipped with a manual discharge placed at the side of the mixer for direct emptying for the drum.



#### TECHNICAL SPECIFICATIONS

Code	Drum Capacity	Efficient Mixing Capacity	Power Supply
<b>B-121/100</b>	125 lt	100 lt	Electric Motor 220 - 240 V / 50 - 60 Hz
<b>B-121/250</b>	340 lt	250 lt	Electric Motor 380 V / 50 - 60 Hz
<b>B-121/350</b>	490 lt	350 lt	Electric Motor 380 V / 50 - 60 Hz
<b>B-121/350-D</b>	490 lt	350 lt	Diesel Engine



## PAN - TYPE MIXER (B-120)

- Used to create trial specimens for the concrete mix design. The pan-type mixers provides efficient and homogeneous mixtures.
- 42 lt and 100 lt capacity models are equipped with removable pan that tilts for easier access and emptying on completion of the mixing operation.
- The pan is rotated by a turntable driven by electric motor
- 100 lt and 225 lt models have a manual discharge door placed at the side of the pan for direct emptying
- Some models are equipped with secondary motor for double-action mixing (as shown in the table below)



### TECHNICAL SPECIFICATIONS

Code	Pan Capacity	Efficient Mixing Capacity	Power Supply	Double-Action Mixing
B-120/020/D	42	20	Electric Motor 220 - 240 V / 50 - 60 Hz	●
B-120/056	100	56	Electric Motor 220 - 240 V / 50 - 60 Hz	○
B-120/056/D	100	56	Electric Motor 220 - 240 V / 50 - 60 Hz	●
B-120/100	130	100	Electric Motor 380 V / 50 - 60 Hz	○
B-120/225	285	225	Electric Motor 380 V / 50 - 60 Hz	○

### CONCRETE

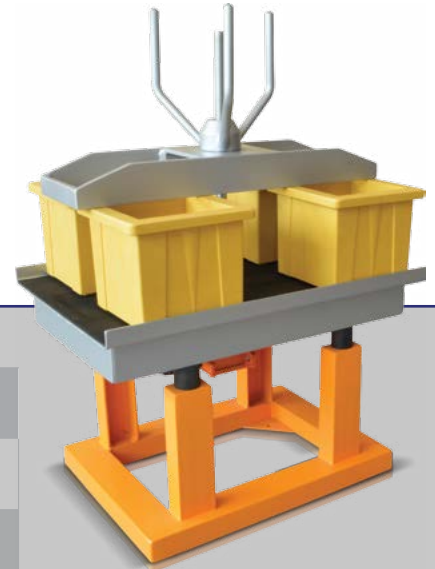
#### MOULDS (B-01x)



Code	Shape	Material	Type	Internal Dimensions (mm)
B-011/M/10	Cube	Steel	Single Gang	100 x 100 x 100
B-011/P/10-2	Cube	Plastic	Double Gang	100 x 100 x 100
B-011/M/15	Cube	Cast Iron	Single Gang	150 x 150 x 150
B-011/P/15	Cube	Plastic	Single Gang	150 x 150 x 150
B-011/M/20	Cube	Cast Iron	Single Gang	200 x 200 x 200
B-010/P/10	Cylinder	Plastic	Single Gang	Ø 100 x 200
B-010/M/10	Cylinder	Steel	Single Gang	Ø 100 x 200
B-010/P/15	Cylinder	Plastic	Single Gang	Ø 150 x 300
B-010/M/15	Cylinder	Steel	Single Gang	Ø 150 x 300
B-017/35	Prism / Beam	Steel	Single Gang	100 x 100 x 350
B-017/40	Prism / Beam	Steel	Single Gang	100 x 100 x 400
B-017/50	Prism / Beam	Steel	Single Gang	100 x 100 x 500
B-017/55	Prism / Beam	Steel	Single Gang	150 x 150 x 550
B-017/60	Prism / Beam	Steel	Single Gang	150 x 150 x 600
B-017/75	Prism / Beam	Steel	Single Gang	150 x 150 x 750

## VIBRATING TABLE (B-125)

- Designed from robust steel and has a very steady frame
- Used to compact the concrete specimens in the laboratory
- Equipped with a vibrating motor
- Supplied with a clamp assembly for moulds.



Code	Table Dimensions	Mould Capacity	Power Supply
B-125/S	600 x 400 mm	4	220 - 240 V / 50 - 60 Hz
B-125/L	1260 x 620 mm	6	220 - 240 V / 50 - 60 Hz
B-125/12V	200 x 200 mm	1	12 V

## POKER VIBRATOR (B-128)

- The lab-type poker vibrator is used for internal compaction for the concrete specimens.
- The flexible shaft is 1 meter long.



### TECHNICAL SPECIFICATIONS

- Ø 25 mm Flexible shaft (1 m long)
- Direct Connection to the Motor
- 220 - 240 V / 50 - 60 Hz

### CONCRETE

#### CURING TANK - PLASTIC (B-140/P)

ASTM C31 • BS 1881-11

- Used to cure cylinders, cubes, beams and other samples that requires total immersion in water at a specified constant temperature.
- Equipped with a digital thermostat and indicator.
- Supplied with a base rack and a water circulation pump.



#### SUPPLIED WITH

- Heater Unit with Digital Thermostat and indicator
- Base Rack
- Water Circulation Pump

Code	Internal Dimensions	Capacity
B-140/P	150 x 100 x 80 (h) cm	1200 lt
B-140/P-L	200 x 100 x 80 (h) cm	1600 lt

#### TECHNICAL SPECIFICATIONS

- Made of plastic
- 220 - 240 V / 50 - 60 Hz



**CURING****CONCRETE**

### **CURING TANK - METAL (B-140/M)** ASTM C31 • BS 1881-11

- Used to cure cylinders, cubes, beams and other samples that requires total immersion in water at a specified constant temperature.
- Equipped with Heater unit (digital thermostat and indicator).
- Supplied with a base rack and a water circulation pump.



#### **SUPPLIED WITH**

- Base Rack
- Water Circulation Pump

#### **TECHNICAL SPECIFICATIONS**

- Made of powder-coated metal
- 220 - 240 V / 50 - 60 Hz



Controlling Unit (B-140/M/CU)

### CONCRETE

#### CONCRETE FLOW TABLE (700 X 700 mm) (B-024/EN) EN 12350-5

- Used for determining the concrete workability
- Consists of flow table, cone and wooden tamper



#### SUPPLIED WITH

- Conical Mould (Ø 130 / Ø 200 mm x 200 mm)
- Wooden Tamping Rod (40 x 40 mm)

#### TECHNICAL SPECIFICATIONS

- Table Dimensions: 700 x 700 mm, hinged from one side, marked at Ø 200 mm

#### CONCRETE FLOW TABLE (Ø 762 mm) (B-024/ASTM) ASTM C124

- Used for determining the consistency of fresh concrete mix



#### SUPPLIED WITH

- Conical Mould (Ø 171.5 mm / Ø 254 mm x 127 mm)
- Tamping Rod (Ø 16 mm x 600 mm)

#### TECHNICAL SPECIFICATIONS

- Table Diameter: 762 mm
- Drop Height: 12.7 mm

## SLUMP SET (B-020)

ASTM C143 • EN 123350-2

- The consistency is a measure of the wetness of the concrete mixture, which is commonly evaluated in terms of slump. The test gives indication of the ease with which the concrete flows.
- Available in galvanized or stainless steel.



Item	Galvanized (B-020/G)	Stainless Steel (B-020/SS)
Slump Cone	B-020/G/C	B-020/SS/C
Base Plate	B-020/G/BP	B-020/SS/BP
Slump Cone Funnel	B-020/G/F	
Tamping Rod (Ø16 mm x 600 mm)	B-020/G/TR	

### CONCRETE

#### ■ SCC SLUMP-FLOW TEST SET (B-021) EN 12350-8

- Used to determine the confined slump-flow and  $t_{500}$  time of Self-Consolidating Concrete (SCC)
- The test is not suitable for concrete mix having aggregate particle sizes more than 40 mm



#### ● TECHNICAL SPECIFICATIONS

- Slump cone, made of galvanized steel
- Base plate (900 x 900 mm), made of stainless steel, marked at:
  - Ø 210 mm
  - Ø 500 mm

#### ■ U-SHAPE BOX APPARATUS (B-029)

- Used to determine the confined flowability of Self-Consolidating Concrete (SCC)

#### ● TECHNICAL SPECIFICATIONS

- Made of stainless steel
- Guillotine form gate





## ■ SIEVE SEGREGATION TEST SET (B-023) EN 12350-11

- Used to determine the sieve segregation resistance of Self-Consolidating Concrete (SCC).



### ● COMPOSED OF

- Perforated Sieve - 5 mm Aperture (Ø 300 mm)
- Pan (Ø 300 mm)
- Bucket (> 11 liters)

## ■ CONCRETE BLEEDING TEST SET (B-028) EN 480-4

- Used to determine the relative quantity of mixing water that will bleed from a sample of freshly mixed concrete



### ● COMPOSED OF

- Cylindrical container with Cover (Ø 250 x 280 mm)
- Tamping Rod B-020/G/TR
- Pipette (50 ml) GL-27/50
- Glass Beaker (100 ml) GCB/0100

### CONCRETE

#### V-FUNNEL APPARATUS (B-025)

- Used in Flow-time determination for Self-Consolidating Concrete (SCC)
- Out flow orifice is equipped with a valve that can be opened momentarily
- Supplied with bucket



#### TECHNICAL SPECIFICATIONS

- Made of stainless steel
- Stand-mounted

#### L-BOX APPARATUS (B-026)

- Used to determine the confined flowability of fresh Self-Consolidating Concrete (SCC) and to evaluate the filling and passing ability
- Made of stainless steel

#### SUPPLIED WITH

- 2 different obstacles:
  - 2 x Ø12 mm smooth bars having 59 mm gaps
  - 3 x Ø12 mm smooth bars having 41 mm gaps

#### TECHNICAL SPECIFICATIONS

- Made of stainless steel
- Guillotine-form gate



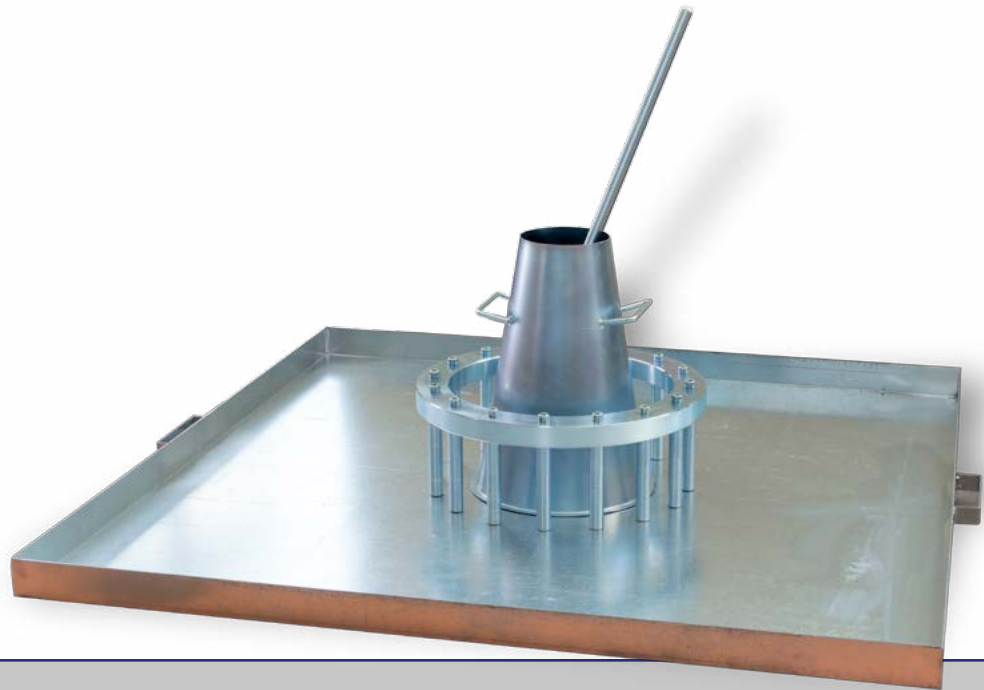
**J-RING APPARATUS (B-027)**

ASTM C1621 • EN 12350-12

- Used to determine the passing ability of self-consolidating concrete (SCC).
- The apparatus consists of a rigid ring supported bars equally spaced on a 300 mm (12 in) diameter circle above a flat surface

**SUPPLIED WITH**

- Slump cone
- Tamping rod
- Base plate.



	<b>B-027/ASTM</b>	<b>B-027/EN/N</b>	<b>B-027/EN/W</b>
Standard	ASTM C1621	EN 12350-12 (Narrow spaced)	EN 12350-12 (Wide Spaced)
Ring Diameter	Ø 300 mm (~ 12")	Ø 300 mm	Ø 300 mm
Number of Bars	16	16	12
Bar Diameter	Ø 16 mm	Ø 18 mm	Ø 18 mm

### CONCRETE

#### ■ WALTZ CONTAINER (B-132) EN 12350-4

- Used to determine the consistency of fresh concrete by determining its degree of compactability
- Box dimensions: 200 x 200 x 400 (h) mm



#### ■ K-SLUMP TESTER (B-031) ASTM C1362

- Used for determining the degree of compaction and the workability of concrete



#### ■ KELLY-BALL PENETRATION APPARATUS (B-022) ASTM C360

- Used to determine the workability of concrete as an alternative to Slump Test, where 1" of kelly ball penetration corresponds to 2" of slump value
- Complete with metal hemispherical cylinder and graduated handle

#### ● TECHNICAL SPECIFICATIONS

- Metal hemispherical cylinder:
  - Diameter : Ø 6"
  - Height : 4 5/8"
- Weight of the movable parts: 30 lb (13.6 kg)





## VEBE CONSISTOMETER (B-130)

ASTM C1170 • ASTM 1176 • EN 12350-3

- Used to determine the consistency of concrete using a vibrating table
- Equipped with Vibrating Motor having fixed amplitude and frequency
- B-130/ASTM/20 model is used to prepare cylindrical test specimens from concrete when the standard procedures of rodding and internal vibration are not applicable



### TECHNICAL SPECIFICATIONS

- Fixed amplitude and frequency
- 220 - 240 V / 50 - 60 Hz

	B-130/EN	B-130/ASTM/50	B-130/ASTM/20
Standard	EN 12350-3	ASTM C1170	ASTM C1176
Usage	Determining the consistency of concrete	Determining the consistency of concrete	Preparing cylindrical test specimens from concrete
Supplied With	Acrylic Disc Slump Cone Tamping Rod	Sliding surcharge weight (50 lb)	Sliding surcharge weight (20 lb)

### CONCRETE

## COMPACTING FACTOR APPARATUS (B-185)

BS 1881-103

- Consists of two conical hoppers attached above a cylinder, that are aligned on a robust steel frame.
- Each hopper is equipped with a hinge for a Quick Release mechanism.
- The compacting factor is the ratio between the weight of the concrete, which is partially compacted in the cone, to the weight of the fully-compacted concrete in the cylinder.
- Supplied with a tamping rod (B-020/G/TR).



### TECHNICAL SPECIFICATIONS

	Upper Hopper	Lower Hopper	Bottom Cylinder Mould
Upper Diameter	Ø 260 mm	Ø 240 mm	Ø 150
Lower Diameter	Ø 130 mm	Ø 130 mm	
Internal Height	280 mm	240 mm	285 mm

## **AIR ENTRAINMENT METER (B-320/B)**

ASTM C213 • BS 1881-106

- Used to determine the the volume change in a sample due to the application of pressure.
- The pressure gauge shows the direct percentage for the amount of air entrained.
- The capacity for the airmeter is 7 liters.
- The maximum aggregate size that can be used in this airmeter is 50 mm.
- The pump is built-in with the equipment.



### **SUPPLIED WITH**

- Straight edge
- Rubber blower bulb
- Tamping rod
- Plastic carrying case

### **TECHNICAL SPECIFICATIONS**

- B Type
- Capacity : 7 lt
- Air Content range : 0% - 100%
- Max Aggragate Size : 50 mm
- Built-in pump

### CONCRETE

#### CONCRETE PENETROMETER (B-135)

ASTM C403

- Used to determine the setting time of concrete, with slump greater than zero, by means of penetration resistance measurements on mortar sieved from the concrete mixture
- Consists of a spring penetrometer with capacity of 100 kgf and interchangeable stainless steel needles
- Equipped with a sliding ring that indicates the load reached upon testing

#### SUPPLIED WITH:

- Stainless Steel Needles Set
- Carrying Case



#### SUPPLIED NEEDLES SET:

Needle Area		Needle Diameter
1 in <sup>2</sup>	645 mm <sup>2</sup>	Ø 28.66 mm
1/2 in <sup>2</sup>	323 mm <sup>2</sup>	Ø 20.28 mm
1/4 in <sup>2</sup>	161 mm <sup>2</sup>	Ø 14.32 mm
1/10 in <sup>2</sup>	65 mm <sup>2</sup>	Ø 9.10 mm
1/20 in <sup>2</sup>	32 mm <sup>2</sup>	Ø 6.38 mm
1/40 in <sup>2</sup>	16 mm <sup>2</sup>	Ø 4.51 mm



## CONCRETE POCKET PENETROMETER - Pen-Type (B-304)

- Used to determine the initial set of concrete mortar



### TECHNICAL SPECIFICATIONS:

- Capacity: 4.5 MPa
- Plunger's surface area: 32.30 mm<sup>2</sup> (~ 1/20 sq.in)

## CONCRETE INITIAL SET PENETROMETER - Dial Model (B-308)

- Used to determine the initial set of concrete mortar



### TECHNICAL SPECIFICATIONS:

- Capacity: 50 kgf (700 lbs/sq.in = 700 psi)
  - Dial with scale readable in both (kgf/cm<sup>2</sup>) and (lbf/sq.in)
- Plunger's surface area: 32.30 mm<sup>2</sup> (~ 1/20 sq.in)

### CONCRETE

#### PULL-OFF TESTER (B-105)

EN 1015-12

- Used to measure the adhesive force / bond tensile strength of two layers of concrete, facing plasters, mortars, building plasters, lime etc. to its base.
- Manually-operated, compact, light and suitable for use in any location
- Fitted with a load cell and high resolution large digital display unit.
- Suitable for measurements from low loads up to 16 kN, granting a wide working range

#### SUPPLIED WITH

- Tensile pin
- Aluminum test plate - Ø 50 mm x 30 mm (10 ea) B-105/C/AL/50
- Drill bit (Ø 50 mm) B-105/DB/50
- Carrying Case



#### TECHNICAL SPECIFICATIONS

- Load capacity: 16 kN
- Working range: 0,25 to 16 kN
- Seat ball assuring axial/central load application
- Battery operated

#### ACCESSORIES

Code	Item
B-105/C/AL/20	Aluminum Test Plate - Ø 20 mm X 30 mm
B-105/C/AL/50	Aluminum Test Plate - Ø 50 mm X 30 mm
B-105/S/AL/50	Aluminum Test Plate - 50 mm X 50 mm X 30 mm
B-105/C/SS/50	Stainless Steel Test Plate - Ø 50 mm X 20 mm
B-105/CR/50	Cylindrical Cutting Ring - Ø 50 mm
B-105/DB/20	Drill Bit - Ø 20 mm
B-105/DB/50	Drill Bit - Ø 50 mm

## BOND STRENGTH TEST

## CONCRETE

## PULL-OUT TESTER (B-106)

- Used to determine the pullout strength of hardened concrete by measuring the force required to pull an anchor steel rebar from a concrete test specimen or structure. The insert or rebar is either cast into fresh concrete or installed in hardened concrete.



### SUPPLIED WITH

- Hydraulic extraction unit (jack and piston assembly)
- Digital display
- Three sets of grippers, suitable to test:
  - Ø 4 mm - Ø 8 mm
  - Ø 10 mm - Ø 20 mm
  - Ø 20 mm - Ø 30 mm

Code	Capacity	Grippers	Specimens to be Tested
B-106/10	100 kN	Two sets of grippers: <ul style="list-style-type: none"> <li>Ø 4 mm - Ø 8 mm</li> <li>Ø 10 mm - Ø 20 mm</li> </ul>	Up to Ø 20 mm
B-106/30	300 kN	Three sets of grippers: <ul style="list-style-type: none"> <li>Ø 4 mm - Ø 8 mm</li> <li>Ø 10 mm - Ø 20 mm</li> <li>Ø 20 mm - Ø 30 mm</li> </ul>	Up to Ø 30 mm

### CONCRETE

## CONCRETE WATER IMPERMEABILITY TESTER (B-245) EN 12390-8

- Used for determining the depth of penetration of water under pressure in hardened concrete specimens.
- Once the concrete specimens are clamped, the water under known pressure is applied.
- The water penetrated to the specimen is measured either by taking the reading through the graduated burette or by breaking the specimen.
- Manometer on the front panel is fixed to check water pressure.
- Air compressor should be ordered separately.



### TECHNICAL SPECIFICATIONS

- Suitable for:
  - Cubes (100 mm, 4")
  - Cubes (150 mm, 6")
  - Cylinders (Ø 150 mm, Ø 160 mm, Ø 6")
- Equipped with graduated burettes to measure the water penetration

Code	Specimen Capacity
B-245/3	1-3 specimens
B-245/6	1-6 specimens



## CRACK DETECTION MICROSCOPE (B-250)

- Used to measure the crack width in the concrete elements.
- Supplied with an adjustable light source and adjustable focus to have a better and clearer view for the crack.



### TECHNICAL SPECIFICATIONS

- Integral illumination
- Rotating eyepiece
- Focus adjustment
- Battery-Operated

Model	Magnification	Range	Subdivision
B-250/040	40X	2.00 mm	0.05 mm
B-250/100	100X	1.00 mm	0.01 mm

## REBAR-DETECTOR (Multi-Detector) (B-050/B)

- Used to detect the most frequent materials found behind walls, ceilings and floors, including ferrous and non-ferrous metals, AC live wires and studs.



### TECHNICAL SPECIFICATIONS

<b>Detectable materials</b>	Electricity, ferrous and non-ferrous metals, wood and metal substructures in drywalls
<b>Detection depth, steel, max.</b>	100 mm
<b>Detection depth, copper, max.</b>	80 mm
<b>Detection depth of live cables, max.</b>	50 mm
<b>Detection depth of wood, max.</b>	25 mm

### CONCRETE

#### ULTRASONIC PULSE VELOCITY TESTER (B-048/M)

ASTM C597 • EN 12504-4 • BS 1881-203

- Used to determine the place for the cracks, voids or defects in the in-situ or precast concrete elements and for long-term observation for the structure which is subjected to all the environmental conditions.
- The data obtained from the machine gives an indication regarding the homogeneity of the structural element using the sound pulse and by measuring the time needed for the sound to travel within the element.
- Calibration tools are also provided to zero the reading.



#### TECHNICAL SPECIFICATIONS

- Measuring range: 0 - 3000  $\mu$ s - accuracy +/- 0,1  $\mu$ s
- Selection of the ultrasonic pulse amplitude adjustable from 250 to 1000 V
- Measurement of the required time by the ultrasonic pulse to go through the tested material.
- Single or continuous acquisition mode with automatic or manual saving.
- Zero calibration with depuration of the time for the pulse to go through the probes.
- Calibration of a defined time value.
- Capacity of data acquisition, processing and filing of the test data up to 30.000 samples.
- Two outlets for connection to the oscilloscope.

The standard appliance includes:

- The instrument in basic configuration in a practical palmer container.
- Two 55kHz probes with connection cables.
- Calibrating cylinder and contact paste.
- Rechargeable Battery NiMh 4,8V > 2000m/A with low battery condition alarm.
- Anti shock case holding the unit and the accessories.

## ULTRASONIC PULSE VELOCITY TESTER (Proceq, Pundit Lab+) (B-048/P)

ASTM C597 • EN 12504-4 • BS 1881-203

- **Measurement performance;** Optimized pulse shaping, automated transmission settings for optimum performance and a range of new, more powerful transducers ensure accurate, stable measurements.
- **Integrated waveform display;** Allows analysis of the received signal and manual triggering directly on the instrument.
- **On-line data acquisition;** Full remote control of all transmission parameters, data logging function and functionality that turns your PC into an oscilloscope.
- **User interface and data analysis software;** Data analysis and export to third party programs.
- **Open interface;** Control Pundit Lab using third party software such as LabVIEW.
- **Integrated gain stage;** Removes the need for an external amplifier when using exponential transducers and long cables.
- **Compressive strength measurement;** Conversion curves for strength estimation can be created in the software and uploaded to the instrument to give instant strength estimations on site.
- **Combined estimates with rebound hammer;** SONREB curves may also be uploaded onto the instrument for improved compressive strength estimates in combination with rebound hammer measurements.
- **Time stamp;** A real time clock has been integrated to provide a time stamp to every measurement recorded.
- **Review list;** Saved measurements may be reviewed directly on site without the need for a PC connection.



### FEATURES

Transit time range	0.1-9999 $\mu$ s
Resolution	0.1 $\mu$ s
Energising pulse	125 V, 250 V, 350 V, 500 V, AUTO
Tx frequency range	24-500 kHz
Transit time	Yes
Pulse velocity	Yes
Path length	Yes
Surface velocity	Yes
Crack depth	Yes
Memory	> 500 readings
Power supply	Mains/Battery(>20h)/USB
IP Classification	IP42
Integrated gain stage	1x, 2x, 5x, 10x, 20x, 50x, 100x, 200x, 500x, 1000x
Compressive strength	Yes
SONREB method (Ultrasonic plus rebound hammer for compressive strength)	Yes
Time stamp for measurements	Yes
Measurement review list on instrument	Yes

### CONCRETE

## REBAR DETECTOR (Proceq, Profoscope+) (B-050/P+) BS 1881-204

- **Versatility;** rebar location and orientation, cover measurement and rebar diameter assessment all provided by a single, fully integrated, cordless instrument.
- **Ease of use;** the intuitive user interface and the the real-time visualization of the rebars make the instrument very easy to use.
- **Durability;** Sealed housing for use in rough environment with replaceable protection cover for long lasting performance, over a wide temperature range.
- **Memory functions;** Two different modes of operation are supported:
  - Manual data storage allows the user to save concrete cover and rebar diameter on individually chosen spots.
  - Automatic data storage is especially designed for surface scans. Every time a rebar is detected, the cover value is stored automatically.
- **Data export and analysis;** The Profolink software offered by Proceq is a professional tool to analyze the measurement results



# proceq

### FEATURES

#### Measuring Range

Up to 185 mm

#### Power Supply

Power source 2 x 1.5 V AA (IR6) batteries

Voltage range 3.6 V to 1.8 V

#### Battery Lifetime

Backlight off > 50 h

Backlight on > 15 h

#### Time Outs

Sleep mode 30 s

Auto shut down 120 s

#### Environmental Conditions

Temperature range -10° to 60° C (14° to 140° F)

Humidity range 0 to 100% rH

Protection class IP54

#### Data Storage

49'500 measurements total (500 objects with 99 measurements)

Compatible with Profolink Software



## COVER METER (Proceq, Profometer 650 AI) (B-050/P650)

- Advanced cover meters and rebar locators based on the eddy current pulse induction principle
- Assisted scan of any surface regardless of its size and geometry
- Universal probe and detachable ruggedized cart with wireless path measuring system
- Complies with international
- Housing specially designed to be used on-site in harsh environments, including carrying strap, integrated stand and sunshield cover
- High resolution colour touchscreen allowing best possible measuring and analysis of the data for an entire working day (battery lifetime >8h)
- Dual core processor supporting diverse communication and peripheral interfaces
- Future proof investment through direct upgrade possibilities to upcoming Profometer products



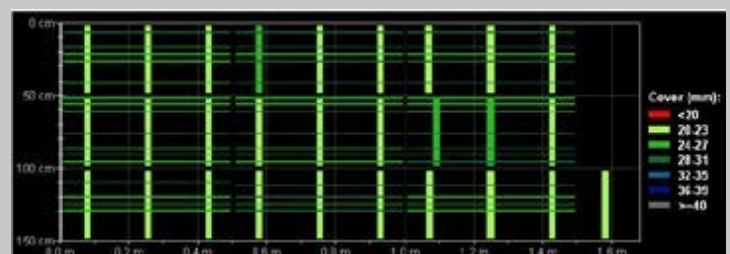
**proceq**

### FEATURES

- Rebar Location
- Cover Measurement
- Diameter Estimation
- 1-Layer NRC
- 2-Layer AI
- Cover Calibration
- Single-Line Scan
- Multi-Line Scan
- Area Scan
- Cross-Line Scan

### CROSS-LINE SCAN

- The 2D Cross-Line Scan extends the Multi-Line Scan with the special functionality of combining scans in the X- and Y-directions.
- Measuring the rebars of the first and second layer typically arranged in a rectangular mesh
- The signal strength spectrum can be seen in addition to the cover and diameter



### CONCRETE

## DIGITAL CONCRETE TEST HAMMER (Proceq, Silver Schmidt) (B-110/D/P) ASTM C805 • BS 1881-202

- The SilverSchmidt features superior performance, unmatched repeatability and intuitive operation all in a rugged and ergonomic unit.
- The SilverSchmidt has the following advantages over the traditional rebound hammer:
  - The rebound value is independent of the impact direction
  - The rebound value is not affected by internal friction
  - Tighter sealing against dirt and dust intrusion for longer life
- The unique design and high quality construction of the SilverSchmidt brings a variety of additional benefits:
  - The SilverSchmidt body lies very comfortably in the hand
  - The display is highly readable under any conditions
  - The new measurement principle and the design of the mechanics enable the SilverSchmidt to outperform its predecessors
  - A large number of measurement points can be easily collected by the instrument and automatically evaluated according to standardized statistical criteria
  - It offers automatic conversion to the required measurement unit (MPa, N/mm<sup>2</sup>, kg/cm<sup>2</sup>, psi)



**proceq**

### TECHNICAL SPECIFICATIONS

<b>Impact energy</b>	2.207 Nm (1.63 ft lbf)
<b>Concrete compressive strength range</b>	10 – 100 MPa (1450 – 14500 psi)
<b>Dimensions of housing</b>	55 x 55 x 255mm (2.16" x 2.16" x 10.04")
<b>Weight</b>	570 g (1.3 lb)
<b>Max. impacts per series</b>	99
<b>Display</b>	17 x 71 pixel, graphic
<b>Battery life</b>	>5000 impacts between charges
<b>Charger connection</b>	USB type B (5V, 100 mA)
<b>Operating temperature</b>	0 to 50 °C (32 to 122 °F)
<b>Storage temperature</b>	-10 to 70 °C (14 to 158 °F)
<b>IP classification</b>	IP54

## NON-DESTRUCTIVE TESTS

## CONCRETE

## CONCRETE TEST HAMMER (B-110)

ASTM C805 • BS 1881-202

- Used to perform a non-destructive test on concrete structure.
- The hammer gives an immediate indication about the compressive strength of the structural element.
- The compressive strength range that can be read by the equipment is from 10 to 70 N/mm<sup>2</sup>.

### SUPPLIED WITH

- Carborundum Stone
- Carrying Case

### TECHNICAL SPECIFICATIONS

- Compressive Strength :10-70 N /mm<sup>2</sup>



Code	Dimensions (± 1 cm)	Approximate Weight (kg)
B-110	35 x 18 x 16 (h)	2

## TESTING ANVIL (B-117)

- Used to verify the calibration for the rebound test hammers for concrete.
- It's made of a very robust stainless steel.
- The rebound value is  $80 \pm 2$ .
- Standards recommend the use of the Anvil before any sequence of test using the test hammers. Before and after every sequence of tests, anvil value should be recorded and

### TECHNICAL SPECIFICATIONS

- Used for Test Hammers
- Rebound Value :  $80 \pm 2$
- Made of Stainless Steel



Code	Dimensions (± 1 cm)	Approximate Weight (kg)
B-117	Dia: 15 / h: 32	17

### CONCRETE

## PERMA2™ RAPID CHLORIDE PERMEABILITY TESTER (B-500)

ASTM C1202 • ASTM C1760 • AASHTO T277

- Used to measure the electrical resistance of concrete against the penetration of chloride (RCPT) according to the standard.
- The measurement data can be used to estimate the chloride diffusion coefficient of concrete for the service life prediction and design of concrete structures as well as the durability-based quality control of concrete.
- Perma2™ is electrically certified for rapid chloride penetrability test in concrete laboratories and its measuring cell sizes are according to the ASTM and AASHTO specifications. Equipped with a verification kit, Perma2™ is an accurate test device for concrete labs.



### FEATURES

- Stand alone operation
- Easy-to-assemble
- Accurate ( $\pm 0.1$  mA)
- Flexible logging interval time (1 to 10 min)
- Auto-seal cells with rubber gasket and spacer (i.e. does not require caulking)
- Automatic temperature control system
- Four measurement channels

### TECHNICAL SPECIFICATIONS

Applied Voltage	60 $\pm$ 0.1 V
Range of current measurement	0 ~ 500 mA $\pm$ 0.1 mA
Temperature measurement range	0 ~ 100 °C
Measurement channels	4
Short circuit protection system	Yes
Measurement display on LCD	Yes
Remaining time display on LCD	Yes
LCD display area	65x33 mm
Dimensions of Perma2™ Device	280x240x104 mm
Weight	2 Kg

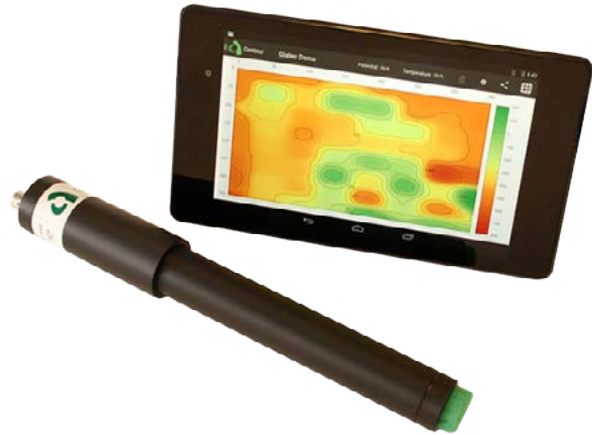
### OPERATING CONDITIONS

Operating temperature	15 ~ 45 °C
Operating humidity	30 ~ 80%
Storage temperature	0 ~ 70 °C
Operating voltage/current	100 ~ 240 V, 50-60Hz



## XCELL™ HALF-CELL CORROSION MAPPING DEVICE (B-505) ASTM C876

- Giatec XCell™ is a smart tablet-based NDT probe for detection and on-site analysis of corrosion in reinforced concrete structures.
- Giatec XCell™ benefits from Bluetooth-enabled maintenance-free sensor that measures the corrosion potential and sends it wirelessly to a tablet for generating half-cell contour plots (i.e. corrosion maps) in real-time.
- Giatec XCell™ can be used for efficient and accurate corrosion mapping. The results are analyzed using the Android-based application onsite for the identification of locations with high probability of corrosion.



### FEATURES

- Single-person operation device
- Maintenance-free electrode
- Tablet/Smart-phone operation device
- Upside down operation capability
- Easy grid generation (on Tablet or Smartphone)
- Fast data assignment to grid points
- Real-time contour plotting
- Automated temperature correction
- Easy data sharing
- Bluetooth V4.0 LE technology

### TECHNICAL SPECIFICATIONS

<b>Voltage Measurement Range</b>	± 1,000 mV
<b>Measurement Resolution</b>	0.1 mV
<b>Sampling Rate</b>	1 s
<b>Input Impedance</b>	>10 M ohm
<b>Temperature Measurement Range</b>	-10 ~ 50 °C
<b>Temperature Measurement Accuracy</b>	0.5 °C
<b>Communication Protocol</b>	Bluetooth V4.0 LE
<b>Probe Weight</b>	250 gr

### OPERATING CONDITIONS

<b>Operating temperature</b>	0 ~ 45 °C
<b>Operating humidity</b>	20 ~ 90%
<b>Storage temperature</b>	-20 ~ 70 °C
<b>Storage humidity</b>	10 ~ 90%
<b>Dimensions of XCell™ Probe</b>	32 mm x 260 mm (D x L)

### CONCRETE

#### RCON2™ CONCRETE BULK RESISTIVITY TESTER (B-510)

- Used to measure the electrical resistivity of concrete specimens in the laboratory, using the same specimens prepared for Compressive Strength Test. The electrical resistivity is correlated well with important durability parameters such as permeability, diffusivity and in general the micro-structure characteristics of concrete.
- Unique device for investigating the micro-structural properties of concrete including:
  - Diffusion of chloride in concrete
  - Rebar corrosion in concrete
  - Setting time of fresh concrete
  - Moisture transfer in concrete
  - Curing of concrete
  - Cathodic protection design
- Fast (measurement time is less than 5 seconds), accurate and flexible. It allows for continuous measurement of electrical resistivity over time, which can be used to monitor several other parameters such as cracking, moisture transfer and time of setting in concrete specimens.



#### TECHNICAL SPECIFICATIONS

Reading Range	1 Ω ~ 100 KΩ	100 KΩ ~ 1 MΩ
Frequency Spectrum	1Hz ~ 30KHz	1Hz ~ 10KHz
Phase Measurement	0 ~ 180°	
Impedance Accuracy	± 2% ± 2digit	
Phase Accuracy	5 % ± 3digit	

#### OPERATING CONDITIONS

Operating temperature	15 ~ 45 °C
Operating humidity	30 ~ 80%
Storage temperature	0 ~ 60 °C
Operating voltage/current	100-250 V ± 10%, 60Hz
Dimensions	200 x 230 x 70 mm

#### MEASUREMENT TIME

Frequency	Sampling time	Reading time (minimum)
1 Hz ~ 4 Hz	5 seconds	10 seconds
5 Hz ~ 30 KHz	1 second	2 seconds

## SURF™ CONCRETE SURFACE RESISTIVITY TESTER (B-515) AASHTO TP95-11

- Used for rapid, easy and accurate measurement of the surface electrical resistivity of concrete based on the four-probe (Wenner-Array) technique. It automatically measures resistivity around the concrete specimen using four channels of 4-probe array (located at 90° from each other). The PC software generates the required reports according to the standard specifications.
- It can determine the chloride permeability of concrete in accordance with AASHTO TP95. The measurement data can be used for durability-based quality control of concrete as well as the service life design of concrete structures.
- The electrical resistivity of concrete is correlated well with important durability parameters such as permeability, diffusivity and in general the micro-structure characteristics of concrete.



### FEATURES

- Variable frequency (13 - 100 Hz)
- Wide resistivity range (0.1 - 1,000 kΩ.cm)
- Fast measurement (8 measurements < 15s)
- Four-channel four-probe measurement
- Limiting moisture loss
- Automatic report generation with PC software
- Fresh concrete testing/crack detection applications
- Continuous measurement mode

### TECHNICAL SPECIFICATIONS

<b>Frequency</b>	1 Hz ~ 4 Hz	5 Hz ~ 30 KHz
<b>Sampling time</b>	5 seconds	1 second
<b>Reading time (minimum)</b>	10 seconds	2 seconds
<b>Single measurement time</b>	1.5 seconds	
<b>Testing time (8 measurements)</b>	<15 seconds	

### OPERATING CONDITIONS

<b>Operating temperature</b>	15 ~ 45 °C
<b>Operating humidity</b>	30 ~ 80%
<b>Storage temperature</b>	0 ~ 60 °C
<b>Operating voltage/current</b>	100-250 V ± 10%, 60Hz
<b>Dimensions</b>	200 x 160 x 70 mm

### CONCRETE

## SMARTBOX™ WIRELESS CONCRETE RESISTIVITY TESTER (B-520) AASHTO TP95-11

- Used for the measurement and monitoring of electrical resistance and temperature in fresh concrete. The continuous measurements are recorded on SmartBox™ and can be downloaded using the mobile application on Android smartphone/tablet.
- It can be used to monitor the electrical resistivity and temperature of fresh concrete. This can provide information on:
  - Water content in fresh concrete
  - Prediction of setting
  - Setting time measurement
  - Crack detection in concrete
- The electrical resistivity of fresh concrete has been shown to provide a good indication on the water content as well as setting and hardening of concrete. It provides an efficient tool for various research studies in these areas.



### FEATURES

- Wireless technology
- Compact design
- Simultaneous measurement of electrical resistance and temperature
- Optimized frequency for fresh concrete
- Long battery life on a single charge
- Mobile application for Android smartphone and tablet

### TECHNICAL SPECIFICATIONS

<b>Reading Range</b>	1 – 3000 $\Omega$
<b>Measurement Frequency</b>	10 kHz
<b>Accuracy</b>	$\pm 2\%$
<b>Measurement Time</b>	<1 s

### OPERATING CONDITIONS

<b>Operating temperature</b>	-20 ~ 45 °C
<b>Operating humidity</b>	10 ~ 90%
<b>Battery Charger Specification</b>	Input: 100-240 Vac (50-60 Hz) Output: 5 Vdc (500 mA)
<b>Dimensions</b>	85 x 55 x 22 mm



## ICOR™ REBAR CORROSION RATE TESTER (B-525)

- Used for detailed corrosion evaluation of reinforced concrete structures without the need to have an electrical connection to the rebar.
- It estimates the corrosion rate of rebar through a non-invasive approach. This means that the need for connecting the device to the rebar (which is the case of other commercial devices) is eliminated in it.
- Equipped with high precision sensors to measure:
  - Corrosion rate of rebar
  - The in- situ electrical resistivity of concrete
  - Corrosion potential of rebar
  - Ambient temperature and relative humidity.
- It utilizes wireless technology to transmit data to a tablet, where data can be stored, analyzed and visualized.



### TECHNICAL SPECIFICATIONS

- Testing time (6 measurements): 5 to 15 seconds

### FEATURES

- **Fast:** measurements within seconds
- **Real-time:** contour mapping of corrosion rate, electrical resistivity and corrosion potential
- **Accurate:** comparable to laboratory techniques
- **Non-destructive:** used for existing structures
- **Non-subjective:** algorithm-based interpretations
- **Efficient:** detect initial signs of corrosion
- **Cost effective:** multiple parameters in a single measurement for durability assessment

### OPERATING CONDITIONS

Operating temperature	0 ~ 45 °C
Operating humidity	20 ~ 90%
Storage temperature	0 ~ 70 °C
Storage humidity	5 ~ 90%
Operating voltage/current	24 v
Dimensions of iCOR™	d250 x 70 mm



# UNIVERSAL TESTING MACHINES



## INDEX

## UNIVERSAL TESTING MACHINES

Item	Code	Page
Universal Tensile and Compression Tester	UTM-001	121
Electromechanical Tensile Tester	UTM-001/EM	127
CBR/Marshall Testing Machine	AT-001	128
Universal Testing Machine	ULF-001	129





## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

### TENSILE TESTING

- Used to test the tensile strength of steel rebar.
- The grippers of the machine is hydraulically operated by 2 independent auxiliary cylinders controlled by separated hydraulic valves. Those grippers are designed to firmly hold the steel rebar and avoid any slipping that might happen during the test on the rebar.
- The upper mobile crosshead part of the machine is driven up/down by hydraulic piston. It is used to adjust the distance between upper and lower grippers to suite the length of the steel rebar.
- Designed with different capacities (upon user's request) such as: 300 kN (30 tons) / 600 kN (60 tons) / 1000 kN (100 tons) / 2000 kN (200 tons)
- Capable of testing specimen with diameters ranging from 8 mm to 42 mm depending on the capacity.
- Provides easier and faster reporting with the printing facility for the results and graphs.
- The height is only **200 - 210** cm (depending on the model/capacity).

### COMPRESSION TESTING

- Used to test the compression strength of concrete cubes/cylinders of different sizes.
- Equipped with an LCD unit that displays the data graphically of each test with the ability to save and recall the results of the tested materials.
- The Data Acquisition Control provides a real-time graphical view for the sample.
- Automatically determines the load rate upon sample type and in accordance with the international standards.
- With the AUTO-STOP functionality, the machine will automatically stop upon finishing the test.
- Upon user requirements, the machine can be either work in fully automatic mode or manual mode at which the user gets the ability to adjust the load rate and period manually.
- The upper seating adjusts itself to apply homogeneous loading on the sample.
- For faster experience while testing, the daylight distance between the upper and lower platens can be adjusted using the hydraulic piston in accordance with the sample height; this will give the machine the ability to test all varieties of samples with a very wide range of sizes.



### UTM

## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

### TENSILE TESTING

- Fully Automatic - PC Controlled
- Hydraulically operated grippers by 2 independent auxiliary cylinders controlled by separated hydraulic valves
- Upper mobile crosshead driven up/down by a separated motor adjusting the distance between upper and lower grips with electronic distance meter
- Available models:
  - 300 kN (30 tons)
  - 600 kN (60 tons)
  - 1000 kN (100 tons)
  - 2000 kN (200 tons)
- Height: 210 cm only.
- Print of Stress/Strain Diagram and Test Results.



### COMPRESSION TESTING

- Fully Automatic.
- Graphical - LCD Data Acquisition Control System.
- Automatic Load Rate upon Sample Type.
- Stops Automatically, when Test is completed.
- Real time graph indication.
- Total Load and also Per Area are given.
- Test results can be transferred to computer to be printed or from the thermal printer.
- Different units are available.
- Calibration done easily on 5 pts.
- Manual Control is available.
- If weight of sample entered, Unit Weight is determined.
- Rigid Frame.
- Upper and Lower Platens in accordance with international Specifications.
- Upper Seating for Homogeneous Loading.
- 220 - 240 V / 50 - 60 Hz (110 V / 60 Hz is also available)

## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

### USING THE MACHINE

- The LCD control unit provides an easy, user-friendly experience with the machine. With the LCD unit, the user can control and monitor the tests/adjust the settings/calibrate the machine.
- Performing the tests are now the easiest ever. With the computer connected to the machine, all the tests/monitoring/calibrating can be done via computer using the state-of-the-art ALFA software provided with the machine.



### CAPACITY vs SAMPLE

Code	UTM-001/LCD/030	UTM-001/LCD/060	UTM-001/LCD/100	UTM-001/LCD/200
Capacity	300 kN	600 kN	1000 kN	2000 kN
Sample Diameter Range	Ø 8 - 28 mm	Ø 8 - 32 mm	Ø 10 - 36 mm	Ø 12 - 42 mm

### UTM

## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

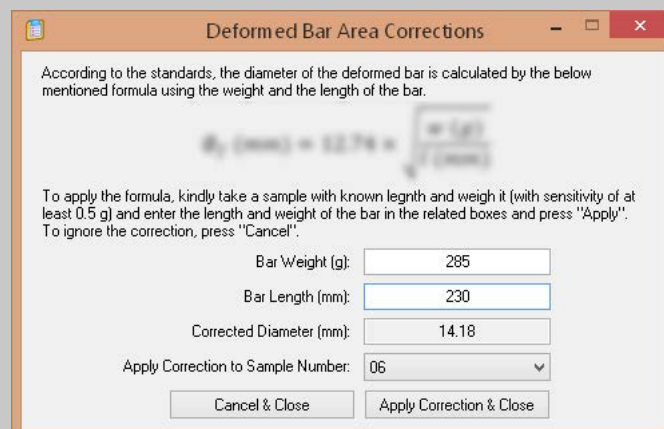
### PERFORMING THE TEST

- The test is performed through the computer using ALFA's state-of-the-art software designed specially to ease the test and perform all the required calculations automatically.



### APPLYING DIAMETER CORRECTION FACTOR

- When testing deformed reinforcement bars, it is usually difficult to measure the correct and effective diameter of the bar. To overcome this problem, ALFA is providing the diameter correction factor option within its software to automatically calculate the effective diameter by using the weight and the length of the tested bar.



The screenshot shows the 'Deformed Bar Area Corrections' dialog box. It contains the following text: 'According to the standards, the diameter of the deformed bar is calculated by the below mentioned formula using the weight and the length of the bar.' Below this is a formula: 
$$d_b (mm) = 12.76 \times \sqrt{\frac{W (g)}{L (mm)}}$$
. The text continues: 'To apply the formula, kindly take a sample with known length and weigh it (with sensitivity of at least 0.5 g) and enter the length and weight of the bar in the related boxes and press "Apply". To ignore the correction, press "Cancel".' The dialog box has input fields for 'Bar Weight (g)' (285), 'Bar Length (mm)' (230), 'Corrected Diameter (mm)' (14.18), and 'Apply Correction to Sample Number' (06). At the bottom, there are 'Cancel & Close' and 'Apply Correction & Close' buttons.

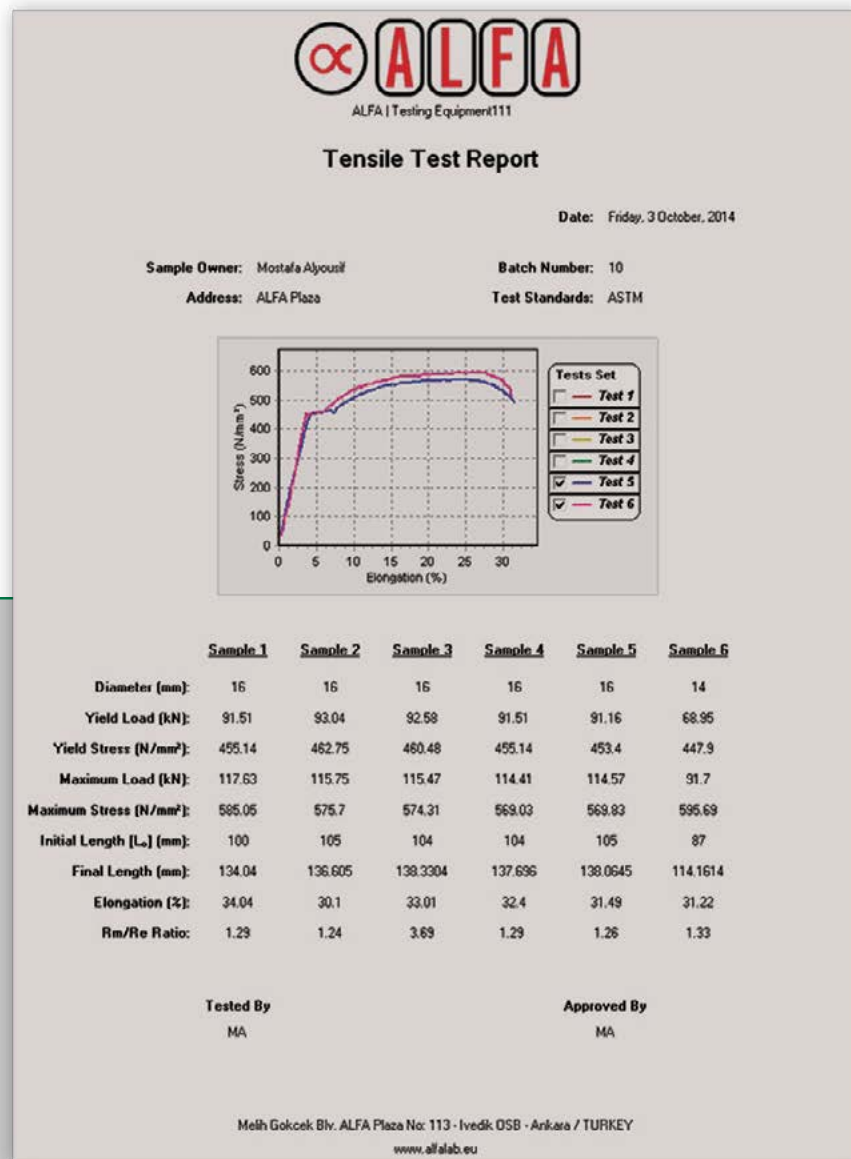


## TENSILE TEST

UTM

## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

## TEST REPORT



### UTM

## UNIVERSAL TENSILE AND COMPRESSION TESTER (UTM-001)

### HAND-HELD POSITIONING UNIT

- This hand-held unit is used for positioning the upper cross-head, to suite the sample height, and to tighten the grippers on the sample before testing.



### SAMPLE GRIPPERS

- The specially designed grippers are used to hold the sample hydraulically while testing. The grippers have 2 different groves to suite wide range of samples.



## TENSILE TEST

UTM

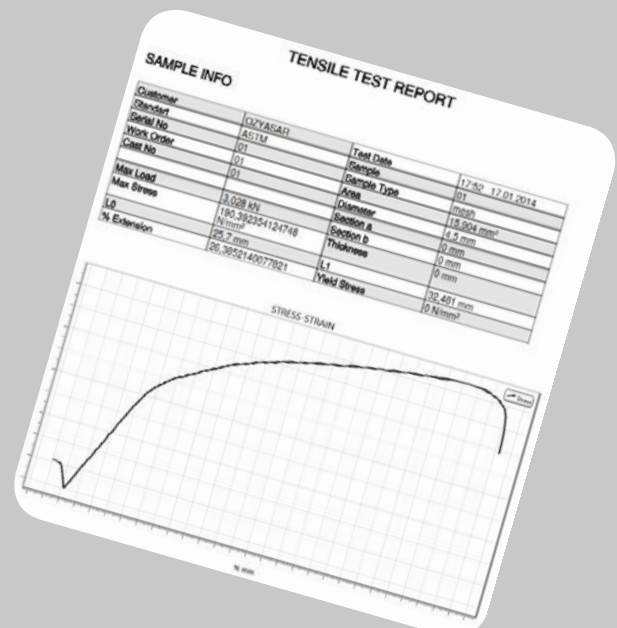
## ELECTROMECHANICAL TENSILE TESTER (UTM-001/EM)

- Specially designed for testing components and for routine materials such as sheets, wires, strips, ropes, belts, screws, composites, nylon ribbon, rubber, geosynthetics, geotextiles ... etc
- Features precision guidance for moving crosshead and a low wearball screw trouble-free tensile tests.



### TECHNICAL SPECIFICATIONS

- Loading Capacity: 100 kN / 150 kN / 200 kN
- Sensitivity: >1%
- Speed Control by Servo-Motor
- Supplied with:
  - Grip Sets for Bars and Metal Sheets
  - Laptop & Software
- 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)



### UTM

#### CBR/MARSHALL TESTING MACHINE (AT-001)

ASTM D1883 • EN 13286-47 • BS 1377-4

- Capacity : 50 kN
- High Precision Load Cell
- Complete with LCD Data Acquisition System
- 
- **Accessories supplied for Marshall test:**
  - Test Speed: 50.8 mm/min
  - Breaking Head
  - Electronic Measure of Flow
- 
- **Accessories supplied for CBR test:**
  - Selectable Test Speed:
    - 1.00 mm/min
    - 1.27 mm/min
  - Penetration Piston
  - Electronic Measure of Penetration
- 
- 220 - 240 V / 50 Hz



#### MARSHALL BREAKING HEAD



#### CBR PENETRATION PISTON





## UNIVERSAL TESTERS

## UTM

**UNIVERSAL TESTING MACHINE (ULF-001)**

ASTM D1883 • EN 13286-47 • BS 1377-4

- Capacity : 50 kN
- High Precision Load Cell
- Complete with LCD Data Acquisition System
- Servo-Controlled system that can perform Marshall, CBR, and Unconfined tests
- Loading Speed can be set between 0.00001 - 51.00000 mm/min
- **Accessories supplied for Marshall Test:**
  - Breaking Head
  - Electronic Measure of Flow
- **Accessories supplied for CBR Test:**
  - Penetration Piston
  - Electronic Measure of Penetration
- **Accessories supplied for Unconfined Test:**
  - Upper and Lower Compression Plates
- 220 - 240 V / 50 Hz



## ● MARSHALL BREAKING HEAD



## ● CBR PENETRATION PISTON



## ● UNCONFINED TEST PLATES



A large warehouse filled with stacks of cement bags on wooden pallets. The bags are brown and have some text on them, though it's not clearly legible. The pallets are made of wood and are stacked in a way that creates a grid-like pattern. The lighting is bright, and the overall scene is one of a well-organized storage area for construction materials.

# CEMENT

## INDEX

## CEMENT

Item	Code	Page
Cement Compression and Flexural Tester	C-001/LCD	133
Compression Jig	C-011/CJ	134
Flexural Jig	C-011/FJ	134
Cement Mould	C-011	135
Linear Shrinkage Mould (Cement)	C-017	135
Cement Vibrating Machine	C-126	136
Mini-Slump Set	C-020	136
Jolting Table	C-125	137
Autoclave Expansion Tester	C-070	138
Blaine Air Permeability Apparatus	C-035	139
Digital Blaine Air Permeability Apparatus	C-035/D	139
Vicat Apparatus	C-090	140
Automatic Vicat Apparatus	C-090/A	141
Workable Life and Correction Time Apparatus	C-096	142
Plunger Penetration Apparatus	C-094	142
Gillmore Apparatus	C-095	143
Motorized Cement Flow Table	C-021/M	144
Cement Flow Table	C-021	145
Cement Mixer	C-050	146
Automatic Cement Mixer	C-050/A	147
Le Chatelier Flask	C-022	148
Le Chatelier Mould	C-023	148
Le Chatelier Bath	G-040/06	149
Le Chatelier Soundness Test Set	C-025	149
Digital Length Comparator	C-018	150
Packaged Cement Tube Sampler	C-028	151
Bulk Cement Slotted Tube Sampler	C-029	151
Grout Flow Cone Apparatus	C-024	152
Mud Balance	C-014	153
Marsh Funnel	C-015	153







## CEMENT COMPRESSION & FLEXURAL TESTER (C-001/LCD)

ASTM C109 • ASTM C349 • EN 196-1

- Used to test the compressive strength of a cement/mortar cube specimens and the flexural strength of mortar prisms.
- Equipped with an LCD Data Acquisition Control System.
- The load rate is automatically controlled according to specimen dimensions.
- The test results can be transferred to a computer (should be ordered separately) or a thermal printer (should be ordered separately).

### EQUIPPED WITH

- Selenoid valve for piston/test type selection
- LCD Graphical Data Acquisition Control System

### SUPPLIED WITH

- C-011/CJ Compression Tests on either 40 mm or 50 mm cube specimens
- C-011/FJ Flexure Tests on 40 x 40 x 160 mm prism specimens

### TECHNICAL SPECIFICATIONS

- Rigid 2-Column frame
- Used for flexure and compression tests on cement specimens
- Full Automatic
- Stops Automatically upon test completion
- Real time graph indication
- Maximum load and stress are shown
- Unit selection available (kN, kgf, lbf)
- User-friendly calibration (password protected)
- 220 - 240 V / 50 - 60 Hz



Code	Flexure Capacity	Compression Capacity
C-001/LCD	15 kN	250 kN
C-001/LCD/HC	25 kN	600 kN

### CEMENT

#### COMPRESSION JIG (C-011/CJ)

- Used for cement compression for the cubes of sizes 40 or 50 mm (to be specified at the time of order).
- The platens have hardness of 60 HRC and the upper one is seat-ball assembled.
- Rust-protected by cadmium plating.

Code	Samples to be tested	Approximate Weight (kg)
C-011/CJ/40	40 x 40 x 40 mm cubes	12
C-011/CJ/50	40 x 40 x 40 mm and 50 x 50 x 50 mm cubes	12



#### FLEXURAL JIG (C-011/FJ)

- The distance between the lower bearers is 100 mm and one of them has a spherical seat.
- Rust-protected by cadmium plating.
- Used for flexure tests of 40 x 40 x 160 mm specimen.

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
C-011/FJ	Dia: 15 / h: 19	11



## CEMENT MOULDS (C-011)

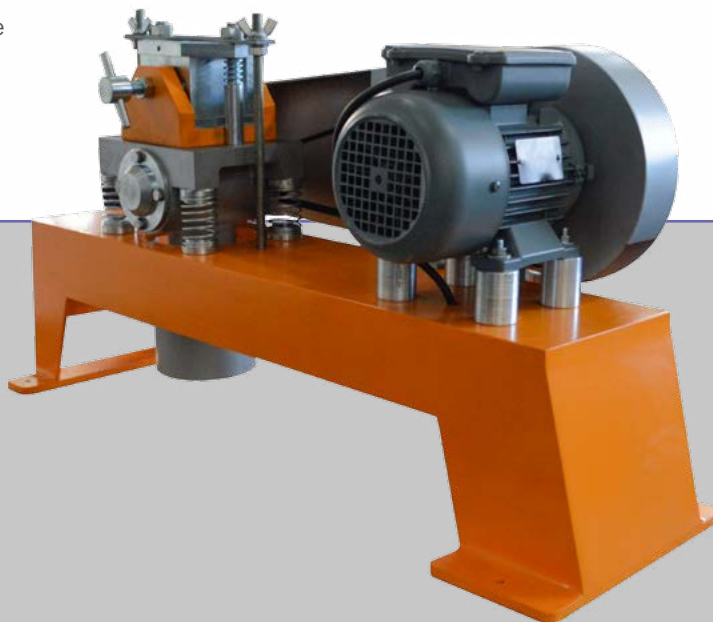


Code	Item	Shape	Material	Gang	Internal Dimensions (mm)
C-011/05	Compression Mould	Cube	Steel	Three	50 x 50 x 50
C-011/05-BRS	Compression Mould	Cube	Brass	Three	50 x 50 x 50
C-011/05-BRZ	Compression Mould	Cube	Bronze	Three	50 x 50 x 50
C-011/07	Compression Mould	Cube	Steel	Single	70.1 x 70.1 x 70.1
C-011/04	Flexure Mould	Prism	Steel	Three	40 x 40 x 160
C-011/04-FH	Feeding Hopper	Prism	Steel or Plastic	Three	40 x 40 x 160
C-017	Linear Shrinkage Mould	Prism	Steel or Plastic	Three	25 x 25 x 285

### CEMENT

#### CEMENT VIBRATING MACHINE (C-126) BS 4550

- Used to vibrate cement mortar cube sample in the 70.7 mm cube moulds.
- Mould should be ordered separately



#### TECHNICAL SPECIFICATIONS

- Vibrates at 12,000 cycles per minute
- 220 - 240 V / 50 - 60 Hz

## DETERMINATION OF CONSISTENCY

#### MINI-SLUMP SET (C-020)

- Used to determine the consistency of cement mix.



#### COMPOSED OF

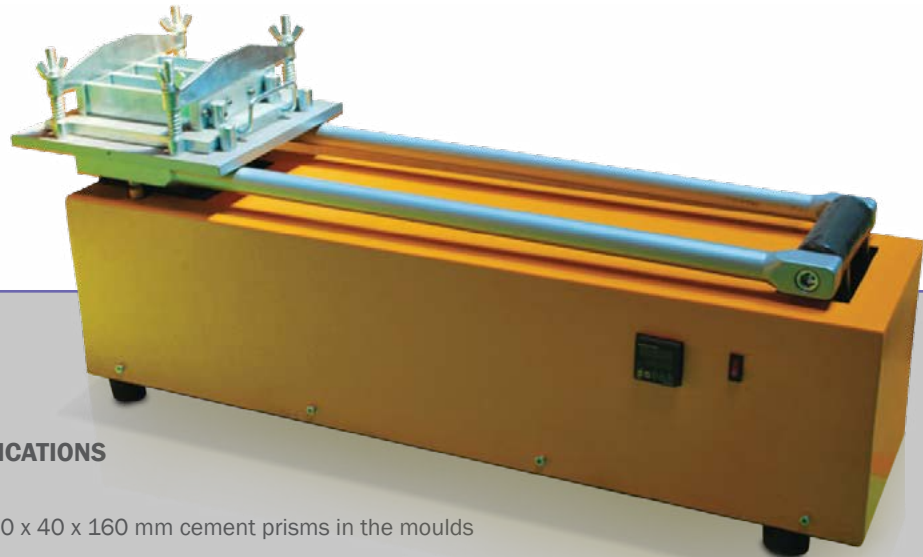
- Galvanized Slump Cone (Ø 50 mm / 100 mm x 151 mm)
- Galvanized Base Plate
- Galvanized Funnel
- Galvanized Tamping Rod (Ø 25 mm x 190 mm)



## JOLTING TABLE (C-125)

EN 196-1

- Used to compact cement mortar prisms in moulds.
- The 3-gang mould is placed on a table which is mounted above a cam rotating at 60 rpm.
- Equipped with digital cycle counter.
- The motor and gearbox assembly are enclosed in a protective housing; therefore, there are no moving parts in the body outside the housing.
- Mould is easily mounted and demounted.
- **Noise-Reduction cabinet (C-125/SPC)** can be purchased separately.



### TECHNICAL SPECIFICATIONS

- Used to compact 40 x 40 x 160 mm cement prisms in the moulds
- Digital Cycle Counter
- Rotating cam driven at 60 rpm
- Table drop height : 15 mm
- 220 - 240 V / 50 Hz

### CEMENT

#### **AUTOClave EXPANSION TESTER (C-070)**

ASTM C151 • ASTM C490 • AASHTO T107

- Used to determine the expansion of a hardened cement paste when exposed to the autoclave conditions.
- The autoclave expansion test provides an index of potential delayed expansion caused by the hydration of CaO or MgO, or both, when present in hydraulic cement.
- It consists of a high pressure boiler made from special alloy steel.



#### **SUPPLIED WITH**

- Specimen rack
- Digital Thermometer

#### **EQUIPPED WITH**

- Pressure Gauge

#### **TECHNICAL SPECIFICATIONS**

- Boiler (Ø 154 mm x 430 mm)

## BLAINE AIR-PERMEABILITY APPARATUS (C-035/ASTM) ASTM C204

- Used for measuring the fineness of hydraulic cement in terms of the specific surface expressed as total surface area of cement

### SUPPLIED WITH

- U-Tube glass manometer with valve (C-035/UT)
- Filter paper - Pack of 100 (C-035/FP)
- Stand
- Stainless Steel Cell & Plunger
- Rubber Aspirator Bulb
- Manometer Liquid
- Perforated disc:  
0.9 mm (30-40 holes, each Ø 1 mm)



## DIGITAL BLAINE AIR-PERMEABILITY APPARATUS (C-035/D/ASTM) ASTM C204 • BS 4359:2

- Used for measuring the fineness of hydraulic cement in terms of the specific surface expressed as total surface area of cement
- Equipped with digital timer.

### SUPPLIED WITH

- U-Tube glass manometer with valve (C-035/UT)
- Filter paper - Pack of 100 (C-035/FP)
- Stand
- Stainless Steel Cell & Plunger
- Rubber Aspirator Bulb
- Perforated disc:  
0.9 mm (30-40 holes, each Ø 1 mm)



### CEMENT

#### VICAT APPARATUS (C-090)

ASTM C187 • ASTM C191 • EN 196-3

- Used to determine the normal consistency of hydraulic cement.
- The reaction between cement and water is the primary cause of the setting of concrete. The setting time for cement and concrete is determined using the Vicat Apparatus.
- By measuring the setting time for concrete/cement via the penetration resistance method (Vicat Apparatus), the time the concrete/cement can stay fresh can be determined. This time indicates the period the mix can stay in the mixer before pouring it into the moulds/frameworks.



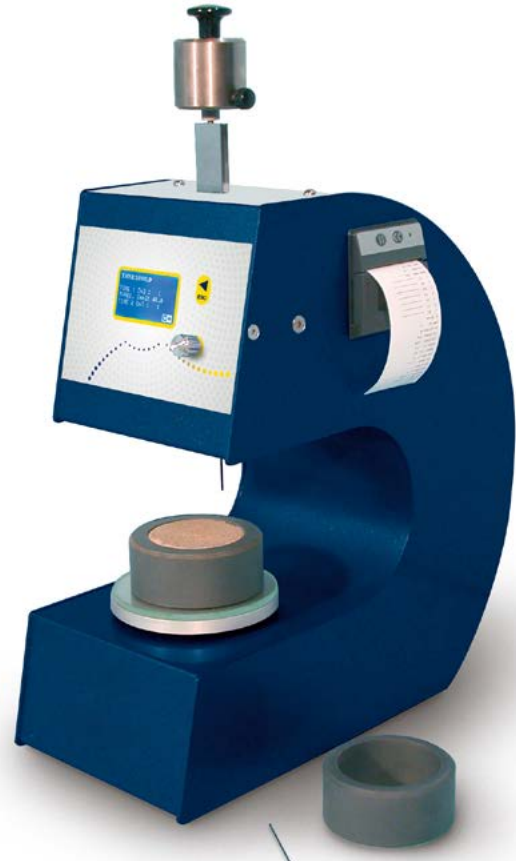
#### TECHNICAL SPECIFICATIONS

Code	C-090/ASTM	C-090/EN
Standard	ASTM C187 - C191	EN 196-3 (Basic Set)
Movable rod weight	300 g	300 g
Vicat Mould	Ø 60 / Ø 70 mm x 40 mm	Ø 70 / Ø 80 mm x 40 mm
Needle	Ø 1 mm	Ø 1.13 mm
Consistency Plunger	Ø 10 mm	Ø 10 mm
Container	○	●
Thermometer	●	●
Glass Plate	●	●



## AUTOMATIC VICAT APPARATUS (C-090/A/EN) EN 196-3

- The reaction between cement and water is the primary cause of the setting of concrete. The setting time for cement and concrete is determined using the Vicat Apparatus.
- By measuring the setting time for concrete/cement via the penetration resistance method (Vicat Apparatus), the time the concrete/cement can stay fresh can be determined. This time indicates the period the mix can stay in the mixer before pouring it into the moulds/frameworks.
- Designed to be fully automatic with very precise and reputable result.
- Test results can be easily printed on any incorporated printer.
- Guiding menu is available in multi-languages (English, French, German and Italian).
- Equipped with a large LCD display to show the test results data. The test will automatically print a report with all data.



### SUPPLIED WITH

- Movable rod (300 g)
- Vicat Mould (Ø 70 / Ø 80 mm x 40 mm)
- Needle (Ø 1.13 mm)
- Consistency Plunger (Ø 10 mm)
- Container
- Glass Plate

### TECHNICAL SPECIFICATIONS

- 220 - 240 V / 50 - 60 Hz

### CEMENT

#### WORKABLE LIFE and CORRECTION TIME APPARATUS (C-096) EN 1015-9

- Used to determine the workable life and correction time of fresh mortar.

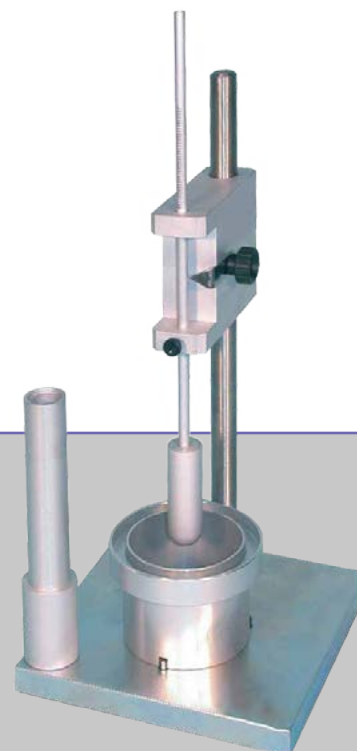


#### TECHNICAL SPECIFICATIONS

- Penetration rod (Ø 5 mm / Ø 6.175 mm x 65 mm)
- Washer (Ø 20 mm)
- Sample container (Ø 75 mm)

#### PLUNGER PENETRATION APPARATUS (C-094) EN 413-2 • EN 459-2 • EN 1015-4

- Used to determine the consistency of cement mix.



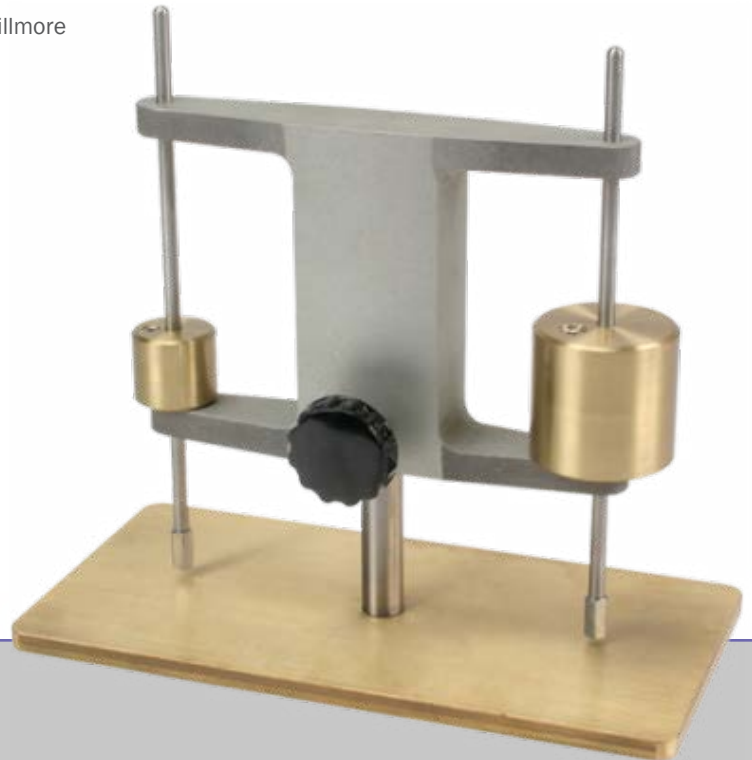
#### COMPOSED OF

- Steel base and frame
- Test cup (Ø 80 mm x 70 mm)
- Plunger assembly (90 g, dropping from 100 mm)
- Tamper (C-021/T/EN) (Ø 40 mm x 200 mm , 0.250 kg)

## GILLMORE APPARATUS (C-095)

ASTM C266 • ASTM C414

- Used to determine the setting time of hydraulic-cement paste by means of the Gillmore needles.
- The purpose of this test method is to establish whether a cement complies with a specification limit on Gillmore time of setting.



### TECHNICAL SPECIFICATIONS

- Initial setting time needle:
  - Weight :  $113.4 \pm 0.5$  g
  - Tip :  $\varnothing 2.12 \pm 0.05$  mm
- Final setting time needle:
  - Weight :  $453.6 \pm 0.5$  g
  - Tip :  $\varnothing 1.06 \pm 0.05$  mm

### CEMENT

## MOTORIZED CEMENT FLOW TABLE (C-021/M)

- The test gives indications about the consistency of cement mortars, which is one of the most important characteristics for the mortars in the engineering aspects.
- The test is done by placing the specimen in the mould. After specifying the number of drops and running the machine, the plate will raise and drop along with the mould in a specific range for a specified number of times (entered by the user using the digital counter) depending on the test needs.
- Driven by motor at 100 rpm.
- 220 - 240 V / 50 Hz



### TECHNICAL SPECIFICATIONS

Code	C-021/ASTM	C-021/EN
Standard	ASTM C230	EN 459-2 , EN 1015-3
Top Table	"Brass Ø 10" (Ø 254 mm)"	"Stainless Steel Ø 300 mm"
Drop height	1/2" (12.7 mm)	10 mm
Brass conical mould	C-021/CM/ASTM	C-021/CM/EN
	"Ø 2.75" / Ø 4.00" x 2" Ø 70 mm / Ø 100 mm x 50 mm"	Ø 70 mm / Ø 100 mm x 60 mm
Tamper	C-021/T/EN	C-021/T/ASTM
	"1/2" x 1" x 6" 12 mm x 25 mm x 150 mm"	Ø 40 mm x 200 mm , 0.250 kg



## CEMENT FLOW TABLE (C-021)

- The test gives indications about the consistency of cement mortars, which is one of the most important characteristics for the mortars in the engineering aspects.
- The test is done by placing the specimen in the mould. By turning the handle, the mould will raise and drop in a specific range for a specified number of times depending on the test needs.



## TECHNICAL SPECIFICATIONS

Code	C-021/ASTM	C-021/EN
Standard	ASTM C230	EN 459-2 , EN 1015-3
Top Table	"Brass Ø 10" (Ø 254 mm)"	"Stainless Steel Ø 300 mm"
Drop height	1/2" (12.7 mm)	10 mm
Brass conical mould	C-021/CM/ASTM	C-021/CM/EN
	"Ø 2.75" / Ø 4.00" x 2" Ø 70 mm / Ø 100 mm x 50 mm"	Ø 70 mm / Ø 100 mm x 60 mm
Tamper	C-021/T/EN	C-021/T/ASTM
	"1/2" x 1" x 6" 12 mm x 25 mm x 150 mm"	Ø 40 mm x 200 mm , 0.250 kg

### CEMENT

#### CEMENT/MORTAR MIXER (C-050)

EN 196-1 • EN 196-3

- Used to assure an efficient mixing for the cement and the mortar samples.
- Can take a capacity up to 5 liters.
- Equipped with a planetary mixing mechanism for better performance.
- The beater speed is adjustable between 140 rpm and 285 rpm.



#### TECHNICAL SPECIFICATIONS

- Bowl Capacity: 5 Lt.
- Planetary mixing action.
- Beater Speeds: 140 rpm / 285 rpm.
- 220 - 240 V / 50 - 60 Hz

## AUTOMATIC CEMENT/MORTAR MIXER (C-050/A)

EN 196-1 • EN 196-3

- Used to assure an efficient mixing for the cement and the mortar samples.
- Can take a capacity up to 5 liters.
- The mixer is equipped with a planetary mixing mechanism for better performance.
- The beater speed is adjustable between 140 rpm and 285 rpm.
- The mixer automatically add the sand at the correct time depending on the selected standard.

### TECHNICAL SPECIFICATIONS

- Automatic mixing
- Bowl Capacity: 5 Lt.
- Planetary mixing action.
- Beater Speeds: 140 rpm / 285 rpm.
- 220 - 240 V / 50 - 60 Hz



### PRESET MIXING PROGRAMS

EN 196-1				
Mixing Water & Cement	Adding Sand	Mixing	Waiting	Mixing
At low speed for 30 sec.	For 30 sec.	At high Speed for 30 sec.	for 90 sec	At high speed for 60 sec.
EN 196-3				
Mixing Water & Cement		Waiting		Mixing
At low speed for 90 sec.		For 30 sec.		At high speed for 90 sec.
EN 196-9				
Mixing Sand & Cement	Adding Water Manually	Mixing		Mixing
At low speed for 30 sec.	User should press "OK" after finishing	At low speed for 60 sec.		At high speed for 60 sec.

### CEMENT

#### LE CHATELIER FLASK (C-022)

ASTM C188 • EN 196-6 • AASHTO T133

- Used to determine the relative density (the specific gravity) of hydraulic cement and lime.
- The measurement is done by taking an empty flask, filling it with cement then adding polar liquid and measure the weight of the flask at each step and using it in the related formula.
- The accuracy for the graduation on the neck is 0.05 ml.



#### TECHNICAL SPECIFICATIONS

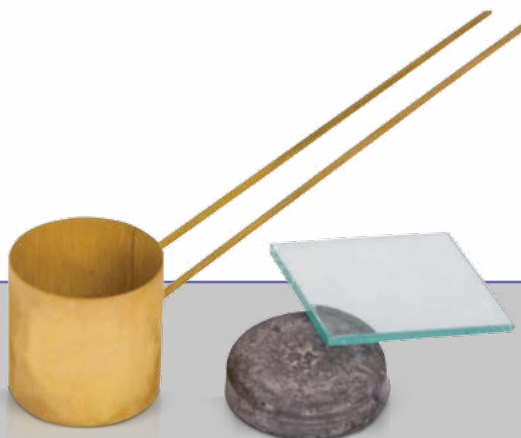
- Graduation (0-1) & (18-24) ml. with 0.05 ml. accuracy.

## SOUNDNESS OF CEMENT

#### LE CHATELIER MOULD (C-023)

EN 196-3

- Used to determine the soundness for cement in either hot or cold water.
- Having an internal diameter of 30 mm and a height of 30 mm.
- The mould has two stems.



#### SUPPLIED WITH

- Glass plates - 50 x 50 mm
- Weight - 100 g



### LE CHATELIER BATH (G-040/06) EN 196-3

- Used with the Le Chatelier Moulds (to be ordered separately) to determine the soundness of the cement.
- Made from stainless steel interior, and equipped with a stainless steel cover and base shelf.
- Equipped with a digital thermostat and indicator.



#### SUPPLIED WITH

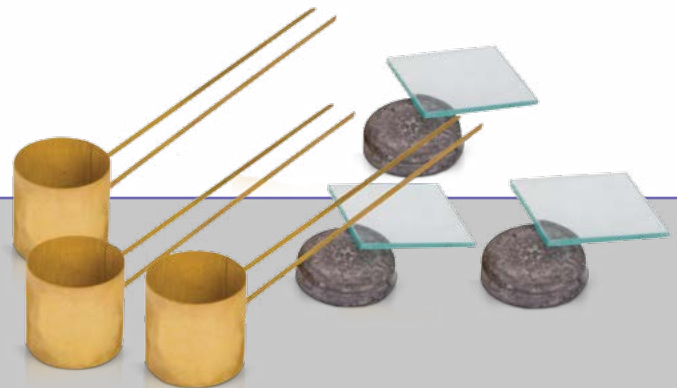
- Stainless Steel Cover
- Base Shelf

#### TECHNICAL SPECIFICATIONS

- Digital Thermostat & Indicator.
- Interior stainless steel.
- 220 - 240 V / 50 - 60 Hz

### LE CHATELIER SOUNDNESS TEST SET (C-025) EN 196-3

- Used to determine the soundness of the cement.



#### COMPOSED OF

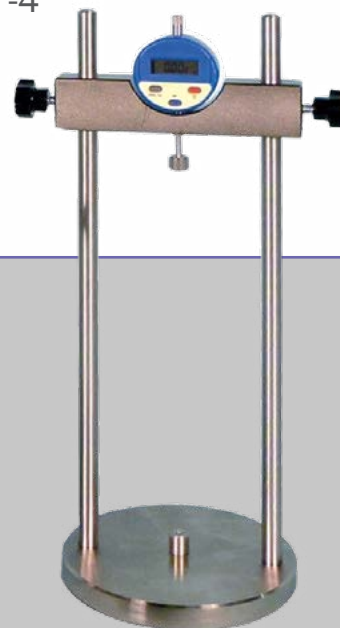
- Le chatelier moulds (3 ea)
- Glass plates - 50 x 50 mm (6 ea)
- Weight - 100 g (3 ea)
- Tamping Rod - Ø 17 mm x 70 g (1 ea)
- Steel Ruler (1 ea)

### CEMENT

#### DIGITAL LENGTH COMPARATOR (C-018)

ASTM C151 • ASTM C490 • EN 12617-4 • EN 1367-4

- Used to determine the length change in hardened cement paste, mortar, and concrete prisms
- Equipped with Digital Gauge - 12.7 / 0.001 mm (DI/D-12/0.001)
- Height adjustable to suit specimens up-to 300 mm



#### REFERENCE RODS

- 160 mm C-018/160
- 200 mm C-018/200
- 250 mm C-018/250
- 254 mm C-018/254
- 280 mm C-018/280

## YIELD OF LIME

#### SLAKING VESSEL (C-459)

EN 459-2 • EN 1015-7

- Used to determine the yield of lime by leaving the specimen to slake in an insulated stainless steel vessel



#### TECHNICAL SPECIFICATIONS

- Made of Stainless Steel
- Double walled, insulated with glass fibres
- Internal Dimensions : Ø 113 x 140 mm

**CEMENT TUBE SAMPLER (Packaged) (C-028)**

ASTM C183 • EN 196-7 • AASHTO T127

- Used to sample cement from packages

**CEMENT SLOTTED TUBE SAMPLER (Bulk) (C-029)**

ASTM C183 • EN 196-7 • AASHTO T127

- Used to sample cement from bulk storage and bulk shipments



### CEMENT

## GROUT FLOW CONE APPARATUS (C-024)

ASTM C939 • EN 445

- Used to determine the time of efflux of a specified volume of fluid hydraulic cement grout through a standardized flow cone and used for preplaced-aggregate (PA) concrete.
- Can be used both at the laboratory and in the field.

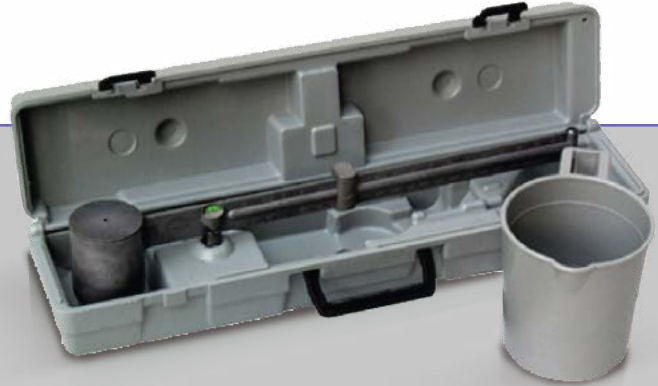


C-024/ASTM	C-024/EN
ASTM C939	EN 445
TECHNICAL SPECIFICATIONS	
<ul style="list-style-type: none"> <li>Level Indicators (x2) - Ø 0.2" (5 mm)</li> <li>Volume of Grout : 1725 ml (± 5 ml)</li> <li>Upper Diameter : Ø 7" (178 mm)</li> <li>Cone Height : 7.5" (190 mm)</li> <li>Discharge Opening : Ø 1/2" (12.7 mm)</li> </ul>	<ul style="list-style-type: none"> <li>Mesh Opening : ≤ 2 mm</li> <li>Upper Diameter : 152 mm</li> <li>Cone Height : 280 mm</li> <li>Discharge Opening : 10 mm</li> </ul>
SUPPLIED WITH	
<ul style="list-style-type: none"> <li>Beaker - 1000 ml</li> <li>Stand</li> </ul>	<ul style="list-style-type: none"> <li>Beaker - 1000 ml</li> <li>Stand</li> </ul>



## MUD BALANCE (C-014)

- Used for accurate determination of fluid density or weight-per-unit-volume (specific gravity) of drilling fluids.



### COMPOSED OF

- Graduated arm with a cup
- Lid
- Knife edge
- Counter weight
- Carrying case.

## MARSH FUNNEL (C-015)

- Used to determine the viscosity of drilling mud and other fluid materials.
- Consists of a funnel and graduated cup. Both made from a very strong and break-resistant plastic.

### SUPPLIED WITH

- Plastic Beaker - 1000 ml (GPB/1000)





# AGGREGATE



## INDEX

## AGGREGATE

Item	Code	Page
Sample Splitter	G-080	156
Large-Capacity Sample Splitter	G-081	157
Aggregate Shape Gauge	AG-036	157
Flakiness Sieve Set	AG-030	158
Grid (Bar) Sieve Set	AG-038	159
Thickness / Flakiness Index Gauge	AG-032	160
Length Gauge (Elongation Index)	AG-034	160
Proportional Caliper Apparatus	AG-037	161
Aggregate Soundness Test Set	AG-042	161
Organic Impurities Set	AG-240	162
Methylene Blue Set	AG-041	163
Sand Equivalent Shaker	AG-040/SS	164
Sand Equivalent Test Set	AG-040	165
Los Angeles Abrasion Tester	AG-191	167
Noise Reduction Cabinet for AG-191	AG-191/SPC	169
Abrasive Charges for AG-191	AG-191/AC	169
Abrasion Tester for Natural Stones and Concrete Tiles	AG-197	170
Dorry Abrasion Tester (Boehme)	AG-199	171
Skid Resistance Tester	AG-190	172
Sand Absorption Cone and Tamper	AG-200	172
Micro-Deval Abrasion Tester	AG-195	173
Aggregate Crushing Value	AG-210	174
Aggregate Impact Value	AG-220	175

### AGGREGATE

#### **SAMPLE SPLITTER (G-080)**

ASTM C136 • EN 933-3 • AASHTO T27

- Designed to halve/divide aggregates, soils, sands and gravel into two representative halves.
- Made of powder coated enameled steel.

#### **SUPPLIED WITH:**

- 3 Collecting Pans



Code	Chute Width (mm)	Number of Chutes
G-080/07	7	12
G-080/09	9	12
G-080/12	12.5	12
G-080/15	15	12
G-080/19	19	10
G-080/25	25	10
G-080/30	30	10
G-080/37	37.5	8
G-080/45	45	8
G-080/50	50	8
G-080/62	62.5	8
G-080/75	75	8

**SPECIMEN PREPARATION****AGGREGATE****UNIVERSAL SAMPLE SPLITTER (G-081)**

ASTM C136 • EN 933-3 • AASHTO T27

- Used to halve/divide large amount of aggregates, soils, sands and gravel into two representative portions.
- Equipped with lever and release hoppers.
- Made of heavy-duty steel.

**SUPPLIED WITH**

- Collecting Pans (2 ea)

**TECHNICAL SPECIFICATIONS**

- Adjustable chutes having a thickness of 1/2"

**PARTICLE SHAPE****AGGREGATE SHAPE GAUGE (AG-036)**

EN 933-4 • EN 933-5 • EN 933-7

- Used to measure the ratio between the length to the thickness of any individual particle.

**TECHNICAL SPECIFICATIONS**

- Made of steel

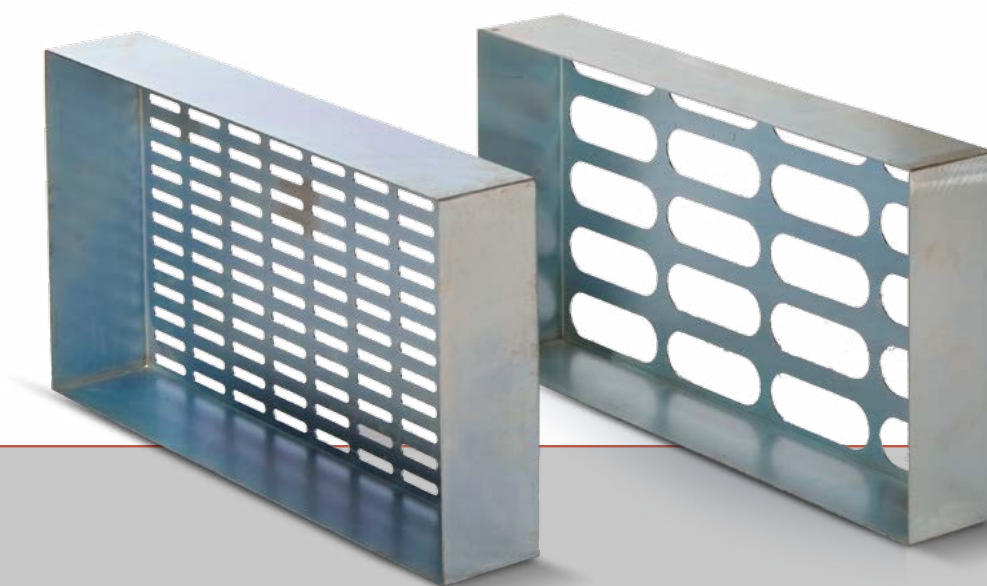


### AGGREGATE

#### FLAKINESS SIEVE SET (AG-030)

BS 812

- Used to determine whether an aggregate particle is flaky or not, that is to determine whether the thickness of the particle is less than 60% of its nominal size or not.
- Each sieve is made of heavy-gauge steel to the dimensions specified in the standard.
- Sieves can be purchased individually (AG-030/xx) or as a set (AG-030).



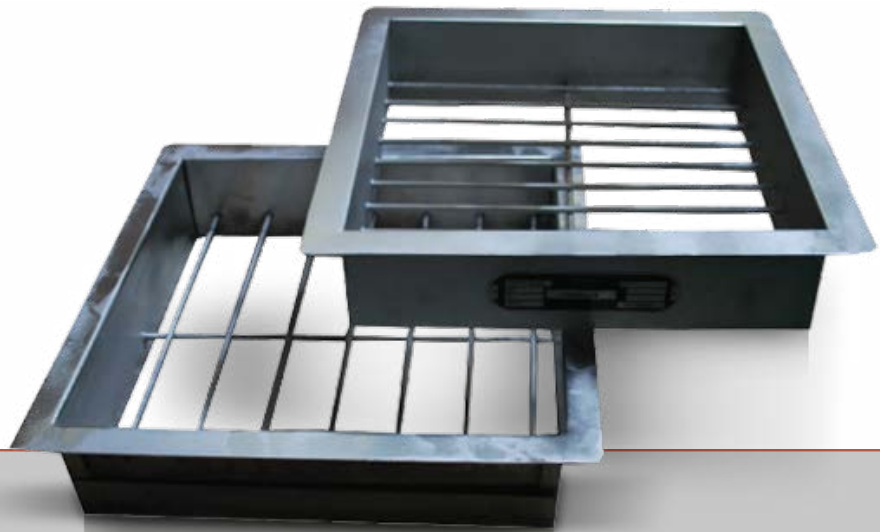
#### LIST OF SIEVES

Code	Slot Dimensions (mm)
AG-030/04	4.9 x 30 mm
AG-030/07	7.2 x 40 mm
AG-030/10	10.2 x 50 mm
AG-030/14	14.4 x 60 mm
AG-030/19	19.7 x 80 mm
AG-030/26	26.3 x 90 mm
AG-030/33	33.9 x 100 mm

## GRID (BAR) SIEVE SET (AG-038)

EN 933-3

- Used to determine the flakiness index of aggregate particles.
- The sieve is made from a robust frame with steel bars.
- Sieves can be purchased individually (AG-038/xx) or as a set (AG-038).



### LIST OF SIEVES

Code	Slot Dimensions (mm)
AG-038/50	50.00 mm
AG-038/40	40.00 mm
AG-038/31	31.50 mm
AG-038/25	25.00 mm
AG-038/20	20.00 mm
AG-038/16	16.00 mm
AG-038/12	12.50 mm

Code	Slot Dimensions (mm)
AG-038/10	10.00 mm
AG-038/08	8.00 mm
AG-038/06	6.30 mm
AG-038/05	5.00 mm
AG-038/04	4.00 mm
AG-038/03	3.15 mm
AG-038/02	2.50 mm

AGGREGATE

## THICKNESS / FLAKINESS INDEX GAUGE (AG-032)

BS 812-105

- Used to determine whether the aggregate is flaky or not, that is to state whether its thickness is less than 60% of its nominal size.



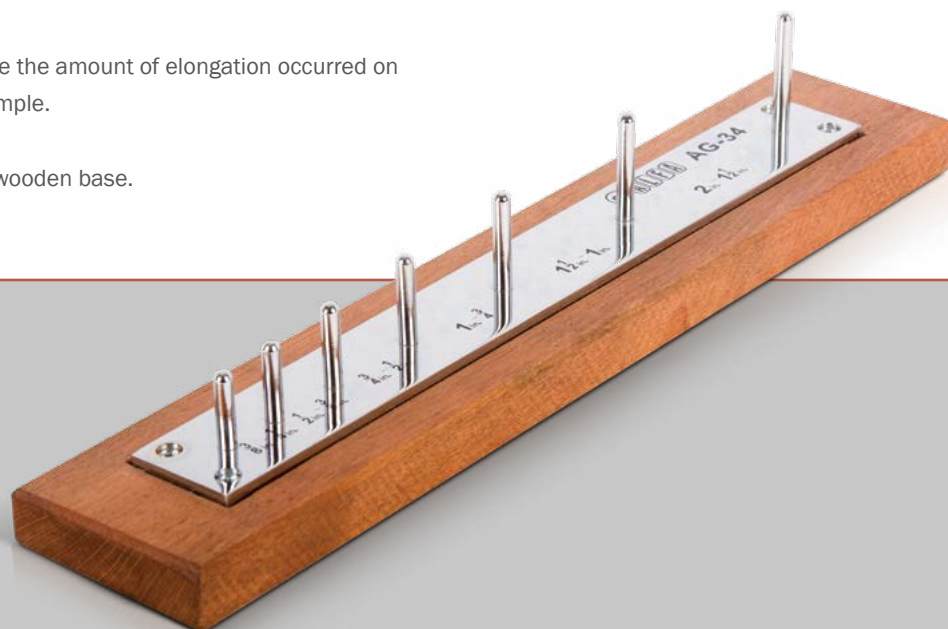
### TECHNICAL SPECIFICATIONS

- Made of steel

## LENGTH GAUGE (Elongation Index) (AG-034)

BS 812


- Used to determine the amount of elongation occurred on the aggregate sample.
- Complete with a wooden base.



## PARTICLE SHAPE

## AGGREGATE

### PROPORTIONAL CALIPER APPARATUS (AG-037) ASTM D4791

- Used to determine the percentages of flat particles, elongated particles, or flat and elongated particles in coarse aggregates.
- 
- According to ASTM, both Method A and Method B can be performed using AG-037, while:
    - Method A** is a reflection of the original procedure as developed prior to Superpave and is intended for all non-Superpave applications.
    - Method B** is a comparison of the maximum particle dimension to the minimum particle dimension and is intended for use with Superpave specifications.

### AGGREGATE SOUNDNESS TEST SET (Magnesium Sulphate Method) (AG-042) ASTM C88

- Used to determine the soundness of aggregate when subjected to weathering action in concrete or other applications.
- The test is done by repeated immersion in saturated solutions of magnesium sulfate followed by oven drying to partially or completely dehydrate the salt precipitated in permeable pore spaces.

#### COMPOSED OF

- Magnesium Sulphate (1 kg)
- Density Basket (Ø 120 mm x 160 mm / 3.35 mm opening)
- Hydrometer (1200 - 1300 g/ml)
- Container with Lid



## AGGREGATE

**ORGANIC IMPURITIES SET (AG-240)**

ASTM C40 • AASHTO T21

- Used to determine the presence of injurious organic impurities in fine aggregates which are to be used in hydraulic cement mortar or concrete.

**COMPOSED OF**

- Organic Color Scale (AG-240/CS)
- Organic Impurities Bottle (AG-240/TB)



## METHYLENE BLUE SET (AG-041) EN 933-9

- Used to determine the amount of clay in the fine proportions of aggregates.

### COMPOSED OF

- 50 ml burette
- Support base with clamp
- Filter paper (Ø 125 mm, pack of 100 pcs)
- Glass Rod (Ø 8 mm x 300 mm)
- 1000 ml beaker
- Methylene blue 100 g
- Kaolinite 500 g
- Mixer with impeller (~ 600 rpm)
  - 220 - 240 V / 50 Hz



### AGGREGATE

#### **SAND EQUIVALENT SHAKER (AG-040/SS)**

ASTM D2419 • EN 933-8

- Provides a constant, uniform and precise shaking for the sand sample in the cylindrical measure used in Sand Equivalent Test Set.
- The equipment has a stroke of  $200 \text{ mm} \pm 10 \text{ mm}$ , shaking at 175 cycle per minute.
- Equipped with a digital stroke indicator.



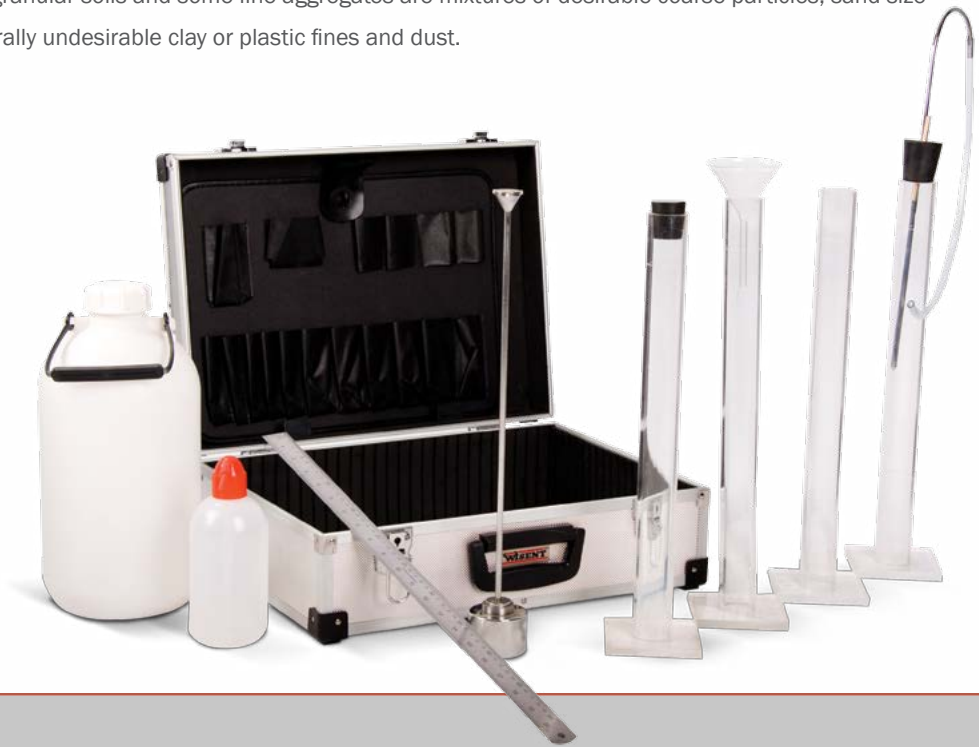
#### **TECHNICAL SPECIFICATIONS**

- Stroke :  $200 \text{ mm} \pm 10 \text{ mm}$
- Rate : 175 cpm
- Digital Stroke Indicator
- 220 - 240 V / 50 - 60 Hz

## SAND EQUIVALENT TEST SET (AG-040)

ASTM D2419 • EN 933-8

- Used to indicate, under standard conditions, the relative proportions of clay-size or plastic fines and dust in granular soils and fine aggregates that pass the 4.75-mm (No. 4) sieve. The term “sand equivalent” expresses the concept that most granular soils and some fine aggregates are mixtures of desirable coarse particles, sand-size particles, and generally undesirable clay or plastic fines and dust.



### COMPOSED OF

Code	AG-040/ASTM	AG-040/EN
Standard	ASTM D2419	EN 933-8
Measuring Cylinder	x 4 Graduated	x 4 Marked at 100 mm and 380 mm
Rubber Stopper	x 2	
Measuring Can	88 ml	200 ml
Plastic Bottle	•	
Irrigator Tube	•	
Syphon Assembly	•	
Weighted Foot Assembly	1000 g	
Funnel	•	
Ruler	•	
Stock Solution	1 lt	



## LOS ANGELES ABRASION TESTER (AG-191)

ASTM C131 • ASTM C535 • EN 1097-2

- Used for testing of coarse aggregates, with a maximum size smaller than 37.5 mm (1-1/2"), for resistance to degradation. It is considered as an indicator of the relative quality or competence of various sources of aggregate having similar mineral compositions.
- A combination of actions including abrasion or attrition, impact, and grinding in a rotating steel drum containing a specified number of steel spheres along with the test specimen.
- Consists of a hollow steel cylinder, with a wall thickness of 12 mm (1/2") closed at both ends having an inside diameter of 711 mm (28"), and an inside length of 508 mm (20").
- The drum rotates at 31 – 33 rpm.
- Supplied with an automatic digital counter that shows the number of revolutions for the drum.
- Supplied less with abrasive charges (should be ordered separately)





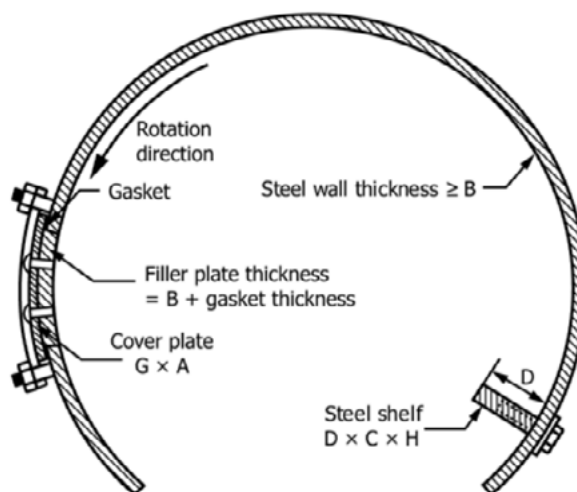
### AGGREGATE

#### LOS ANGELES ABRASION TESTER (AG-191)

ASTM C131 • ASTM C535 • EN 1097-2

#### DRUM DIMENSIONS

A	1/4" 6 mm
B	1/2" 12 mm
C	1" 25 mm
D	3 1/2" 90 mm
G	7 1/2" 190 mm
H (Drum Width)	20" 510 mm
Ø (Drum Diameter)	28" 711 mm



#### SUPPLIED WITH

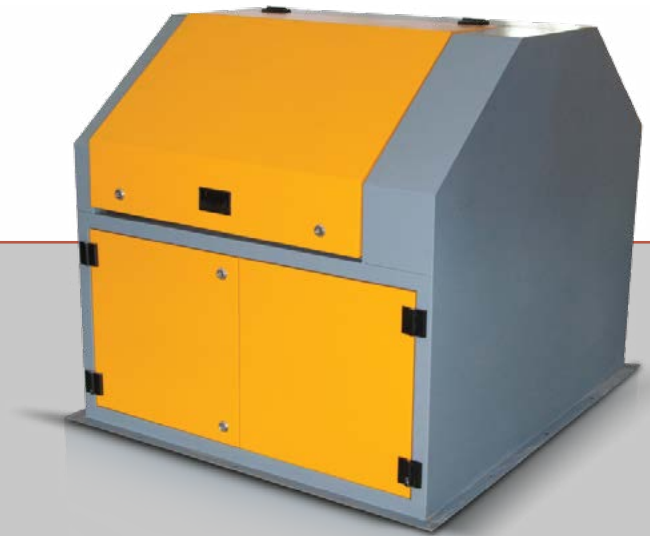
- Collecting tray

#### TECHNICAL SPECIFICATIONS

- Automatic digital counter
- The drum rotates at 31 - 33 rpm
- 220 - 240 V / 50 - 60 Hz

## NOISE REDUCTION CABINET (AG-191/SPC)

- The cabinet is to decrease the noise.
- AG-191/SPC should be ordered separately.



## ABRASIVE CHARGES (AG-191/AC)

ASTM C131 • ASTM C535 • EN 1097-2

- Abrasive charges are used with the Los Angeles Abrasion Tester.



Code	AG-191/AC/ASTM (Total of 12 charges)		AG-191/AC/EN (Total of 11 charges)
Standard	ASTM C131		EN 1097-2
Diameter	Ø 47.6 mm	Ø 46.0 mm	Ø 47.6 mm - 440 g
Weight	440 g	400 g	440 g
Quantity	5 each	7 each	11 each

### AGGREGATE

#### ■ **ABRASION TESTER for NATURAL STONES and CONCRETE TILES (AG-197) EN 1342**

- Used to determine the abrasion-resistance of the natural stones and tiles.
- Equipped with abrasion disc of 70 mm thickness.
- Supplied with 1 kg pack of white corundum.



#### ● **TECHNICAL SPECIFICATIONS**

- Abrasion Disc is 70 mm thick
- Equipped with Digital revolution counter
- 220 - 240 V / 50 - 60 Hz

## **DORRY ABRASION TESTER - BÖHME (AG-199)** EN 1339

- Used to determine the abrasion-resistance of aggregate particles.
- Horizontal abrasion disc diameter of 750 mm.
- Equipped with a digital revolution counter, a sample holder and a beam-loading device.
- Abrasive powder (AG-199/P) should be ordered separately



### **EQUIPPED WITH**

- Equipped with automatic digital counter which stops at the required number of revolutions

### **TECHNICAL SPECIFICATIONS**

- Horizontal Abrasion Disc Ø 750 mm
- Rotation Speed: 30 rpm
- Equipped with automatic digital counter which stops at the required number of revolutions
- Sample holder mounted beam loading device & weight
- 220 - 240 V / 50 - 60 Hz

### AGGREGATE

#### SKID RESISTANCE TESTER (AG-190)

ASTM E-103 • BS 812-144 • EN 1097

- Used for measuring surface frictional properties. It is used to measure the energy loss when a rubber slider edge is propelled over a test surface.
- Suitable for laboratory as well as field tests on flat surfaces, and for polish value measurements on curved laboratory specimens from accelerated polishing-wheel tests.

#### SUPPLIED WITH

- 6 rubber sliders
- Specimen Holder



#### SAND ABSORPTION CONE & TAMPER (AG-200)

EN 1097-6 • BS 812

- Used to determine the specific gravity of the required specimens.
- Made of a rigid and strong steel.

#### TECHNICAL SPECIFICATIONS

- Cone (Ø 40 mm / Ø 90 mm x 75 mm)
- Tamper (Base Ø 25 mm)





## **MICRO-DEVAL ABRASION TESTER (AG-195)**

### **EN 1097-1**

- Used to determine the abrasion-resistance of aggregate particles.
- The machine is made of a rigid steel frame on which the following can be mounted:
  - 2 cylinders (Ø 200 mm x 154 mm)
- Transparent safe guard is fixed on the machine to increase the safety level and insure fault-less environment.
- Equipped with an automatic digital counter.



#### **SUPPLIED WITH**

- Stainless Steel Drums : Ø 200 mm x 154 mm (2 ea)
- Stainless Steel Spheres : Ø 10 mm (Pack of 5 Kg/drum)

#### **EQUIPPED WITH**

- Automatic Digital Counter
- Safety Transparent Guard

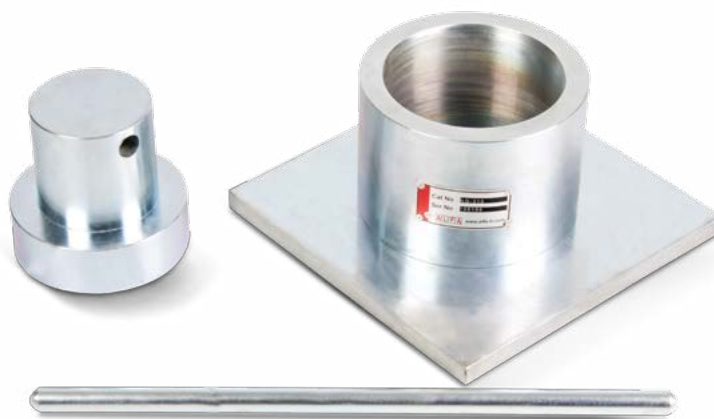
#### **TECHNICAL SPECIFICATIONS**

- Revolution Speed: 100 rpm
- 220 - 240 V / 50 - 60 Hz

### AGGREGATE

## AGGREGATE CRUSHING VALUE (AG-210) BS 812-110

- Used to determine the crushing value for aggregate particles.
- Contains the standard Aggregate Crushing Value pieces.
- The cylinder supplied with the set is made of a heavy-duty steel to resist the impacts during the test.
- Includes a plunger, tamping rod and a base plate.



### TECHNICAL SPECIFICATIONS

AG-210/075	AG-210/150 (TFV Test)
Used for aggregate passing 9.5 mm sieve	Used for aggregate passing 12.7 mm and retaining on 9.5 mm sieve <b>(Ten Percent Fines Value Test)</b>
Steel Cylinder (Ø 75 mm)	Steel Cylinder (Ø 150 mm)
Plunger	Plunger
Tamping Rod (Ø 8 mm x 300 mm)	Tamping Rod (Ø 16 mm x 600 mm)
Measure (Ø 57 mm x 90 mm)	Measure (Ø 115 mm x 180 mm)
Base Plate	Base Plate

## AGGREGATE IMPACT VALUE (AG-220)

BS 812

- Used to determine the aggregate particle resistance to impact.
- Supplied with automatic blow counter.
- Supplied with a sample cylinder, measuring cylinder and a tamping rod.



### SUPPLIED WITH

- Cylindrical measure (Ø 75 mm x 50 mm)
- Tamping Rod

### EQUIPPED WITH

- Blow counter
- Hammer release mechanism





# SOIL



## INDEX

## SOIL

Item	Code	Page
Liquid Limit Device (Casagrande Method)	T-030	178
Motorized Liquid Limit Device (Casagrande Method)	T-030/M	178
Liquid Limit Device (Cone Penetrometer Method)	T-090	179
Plastic Limit Set	T-035	180
Shrinkage Limit Set	T-037	181
Linear Shrinkage Mould, (Soil)	T-039	181
Soil Pocket Penetrometer - Pen-Type	T-304	182
Soil Penetrometer - Dial Model	T-308	182
Soil Proctor Penetrometer	T-310	183
Hand Vane Tester	T-175	183
Lightweight Dynamic Penetrometer	T-300/LW	184
TRL Dynamic Penetrometer	T-300/TRL	184
Balloon Density Apparatus	T-067	185
Compaction Determination Apparatus	T-065	185
Sand Cone Set	T-061	186
Soil Surface Sampler	T-058	188
Soil Auger	T-305	189
Standard Proctor Set	T-050	190
Automatic Soil Compactor	T-055	191
Moisture / Temperature Tester	T-462	192
Water Level Indicator	T-470	192
Universal Carbide Tester (Speedy Moisture Tester)	T-068	193
Electrical Density Gauge	EDG	194
Nuclear Density / Moisture Gauge	EZ-121	195
Laboratory CBR Tester - LCD	T-001/LCD	197
Field CBR Tester	T-001/F	198
Conversion Frame for T-001/F	T-001/F/CF	198
Laboratory CBR Tester - Digital	T-001/D	199
Laboratory CBR Tester - Load-Ring	T-001/LR	199
CBR Equipment	T-01x	200
Sample Extruder	T-020	201
Universal Extruder	T-025	201
Vibratory Compaction Hammer (Kango Hammer)	T-129	202
Hydrometer Set	T-251	204
Constant Head Permeability Set	T-250/CH	205
Falling Head Permeability Set	T-250/FH	205
Oedometer, Consolidation	T-210	206
Relative Density Test Set	T-045	208
Unconfined Compression Tester	T-201	209
Direct Shear Tester	T-220	210
Fully Automatic Triaxial Tester	T-333/A	213



### SOIL

## LIQUID LIMIT DEVICE (Casagrande Method) (T-030)

ASTM D4318 • BS 1377 • AASHTO T89

- Used to determine the moisture content at which soil passes from plastic to liquid state. This feature is very important in specifying the type of the soil, moreover, in determining the other parameters that rely on the soil type.
- Includes a cup that drops on a hard rubber base. It is also equipped with a drop counter.
- The grooving tool is supplied with the equipment (Testing standard is to be specified at the time of order).
- Comprising of:
  - Hard rubber base
  - Brass cup
  - Cam mechanism
  - Blow counter



Motorized Liquid Limit Device (T-030/M)

### SUPPLIED WITH

- Grooving Tool (T-030/GT)

ASTM Grooving Tool (T-030/GT/ASTM)

AASHTO Grooving Tool (T-030/GT/AASHTO)

### ORDERING INFORMATION

Code	Standard	Item
T-030/ASTM	ASTM D4318	Casagrande Apparatus - ASTM
T-030/BS	BS 1377-2	Casagrande Apparatus - BS
T-030/GT/ASTM	ASTM D4318	ASTM Grooving Tool
T-030/GT/BS	BS 1377-2	BS Grooving Tool
T-030/GT/AASHTO	AASHTO T89	AASHTO Grooving Tool
T-030/M/ASTM	ASTM D4318	<b>Motorized</b> Casagrande Apparatus - ASTM
T-030/SBC	ASTM • BS • AASHTO	Smooth Brass Cup
T-030/RBC	ASTM • BS • AASHTO	Roughed Brass Cup

## LIQUID LIMIT DEVICE (Cone Penetrometer Method) (T-090) BS 1377-2

- Used to determine the moisture content while the soil specimen is passing from plastic to liquid state; by measuring the penetration of standard cone free falling into the soil under controlled conditions.
- Equipped with a release button.



Digital Cone Penetrometer (T-090)

**T-090** Hand-operated model with a digital indicator to be used with a stopwatch.



Semi-Automatic Digital Cone Penetrometer (T-090/SA)

**T-090/SA** Semi-Automated model with a digital indicator. It releases and stops the plunger automatically and shows the penetration measurements on a digital indicator.

### SUPPLIED WITH

- Penetration Cone: (T-090/PC)
  - Length: 35 mm
  - Angle: 30°
- Sample Cup (Ø 55 mm x 35 mm) (GL-20/S)

### SOIL

#### PLASTIC LIMIT SET (T-035)

ASTM D4318 • BS 1377-2 • AASHTO T-90

- Used to determine the plastic limit (lowest moisture content) at which a sample can be rolled into threads, 3 mm diameter, without breaking and/or cracking.



#### COMPOSED OF

- |                         |                   |           |
|-------------------------|-------------------|-----------|
| • Stainless steel rod   | (Ø 3 mm)          | T-035/SSR |
| • Glass plate           | (300 mm x 300 mm) | GL-38     |
| • Moisture tin (6 ea)   | (Ø 55 mm x 35 mm) | GL-20/S   |
| • Evaporating dish      | (Ø 120 mm)        | GPP/12    |
| • Spatula               | (100 mm)          | GL-17/S   |
| • Plastic Carrying Case |                   |           |

## SHRINKAGE LIMIT SET (T-037)

ASTM D427 • AASHTO T-92

- Used to determine the maximum amount of moisture in the sample at which the soil will not shrink while drying.



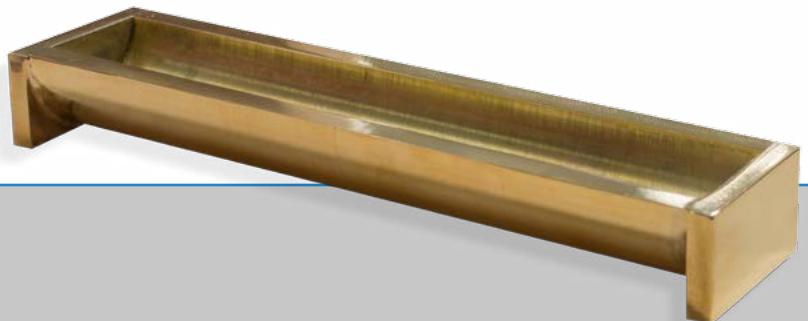
### COMPOSED OF

- |                         |                   |          |
|-------------------------|-------------------|----------|
| • Shrinkage dish (2 ea) | (Ø 45 mm x 10 mm) | T-037/D  |
| • Crystallizing Dish    | (Ø 55 mm x 35 mm) | GL-20/S  |
| • Shrinkage Prong Plate |                   | T-037/PP |
| • Evaporating Dish      | (Ø 120 mm)        | GPP/12   |
| • Graduated Cylinder    | (25 ml)           | GCM/0025 |
| • Spatula               | (100 mm)          | GL-17/S  |
| • Plastic Carrying Case |                   |          |

## LINEAR SHRINKAGE MOULD (T-039)

BS 1377-2

- Used to determine the shrinkage percentage of a soil sample with low clay content.



### TECHNICAL SPECIFICATIONS

- Length : 140 mm
- Radius : 12.5 mm



### SOIL

#### SOIL POCKET PENETROMETER - Pen-Type (T-304)

- Used to determine the classification of cohesive soil based on its consistency, shear strength and the approximate unconfined compressive strength.



Code	Capacity	Plunger's Surface Area
T-304/05	4.5 kgf/cm <sup>2</sup>	32.30 mm <sup>2</sup> (~ 1/20 sq.in)
T-304/16	16 kgf/cm <sup>2</sup>	32.30 mm <sup>2</sup> (~ 1/20 sq.in)

#### SOIL PENETROMETER - Dial-Type (T-308)

- Used to determine the angle of friction, the cohesion index and the approximate unconfined compressive strength.
- Can be used on the foundation soil from clayey soil to sandy soil.
- The Zero Setting for the equipment can be done by pushing the reset button.

#### SUPPLIED WITH

- 5 Different Plungers:
  - Ø 6.35 mm - Ø 10 mm - Ø 15 mm - Ø 20 mm - Ø 25 mm



## SOIL PROCTOR PENETROMETER (T-310)

ASTM D1558

- Used to determine the moisture-penetration resistance relationships of fine-grained soils
- Capacity: 40 kgf (90 lb)
- Supplied with interchangeable stainless steel penetration needles

Needle Area		Needle Diameter
1 in <sup>2</sup>	645 mm <sup>2</sup>	Ø 28.55 mm
3/4 in <sup>2</sup>	484 mm <sup>2</sup>	Ø 24.79 mm
1/2 in <sup>2</sup>	323 mm <sup>2</sup>	Ø 20.22 mm
1/3 in <sup>2</sup>	215 mm <sup>2</sup>	Ø 16.54 mm
1/5 in <sup>2</sup>	129 mm <sup>2</sup>	Ø 12.83 mm
1/10 in <sup>2</sup>	65 mm <sup>2</sup>	Ø 9.07 mm
1/20 in <sup>2</sup>	32 mm <sup>2</sup>	Ø 6.40 mm
1/30 in <sup>2</sup>	22 mm <sup>2</sup>	Ø 5.23 mm
1/40 in <sup>2</sup>	16 mm <sup>2</sup>	Ø 4.52 mm



## HAND VANE TESTER (T-175)

ASTM D2573

- Used to determine the shear strength of the soil either in the laboratory or in the field (in-situ). It is very easy to use and gives the result directly in kPa.



Vane Adaptor	Capacity
Standard	0 - 10 N/cm <sup>2</sup> (0 - 100 kPa)
Sensitive	0 - 2 N/cm <sup>2</sup> (0 - 20 kPa)
High Capacity	0 - 25 N/cm <sup>2</sup> (0 - 250 kPa)

### SOIL

#### **LIGHTWEIGHT DYNAMIC PENETROMETER (T-300/LW)** DIN 4094

- Used to determine the structural properties of the pavement, roads or any other existing construction areas with boundless materials.



#### **COMPOSED OF**

- Sounding rods - Ø 20 mm x 1 m (11 ea)
- Lifting device
- Grooved rod for sample extraction (1 ea)
- Hammer (10 kg) falling from 500 mm height
- Anvil
- Coupling
- Drive point 90° x 500 mm<sup>2</sup> (1 ea)
- Drive point 90° x 1000 mm<sup>2</sup> (1 ea)
- Carrying Case

#### **TRL DYNAMIC PENETROMETER (T-300/TRL)** ASTM D6951

- Used to determine the structural strength of pavement layers in the field.



#### **SUPPLIED WITH**

- Hammer (8 kg) falling from 575 mm fixed height
- Driving rod (16 mm)
- Disposable cone tip (Ø 20 mm / 60°)
- Coupler assembly
- Carrying case

**DETERMINATION OF  
DENSITY****SOIL****BALLOON DENSITY APPARATUS (T-067)**

ASTM D2167

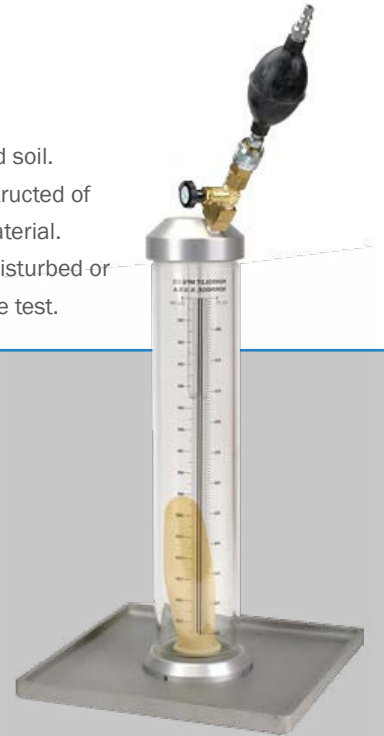
- Used to determine the in-place density and unit weight of compacted or firmly bonded soil.
- Suitable for use as a means of acceptance for compacted fill or embankments constructed of fine-grained soils or granular soils without appreciable amounts of rock or coarse material.
- Also may be used for the determination of the in-place density and unit weight of undisturbed or in situ soils, provided the soil will not deform under the pressures imposed during the test.

**SUPPLIED WITH**

- Rubber balloons (Pack of 5) T-067/RB
- Base plate T-067/BP

**TECHNICAL SPECIFICATIONS**

- Capacity: 1600 ml

**COMPACTION DETERMINATION APPARATUS (T-065)**

- Used to determine the compaction percentage of the soil sample.
- Consists of a 12" diameter ring and supplied with complete accessories needed to perform the test.





### SOIL

#### SAND CONE SET (T-061)

ASTM D1556 • AASHTO T-191 • BS 1377-9

##### ASTM SETS

Code	T-061/06	T-061/12
Standard	ASTM D1556	-
Double-Cone (T-061/xx/DC)	Cast-Aluminum (Ø 6.5")	Ø 12"
Base Plate (T-061/xx/BP)	Cast-Aluminum	•
Plastic Jar (T-061/xx/PJ)	•	○
Calibration Container (T-061/xx/CC)	Ø 150 mm x 200 mm (Should be ordered separately)	○

##### BS SETS

Code	T-061/100	T-061/150	T-061/200
Standard	BS 1377-9		
Cone Diameter	Ø 100 mm	Ø 150 mm	Ø 200 mm
Base Plate (T-061/xxx/BP)	•	•	•
Sand Pouring Cylinder (T-061/xxx/SPC)	•	•	•
Calibration Container (T-061/xxx/CC)	Ø 100 mm x 150 mm	Ø 150 mm x 200 mm	Ø 200 mm x 250 mm

##### ACCESSORIES

Code	Item
T-061/SP	Steel Peg
T-061/SS	Standard Sand (Pack of 1350 g)

**SAND CONE SET (T-061)**

ASTM D1556 • AASHTO T-191 • BS 1377-9

- Used to determine the in-situ density of the fine grain compacted soil. The test consists of making a hole in the compacted soil layer, filling it with known-density soil sample from the container (plastic jar/sand pouring cylinder), then measuring the soil weight along with the water content.
- Contains a sand cone and a base plate that has an opening designed for the cone to sit into. The set also contains a container (plastic jar/sand pouring cylinder) to be used during the test.

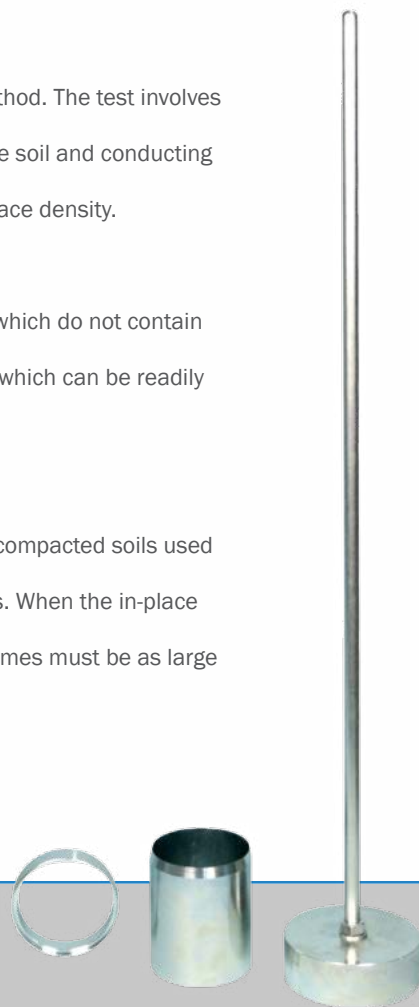


### SOIL

#### SOIL SURFACE SAMPLER (T-058)

ASTM D2937 • BS 1377-9

- Used to determine the in-place density of soil by the drive-cylinder method. The test involves obtaining an intact soil sample by driving a thin-walled cylinder into the soil and conducting specific measurements and calculations for the determination of in-place density.
- The apparatus can be used to determine the in-place density of soils which do not contain significant amounts of particles larger than 4.75 mm ( 3/16 in.), and which can be readily retained in the drive cylinder.
- The apparatus may also be used to determine the in-place density of compacted soils used in construction of structural fill, highway embankments, or earth dams. When the in-place density is to be used as a basis for acceptance, the drive cylinder volumes must be as large as practical and not less than 850 cm<sup>3</sup> (0.030 ft<sup>3</sup>).



#### ORDERING INFORMATION

Code	T-058/ASTM	T-058/EN
Standard	ASTM D2937	BS 1377-9
Drive Cylinder (Cutter)	Ø 4"	Ø 100 mm
Drive Head (Dolly)	Ø 4"	Ø 100 mm
Drive Hammer Weight	10 lb (~4.5 kg)	13.5 kg

## SOIL AUGER (T-305)

- Used to take samples from the surface or near-surface soils.  
It is also used to extract disturbed samples from a soil bulk for boring logs.
- Consists of a T handle, extension tube and an auger head.
- The auger head comes in different diameters, to be chosen depending on the soil type and the desired amount of soil to be extracted.



Code	T-305/063	T-305/080	T-305/100	T-305/150
Auger Head Diameter	Ø 2.5" (63.50 mm) (T-305/AH/063)	Ø 80 mm (T-305/AH/080)	Ø 100 mm (T-305/AH/100)	Ø 150 mm (T-305/AH/150)
T-Handle	•	•	•	•
Extension Tube	1000 mm	1000 mm	1000 mm	1000 mm



### SOIL

#### STANDARD PROCTOR SET (T-050/S)

ASTM D558 • ASTM D698 • ASTM D1557 • EN 13286-2 • BS 1377-4

- Used to determine the relationship between the moisture content and the density for the compacted soil sample. Specifying this relationship will help detecting the optimum moisture content of the compacted soil sample along with its maximum dry density.



Item	Standard Proctor Mould (ASTM)	Standard Proctor Rammer (ASTM)	Standard Proctor Mould (EN)	Standard Proctor Rammer (EN)	Standard Proctor Mould (BS)	Standard Proctor Rammer (BS)
Code	T-050/S-M/ASTM	T-050/S-R/ASTM	T-050/S-M/EN	T-050/S-R/EN	T-050/S-M/BS	T-050/S-R/BS
Diameter	4" (101.6 mm)	2" (50.8 mm)	100 mm	50 mm	105 mm	50 mm
Height (Drop)	4.584" (116.4 mm)	12" (304.8 mm)	120 mm	305 mm	115.5 mm	300 mm
Weight	-	5.5 lb (2.495 kg)	-	2.50 kg	-	2.50 kg

#### MODIFIED PROCTOR SET (T-050/M)

ASTM D558 • ASTM D698 • ASTM D1557 • EN 13286-2 • BS 1377-4

- Used to determine the relationship between the moisture content and the density for the compacted soil sample. Specifying this relationship will help detecting the optimum moisture content of the compacted soil sample along with its maximum dry density.



Item	Modified Proctor Mould (ASTM)	Modified Proctor Rammer (ASTM)	Modified Proctor Mould (EN)	Modified Proctor Rammer (EN)	Modified Proctor Mould (BS)	Modified Proctor Rammer (BS)
Code	T-050/M-M/ASTM	T-050/M-R/ASTM	T-050/M-M/EN	T-050/M-R/EN	T-050/M-M/BS	T-050/M-R/BS
Diameter	6" (152.4 mm)	2" (50.8 mm)	150 mm	50 mm	N/A	50 mm
Height (Drop)	4.584" (116.4 mm)	18" (457.2 mm)	120 mm	457 mm	N/A	450 mm
Weight	-	10 lb (4.5364 kg)	-	4.50 kg	N/A	4.50 kg

**AUTOMATIC SOIL COMPACTOR (T-055)**

ASTM D558 • ASTM D698 • ASTM D1557 • EN 13286-2

- Used to determine the relationship between molding water content and dry unit weight of soil.
- Specifying this relationship will help detecting the optimum moisture content of the compacted soil sample along with its maximum dry density.
- Can perform both standard and modified compactions on soil samples assuring uniform and precise practice.
- Safety transparent door eliminates risks and allows observation.
- Equipped with automatic digital counter which stops at the required number of blows.
- The compactor can be used to compact samples in both standard and modified proctor moulds.



Automatic Soil Compactor (T-055)

Item		Automatic Proctor (ASTM)	Automatic Proctor (EN)
Standard	Diameter	2" (50.8 mm)	50 mm
	Drop Height	12" (304.8 mm)	305 mm
	Weight	5.5 lb (2.495 kg)	2.50 kg
Modified	Diameter	Circular: 2" (50.8 mm) Sector: 2.9" (73.7 mm)	50 mm
	Drop Height	18" (457.2 mm)	457 mm
	Weight	10 lb (4.5364 kg)	4.50 kg



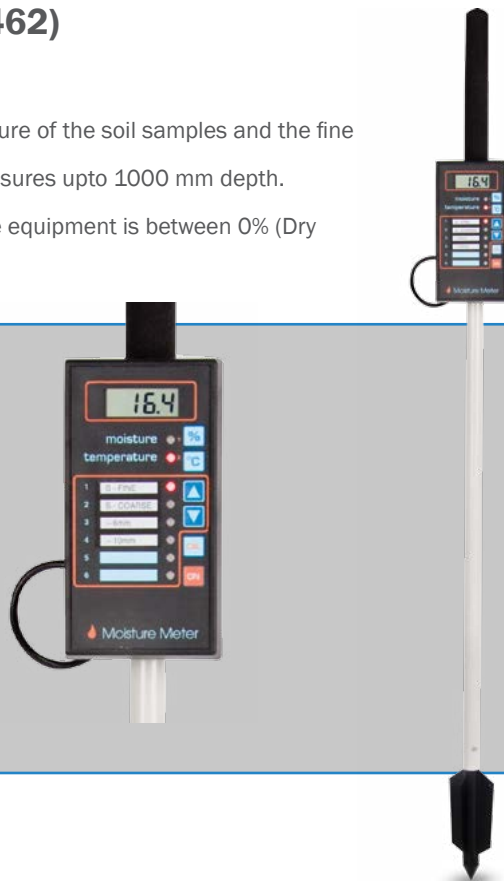
### SOIL

#### MOISTURE / TEMPERATURE TESTER (T-462)

- Used to determine the moisture percentage and the temperature of the soil samples and the fine aggregates with maximum particle diameter of 10 mm. It measures upto 1000 mm depth.
- The range of the moisture content that can be detected by the equipment is between 0% (Dry condition) to 35% with sensitivity of (0.5%).

##### TECHNICAL SPECIFICATIONS

- Depth : 1 m
- Moisture : 0-35% (0.5 %)
- Temperature : -20 / +60 (0.5 °C)



#### WATER LEVEL INDICATOR (T-470)

- Used for determining the level of water in boreholes, wells or any other ground opening.
- Pilot lamp is activated when the probe touches the surface of the water.
- Custom length can be manufactured upon request.

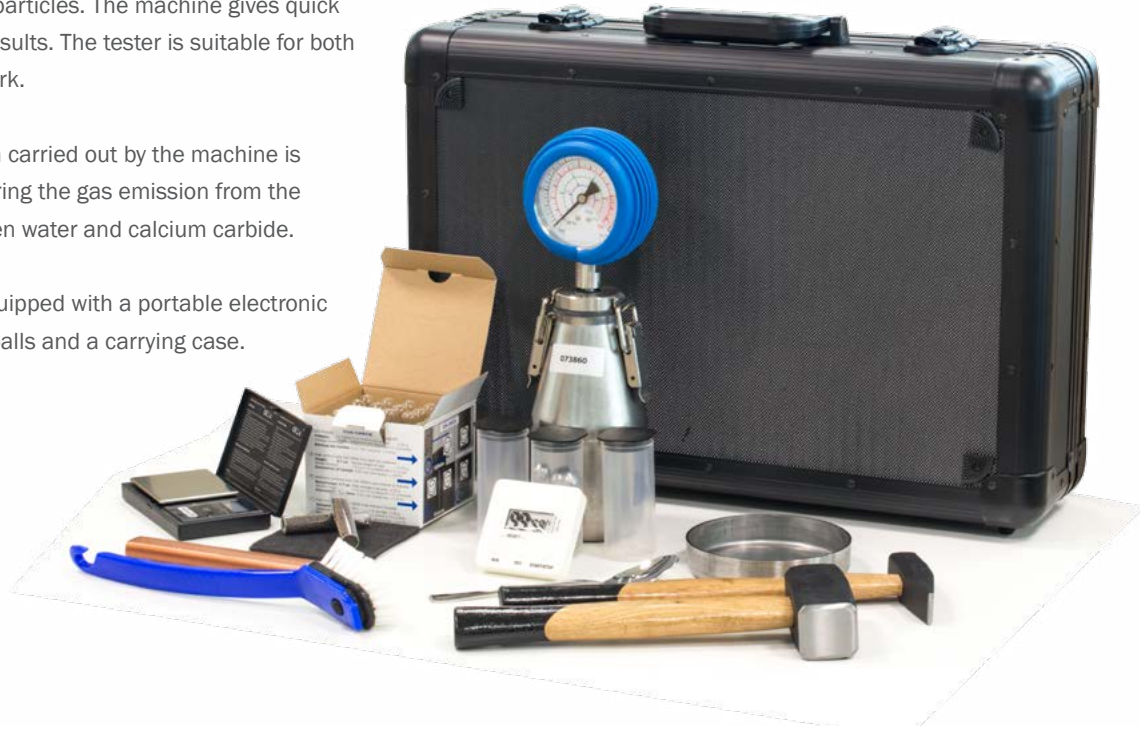
##### AVAILABLE MODELS

- Length: 50 m (T-470/050)
- Length: 100 m (T-470/100)
- Length: 150 m (T-470/150)
- Length: 200 m (T-470/200)



## UNIVERSAL CARBIDE TESTER (Speedy Moisture Tester) (T-068)

- Used to determine the moisture in the soil, sand and aggregate particles. The machine gives quick and accurate results. The tester is suitable for both lab and field work.
- The mechanism carried out by the machine is through measuring the gas emission from the reaction between water and calcium carbide.
- The tester is equipped with a portable electronic balance, steel balls and a carrying case.



### SUPPLIED WITH

- Calibrated Pressure Bottle
- Moisture Meter
- Precise Digital Scale
- Spherical balls
- Sample Cups (2 ea)
- Hammer
- Chisel
- Sampling Spoon
- Sample Grinding Bowl
- Set of 25 ampoules of Calcium Carbide
- Digital Timer/Stopwatch
- Calibration set
- Cleaning Brush
- Carrying Case

### SOIL

## ELECTRICAL DENSITY GAUGE (EDG)

ASTM D7698

- The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations.
- The EDG is a portable, battery-powered instrument capable of being used anywhere without the concerns and regulations associated with nuclear safety.
- Its user-friendly, step-by-step menu guides the user through each step of the testing procedure and cautions the user when values do not correspond to established curves for the material being tested.
- Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with traditional methods, including the nuclear gauge and/or a sand-cone and oven moisture test combination.
- When conducting a test, the EDG measures and displays the results for wet and dry density, gravimetric moisture content and percent compaction.



### TECHNICAL SPECIFICATIONS

- Portable, battery powered.
- Step-by-step menu guide throughout the test.
- Power: Li-ion Battery

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
EDG	53 x 43 x 20 (h)	7





## NUCLEAR DENSITY / MOISTURE GAUGE (EZ-121)

- Used to determine density and the moisture content of the sample in a very short period with very accurate results.
- The testing time can be chosen from the control panel as 15 seconds, 1 minute and 4 minutes.
- The depth range that can be measured by this equipment is 12" (30 cm), with 1" measurement increment.



### TECHNICAL SPECIFICATIONS

- Test time: 15 sec / 1 min / 4 min
- Depth Range up to 12" (30 cm)
- Increment: 1" (2.5 cm)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
EZ-121	Gauge : 40 x 22 x 14 (h)	41
	Reference Standard : 35 x 20 x 8 (h)	
	Transit Case : 79 x 36 x 50 (h)	
	Accessory Case : 50 x 25 x 13 (h)	





**LABORATORY CBR TESTER - LCD (T-001/LCD)**

ASTM 1883 • BS 1377-4 • EN 13286-47

- The California Bearing Ratio (CBR) is a penetration test carried out to evaluate the mechanical strength of road subgrades and base-coarse layers.
- Equipped with an LCD Data Acquisition System to view/perform the test and show the CBR index automatically upon finishing the test.
- Has a capacity of 50 kN and automatically performs the test, with an automatic stop after finishing the test and returning to initial position.
- The LCD screen shows the Loading versus Penetration in a real time graph during the test.
- Equipped with output port to RS 232 or normal printer.

**SUPPLIED WITH**

- Load cell: 50 kN cap
- Penetration Piston

**TECHNICAL SPECIFICATIONS**

- Capacity: 50 kN
- Graphical LCD Data Acquisition system
- Two loading rate: (1 mm/min) and (1.27 mm/min)
- Automatic stop when test complete
- Loading vs. Penetration is shown graphically
- CBR index is given automatically
- RS 232 or output to printer is available
- 220 - 240 V / 50 - 60 Hz



### SOIL

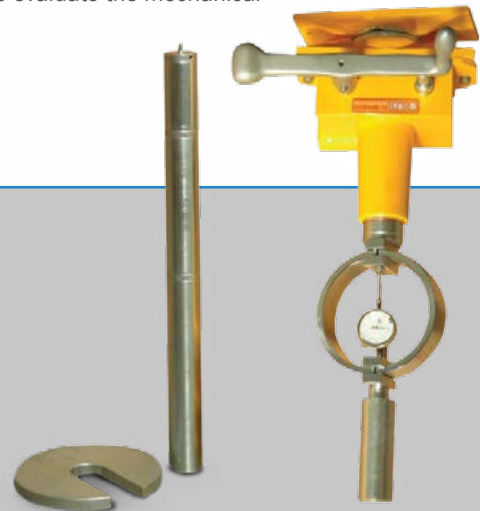
#### FIELD CBR TESTER (T-001/F)

ASTM 1883 • BS 1377-4 • EN 13286-47

- The California Bearing Ratio (CBR) is a penetration test carried out to evaluate the mechanical strength of road subgrades and base-coarse layers.
- Equipped with a mechanical jack (2-speed), and a load ring.

#### COMPOSED OF

- Load Ring Capacity : 50 kN
- Mechanical Jack - 2 Speed
- CBR Penetration Piston
- Penetration Dial (2 ea)
- Dial Holder
- Extension Rods Surcharge Weight



#### CONVERSION FRAME for FIELD CBR TESTER (T-001/F/CF)

ASTM 1883 • BS 1377-4 • EN 13286-47

- This frame cannot be used alone, the frame is used to convert the field CBR (T-001/F) in order to use it in the laboratory.



## CALIFORNIA BEARING RATIO

### SOIL

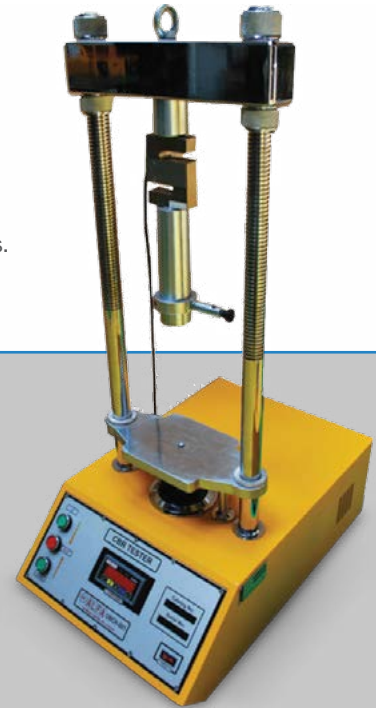
#### LABORATORY CBR TESTER - Digital (T-001/D)

ASTM 1883 • BS 1377-4 • EN 13286-47

- The California Bearing Ratio (CBR) is a penetration test for evaluation of the mechanical strength of road subgrades and base-courses.
- Has a capacity of (50 kN) and the machine is suitable to be used in laboratories.

#### TECHNICAL SPECIFICATIONS

- Load Cell Capacity : 50 kN
- Loading Speed : 1.27 mm/min
- Penetration Dial Indicator : 25 / 0.01 mm
- Penetration Piston : Ø 1.954" (Ø 49.63 mm)
- 220 - 240 V / 50 - 60 Hz



#### LABORATORY CBR TESTER - Load Ring (T-001/LR)

ASTM 1883 • BS 1377-4 • EN 13286-47

- The California Bearing Ratio (CBR) is a penetration test for evaluation of the mechanical strength of road subgrades and base-courses.
- Has a capacity of (50 kN) and the machine is suitable to be used in laboratories.

#### TECHNICAL SPECIFICATIONS

- Load Ring Capacity : 50 kN
- Loading Speed : 1.27 mm/min
- Penetration Dial Indicator : 25 / 0.01 mm
- Penetration Piston : Ø 1.954" (Ø 49.63 mm)
- 220 - 240 V / 50 - 60 Hz





### SOIL

## CBR EQUIPMENT (T-01x)

ASTM 1883 • BS 1377-4 • EN 13286-47



Code	Item	ASTM (T-01x/ASTM)	EN (T-01x/EN)	BS (T-01x/BS)
T-010	CBR Mould	Ø 6" x 7" (Ø 152.4 mm x 177.8 mm) with collar and perforated base plate	Ø 150 mm x 120 mm with collar and perforated base plate	Ø 152 mm x 127 mm with collar and perforated base plate
T-010/C	CBR Mould Collar	Ø 6" x 2" (Ø 152.4 mm x 50.8 mm)	Ø 150 mm	Ø 152 mm x 50 mm
T-010/M	CBR Mould Body	Ø 6" x 7" (Ø 152.4 mm x 177.8 mm)	Ø 150 mm x 120 mm	Ø 152 mm x 127 mm
T-010/CE	CBR Cutting Edge	Ø 6" (Ø 152.4 mm)	○	○
T-011	Solid Base Plate	Plated Steel	Plated Steel	Plated Steel
T-012	Perforated Base Plate	28 x Ø 1/16" (Ø 1.59 mm) holes	Plated Steel	Plated Steel
T-013	Spacer Disc with T-Handle	Ø 5 15/16" x 2.416" (Ø 150.80 mm x 61.37 mm)	Ø 149.5 mm x 36 mm	Ø 150 mm x 50 mm
T-014	Slotted Surcharge Weight	Ø 5 29/32" (Ø 150.02 mm) 5 lb (2270 g)	○	○
T-014	Split Surcharge Weight	○	2000 g	2000 g
T-015	Annular Surcharge Weight	Ø 5 29/32" (Ø 150.02 mm) 5 lb (2270 g)	2000 g	2000 g
T-016	Swell Plate with Stem	Ø 5 29/32" (Ø 150.02 mm) 42 x Ø 1/16" (Ø 1.59 mm) holes Brass, less than 2.8 lb (1.27 kg)	Plated Steel	Plated Steel
T-017	Tripod	Plated Steel	Plated Steel	Plated Steel
T-018	Dial Indicator	10 mm / 0.01 mm	25 mm / 0.01 mm	25 mm / 0.01 mm
T-019	Plastic Soaking Tank	•	•	•

## SAMPLE EXTRUDER (T-020)

- Used to extract the sample from its mould. It can be used with proctor test moulds, CBR test moulds, Marshall test moulds and other moulds having the diameter 100 mm / 4" to 150 mm / 6".
- The machine is actuated using a manual hydraulic jack.

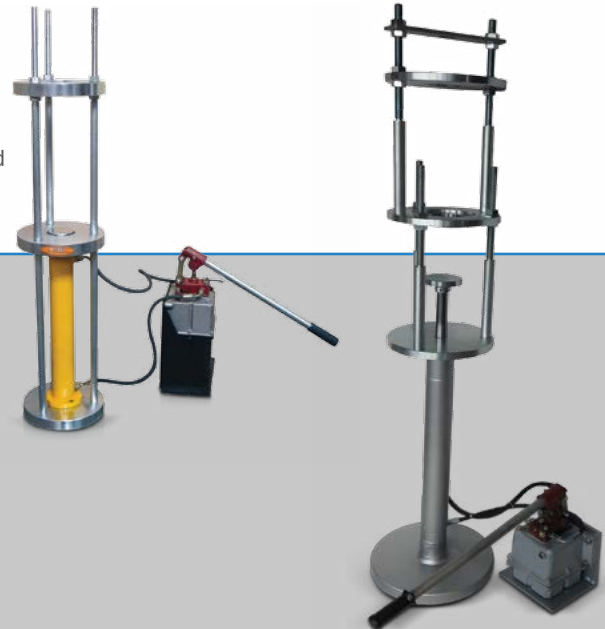


### TECHNICAL SPECIFICATIONS

- Manual-Hydraulic Type
- Used for 100 mm / 4" to 150 mm / 6" diameter samples
- Can be used with Proctor, CBR, Marshall moulds

## UNIVERSAL EXTRUDER (T-025)

- Used to extract the sample out of Shelby moulds, proctor moulds and CBR moulds.
- Controlled by a hydraulic jack having 400 mm stroke.
- Supplied with all the needed adaptors to meet the need of the user, to be specified at the time of inquiry.



### TECHNICAL SPECIFICATIONS

- Used for:
  - Shelby, proctor moulds, CBR mould
  - Piston stroke 400 mm
  - Supplied with adaptors

### SOIL

#### **VIBRATORY COMPACTION HAMMER (Kango Hammer) (T-129)**

EN 13286-4 • BS 1377-4 • BS 1924-2

- Used to compact concrete, proctor, CBR and bituminous mixtures.
- Considered as an alternative method in determining the relationship between dry density and water content in the compacted soil specimens.



#### **SUPPLIED WITH**

- Vibrating Hammer (220 - 240 V / 50 - 60 Hz)
- Supporting frame
- Compaction Foots (Ø102 mm & Ø146 mm)

## DIGITAL PLATE LOAD SET (T-063/D)

ASTM D1194 • ASTM D1195 • ASTM D1196

- Used to determine the bearing capacity of soil layers in road constructions, foundations, highways, airport and subgrades and sub-layers of soil.
- Includes a hydraulic loading device, digital indicator, a manual pump, datum bar, dial holder and two dial indicators.



Code	T-063/D/100	T-063/D/250	T-063/D/500
Capacity	100 kN	250 kN	500 kN
Digital Load Indicator	•	•	•
Dial Indicator + Holder	30 mm / 0.01 mm (x3)	30 mm / 0.01 mm (x3)	30 mm / 0.01 mm (x3)
Bearing Plate (Ø 300 mm)	•	○	○
Bearing Plate (Ø 450 mm)	•	•	○
Bearing Plate (Ø 600 mm)	○	•	•
Bearing Plate (Ø 760 mm)	○	○	•

### SOIL

## HYDROMETER SET (T-251)

### ASTM D422

- Used to determine the distribution of particle sizes smaller than 75  $\mu\text{m}$
- Set comprises of:
  - T-251/HSS High-Speed stirrer (not less than 10,000 rpm)
  - T-251/WB Temperature-controlled water bath with water circulating unit
  - T-251/SC Sedimentation cylinder (6 ea)
  - T-251/151H Soil Hydrometer (151H: 0.995 - 1.038 g/ml)
  - CHE-11 Sodium Hexametaphosphate (1 kg)
  - GCB/0250 Glass beaker (250 ml)
- 220 - 240 V / 50 - 60 Hz



### SUPPLIED WITH

- |   |            |
|---|------------|
| ▪ High-Speed stirrer (not less than 10,000 rpm)                 | T-251/HSS  |
| ▪ Temperature-controlled water bath with water circulating unit | T-251/WB   |
| ▪ Sedimentation cylinder (6 ea)                                 | T-251/SC   |
| ▪ Soil Hydrometer (151H: 0.995 - 1.038 g/ml)                    | T-251/151H |
| ▪ Sodium Hexametaphosphate (1 kg)                               | CHE-11     |
| ▪ Glass beaker (250 ml)   | GCB/0250   |
| ▪ Sodium Hexametaphosphate                                      | CHE-11     |

### TECHNICAL SPECIFICATIONS

- 220 - 240 V / 50 - 60 Hz



## CONSTANT HEAD PERMEABILITY SET (T-250/CH)

ASTM D2434 • BS 1377-5 • AASHTO T215

- Used to determine the permeability of granular-grained soils

Code	T-250/CH/075	T-250/CH/114
Permeameter stand with 3 tubes	•	•
Transparent Plastic Permeability Cell	Ø 75 mm	Ø 114 mm
Water Reservoir Tank	•	•
Take-Off Points	3	12 (6 blacked off)



## FALLING HEAD PERMEABILITY SET (T-250/FH)

- Used to determine the permeability of fine-grained soils

### SUPPLIED WITH

- Permeameter stand with 3 tubes
- Plated-Steel Falling-head permeability cell - Ø 100 mm (1 ea)
- Water Reservoir Tank



### SOIL

#### OEDOMETER - CONSOLIDATION (T-210)

ASTM D2435 • ASTM D3877 • ASTM D4546 • BS 1377-5

- Used to determine the behavior of the soil sample upon certain loading in a specified period of time. It indicates the settlement characteristics of the soil which is known as Consolidation.
- The loading ratio for the device is 10:1 and designed as front loading type. The rear weight is used for balancing the device.
- The device has a support for a screw jack and supplied with a dial and its holder, consolidation cell, two porous discs and weight set.
- Fixed on a frame and can be ordered as 1, 2 or 3 devices on the same frame.



Oedometer - Standard Single-Arm Model (T-210)

#### SUPPLIED WITH

- Dial Indicator : 12.7 / 0.002 mm
- Dial Holder
- Consolidation Cell
- Porous Discs (2 ea)
- Weight Set (3 x 10 kg, 2 x 5 kg, 3 x 2 kg, 3 x 1 kg, 2 x 0.5 kg)

#### TECHNICAL SPECIFICATIONS

- Front Loading Type
- Load Ratio = 10:1
- Rear Balancing Weight
- Screw Jack Support
- Oedometers can be ordered as one (T-063/1), two (T-063/2) or three (T-063/3) devices on the same frame.



Oedometer - Set of 3 (T-210/3)

## OEDOMETER - CONSOLIDATION w/ DEFORMATION-MEASURING SENSOR (T-210/E)

ASTM D2435 • BS 1377-6

- Equipped with electronic deformation measuring sensor.
- Can be connected to a Data Acquisition System to record and monitor the specimen behavior during consolidation.



## DATA ACQUISITION SYSTEM for T-210/E (T-210/DAS)

- Up to 4 consolidation units can be connected.
- Transfers the data instantly to computer via USB port.
- Software is supplied with the equipment.
- 220 - 240 V / 50 - 60 Hz

### SOIL

#### RELATIVE DENSITY TEST SET (T-045)

ASTM D2453 • EN 13286-5

- Used to determine the maximum-index dry density/unit weight of cohesionless, free-draining soils using a vertically vibrating table.
- For many cohesionless free-draining soils, the maximum index density/unit weight is one of the key components in evaluating the state of compactness of a given soil mass that is either naturally occurring or placed during construction.
- Relative density and percent compaction are commonly used for evaluating the state of compactness of a given soil mass. Density/unit weight index is also sometimes used.

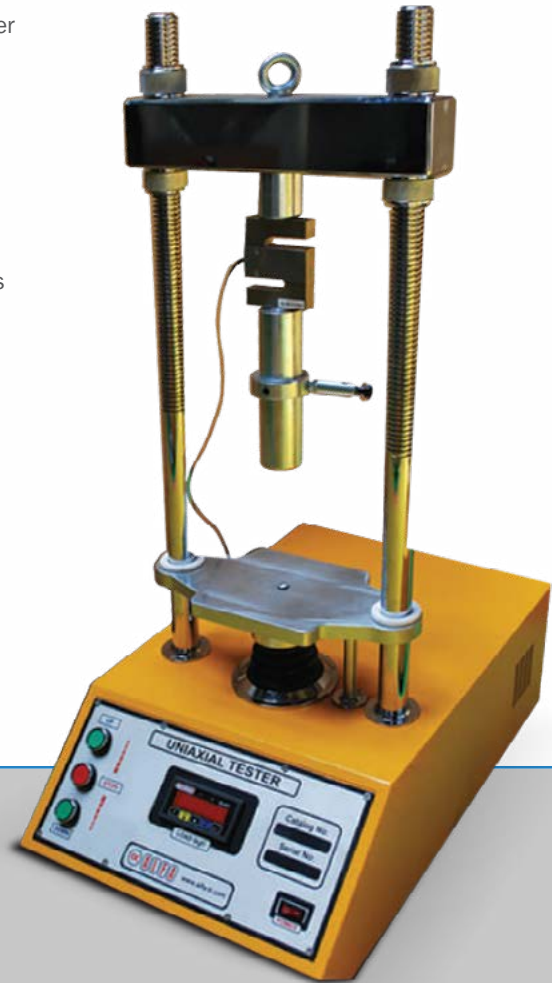


Code	
T-045/ASTM	T-045/EN
Test Standard	
ASTM D2453	EN 13286-5
Vibrating Table	
Electromagnetic (760 mm x 760 mm) 220 - 240 V / 50 - 60 Hz	
Mould(s)	
0.500 cu.ft. (14,200 cm³) / Ø 11" (279.40 mm)	0.500 cu.ft. (14,200 cm³) / Ø 11" (279.40 mm)
0.100 cu.ft. (2,830 cm³) / Ø 6" (152.40 mm)	
Surcharge Weight(s)	
56.50 lb (25.6 kg) for Ø 6" mould	190 lb (86.2 kg) for Ø 11" mould
190 lb (86.2 kg) for Ø 11" mould	

**UNCONFINED COMPRESSION TESTER (T-201)**

ASTM D2166 • EN 1377-7

- Used to determine the Unconfined Compressive Strength (UCS) and the material's behavior and characteristics under axial loading up to failure point. It can also determine the local deformation of the soil sample upon loading.
- Equipped with a load cell (50 kN) and digital indicator.
- The digital indicator has a "Peak Hold" function that shows the maximum load.

**SUPPLIED WITH**

- Upper and lower compression platens

**EQUIPPED WITH**

- Load Cell 50 kN
- Digital Load Indicator
- Digital Deformation Indicator

**TECHNICAL SPECIFICATIONS**

- Loading Speed: 1.00 mm/min
- 220 - 240 V / 50 Hz

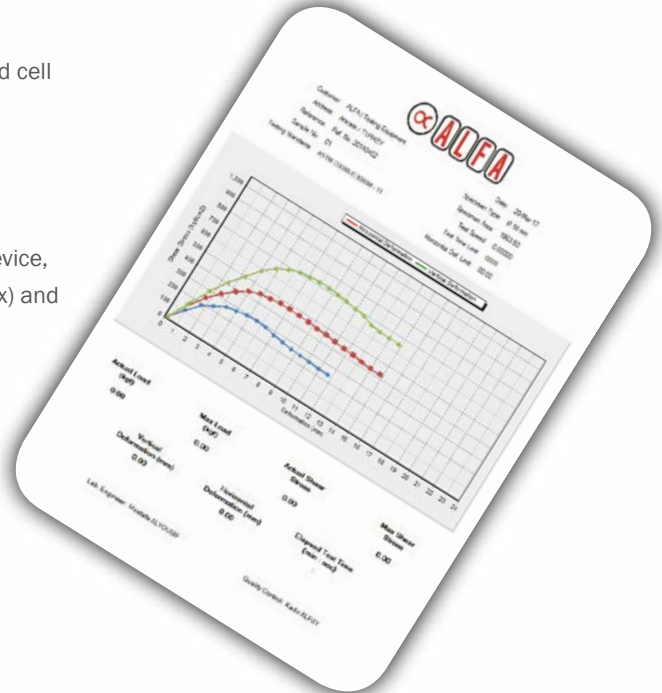


### SOIL

#### DIRECT SHEAR TESTER (T-220)

ASTM D3080 • BS 1377-7

- Used to determine the resistance of soil against shear forces applied on it.
- The device is equipped with a KIOSK type touch screen, load cell with a capacity of 5 kN.
- The loading speed varies from 5 – 0.00001 mm/min.
- Supplied with vertical and horizontal dials, beam loading device, shear box (either 60 mm diameter or 60x60 mm square box) and weight set.



**DIRECT SHEAR TESTER (T-220)**

ASTM D3080 • BS 1377-7

**SUPPLIED WITH**

- Software
- Shear Box 60 mm dia. or 60 mm square (To be specified at the time of order)
- Weight Set (3 x 10 kg, 2 x 5 kg, 3 x 2 kg, 3 x 1 kg, 2 x 0.5 kg)

**EQUIPPED WITH**

- Electronic Deformation Sensor (Vertical and Horizontal)
- Beam Loading Arm

**TECHNICAL SPECIFICATIONS**

- LCD Graphical System
- Shear force measurement by Load Cell
- Maximum Shear Force: 5000 N
- Maximum Vertical Load: 500 N / 5000 N (using 10:1 loading arm)
- Speed Range: 0.00001 - 5.00000 mm/min
- 220 - 240 V / 50 - 60 Hz



## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

- Used to perform large range of Triaxial tests on soil samples to determine the strength parameters and the mechanical properties.
- Capable of performing:
  - Standard Triaxial Tests:
    - UU Test (Unconsolidated Undrained Test)
    - CU Test (Isotropically Consolidated Undrained Test)
    - CD Test (Isotropically Consolidated Drained Test)
  - Wide range of advanced Triaxial tests (ie,  $K_0$  consolidation, and custom stress paths)
- Capacity:
 

▪ Frame	: 200 kN (20 tons)
▪ Load Cell	: 20 kN (2 tons)
▪ Cell	: 2000 kPa
▪ Pressure Transducer	: 25 bar
▪ Water Tank	: > 30 lt
▪ Ram travel	: 50 mm
- Sample Dimensions
 

▪ Triaxial Tests	: 35 – 70 mm
▪ Flexible Wall Permeability	: 35 – 90 mm
- The load cell is installed inside the cell to eliminate the piston friction calculations from the test and provide very precise measurements, which is directly applied on the sample. The water-proof load cell is made completely of stainless steel.





### SOIL

## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

- The load is applied by servo-motor, which allows sensitive control on loading speed ranging from 0.00001 – 9.99999 mm/min.
- The cell is made of high-strength plexiglass specially designed for this particular device with thickness of 10 mm.
- Equipped with 2 PVAs (Pressure-Volume Actuator) which controls and measures both pressure change volume change in the cell and the sample. The PVA is completely controlled from computer with the supplied software.
- The pressure is measured using very precise pressure transducer that sends the data to the equipped acquisition system.
- The acquisition system gathers the data from all the sensors (load cell, pressure transducers, electronic position indicators ... etc), analyses it and sends it to the computer via USB.
- The water tank is fitted with a magnetic stirrer to de-air the water before pumping it into the system. Adding this feature significantly reduces the time required to saturate the sample and provide air-free water during the test to the whole system.
- The LCD indicator at the front of the system shows the readings from all the sensors and the position of the PVA pistons with the amount of water left in each one simultaneously.
- The tests are all performed from computer with the help of ALFA's state-of-the-art Triaxial Control software (refer to appendix A for more details).
- The device is supplied with all the required accessories to perform Triaxial Tests, Uniaxial UCS Tests, Permeability Tests, and all the tools for proper sample preparation.

### SUPPLIED WITH

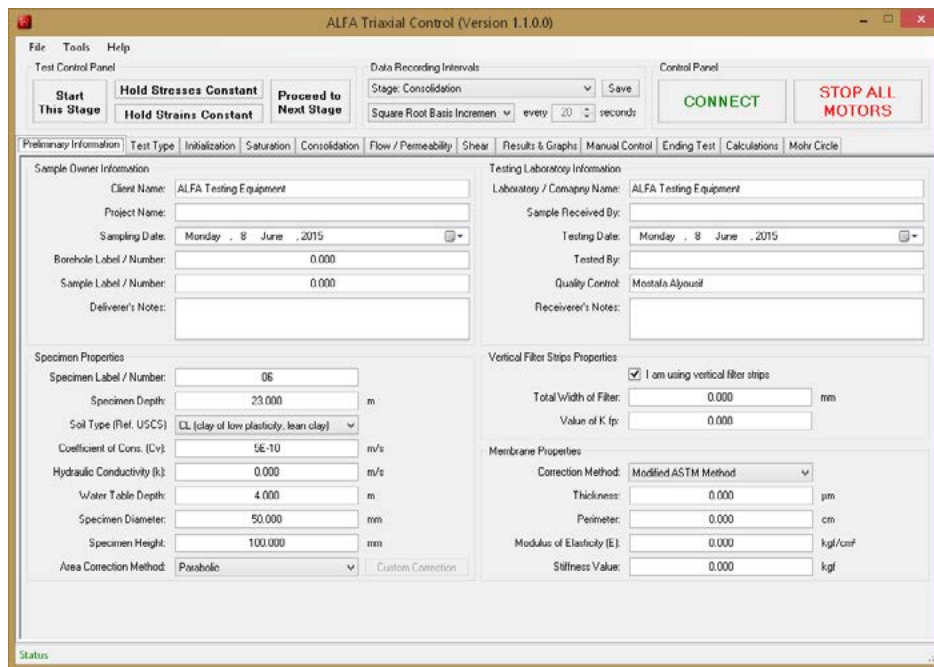




## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE



- The software provides full control on ALFA's Triaxial Tester (T-333/A). It consists of different tabs with self-explanatory notes and guides taken from the international standards and based on the findings of reliable researchers and universities in the world.
- Each tab guides the user to what should be done in very simple step-by-step progress. The top part of the software is constant that provides quick access to some important control functions on the software and the machine like proceeding to next stage, changing the data recording method for the report, emergency stop for the machine ... etc.

### SOIL

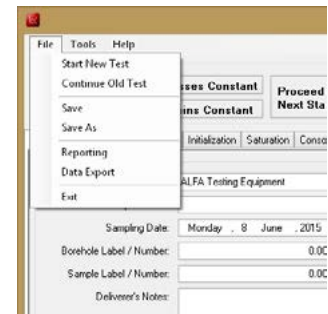
## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE

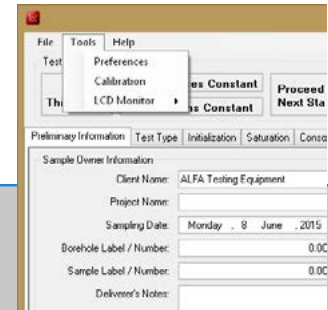
#### File Menu

- Start New Test Used to start new test from beginning
- Continue Old Test Used to continue an old test and merge the data of sets together for comparison
- Save Saves the current test
- Save As Saves the current test to different file
- Reporting Adjust the report settings and what to include in it
- Data Export Export the data to third-party applications like Excel
- Exit Closes the software



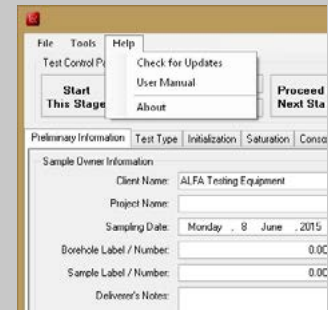
#### Tools Menu

- Preferences Adjust test preferences like units, connections ... etc
- Calibration Perform / check the sensors' calibration
- LCD Monitor Turn ON and OFF the LCD monitor



#### Help Menu

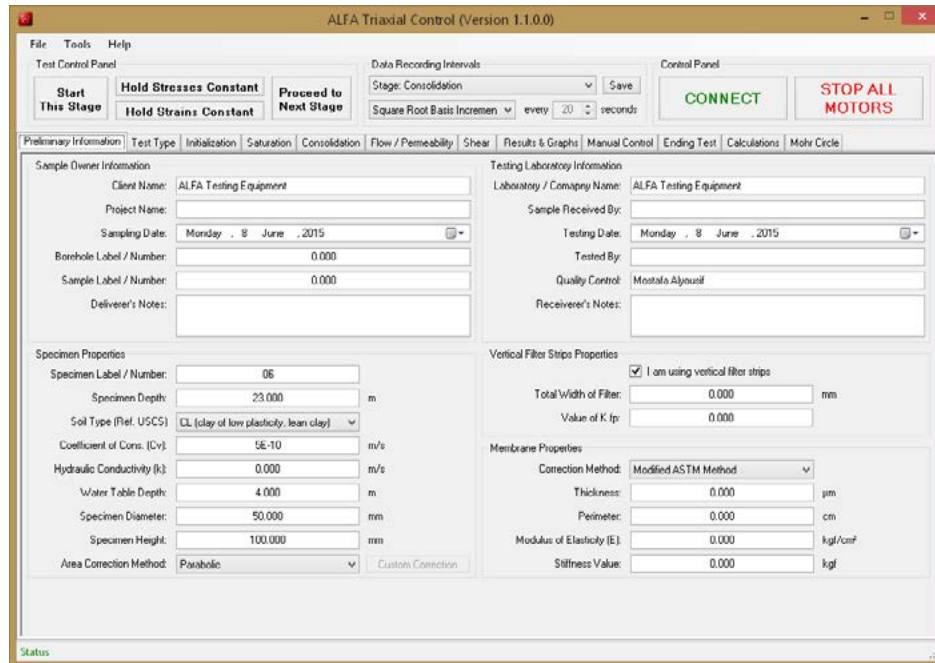
- Check for Updates Check if there is any update available for the software (requires internet connection)
- User Manual Views the user manual
- About Gives information about the software and its version



## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Preliminary Information Tab



The screenshot shows the 'Preliminary Information' tab of the ALFA Triaxial Control software. The interface includes a menu bar (File, Tools, Help), a 'Test Control Panel' with buttons for 'Start This Stage', 'Hold Stresses Constant', 'Hold Strains Constant', and 'Proceed to Next Stage'. A 'Data Recording Intervals' section shows 'Stage: Consolidation' and 'Square Root Basis Incremen' set to 'every 20 seconds'. A 'Control Panel' has 'CONNECT' and 'STOP ALL MOTORS' buttons. The main area is divided into several sections for data entry:

- Sample Owner Information:** Client Name (ALFA Testing Equipment), Project Name, Sampling Date (Monday, 8 June, 2015), Borehole Label / Number (0.000), Sample Label / Number (0.000), and Deliverer's Notes.
- Testing Laboratory Information:** Laboratory / Company Name (ALFA Testing Equipment), Sample Received By, Testing Date (Monday, 8 June, 2015), Tested By, Quality Control (Mostafa Alyousif), and Receiver's Notes.
- Specimen Properties:** Specimen Label / Number (06), Specimen Depth (23.000 m), Soil Type (Ref. USCS) (CL (clay of low plasticity, lean clay)), Coefficient of Cons. (Cv) (56-10 m/s), Hydraulic Conductivity (k) (0.000 m/s), Water Table Depth (4.000 m), Specimen Diameter (50.000 mm), Specimen Height (100.000 mm), and Area Correction Method (Parabolic).
- Vertical Filter Strips Properties:** A checkbox for 'I am using vertical filter strips' is checked. Total Width of Filter (0.000 mm) and Value of K (0.000).
- Membrane Properties:** Correction Method (Modified ASTM Method), Thickness (0.000 µm), Perimeter (0.000 cm), Modulus of Elasticity (E) (0.000 kgf/cm²), and Stiffness Value (0.000 kgf).

A 'Status' bar is visible at the bottom left of the window.

#### Sample Owner Information:

- To be filled with the sample owner's information. These information are used in the final report.

#### Testing Laboratory Information:

- To be filled with the testing laboratory or institute's information. These information are used in the final report.

#### Specimen Properties:

- Specimen number, depth, coefficient of consolidation, water table, soil type, diameter, height, area correction method ... etc are all selected and specified from this section. These information are crucial and to be used in further calculations and to decide the behavior of the equipment based on the sample properties.

#### Vertical Strips:

- Specifying whether the vertical strips are used or not, with its properties.

#### Membrane Properties:

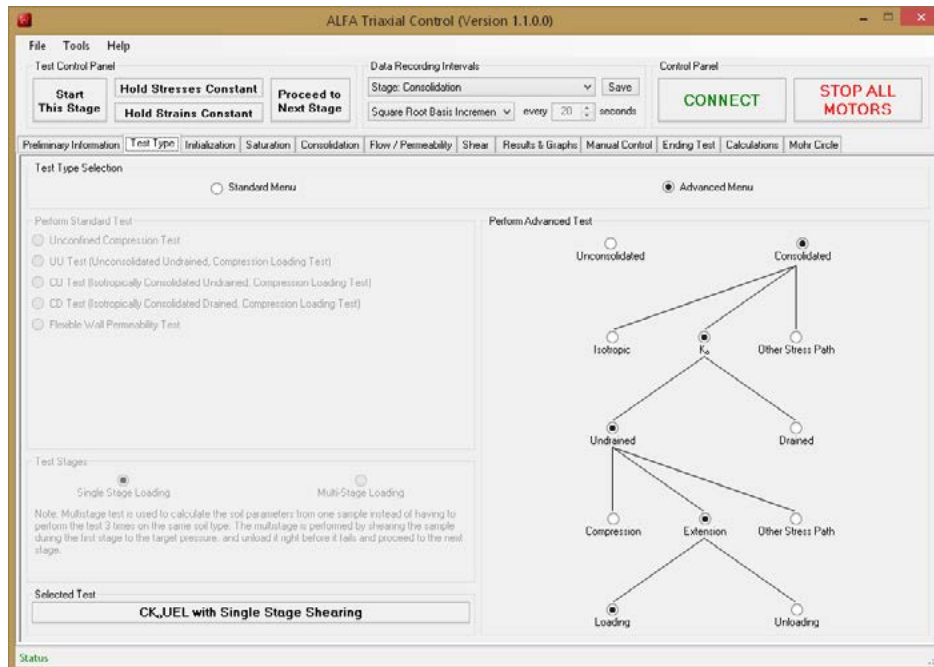
- Specify the correction method for the membrane and specify its properties.

### SOIL

## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Test Type Tab



#### Test Type Selection:

- Select whether to have simplified menu (for standard tests) or advanced menu (for custom tests).

#### Perform Standard Test:

- Choose the test type from simplified selections.

#### Perform Advanced Test:

- Choose the test from stage-by-stage selection. This option gives the ability to perform any custom test on the sample from very wide range of functions based on international standards and findings of reliable researchers and institutes.

#### Test Stages:

- Select between single-stage or multi-stage tests. This option gives the ability to obtain 3 mohr circles and determine the strength parameters from a single Triaxial soil sample.

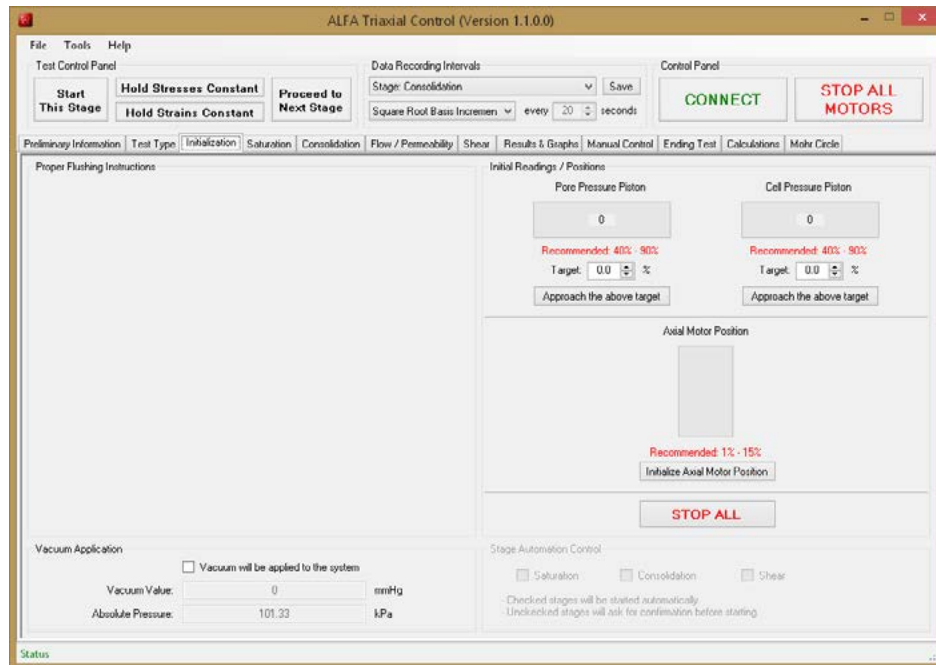
#### Selected Test:

- Displays the chosen test type.

## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Initialization Tab



#### Proper Flushing Instructions:

- Some instructions to perform proper flushing for the setup to avoid having air bubbles left over.

#### Initial Readings / Positions:

- Shows and controls the initial positions of each piston/motor to avoid over-travelling or running out of water during the test.

#### Vacuum Application:

- Gives the ability to include the vacuum calculations to the software if applied (used for sand samples).

#### Stage Automation Control:

- Gives the option to select which stage to start automatically.

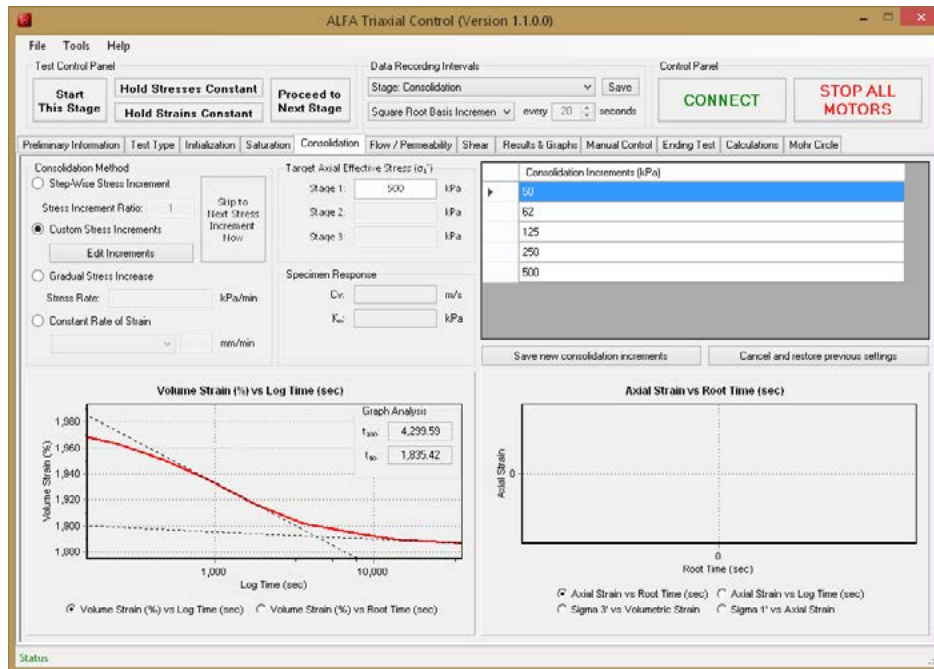


### SOIL

## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Consolidation Tab



#### Consolidation Method:

- Gives the ability to select which method to follow in order to consolidate the sample.

#### Target Pressures:

- Gives the option to target 3 consolidation pressures in multi-stage mode to obtain the strength parameters from single sample.

#### Specimen Response:

- Shows the consolidation value and the K<sub>0</sub> value.

#### Graphs:

- Axial Strain vs  $\sigma_1$
- $\sigma_3$  vs  $\sigma_1$
- Volumetric strain vs time (for t<sub>50</sub> and t<sub>100</sub> calculations)

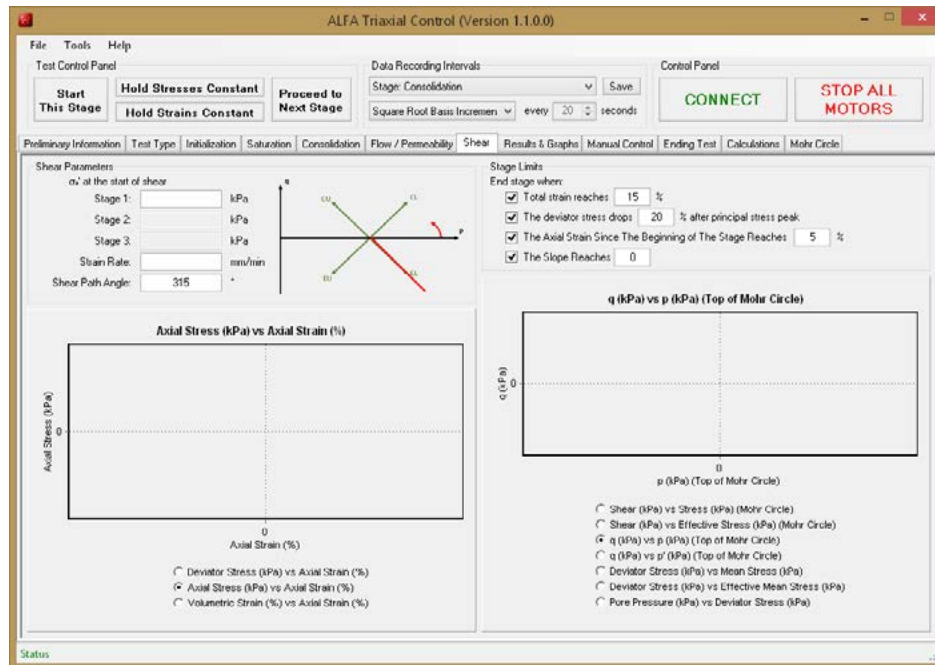
## SHEAR STRENGTH PARAMETERS

SOIL

### FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

#### TRIAXIAL SOFTWARE : Shear Tab



#### Shear Parameters:

- Displays the target pressure for each stage and gives the ability to draw any custom path for the sample. The strain rate is also specified in this section.

#### Stage Limits:

- Gives the option to end the test with any desired limitations..

#### Graphs:

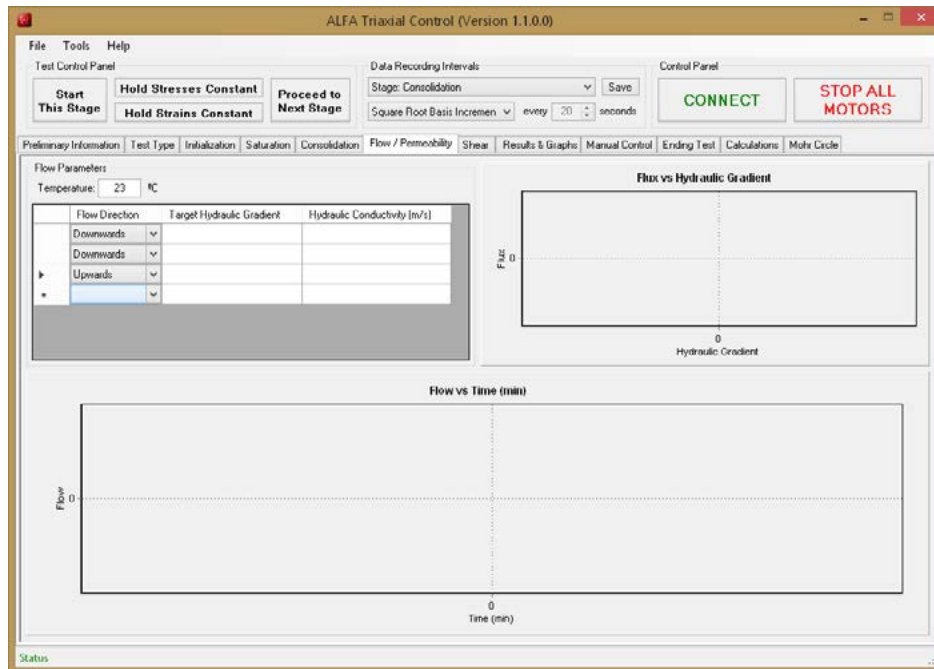
- Mohr Circle graphs and calculations
- q vs p
- q vs p'
- Deviator stress vs mean stress
- Pore pressure vs deviator stress

### SOIL

#### FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

#### TRIAXIAL SOFTWARE : Flow/Permeability Tab



#### Flow Parameters:

- Displays the target pressure for each stage and gives the ability to draw any custom path for the sample. The strain rate is also specified in this section.

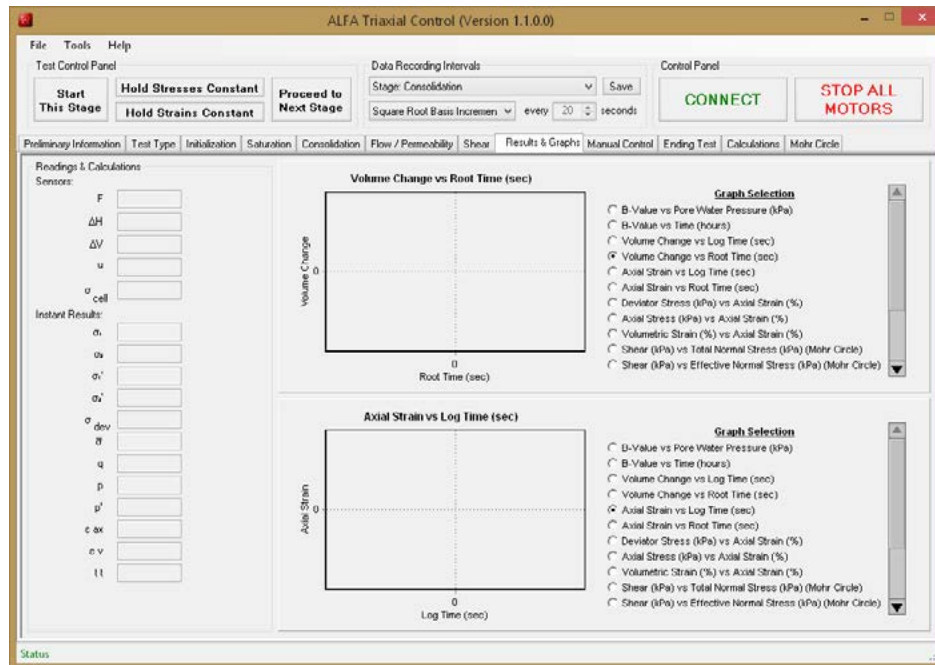
#### Graphs:

- Flow vs time
- Flux vs hydraulic gradient

## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Results & Graphs Tab



#### Readings and Calculations:

- Shows the readings from all the sensors and the calculated values for each parameter simultaneously.

#### Graphs:

- B-Value vs Pore Water Pressure (kPa)
- a-Value vs Time (hours)
- Volume Change vs Log Time (sec)
- Volume Change vs Root Time (sec)
- Axial Strain vs Log Time (sec)
- Axial Strain vs Root Time (sec)
- Deviator Stress (kPa) vs Axial Strain
- Axial Stress (kPa) vs Axial Strain
- Volumetric Strain vs Axial Strain
- Shear (kPa) vs Total Normal Stress (kPa) (Mohr Circle)
- Shear (kPa) vs Effective Normal Stress (kPa) (Mohr Circle)
- q (kPa) vs p (kPa) (Top of Mohr Circle)
- q (kPa) vs p' (kPa) (Top of Mohr Circle)
- Deviator Stress (kPa) vs Mean Stress (kPa)
- Deviator Stress (kPa) vs Effective Mean Stress (kPa)
- Pore Pressure (kPa) vs Deviator Stress (kPa)

### SOIL

#### FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

#### TRIAXIAL SOFTWARE : Mohr Circle Tab



#### Mohr Circle

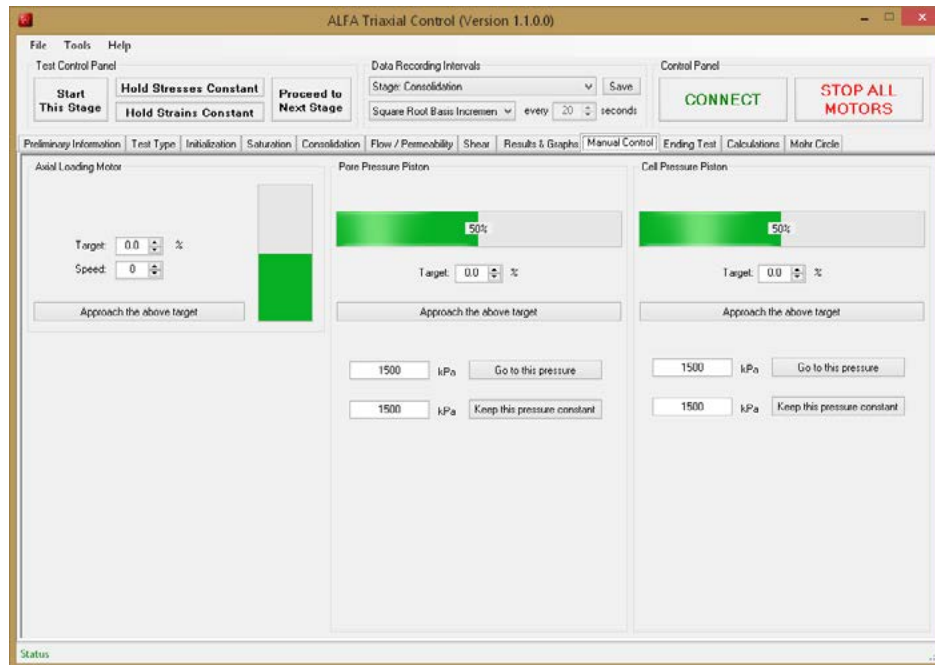
- The software allows the user to combine and compare tests from different samples together in one single report, draw the corresponding mohr circles and calculate the related soil characteristics.



## FULLY AUTOMATIC TRIAXIAL TESTER (T-333/A)

ASTM D2850 • D4767 • D7181

### TRIAXIAL SOFTWARE : Manual Control Tab



- Provides manual control on each motor/PVA.

#### Ending Test Tab:

- Gives instructions on how to end the test properly and empty the cell from water ... etc.

# ASPHALT/BITUMEN

## INDEX

## ASPHALT / BITUMEN

Item	Code	Page
Marshall Stability Tester - LCD	A-001/LCD	229
Marshall Breaking Head	A-001/BH	230
Indirect Splitting Tensile Device	A-001/IT	230
Marshall Mould	A-010	230
Marshall Stability Tester - Digital	A-001/D	231
Marshall Stability Tester - Load-Ring	A-001/LR	231
Sample Extruder	A-020	232
Manual Marshall Compactor	A-016	232
Automatic Marshall Compactor	A-015	233
Marshall Water Bath	G-040	234
Bitumen Penetrometer	A-090	235
Semi-Automatic Bitumen Penetrometer	A-090/SA	235



## INDEX

## ASPHALT / BITUMEN

Item	Code	Page
MOT Straight Edge	A-047	236
Travelling Beam Apparatus (Hi-Low Detector)	A-069	236
Benkelman Beam Apparatus	A-068	237
Filter Paper	FP	237
Flash and Fire Point Apparatus By Cleveland Open Cup method	A-470	238
Bacon Sampler (Thief Method)	A-028	238
Centrifuge Extractor	A-031	239
Reflux Extractor	A-035	239
Solvent Recovery Apparatus	A-042	240
Solubility Tester	A-438	240
Emulsion Distillation Unit	A-450	241
Water Content in Bituminous Materials Test Set	A-455	241
Saybolt Viscometer	A-430	242
Kinematic Viscometer	A-435	242
Ring and Ball (Softening Point) Apparatus	A-472	243
Automatic Ring and Ball (Softening Point) Apparatus	A-472/A	243
Asphalt Oven with Rotating Shelves (TFO)	A-030/TFO	244
Rolling Thin Film Oven (RTFO)	A-030/RTFO	245
Bitumen Content Oven (Ignition Method)	A-030/IGN	246
Vacuum Pycnometer	A-490	247
Vibro-Deairator for A-490	A-490/VD	247
Marshall Mixer	A-050	248
Coring Machine (Trailer Mounted)	A-065	250
Coring Machine (Portable)	A-066	251
Fraass Breaking Point Apparatus	A-465	252
Particle Charge Tester	A-460	252
Nuclear Density / Moisture Gauge	EZ-121	253
Force Ductility Tester	A-440/F	254
Ductility Tester	A-440	255
Ductility Mould	A-440/xM	255
Pressure Aging Vessel	A-800	256
Vacuum Degassing Oven	A-805	258
Bending Beam Rheometer	A-810	260
Bending Beam Rheometer	A-813	262
Dynamic Shear Rheometer	A-820	264
Rotational Viscometer	A-823	265
Gyratory Compactor	A-825	266
Asphalt Roller Compactor	A-830	268
Unitracker (Single Wheel)	A-835	270
Smart Tracker (Multi-Wheels)	A-840	272
Asphalt Shear-Box Compactor	A-845	274
Asphalt Pavemix	A-850	275





## MARSHALL STABILITY

ASPHALT / BITUMEN

**MARSHALL STABILITY TESTER (A-001/LCD)**  
ASTM D1559 • EN 12697-34 • AASHTO T245

- Used to determine the stability of the bituminous mix materials, and the resistance against plastic deformation and flow value of the materials.
- Equipped with an LCD Data Acquisition System to control the test, and display the results in a very easy and simple way.
- Has a capacity of 50 kN and a loading rate of 2"/minute (50.8 mm/min).
- Fully automatic and to stop the test by itself when finishes and return to its initial position.
- Equipped with RS 232 port for computer connection and thermal printer (both should be ordered separately) to report the results quickly and directly from the machine.
- Supplied with load cell that has a capacity of 50 kN and flow-meter.

**SUPPLIED WITH**

- Load cell: 50 kN capacity
- Breaking Head - 4"
- Software

**TECHNICAL SPECIFICATIONS**

- Capacity : 50 kN
- High Precision Load Cell
- Electronic Measure of Flow
- Peak Hold of load and Flow
- Equipped with LCD Indicator
- Load Rate: 50.8 mm/min (2"/ min)
- 220 - 240 V / 50 - 60 Hz





### ASPHALT / BITUMEN

#### MARSHALL BREAKING HEAD (A-001/BH)

- Used, along with A-001, to determine the stability of bituminous mix materials, and the resistance against plastic deformation and flow value of the materials.
- Available in 4" (A-001/BH/4) and 6" (A-001/BH/6)



#### INDIRECT SPLITTING TENSILE DEVICE (A-001/IT)

- Used, along with A-001, to determine the splitting tensile strength of asphalt cores and/or moulded specimens.



#### MARSHALL MOULD (A-010)

ASTM D6926 • EN 12697-10 • AASHTO T245

- Used in preparing and compacting asphalt specimens. The prepared specimen is then used in Marshall Stability tests to determine the strength and flow of that specific Marshall Mix.
- The mould is made of a heavy-duty steel and protected against corrosion.
- The mould is supplied with base plate and collar.



#### TECHNICAL SPECIFICATIONS

- Made of Galvanized Steel
- Diameter:
  - Ø 4" B-010/4
  - Ø 6" B-010/6

## MARSHALL STABILITY

## ASPHALT / BITUMEN

## MARSHALL STABILITY TESTER - DIGITAL (A-001/D)

ASTM D1559 • EN 12697-34 • AASHTO T-245

- Used to determine the stability of the bituminous mix materials, and the resistance against plastic deformation and flow value of the materials.
- Has a capacity of 50 kN and equipped with a digital indicator that shows the load. The digital indicator displays the maximum load during the test via Peak Hold function.
- Supplied with stability mould (Marshall Breaking Head).



### TECHNICAL SPECIFICATIONS

- Capacity: 50 kN
- Equipped with Load Cell
- Complete with Digital Indicator
- 220 - 240 V / 50 - 60 Hz

## MARSHALL STABILITY TESTER - DIGITAL (A-001/D)

ASTM D1559 • EN 12697-34 • AASHTO T-245

- Used to determine the stability of the bituminous mix materials, and the resistance against plastic deformation and flow value of the materials.
- Has a capacity of 50 kN and equipped with a Load Ring that indicates the load.
- Supplied with stability mould (Marshall Breaking Head).

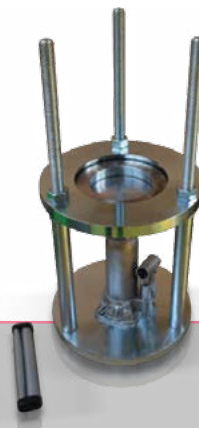


### TECHNICAL SPECIFICATIONS

- Capacity: 50 kN
- Equipped with Load Ring
- Complete with Dial Indicator
- 220 - 240 V / 50 - 60 Hz

#### **SAMPLE EXTRUDER (A-020)**

- Used to extract the sample from its mould. It can be used with proctor test moulds, CBR test moulds, Marshall test moulds and other moulds having the diameter 100 mm to 6".
- The machine is actuated using a manual hydraulic mechanism.



#### **TECHNICAL SPECIFICATIONS**

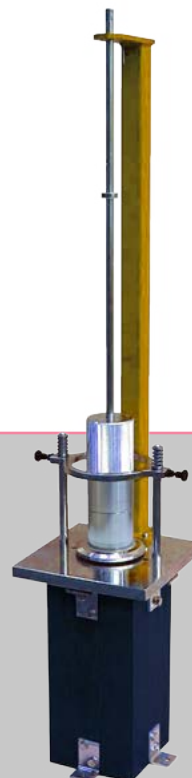
- Manual-Hydraulic Type
- Used for 100 mm to 6" diameter samples
- Can be used with the moulds of Proctor, CBR, Marshall Tests

#### **MANUAL MARSHALL COMPACTOR (A-016)** ASTM D6926

- Used to determine the resistance of an asphalt specimen to plastic flow.
- The test is performed using a manually dropped hammer.

#### **COMPOSED OF**

- Compaction Hammer
- Wooden Pedestal
- Steel Plate
- Mould Holder
- Hammer Guide



**AUTOMATIC MARSHALL COMPACTOR (A-015)**

ASTM D6926 • EN 12697-10 • AASHTO T245

- Used to determine the resistance of asphalt sample to plastic flow. The test is performed in a fully automatic mechanism and programmed to stop automatically at the required number of blows.
- Supplied with the standard height and rammer weight according to ASTM/EN standards.
- Equipped with a blow counter, wooden pedestal and quick action clamping.



ASTM Model (A-015/ASTM)



EN Model (A-015/EN)

**TECHNICAL SPECIFICATIONS (ASTM)**

- Blow Rate : 55 ± 5 blows per minute
- Rammer Diameter : 100.33 mm ± 0.25 mm
- Rammer Weight : 4536 g ± 9 g
- Drop Height: 457.205 mm ± 0.635 mm
- 220 - 240 V / 50 - 60 Hz

**TECHNICAL SPECIFICATIONS (EN)**

- Equipped with safety guard
- Wooden pedestal : 200 x 200 x 450 (h) mm
- Concrete base : 450 x 450 x 200 (h) mm
- Blow Rate : 50 blows in 55/60 seconds
- Rammer Weight : 4535 g ± 15 g
- Drop Height : 460 ± 3 mm
- 220 - 240 V / 50 - 60 Hz

#### WATER BATH (G-040)

- Used to cure specimens at constant temperature.
- Exterior is made of powder coated steel and the interior tank and the cover are stainless steel.
- Supplied with perforated rack which ensures uniform temperature distribution around the specimen.
- Equipped with digital thermoregulator with range of ambient to 82°C (180°F), and pilot light heat indicator.
- The tank is insulated from the outer cabinet with thick mineral wool to reduce thermal loss and to help maintain constant temperature throughout the tank.
- Available in 6 different models as shown in the table below.



Water Bath (G-040/30)



Water Bath (G-040/30)

#### EQUIPPED WITH

- Digital Thermostat & Indicator

#### SUPPLIED WITH

- Stainless Steel Cover & Base Rack

#### TECHNICAL SPECIFICATIONS

- Interior Stainless Steel
- 220 - 240 V / 50 - 60 Hz

Code	Capacity	Circulation	Cooling
G-040/30	30 lt	○	○
G-040/30/CI	30 lt	●	○
G-040/30/CC	30 lt	●	●
G-040/60	60 lt	○	○
G-040/60/CI	60 lt	●	○
G-040/60/CC	60 lt	●	●



## PENETRATION

## ASPHALT / BITUMEN

**BITUMEN PENETROMETER (A-090)**

ASTM D5 • EN 1426 • AASHTO T49

- Used to determine the penetration of semi-solid and solid bituminous materials.
- The penetration test is used as a measure of consistency. Higher values of penetration indicate softer consistency.



Bitumen Penetrometer (A-090)

**A-090** Hand-operated model with a digital indicator to be used with a stopwatch.



Semi-Automatic Bitumen Penetrometer (A-090/SA)

**A-090/SA** Semi-Automated model with a digital indicator. It releases and stops the plunger automatically and shows the penetration measurements on a digital indicator.

**SUPPLIED WITH**

- Penetration Needle (A-090/PN)
- Sample Cup (Ø 55 mm x 35 mm) (x3) (A-090/SC)
- Transfer Dish (Ø 127 mm x 23 mm) (A-090/TD)

### ASPHALT / BITUMEN

#### MOT STRAIGHT EDGE - 3 m (A-047) EN 13036-7

- Used to measure the surface irregularities of an asphalt pavement.
- Supplied with the graduated wedges.



#### TECHNICAL SPECIFICATIONS

- Length : 3 m

#### TRAVELLING BEAM - Hi-Low Detector (A-069)

- Used for checking planeness/irregularities in concrete and bituminous road surfaces.
- The travelling beam is 3 meters long.
- Deviation of the surface is shown on a scale;
  - in increments of 2 mm from 0 - 10 mm
  - in increments of 5 mm from 10 - 25 mm



#### TECHNICAL SPECIFICATIONS

- Length : 3 m
- Equipped with scale (up to 25 mm)

## **BENKELMAN BEAM APPARATUS (A-068)**

ASTM D4695 • AASHTO T256

- Used to measure the deflection of flexible pavements under the action of moving truck



## **FILTER PAPER (FP)**

- |                                     |               |
|-------------------------------------|---------------|
| ▪ Used for Centrifuge: 1500 g       | A-031/1500/FP |
| ▪ Used for Centrifuge: 3000 g       | A-031/3000/FP |
| ▪ Used for Blaine Apparatus         | C-035/FP      |
| ▪ Used for Reflux Extruder (400 mm) | A-035/FP      |
| ▪ Used for CBR Mould                | T-010/FP      |
| ▪ Used for Marshall Mould           | A-010/FP      |



### ASPHALT / BITUMEN

#### FLASH and FIRE POINT APPARATUS by CLEVELAND OPEN CUP METHOD (A-470)

- Used to determine the maximum temperature bitumen can be safely heated without the danger of an instantaneous flash in the presence of an open flame.
- Supplied with an electronic heater, a thermoregulator, two thermometers, and a sample cup.

#### SUPPLIED WITH

- Electric heater
- Thermoregulator
- Two Thermometers
- Sample Cup



#### BACON SAMPLER (Thief Method) (A-028)

ASTM D140 • EN 58 • AASHTO T40

- Used for obtaining asphalt, bitumen or oil samples within a tank

#### TECHNICAL SPECIFICATIONS

- Made from brass



## BITUMEN PROPERTIES

## ASPHALT / BITUMEN

## CENTRIFUGE - EXTRACTOR (A-031)

ASTM D2172 • AASHTO T-164

- Used to determine the bitumen percentage in asphalt mixtures.
- The extractor is available in two capacities (1500 g and 3000 g), and is equipped with a speed control knob.
- Filter Papers should be ordered separately



### TECHNICAL SPECIFICATIONS

- Capacity:
  - 1500 g A-031/1500
  - 3000 g A-031/3000
- Speed control knob
- Brake for fast stopping
- Filter Papers should be ordered separately
- 220 - 240 V / 50 - 60 Hz

## REFLUX EXTRACTOR (A-035)

ASTM D2172 • AASHTO T-164

- Used to determine the percentage of bitumen in the asphalt pavement mixtures.
- Equipped with a glass cylinder, two wire mesh cones and brass condenser.
- Filter Papers should be ordered separately



### TECHNICAL SPECIFICATIONS

Code	A-035/1	A-035/4
Capacity	1000 g	4000 g
Glass Jar Cylinder	A-035/1/G	A-035/4/G
Wire Mesh Cone (Set of 2)	•	•
Thermometer	•	•
Hotplate	GL-11/S1	GL-11/S1
Brass Condenser	•	•



#### SOLVENT RECOVERY APPARATUS (A-042)

- Used to recover non-flammable solvents using condensation process
- Single-Chamber
- 220 - 240 V / 50 - 60 Hz



#### SOLUBILITY TESTER (A-438)

ASTM D2042 • EN 12592

- Used to determine the degree of solubility in trichloroethylene of asphalt materials having little or no mineral matter.

#### COMPOSED OF

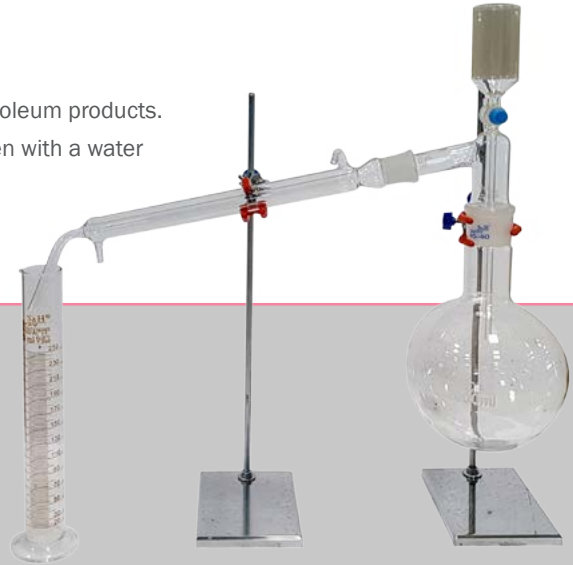
- Filter Flask - 500 ml with Rubber Stopper (GCFF/0500)
- Vacuum Pump (GL-02/S/051)
- Gooch Crucible with Funnel (30 ml)
- Filter Papers (25 mm diameter) (5 Packs of 100)



## EMULSION DISTILLATION UNIT (A-450)

ASTM D402 • AASHTO T-78

- Used to determine the amount of water in bitumen and petroleum products. The mechanism of the test is done via distilling the specimen with a water immiscible (volatile solvent).



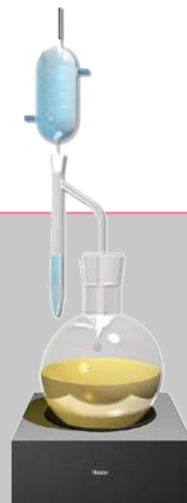
### COMPOSED OF

- Distillation Flask
- Condenser
- Ring Burner
- Thermometer (2ea)

## WATER CONTENT IN BITUMINOUS MATERIALS TEST SET (Dean-Stark Method) (A-455)

ASTM D95 • ASTM D244 • AASHTO T55

- Used to determine the water content in the range from 0 to 25 % volume in petroleum products, tars, and other bituminous material



### SUPPLIED WITH

- Glass balloon - 500 ml
- Glass receiver - 10 ml
- Glass reflux condenser
- Electrical heater with clamping system

### ASPHALT / BITUMEN

#### **SAYBOLT VISCOMETER (A-430)** ASTM D88 • AASHTO T-72

- Used to determine the viscosity of the petroleum products at a specified temperature.
- The body of the machine is made of stainless steel.



#### **SUPPLIED WITH**

- Filter funnel
- Universal Orifice
- Furol Orifice
- Saybolt receiving flask (A-430/F)

#### **EQUIPPED WITH**

- Electrical Heater with Digital Thermostat
- Mixer for Homogeneity

Code	Item
A-430	Saybolt Viscometer (One Tube)
A-430/2	Saybolt Viscometer (Two Tube)
A-430/F	Flask for Viscometer

#### **KINEMATIC VISCOMETER (A-435)** ASTM D2170

- Used to determine the kinematic viscosity of the bitumen and road oil.
- Equipped with electronic thermostat, thermometer and a heating unit.
- Equipped with water circulating unit to provide homogeneous/constant temperature all over the bath.

#### **SUPPLIED WITH**

- Viscosity Tube(s) in accordance with ASTM D2170 (To be specified at the time of inquiry).
- Digital Thermostat & Indicator with accuracy of 0.02 °C.



## SOFTENING POINT

## ASPHALT / BITUMEN

**RING And BALL SOFTENING POINT APPARATUS (A-472)**

- Used to determine the softening point of bitumen immersed in distilled water.

**COMPOSED OF**

- Hotplate
- Glass Beaker - 600 ml GCB/0600
- Brass frame
- Rings w/ centering guide (2 ea)
- Balls (2 ea)
- Glass Thermometer 200°C GTC/200

**AUTOMATIC RING and BALL APPARATUS (A-472/A)**

- Used to determine softening point of bitumen automatically
- Microprocessor controlled, touch screen control unit
- Electronically controlled temperature bath
- Equipped with Magnetic stirrer

**SUPPLIED WITH**

- Glass Beaker
- 2 pcs. brass rings
- 2 pcs. ball centering guides
- 2 pcs. steel balls



### ASPHALT / BITUMEN

#### ■ ASPHALT OVEN WITH ROTATING SHELVES (A-030/TF0)

ASTM D6 • ASTM D1754 • EN 13303 • EN 12607-2

- Used to determine the effects of heat and air on a film of semi-solid asphaltic materials. The effects of this treatment are determined from measurements of selected asphalt properties before and after the test.
- Internal chamber and external frame all made of stainless steel, double wall insulation with fiberglass, double-glazed door.
- Equipped with a digital thermostat and an indicator with operating temperature up to 180°C (356°F) fitted with overheat thermostat to prevent accidental over-temperature and to provide a safe working environment. The maximum temperature is regulated with the Proportional Integral Derivative (PID) control and goes to a maximum set value.



#### ● SUPPLIED WITH

- Rotating Shelf
- Containers - dia : 55 x 35 mm (9 ea)
  - used for determination of Loss on Heating (ASTM D6 / EN 13303)
- Containers - dia : 140 x 9.5 mm (2 ea)
  - used for determination of Thin Film (ASTM D1754 / EN 12607-2)

#### ● TECHNICAL SPECIFICATIONS

- Internal and External Chambers from Stainless Steel
- Insulation with fiber glass
- Glass door for inspection
- Temperature control by digital thermoregulator
- Safety Thermostat for overheating
- Rotation : 5-6 rpm
- 220 - 240 V / 50 - 60 Hz



## ROLLING THIN FILM OVEN (A-030/RTFO)

ASTM D2872 • EN 12607-1

- Used to determine the effects of heat and air on a moving film of semi-solid asphaltic materials. The effects of this treatment are determined from measurements of the selected properties of the asphalt before and after the test.
- Internal chamber and external frame are made of stainless steel. Double wall insulation is made of fiberglass and the door is double glazed.
- The door has large glass for inspection during the test.
- Equipped with safety thermostat to prevent accidental over-heating.
- Clear, transparent, heat-resistant glass containers are supplied with the oven.
- Should be connected to a suitable air pressure supply (can be ordered separately).



### EQUIPPED WITH

- Ventilation device
- Precision digital thermostat to maintain 163 °C temperature
- Control thermometer
- Safety thermostat to prevent accidental over-heating

Code	Item	Standard
A-030/RTFO/ASTM	Rolling Thin Film Oven - ASTM	ASTM D2872
A-030/RTFO/EN	Rolling Thin Film Oven - EN	EN 12607-1
A-030/RTFO/GC	Glass Container (Ø 64 mm x 140 mm)	ASTM / EN

## BITUMEN CONTENT OVEN – IGNITION METHOD (A-030/IGN)

- Used to determine the bitumen/binder content in the asphalt and hot-mix samples.
- “After Burner” unit is installed at the top of the oven to reduce the gas emission during the test.
- The maximum temperature for the oven chamber is 600 °C.
- The maximum temperature for the After-Burner unit is 950 °C.
- The bottom of the innerchamber is made of insulating bricks with high strength against abrasion and impacts. The sides of the inner chamber with the ceiling lid are made of fiber board to provide better thermal insulation.
- The outer case is made of galvanized steel.
- The 7” True-Flat-Touch control panel is very user friendly and programmed to display the results graphically and in real-time during the test.
- Equipped with a sample plate and holder made of Nichrome.
- Weighing system (Capacity: 4 kg / Readability: 0.1 kg) is integrated in the oven.
- The oven is equipped with a thermal printer for faster/easier result reporting.



### SUPPLIED WITH

- After-Burner Unit.
- 7” Touch LCD Control Panel.
- Thermal Printer.
- Built-in Weighing System (Capacity: 4 kg / Readability: 0.1 kg).
- Sample Plate & Sample Holder.

### TECHNICAL SPECIFICATIONS

- Chamber Maximum Temperature: 600 °C.
- After-Burner Maximum Temperature: 950 °C.
- Inner made of insulating bricks & fiber board.
- Outer made of galvanized steel.

## VACUUM PYCNOMETER (A-490)

ASTM D2041 • EN 12697-5 • EN 13108

- Used to determine the theoretical maximum specific gravity and density of uncompacted bituminous paving mixtures at 25 °C [77 °F]
- Made of transparent plexiglass
- Capacity: 10 lt
- Complete with:
  - Valve & Gauge
  - Clippers (4 ea)
  - GCFF/0500 Filter Flask - 500 ml
- Used to rapidly determine the asphalt content, bulk specific gravity of aggregates, the specific gravity of bituminous compacted road mixtures and the percent air voids in the sample.
- Vacuum pump must be ordered separately.



### TECHNICAL SPECIFICATIONS

- Minimum vacuum required: 30 mm/Hg
- Vacuum pump must be ordered separately.

## VIBRO-DEAIRATOR (A-490/VD)

- 220 - 240 V / 50 - 60 Hz

#### **MARSHALL MIXER (A-050)**

EN 12947-3 • BS 548-107

- Used to mix the samples with bituminous materials. The mixer provides uniform and quick mixing process.
- The beaters in the mixer rotates in both planetary and spindle ways to provide the best and the most efficient mixing state.
- Equipped with a stainless steel bowl and beater.

#### **AVAILABLE MODELS**

- 5 lt (A-050/05)
- 10 lt (A-050/10)
- 20 lt (A-050/20)

#### **20 lt MODEL FEATURES**

- Capacity : 20 lt
- Spindle Speed : 75 rpm
- Planetary Speed : 45 rpm
- Supplied with:
  - 30 lt stainless steel bowl
  - stainless steel beater
- Equipped with Digital Timer and Digital Thermometer
- 220 - 240 V / 50 Hz



## MIXING

## ASPHALT / BITUMEN

## MARSHALL MIXER (A-050)

EN 12947-3 • BS 548-107



### 10 Lt MODEL FEATURES

- Capacity : 10 Lt (Ø 300 x 145 mm)
- Spindle Speed : 420 rpm
- Planetary Speed : 130 rpm
- Supplied with:
  - Stainless steel bowl
  - Stainless steel beater
- Equipped with Safety Switch
- 220 - 240 V / 50 Hz



### 5 Lt MODEL FEATURES

- Capacity : 5 Lt (Ø 200 x 160 mm)
- Spindle Speed : 420 rpm
- Planetary Speed : 130 rpm
- Supplied with:
  - Stainless steel bowl
  - Stainless steel beater
- Equipped with Safety Switch
- 220 - 240 V / 50 Hz



#### CORING MACHINE - TRAILER MOUNTED (A-065)

- Used to take core samples from asphalt.
- Installed on a trailer for easy transportation.
- Equipped with a petrol engine, four stabilizing feet, 100 lt water tank.
- Core Bits for the machine should be ordered separately



#### TECHNICAL SPECIFICATIONS

- Trailer Mounted
- Petrol Engine
- Stabilizing Feet (4 ea)
- Water Tank (100 Lt)



## CORING MACHINE - PORTABLE (A-066)

- Used to take core samples from asphalt and concrete.
- The machine is designed to be portable and easily carried in a pick-up car.
- Equipped with a petrol engine, four stabilizing screw stands and a vertical screw feed.
- Suitable for Easy Single Person Operation.
- Core Bits for the machine should be ordered separately



## TECHNICAL SPECIFICATIONS

- Portable unit.
- Equipped with:
  - Petrol engine
  - Four stabilizing screws.
  - Vertical screw feed
  - Water inlet
- Engine Configuration : Vertical Shaft
- Engine Fuel : Gasoline
- Starter : Rewind
- Bit Capacity : Up to 6" (150 mm) diameter bits

### ASPHALT / BITUMEN

#### FRAASS BREAKING POINT APPARATUS (A-465) EN 12593

- Used to determine the breaking point of solid and semi-solid bitumens.
- That is the temperature at which bitumen becomes brittle, as indicated by the appearance of cracks when a thin-film of the bitumen on a metal plaque is cooled and flexed in accordance with pre-defined conditions.



#### PARTICLE CHARGE TESTER (A-460) ASTM D224

- Used to determine the particle charge (cationic) for the asphalt cement (bitumen) emulsion.
- Equipped with milliammeter, variable resistor, rechargeable batteries and two stainless steel electrodes.

#### FEATURES

- Identify cationic emulsions
- Equipped with:
  - Milliammeter
- Supplied with:
  - Variable Resistor
  - Rechargeable Battery
  - 2 electrodes (ss)
  - Carrying Case



## ■ NUCLEAR DENSITY / MOISTURE GAUGE (EZ-121)

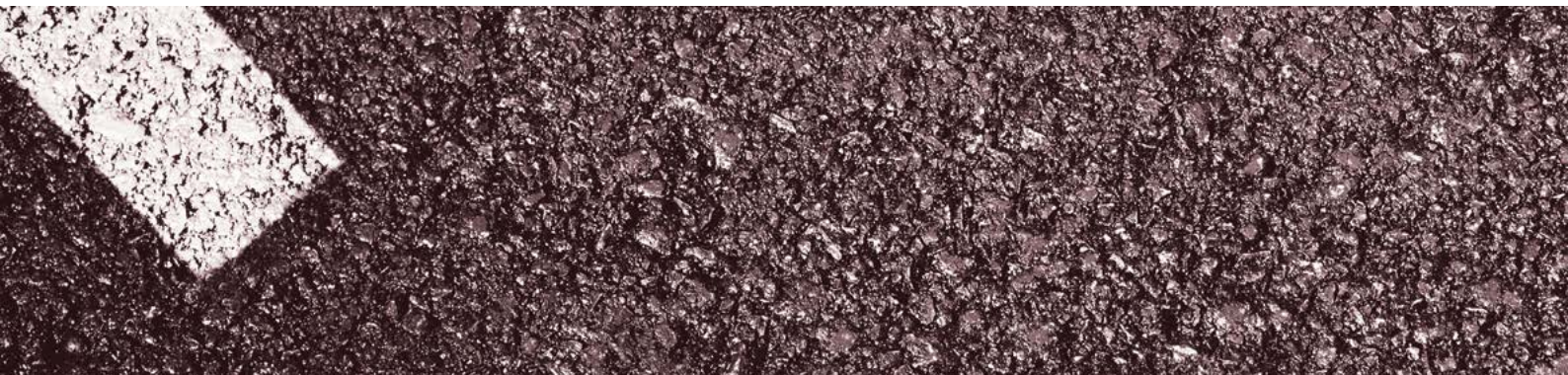
- Used to determine the density and moisture content of a sample in a very short period with very accurate results.
- The testing time can be chosen from the control panel as 15 seconds, 1 minute and 4 minutes.
- The depth range that can be measured by this equipment is 12" (30 cm), with 1" measurement increment.
- Supplied with all the necessary accessories to perform the test.



## ● TECHNICAL SPECIFICATIONS

- Test time: 15 sec / 1 min / 4 min
- Depth Range up to 12" (30 cm)
- Increment: 1" (2.5 cm)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
EZ-121	Gauge : 40 x 22 x 14 (h)	41
	Reference Standard : 35 x 20 x 8 (h)	
	Transit Case : 79 x 36 x 50 (h)	
	Accessory Case : 50 x 25 x 13 (h)	





#### ■ **FORCE DUCTILITY TESTER (A-440/F)**

ASTM D113 • ASTM D6084 • EN 13398 • EN 13589 • EN 13703 • AASHTO T51

- Used to determine the ductility of a bituminous material measured by the distance to which it will elongate before breaking when two ends of a briquet specimen of the material are pulled apart at a specified speed and at a specified temperature
- Machine is controlled by LCD/PC
- Thermostatically controlled Heating & Cooling System
- Interior Stainless Steel (Length: 1500 cm)
- Briquette Capacity : 3
- Testing Speed : 5-100 mm/min
- Elongation measured by optical system
- Equipped with :
  - 3 Submersible Loadcells (each 500 N capacity)
  - Heating/Cooling System
  - Data acquisition system with Real-time graphs
- Supplied with:
  - Ductility Mould (3 ea)      A-440/DM/ASTM
  - Base Plate (3 ea)      A-440/BP
- 220 - 240 V / 50 Hz





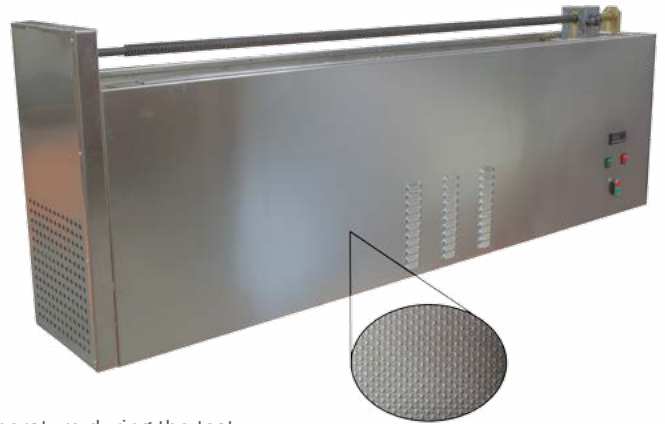
## DUCTILITY

## ASPHALT / BITUMEN

## DUCTILITY TESTER (A-440)

ASTM D113 • ASTM D6084 • EN 13398 • EN 13589 • EN 13703 • AASHTO T51

- Used to determine the ductility of a bituminous materials by measuring the distance to which it will elongate before breaking when two ends of a briquet specimen of the material are pulled apart at a specified speed and temperature.
- Unless otherwise specified, the test shall be made at a temperature of  $25^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$  and with a speed of  $50 \text{ mm/min} \pm 5.0 \%$ .
- The internal bath and external body are made of stainless steel, with double wall fiberglass insulation.
- Equipped with a thermoregulator to maintain the test temperature during the test.
- In hot areas, upon request, refrigerating unit can be also equipped with the machine (A-440/CU).
- Equipped with circulation motor used to maintain a constant temperature.
- Supplied with ductility mould and plate (set of 2).



### TECHNICAL SPECIFICATIONS

- Digital Thermostat & Indicator
- Interior Stainless Steel
- 220 - 240 V / 50 - 60 Hz



### AVAILABLE MOULDS

Ductility Mould (A-440/M)

Code	Name	Standard
A-440/DM/ASTM	Ductility Mould - ASTM	ASTM D6084
A-440/ERM/ASTM	Elastic Recovery Ductility Mould - ASTM	ASTM D6084
A-440/DM/EN	Ductility Mould - EN	EN 13398
A-440/FDM/EN	Force Ductility Mould - EN	EN 13398
A-440/BP	Base Plate for Mould	

### AVAILABLE TESTERS

Code	A-440 Regular Model	A-440/CU Equipped with Cooling Unit
Testing Speed	50 mm/min	
Cooling Unit	○	●
Mould Capacity	3	

## PRESSURE AGING VESSEL (A-800)

ASTM D6521 • EN 14769 • AASHTO R28

<b>Construction</b>	Benchtop unit with integral vessel/oven design
<b>Specimen Capacity</b>	10 TFOT sample trays (included)
<b>Vertical Loading with Fixture</b>	Parallel within 0.002 in (0.05mm)
<b>Front Panel Display</b>	7-inch full-color touch-screen display
<b>Battery Backup System Optional</b>	4 hours minimum backup at full load. 60-day advance notification of end of useful battery.
<b>Operating Pressure</b>	2.10 ± 0.05 MPa (304psi)
<b>Temperature Range</b>	80 °C to 115 °C ± 0.1 °C Programmable from 50 °C to 150 °C
<b>Temperature Control</b>	Microprocessor-based with Platinum RTD
<b>Temperature Control Resolution</b>	± 0.1 °C from 80 °C to 115 °C
<b>Test Temperature Uniformity</b>	± 0.5 °C
<b>Time to Setpoint</b>	3 hours from ambient
<b>Return to Setpoint</b>	120 min. after preheating and loading of specimens
<b>Over-Temperature Protection</b>	Thermal shut-down switch (170 °C/338 °F)
<b>Pressure Vessel Specifications</b>	Per ASME code section VIII, division 1; 1992 A 93
<b>Maximum Pressure</b>	325 psi (2.24 MPa) at 120 °C (250 °F)
<b>Pressure Safety Release</b>	325 psi (2.24 MPa)
<b>Air Inlet</b>	1/4 in. male NPT
<b>Power Requirements</b>	230 VAC 50/60 Hz
<b>Compressed Air Requirements</b>	A source of compressed air with a pressure of at least 325 psi (2.24 MPa) is required.
<b>Approximate Shipping Weight</b>	425 lbs. (195kg)
<b>Electrical Outlet Requirements</b>	NEMA 6-15

## **PRESSURE AGING VESSEL (A-800)**

ASTM D6521 • EN 14769 • AASHTO R28

- Used to prepare specimens for tests developed by the Strategic Highway Research Program (SHRP).
- It simulates in-service oxidative aging that occurs in asphalt binders during service and meets ASTM D6521, AASHTO R28, and EN 14769 test standards as part of the PG grading according to Superpave.
- It consists of a vertical pressure vessel enclosed in a stainless steel cabinet with encased band heaters, a precision sample holder for the simultaneous testing of ten specimens, a set of ten TFOT specimen trays, pressure and temperature measurement devices, and a specimen loading and unloading tool. Test interruption or data loss due to power failure is prevented through an optional battery backup system, and the PAV3's network-ready modem allows users to monitor and regulate their equipment remotely using a computer, tablet, or smart phone.



### **PAV Sample Holder**

- The new PAV3 sample holder is one solid, sturdy unit with no assembly required.
- Leveling is made easy with the vessel's interior leveling ring, and a small bubble level between the slots further assures accurate verification.

### **Increased Control Options**

- The PAV3 features programmable temperatures between 50°C and 150°C, and between 80°C to 115°C the tolerance is well within  $\pm 0.1^\circ\text{C}$ . Pressurization is programmable from 1 hour to 99 hours. This enables AASHTO R28, ASTM D5621, and EN 14769 specifications to be met without any special programming, allowing greater freedom for research and development projects.

### **Data Acquisition**

- Temperature, pressure, and time data are collected throughout the aging process. This information is available to view in real time on the touchscreen display, in the form of raw data or graphs. Once the aging process is complete, a .CSV file can be created and downloaded onto a flash drive using the USB port on the front of the PAV3. The .CSV file can then be easily manipulated using Microsoft Excel or other spreadsheet programs.

## VACUUM DEGASSING OVEN (A-805)

ASTM D6521 • EN 14769 • AASHTO R28

<b>Unit Properties</b>	Self contained automatic vacuum system with illuminated power light and programmable touchscreen controller
<b>Temperature Range</b>	Room temperature to 200 °C
<b>Soak Time</b>	Up to 4,320 minutes
<b>Degass Time</b>	Up to 4,320 minutes
<b>Unit Dimensions</b>	24 inches wide x 16 inches deep x 12 inches high
<b>Operating Pressure</b>	Adjustable from 15 kPa to atmosphere
<b>Pressure Safety Release</b>	Solenoid Valve
<b>Inlet</b>	Internal air pump
<b>Construction</b>	Stainless steel
<b>Sample Capacity</b>	Up to (8) four ounce samples or (4) eight ounce samples
<b>Alarm</b>	Audio and visual alarm
<b>Temperature Accuracy</b>	± 5 °C at 170 °C
<b>Vacuum Gage</b>	Indicated in both kPa and in. hg.
<b>Power Requirements</b>	230 VAC/50-60 Hz or 115 VAC/60 Hz
<b>Accessories</b>	Vacuum Degassing Oven Verification kit: <ul style="list-style-type: none"> <li>• Vacuum Gage (NIST traceable optional)</li> <li>• Calibration Block</li> <li>• Vessel Cap</li> <li>• Thermometer (NIST traceable optional)</li> </ul>

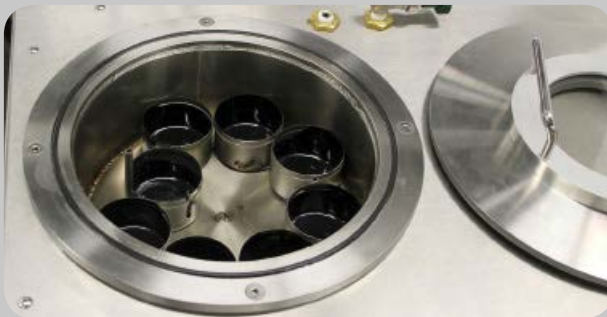
## VACUUM DEGASSING OVEN (A-805)

ASTM D6521 • EN 14769 • AASHTO R28

- Used to remove the air bubbles from aged asphalt binder and other materials, as part of the PG grading according to Superpave.
- With the Vacuum Degassing Oven, operators now have the option to test up to eight four ounce samples or four eight ounce samples.

### Programmable Test Parameters

- Each Vacuum Degassing Oven features a seven inch industrial strength touchscreen display, ideal for the newly designed software. Programmable parameters allow the user to enter a custom temperature (room temperature to 200 °C), soak time (0 to 4,320 minutes), and degas time (0 to 4,320 minutes).
- Enhanced specimen capacity allows users to test a higher number of samples at the same time - increasing efficiency and saving valuable lab time.



- Enhanced specimen capacity allows users to test a higher number of samples at the same time, increasing efficiency and saving valuable lab time.



## BENDING BEAM RHEOMETER (A-810)

ASTM D6648 • AASHTO T313

<b>Load Frame</b>	Integral stainless steel frictionless construction
<b>Loading Shaft</b>	In-line stainless steel with blunt point
<b>Test Load</b>	Variable test range from 0 to 200g standard System maintains required test load within $\pm 0.5g$ throughout the test cycle
<b>Test Cycle Times</b>	Cycle times for pre-load, recovery, and test load are completely operator-adjustable
<b>Load Cell</b>	500g (temperature-compensated)
<b>Mechanical Overload Protection</b>	Standard
<b>Test Weights</b>	Calibrated and traceable to NIST
<b>Sample Supports</b>	25mm (0.98 in.) diameter stainless steel spaced 4.00 in. (101.6mm) apart
<b>LVDT Displacement Transducer</b>	0.25 in. (6.35mm) calibrated range to provide 2 $\mu$ m resolution throughout testing and verification range
<b>Data Display</b>	Large on-screen display of load, displacement, and bath temperature provides ease of set-up and operation. Real-time displacement, loading, and temperature graphs are displayed during the test cycle and can be re-plotted and re-scaled as needed for easy viewing
<b>Cooling Unit</b>	Included (non-CFC refrigerant)
<b>Recommended Cooling Bath Fluid</b>	Non-flammable ethylene glycol mixture
<b>Operating Temperature</b>	Ambient to -40° F (-40° C)
<b>Temperature Measurement</b>	Platinum RTD
<b>Power Requirements</b>	115VAC 50/60Hz Standard 230VAC 50Hz Optional
<b>Compressed Air Requirements</b>	50 psi (0.34 MPa) clean, dry air supply required
<b>Approximate Shipping Weight</b>	250 lbs. (115kg)

## BENDING BEAM RHEOMETER (A-810)

ASTM D6648 • AASHTO T313

- Used to perform flexural tests on asphalt binder and similar specimens per ASTM and AASHTO.
- These tests, initially developed by the Strategic Highway Research Program (SHRP), consist of a constant force being applied to a specimen in a chilled fluid bath in order to derive specific rates of deformation at various temperatures.
- It consists of a fluid bath base unit, a three-point bend test apparatus which is easily removed from the base unit for specimen loading and unloading, an external cooling unit with temperature controller, and a calibration hardware kit with carrying case.
- Additionally, the Bending Beam Rheometer has recently been redesigned according to the latest revisions of the relevant ASTM and AASHTO specifications. This new design includes updated and improved software as well as features that make the Bending Beam Rheometer safer, easier, and more accurate.
- Recording of data points is now twice as accurate (two readings per second as opposed to one).
- For verification that seating loads were within specifications, a graph shows the pre-load results before the initial tests and can be viewed digitally at a later time.
- The pre-test mode includes continuous contact between the loading shaft, anvils, and specimen, and the applying and reapplying of 35mN and 980mN of force.
- All test parameters can be changed, so any future revisions to the ASTM/AASHTO standards can be accommodated.
- The data acquisition system records all raw data points, test specimen/setup data, and the test report in standard ASCII files that can be recalled, printed, or imported into other software packages for further analysis or custom reporting.
- Constant system error checking ensures that the correct parameters have been set prior to test initiation, so specimens are not accidentally destroyed before running the test.



## BENDING BEAM RHEOMETER (A-813)

ASTM D6648 • EM 14771 • AASHTO T313 • AASHTO TP 87

<b>Load Frame</b>	Integral stainless steel frictionless construction
<b>Loading Shaft</b>	In-line stainless steel with blunt point
<b>Test Load</b>	Variable test range from 0 to 400 mN standard. System maintains required test load within +/- 5mN throughout test cycle.
<b>Test Cycle Times</b>	Cycle times for pre-load, recovery, and test load are completely operator-adjustable.
<b>Load Cell</b>	500 g (temperature-compensated)
<b>Mechanical Overload Protection</b>	Standard
<b>Test Weights</b>	Calibrated and traceable to NIST
<b>Sample Supports</b>	3mm (.118") radius stainless steel spaced 4.00in (101.6mm) apart
<b>LVDT Displacement Transducer</b>	0.25in (6.35mm) calibrated range to provide 2um resolution throughout testing and verification range.
<b>Data Display</b>	Large on-screen display of load, displacement, and bath temperature provides ease of set-up and operation. Realtime displacement, loading, and temperature graphs are displayed during the test cycle and can be re-plotted and re-scaled as needed for easy viewing.
<b>Cooling Unit</b>	Included (non-CFC refrigerant)
<b>Operating Temperature</b>	Ambient to -40° F (-40° C)
<b>Temperature Measurement</b>	Platinum RTD
<b>Power Requirements</b>	115VAC 50/60Hz or 230VAC 50Hz
<b>Compressed Air Requirements</b>	50psi (0.34 MPa) clean, dry air supply required
<b>Digital Air Regulation</b>	Linearity of < +/- 1.5% of span Hysteresis Repeatability < 1.0% of span Supply Pressure Sensitivity < 0.2% of span per 1.0 PSIG

## BENDING BEAM RHEOMETER (A-813)

ASTM D6648 • EM 14771 • AASHTO T313 • AASHTO TP 87

- Used to perform flexural tests
- on asphalt binder and similar specimens as part of the PG grading system according to Superpave.
- Its new external chiller is now more compact and omits less noise during operation. Programmable test parameters allow users to input and save their own unique settings, allowing the Bending Beam Rheometer to satisfy a diverse range of testing applications.
- Consists of a fluid bath base with a built-in touchscreen computer, load frame, and external chiller.
- During operation, a known force is applied to the center of a horizontally supported specimen beam submerged in a cold liquid bath while internal software calculates the flexural creep stiffness of the beam.
- Used in part to determine a sample's critical cracking temperature and low temperature PG grade, the Bending Beam Rheometer's -40 °C to 25 °C temperature range is efficiently calculated by a platinum RTD measuring device.
- The 500g load cell and changeable specimen supports easily transition the Bending Beam Rheometer for crack sealant testing, and the free standing external chiller ensures that the cooling fluid maintains a constant temperature.



### Programmable Test Parameters

- Programmable test parameters allow the user to define a test and save those parameters for later testing. Predefined test parameters include the standard ASTM BBR test as well as the crack sealant test and the sliver test. The BBR3's programmable test parameters include: Deflection Plot, Load Plot, Bath Temperature, Stirrer Speed, Specimen size, Testing Times, Load, and Testing Company.

### Reporting Features

- Reporting features on the new BBR3 include the ability to name your sample and enter any important notes. Test data is now collected twice per second.
- In addition to these new features, BBR3 users now also have the ability to upload their company logo directly into their test report.

## DYNAMIC SHEAR RHEOMETER (A-820)

ASTM D7175 • ASTM D 4402 • ASTM D7405 • EN 14770 • AASHTO T350

- Plate-Plate-Measuring system, peltier tempered consists of a peltier control unit, peltier tempered basic plate, basic plate support, adapter, exchange grip, 2 exchangeable plates (Ø 8 mm and Ø 25 mm), measuring plate P3 (Ø 25 mm), measuring plate P4 (Ø 8 mm),
- Software for Bitumen tests according to DIN EN 14770, ASTM D7175-08, ASTM D 4402 / D4402 M, ASTM D7405-10a, AASHTO T350-14, AASHTO M332-14, AASHTO T315-12, AASHTO TP 70, AASHTO M320-10 for test execution as well as display and analysis of measuring data of:
  - **CR-Tests** (shear rate tests e.g. to realise viscosity test according to ASTM D 4402 / D 4402M),
  - **CS-Tests** (shear stress tests e.g. to realise Creep Recovery tests, MSCR-Tests acc. to ASTM D7405-10a, AASHTO P70, AASHTO T 350-14 and AASHTO M332-14) and
  - **Oscillation tests** (e.g. to determine complex shear modulus and phase angle acc. to ASTM D7175-08, AASHTO T315-12, AASHTO M320-10 and DIN EN 14770)
- 1 set of trimming tools, 1 set of rubber moulds, 20ml calibration fluid NF 5 000 000



## TECHNICAL SPECIFICATIONS

- Speed Range : 0,1 ... 1000 rpm
- Speed Resolution : 0.015 rpm
- Temperature Range : -10 ... +150°C
- Angle Range : -50 ... 300°
- Angle Resolution : 0,001°
- Frequency Range : 0,001 ... 10Hz
- Torque : 0,1 ... 150 mNm
- Torque Resolution : 0.002 mNm
- 220 - 240 V / 50 - 60 Hz



## ROTATIONAL VISCOMETER (A-823)

ASTM D2196 • ASTM D 4402 • EN 13302 • AASHTO T316

- Determines the dynamic viscosity of a substance by the rotation of a specified spindle within the sample at the speed giving the maximum torque reading on the viscometer.
- The resulting torque reading is used to calculate the viscosity of the substance.

### TECHNICAL SPECIFICATIONS

- Viscosity range : 100 -13,000,000 cP
- Rotational speed range : 0.3 - 100 rpm
- Thermometer : 0 °C to +100 °C resolution 0.1 °C pre
- Touch key board with 6 keys
- Direct readout on graphic display



### Data displayed:

- Selected speed rpm (18 selectable)
- Selected spindle
- Viscosity result: cP or cSt base scale
- Percentage: %
- Sample Temperature: °C or °F
- Shear rate, shear stress, density
- This instrument determines both relative and absolute viscosity
- Program: 10 working memories; Unit converter: SI to CGS
- Auto alarm in the case of any fault being detected
- Automatically checks for correct operation point by scanning at different speeds
- Calibration by the user himself
- Stainless steel spindles: R2, R3, R4, R5, R6 and R7
- 220 - 240 V / 50 - 60 Hz

## GYRATORY COMPACTOR (A-825)

ASTM D6925 • EN 12697-10 • EN 12697-31 • AASHTO T312

### AVAILABLE MODELS

Code	A-825/ASTM	A-825/EN
Standards	ASTM	EN
Testing Angle	1.16°	0.82°

### ACCESSORIES REQUIRED TO PERFORM THE TEST

Code	A-825/ACC/100	A-825 /ACC/150
Mould	Ø 100 mm	Ø 150 mm
Base Plate	•	•
Mould with Holes For Cold Mixes	Ø 100 mm	Ø 150 mm
Top Penetration Piston	Ø 100 mm	Ø 150 mm
Metallic Disc	Pack of 2	Pack of 2
Filter Paper	Pack of 100	Pack of 100

### FEATURES

- Rigid steel frame ensuring excellent angle control.
- Electro-pneumatic action with servo-controlled regulator.
- Full color touch screen control unit, running like a standard PC based on Windows operating system.
- Software for PC control acquisition and data processing.
- Optional shear stress measurement.
- Concept based on American DOT principles.
- Cold mix emulsions which can be compacted.
- 220 - 240 V / 50 - 60 Hz

## GYRATORY COMPACTOR (A-825)

ASTM D6925 • EN 12697-10 • EN 12697-31 • AASHTO T312

- Used to simulate and reproduce the real compaction conditions under actual road paving operations, hence determining the compaction properties of the asphalt.
- Such compaction is achieved in a fully automatic way, by combining the rotary action and the vertical resultant force applied by a mechanical head. The Compactor comprises a highly rigid steel frame ensuring excellent angle control.
- Load is applied by an electro-pneumatic cylinder, servo-controlled by a precision pressure regulator; the height is measured by a linear transducer. Gyratory motion is generated by an eccentric high precision system allowing an easy set up with precision and constant angle of gyration.
- The rotation speed is controlled by an inverter through on board computer control.
- Using the proper perforated mould, the Compactor is able to run tests also on cold emulsified asphalt mix.
- The acquired results are also employed in the investigation of volumetric and mechanical characteristics of the asphalt mix.
- The touch-screen icon interface allows an easy set up of the parameters and an immediate automatic execution of the test, data acquisition and processing, graphics and file. A remote test control is available through a dedicated software, provided in bundle.



## TECHNICAL SPECIFICATIONS

- Compacted specimen size: dia 100 and 150 mm; height from 0 to 200 mm for both sizes.
- Mould dimensions: Internal dia 100 and 150 mm; height 250 mm for both moulds.
- Gyratory angle: adjustable from 0 to 2,4°
- Number of cycles (gyratory): adjustable from 1 to 5000
- Gyration rate: adjustable from 5 to 60 work cycles/min (30 cycles/min requested by Standards)
- Vertical load on 150mm dia specimen: adjustable from 10 to 900 kPa (900 kPa with 9 bar compressor), (800 kPa with 8 bar compressor), (700 kPa with 7 bar compressor)
- Vertical load on 100 mm dia specimen: adjustable from 23 to 1500 kPa (with 7 bar compressor)
- The vertical load on the specimen is automatically controlled and adjusted by the electronic system.

### ASPHALT / BITUMEN

#### ASPHALT ROLLER COMPACTOR (A-830)

EN 12697-33

#### ACCESSORIES

Code	Accessories	Dimensions
A-830/SR/01	Segment Roller	320 x 260 mm
A-830/SR/02	Segment Roller	500 x 400 mm
A-830/SR/03	Segment Roller	400 x 305 mm
A-830/SR/04	Segment Roller	305 x 305 mm
A-830/M/01	Asphalt Slab Mould	320 x 260 x 180 mm
A-830/M/02	Asphalt Slab Mould	305 x 305 x 50 mm
A-830/M/03	Asphalt Slab Mould	305 x 305 x 100 mm
A-830/M/04	Asphalt Slab Mould (without handles)	400 x 305 x 50 mm
A-830/M/05	Asphalt Slab Mould	400 x 305 x 100 mm
A-830/M/06	Asphalt Slab Mould	500 x 400 x 180 mm
A-830/M/07	Asphalt Slab Mould	400 x 305 x 120 mm
A-830/M/08	Asphalt Slab Mould	320 x 260 x 50 mm
A-830/CP/01	Centering Plate	400 x 305 mm
A-830/CP/02	Centering Plate	305 x 305 mm
A-830/CP/03	Centering Plate	320 x 260 mm

## ■ ASPHALT ROLLER COMPACTOR (A-830) EN 12697-33

- Used to produce representative sample slabs of several dimensions of bituminous mixtures laid and compacted on site
- The Roller Compactor fully operates with the electro-mechanical system, and therefore it does not require any air source (compressor) or hydraulic pressure.
- The compaction is performed through a segmented roller with alternated operated rotation which simulates the on-site action of a street roller. The compaction cycle can be programmed in accordance to a certain load or deformation value.
- The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards specifications and research requirements.
- The sample slabs can be also cored or cut off to obtain cylinders and beams for bending fatigue, indirect tensile, static and dynamic creep, stiffness, and 4-point tests.
- Roller segmens should be ordered separately.



## ● TECHNICAL SPECIFICATIONS

- Sturdy frame made of steel
- Mould supporting table with alternating displacement system, for table displacement and vertical load pressure
- Integrated touch screen control unit based on Windows operating system. The control unit runs like a standard PC for the management and analysis of data, test results, graphs. The touch-screen icon interface allows an easy set up of the parameters and an immediate execution of the test.
- Direct Internet and Intranet (LAN) connection for remote technical assistance. This features allows operators to establish a remote communication and receive software updates.
- Unlimited memory storage with: 2 USB ports, 1 SD card slot.
- Simple and quick roller and mould positioning
- Perfect horizontal flatness of the slab surface
- Uniform density and dimensions of the slabs
- Easy to maintain



## UNITRACKER (Single Wheel) (A-835) EN 12697-22

### ACCESSORIES

Code	Accessories	Dimensions
A-830/M/01	Mould with Handle	320 x 260 x 180 mm
A-830/M/02	Mould with Handle	305 x 305 x 50 mm
A-830/M/03	Mould with Handle	305 x 305 x 100 mm
A-830/M/04	Mould (without handles)	400 x 305 x 50 mm
A-830/M/05	Mould with Handle	400 x 305 x 100 mm
A-830/M/06	Mould with Handle	500 x 400 x 180 mm
A-830/M/07	Mould with Handle	400 x 305 x 120 mm
A-830/M/08	Mould with Handle	320 x 260 x 50 mm
A-830/M/09	Mould with Handle	Ø 200 x 50 mm

- The sample table has dimensions: 400 x 390 mm and can accept rectangular slabs of several sizes:
  - 305 x 305 mm, 50 or 100 mm high
  - 305 x 400 mm, 50 or 100 mm high
  - 200 mm dia. core samples, 50 mm high

The sample confinement frames are not included and have to be ordered separately (see accessories)

### EQUIPPED WITH

- Two doors with insulated glass for inspection

## UNITRACKER (Single Wheel) (A-835) EN 12697-22

- Used in evaluating the deformation depth of a bituminous mixture subjected to cycles of passes of a loaded rubber wheel under constant and controlled temperature conditions. It is used to simulate the effect of traffic and to measure the deformation susceptibility of the bituminous sample.
- It performs the test as per procedures A and B (6 or 2 tests) as specified by the EN Standard.
- The machine is supplied complete with adaptors for a correct mould positioning and locking.
- The wheel tracker is equipped with 3 temperature probes:
  - 1 probe, connected to the thermoregulator, for the control and adjustment of the cabinet temperature.
  - 2 probes for temperature measurement inside the specimen.



## TECHNICAL SPECIFICATIONS

- Travel of the table: 230 +/- 5 mm
- Table cycle frequency: adjustable 15 to 40 cycles per minute.
- Hard rubber tyred wheel having outside diameter 200 mm
- Wheel load on the sample: 700N +/- 10N. The load is applied on the sample through a lever.
- The effective load applied on the sample can be adjusted by micrometrical weights positioning.
- Continuous real time rut depth measurement (penetration of the wheel into the sample) through a linear transducer 40 mm travel by 0,01 mm accuracy.
- The test frame is made of robust aluminium alloy and it is contained in a climatic cabinet with adjustable temperature from 30 to 65°C. +/- 1.0°C.
- The cabinet is equipped with two doors with insulated glass for inspection
- The sample table has dimensions: 400 x 390 mm and can accept rectangular slabs of several sizes:
  - 305 x 305 mm, 50 or 100 mm high
  - 305 x 400 mm, 50 or 100 mm high
  - 200 mm dia. core samples, 50 mm high

**The sample confinement frames are not included and have to be ordered separately (see accessories)**

## SMART TRACKER (Multi-Wheels) (A-840)

EN 12697-22 • AASHTO T324

### TECHNICAL SPECIFICATIONS

- Comply with EN 12697-22 and AASHTO T324.
- No lifting of heavy wheel assemblies. Wheels retract automatically away from samples and park into rest position.
- Sturdy machine, designed for the rugged construction laboratory environment stainless steel sample tanks.
- Two independent loaded wheel systems each capable of conducting wet or dry sample tests simultaneously.
- Sliding sample positioning mechanism for easy mould handling and placement in the machine.
- Does not require lifting of heavy wheel components.
- Fully Automatic machine. Detects and stops the test when the target rut depth is reached.
- Touch-screen control unit based on Windows operating system for user friendly execution of the test, management of the data and visualization of the results.
- Each of the two wheel assemblies is equipped with displacement transducers for rut measurement.
- Mechanical recirculating water bath for temperature control within  $\pm 1$  °C.
- Easy to load, unload, drain water and clean the unit after each test.
- Small footprint to accommodate small construction labs.

## SMART TRACKER (Multi-Wheels) (A-840)

EN 12697-22 • AASHTO T324

- Designed to allow researchers and practitioners to conduct tests under dry (in air) and/or under water (wet).
- Can perform wet or dry test with both wheels or run one wheel under dry and one wheel under wet condition simultaneously during a single test.
- The Hamburg wheel tracking device can be used to determine the resistance of Hot Mix Asphalt (HMA) to rutting and moisture sensitivity. Meets and exceeds EN and AASHTO.
- Designed with innovative features and the needs of the end users in mind.
- Used to determine the creep slope, stripping inflection point and stripping slope.



**Supplied with user-friendly software, integrated into the on-board digital control unit based on Windows operating system:**

- The software is fully customizable by the operator according to EN and AASHTO Standards, and the personal needs.
- Automatic calculation of stripping inflection point (AASHTO).
- Test execution and all parameters, such as water/air temperature, specimen temperature, rut depth... can be monitored in real time.
- The software also allows exporting test data to an Excel compatible format.

## ASPHALT SHEAR-BOX COMPACTOR (A-845)

- The Asphalt Shear-Box Compactor compacts large asphalt prisms that can be sawn to produce four to six beams or slabs for laboratory wheel tracking; or the prism can be cored to produce three to four 100mm diameter cylinders, all having essentially identical properties.
- Extremely sturdy fabricated frame combined with precision machined components
- Servo hydraulic vertical ram with integral hydraulic power supply
- Precision electro-mechanical shearing motion
- Integral specimen extruder
- Electronic control unit with touch screen color display (no need for PC)
- Unlimited memory storage with: 2 USB ports, 1 SD card slot , RS232/485 serial port
- The compaction cycle can be programmed by specifying vertical stress/ load and test termination conditions; Number of cycles, Specimen height and/or density
- Asphalt Shear-Box Compactor can be equipped with a load cell for shear stress measurement, upon request



## TECHNICAL SPECIFICATIONS

- |                                   |   |
|-----------------------------------|---|
| • Vertical force                  | : Up to 100kN                                       |
| • Shearing force                  | : Up to 50kN  |
| • Shear angle                     | : $4^{\circ} \pm 0.1^{\circ}$                       |
| • Shearing cycle rate             | : $3 \pm 0.1$ gyrations per minute                  |
| • Mould width                     | : $150\text{mm} \pm 0.1\text{mm}$                   |
| • Mould length                    | : $450\text{mm} \pm 0.1\text{mm}$                   |
| • Mould surface finish (inside)   | : Smoother than $0.4\mu\text{m rms}$                |
| • Mould surface hardness          | : More than 48 Rockwell C                           |
| • Mould capacity                  | : Approx. 20 litres                                 |
| • Loading platen width            | : $149\text{mm} \pm 0.2\text{mm}$                   |
| • Loading platen length           | : $449\text{mm} \pm 0.2\text{mm}$                   |
| • Loading platen smoothness       | : Smoother than $0.4\mu\text{m rms}$                |
| • Loading platen surface hardness | : More than 48 Rockwell C                           |
| • Number of cycles                | : Up to 100   |
| • Vertical stress                 | : $0.1$ to $1.5\text{MPa} \pm 0.01\text{MPa}$       |
| • Compaction height               | : $145\text{mm}$ to $185\text{mm} \pm 0.1\text{mm}$ |
| • 220 - 240 V / 50 - 60 Hz        |   |



## ■ ASPHALT PAVEMIX (A-850)

ASTM D6307 • EN 12697-35 • AASHTO TP53

- The PaveMix has been expressly designed to prepare homogeneous bituminous mixtures at a strictly controlled temperature.
- The preparation of the bituminous sample is obtained in a short time period (a few minutes) to avoid any mechanical aggregate degradation and to fully coat all mineral components.
- Main frame holding a horizontal stainless steel bowl with a helical mixing shaft.
- The bowl, double wall insulation made of stainless steel, contains an electric heater with probe sensor granting constant and uniform temperature control.
- An electromechanical motion allows to tilt the bowl to get easy the unloading operation.
- The mixer produces representative samples to perform:
  - Gyrotory compaction tests
  - Marshall stability tests
  - Wheel tracking wet and dry tests
  - Slabs compaction laboratory tests
  - Beam fatigue and Stiffness tests
  - Asphalt general purpose tests



## ● TECHNICAL SPECIFICATIONS

- Mixing capacity : 32 litres max.
- Mixing bowl : stainless steel AISI 316
- Mixing temperature : selectable from ambient up to 260 °C through sensitive probe and digital display control.
- Mixing speed : adjustable from 4 to 40 rpm.
- Easy tilting unloading operation by electromechanical motion.
- 220 - 240 V / 50 - 60 Hz

A high-contrast, black and white photograph of a steep, rocky cliff face. The rock surface is highly textured with numerous cracks, fissures, and ledges. A thin, vertical white line, possibly a cable or rope, runs down the left side of the frame. On the right side, a person is visible, partially obscured, wearing a red helmet and a yellow safety harness, appearing to be working on or climbing the rock face. The overall scene conveys a sense of ruggedness and technical challenge.

# ROCK MECHANICS



## INDEX

## ROCK MECHANICS

Item	Code	Page
Digital Point Load Apparatus	RM-120	278
Digital Point Load Apparatus w/ Load Cell	RM-120/LC	278
Rock Compression Tester	RM-001	279
Slake Durability Tester	RM-130	280
Core Cutting Machine	RM-063	280
Rock Classification Hammer	RM-110	281



### ROCK MECHANICS

#### DIGITAL POINT LOAD APPARATUS (RM-120)

- Used to determine the strength value of the rock specimens either in the field or in the laboratory.
- Designed to be light and easily ported from place to another.
- Consists of two-column crosshead frame and a hand operated hydraulic jack, and the load is measured either by a digital manometer (RM-120) or by a precise load cell and a digital readout unit (RM-120/LC).
- The samples to be tested do not need to be regular in shape since the equipment can perform the test on irregular specimens too.
- Equipped with a digital indicator to measure the result.
- Provided with manual-hydraulic loading.



Point Load with Digital Manometer (RM-120)

#### TECHNICAL SPECIFICATIONS

- Light and portable
- Capacity: 50 kN
- Max. Sample size : 102 mm
- Can test irregular shaped samples
- Force Reading Unit:
  - Load Cell with Digital Indicator
  - Digital Manometer
- Manual - Hydraulic Loading



Point Load with Load Cell and Digital Readout Unit (RM-120/LC)

## ROCK COMPRESSION TESTER (RM-001)

- Used to determine the compressive strength of rock core specimens.
- Servo-Controlled system provides high accuracy and precise tuning for the load rate.
- The load rate is adjustable between 0.8 kN/sec to 3.2 kN/sec.



## TECHNICAL SPECIFICATIONS

- Servo-Controlled, Fully Automatic
- Capacity: 1000 kN
- Adjustable Load Rate : 0.8 - 3.2 kN/sec
- Spacer Discs (Ø 200 mm) with heights of 100 / 80 / 60 / 40 / 20 mm
- 220 - 240 V / 50 - 60 Hz



### ROCK MECHANICS

#### SLAKE DURABILITY TESTER (RM-130)

- Used to determine the durability of the rock specimens to weakening and disintegrating when subjected to the climatic slaking effects.
- Equipped with a motorized drive unit that rotates two drums. Drums rotate at 20 rpm inside acrylic water tank.
- The drums are made of stainless steel mesh.

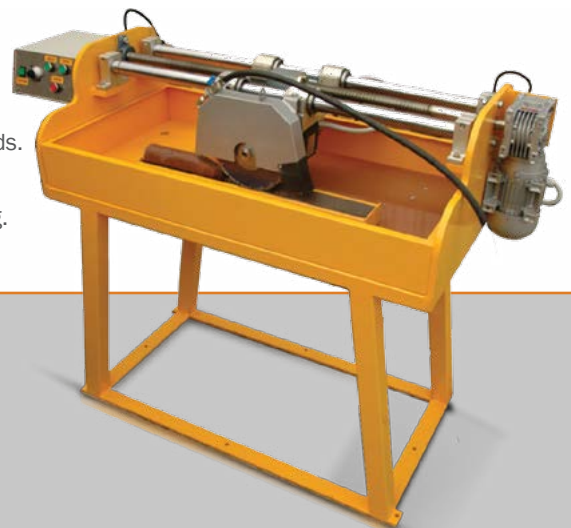


#### TECHNICAL SPECIFICATIONS

- Motorized Drive Unit
- Rotates 2 drums
- Rotates at 20 rpm
- Acrylic Water Tank
- Drums of Stainless Steel Mesh
- Drum Size : Ø 140 mm x 100 mm
- 220 - 240 V / 50 - 60 Hz

#### CORE CUTTING MACHINE (RM-063)

- Used to cut core samples.
- Equipped with a disc holder for a maximum diameter of 230 mm.
- The distance of the disc is adjustable according to the user's needs.
- Supplied with a water pump for cooling the materials while cutting.



#### TECHNICAL SPECIFICATIONS

- Used for cutting core samples.
- Disc diameter: Maximum 230 mm.
- Supplied with water pump for cooling.
- 220 - 240 V / 50 - 60 Hz

## ROCK CLASSIFICATION HAMMER (RM-110)

- Used to determine the rock classification.
- The impact energy of the equipment is 0.74 Nm
- The core that is going to be tested is placed horizontally and the impact is applied on it.
- Supplied with a carrying case.
- Rock Cradle should be ordered separately.



### SUPPLIED WITH

- Carrying Case

### TECHNICAL SPECIFICATIONS

- Similar to Concrete Test Hammer
- Impact Energy : 0.74 Nm
- Core is positioned horizontally





# MINING, COAL, IRON & STEEL



## INDEX

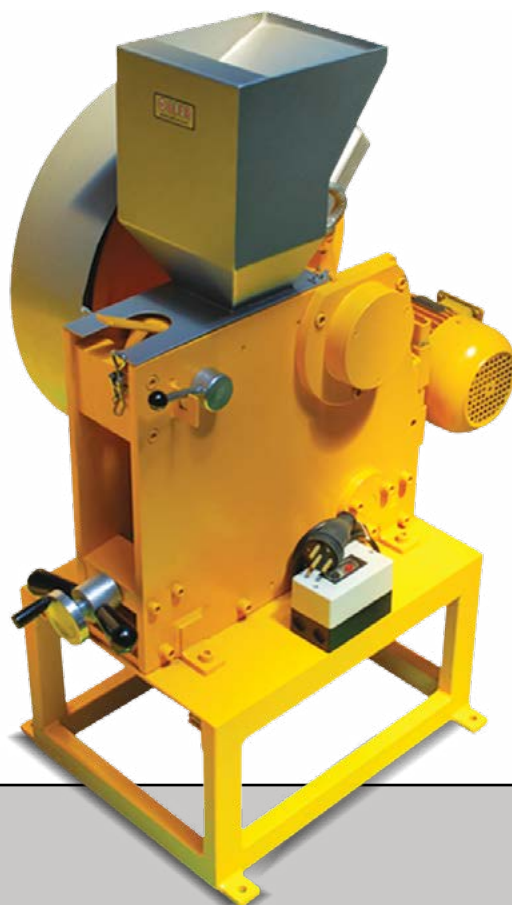
## MINING / COAL / IRON & STEEL

Item	Code	Page
Jaw Crusher	G-412/S	284
Jaw Crusher (Large Capacity)	G-412/L	285
Cylindrical Crusher	G-415	286
Hammer Crusher	M-440	287
Shredder Machine	M-407	288
Disc Mill	G-420	289
Vibratory Disc Mill	G-430	290
Planetary Disc Mill	M-434	291
Universal Cutting Machine	B-062	292
Core Cutting Machine	RM-063	292
Laboratory Oven	G-030	293
Sample Splitter	G-080	294
Sieve	SV	294
Electromagnetic Sieve Shaker	G-041	295
Electromechanical Sieve Shaker	G-041/DA	295
Flotation Machine	M-050	296
Pressure Filter	M-053	296
Magnetic Separator - Davis Tube Type	M-074	297
Magnetic Separator - Drum Type	M-075	297
Pellet Press	M-002	298
Pellet Strength Tester	M-003	298
Grading and Weighing System	M-041/ETS	299
Shatter Indices Tester	M-015	300
Hardgrove Grindability Index Tester	M-195	301
Abrasion and Crumbling Index Tester	M-191	301
Universal Tensile and Compression Tester	UTM-001	302
Compression Tester for Iron/Steel	M-001/LCD	303
Steel Sheet Sampling Machine	M-043	304
Aluminum Sampling Machine	M-062	305

## MINING, COAL, IRON & STEEL

### JAW CRUSHER (G-412/S)

- Used to crush samples with medium-hard, hard, brittle and tough materials. Efficiency and safety makes it ideal for sample preparation in laboratories and industrial plants.
- Application examples are so wide such as construction materials, glass, granite, minerals, quartz, rocks, silicon, slag, coal, oxide ceramics ... etc.
- The materials after crushing have high degree of size reduction and high fineness.
- Jaw Dimensions: 100 x 350 mm, made of (16%-18% Mn + 1.5% Cr).
- Double action of jaws that opens/closes from the bottom and the crushing mechanism is from top to bottom.
- Supplied complete with electrical motor.



### TECHNICAL SPECIFICATIONS

- Jaw Opening : 100 x 100 mm
- Jaws dimension : 100 x 350 mm
- Jaws are made of (16-18% Mn) + (1.5% Cr)
- Double Action of jaws:
  - Opening /closing at bottom
  - Crushing form up to bottom
- Jaw opening at the bottom is adjustable.
- 380 V / 50 Hz



## ■ JAW CRUSHER (Large Capacity) (G-412/L)

- Used to crush samples with medium-hard, hard, brittle and tough materials. Efficiency and safety makes it ideal for sample preparation in laboratories and industrial plants.
- Application examples are so wide such as construction materials, glass, granite, minerals, quartz, rocks, silicon, slag, coal, oxide ceramics ... etc.
- The materials after crushing have high degree of size reduction and high fineness.
- Jaw Dimensions: 165 x 270 mm, made of (16%-18% Mn + 1.5% Cr).
- Double action of jaws that opens/closes from the bottom and the crushing mechanism is from top to bottom.
- Supplied complete with electrical motor.



## ● TECHNICAL SPECIFICATIONS

- Jaw Opening : 160 x 90 mm
- Jaws dimension : 165 x 270 mm
- Jaws are made of (16-18% Mn) + (1.5% Cr)
- Double Action of jaws:
  - Opening /closing at bottom
  - Crushing form up to bottom
- Jaw opening at the bottom is adjustable.
- 380 V / 50 Hz

## MINING, COAL, IRON & STEEL

### ■ CYLINDRICAL CRUSHER (G-415)

- Made of hardened steel cylinders. The distance between the cylinders is adjustable.
- The materials feed size is < 20 mm, and it is supplied with overload protection with 2 springs.
- Supplied with feed hopper and collector.
- Supplied complete with the electrical motor.



### ● TECHNICAL SPECIFICATIONS

- Material feed size < 20 mm
- Cylinders are steel and hardened.
- Distance between cylinders is adjustable
- Overload protection with 2 springs
- Feed hopper and collector
- 380 V / 50 Hz

## ■ HAMMER CRUSHER (M-440)

- Used to crush medium-hard materials and specially coal and coke
- Supplied with feed hopper and collector
- Automatic cut-off electricity if the
- Sieves (3 ... 9 mm) upon request (to be specified at the time of order)
- Easy to clean



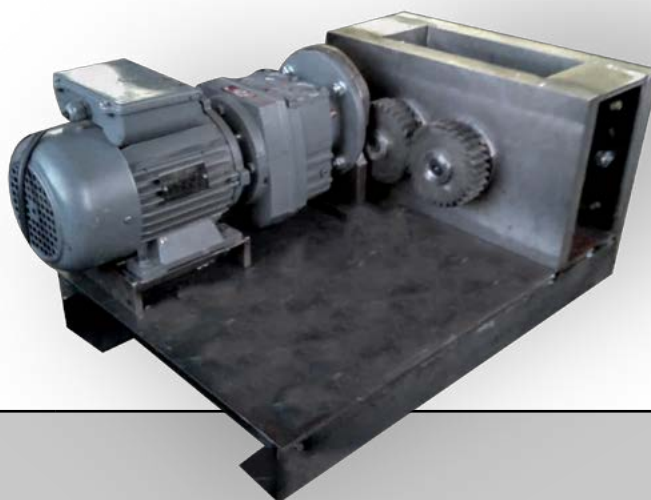
## ● TECHNICAL SPECIFICATIONS

- Material feed size is < 50 mm
- Final fineness is maximum 3 mm (with 3 mm sieve installed)
- Capacity: 250 – 700 kg/hr
- 220 - 240 V / 50 - 60 Hz

## MINING, COAL, IRON & STEEL

### SHREDDER MACHINE (M-407)

- Used to shred medium-hard minerals, ores, coal, coke, hard plastic, wood, paper, tires and brittle materials
- Heavy-Duty construction
- Low horsepower, energy efficient
- Auto-reversing mechanism to avoid damagin shredding units



### TECHNICAL SPECIFICATIONS

- Shredding Discs: 150 - 200 mm in diameter
- Capacity: Depending on material to be shredded, 50 - 250 kg/hr
- 380 V / 50 Hz

## DISC MILL (G-420/S)

- Used under rough conditions for grinding of hard, medium-hard, brittle and tough materials
- Required few minutes to achieve the desired grind size, and work continuously
- Application examples: minerals, ores, bauxite, clinkers, chalk, chamotte, concrete, construction materials, soil samples, gypsum ... etc.

### TECHNICAL SPECIFICATIONS

- Capacity : 20 – 100 kg/hr depending on material and final size
- Disc diameter : 170 mm
- Feeding size : < 10 mm
- Final fineness : 50 – 200 microns
- Collector : 25 x 20 x 8 cm
- 380 V / 50 Hz



## DISC MILL (G-420/L)

- Used under rough conditions for grinding of hard, medium-hard, brittle and tough materials
- Required few minutes to achieve the desired grind size, and work continuously
- Application examples: minerals, ores, bauxite, clinkers, chalk, chamotte, concrete, construction materials, soil samples, gypsum ... etc.

### TECHNICAL SPECIFICATIONS

- Capacity : 40 – 200 kg/hr depending on material and final size
- Disc diameter : 205 mm
- Feeding size : < 15 mm
- Final fineness : 50 – 200 microns
- Collector : 25 x 20 x 8 cm
- 380 V / 50 Hz





## MINING, COAL, IRON & STEEL

### VIBRATORY DISC MILL (G-430)

- Used for quick grinding, assuring that no sample loss can be experienced.
- It has a very wide range grinding and finishes the job in an extremely short time.
- The maximum materials feed size is 15 mm and grinds to a final fineness of 50 micron.
- The jar size that is supplied with the equipment is 100 ml.



### TECHNICAL SPECIFICATIONS

- Suitable for quick grinding
- No sample loss
- Wide range grinding
- Extremely short grinding time
- Material feed size < 15 mm
- Final Fineness < 50 mic
- Jar Size 100 ml
- 380 V / 50 Hz

## PLANETARY DISC MILL (M-434)

- Used whenever highest fineness is required
- Robust model with 4 grading stations
- Short grinding time assured by centrifugal force of planetary mixing
- Jars are made of hardened steel (also available in stainless steel upon request)
- Used for grinding minerals, ores, coal, coke, alloys, bentonite, bones, cement clinkers, concrete, glass, gypsum, limestone, polymers, seeds ... etc.
- Feed size is < 10 mm
- Final fineness is < 10 microns
- Speed control for required applications
- Automatic cut-off energy if the cover is opened



### TECHNICAL SPECIFICATIONS

- Robust model with 4 grading stations
- Feed size is < 10 mm
- Final fineness is < 10 microns
- Speed control for required applications
- Automatic cut-off energy if the cover is opened
- 220 - 240 V / 50 Hz

## MINING, COAL, IRON & STEEL

### UNIVERSAL CUTTING MACHINE (B-062)

- Used to cut construction materials
- It is equipped with a disc holder
- Ideal for wet cutting
- Supplied with precision linear guide bar system with movable specimen trolley, a disk with dust-proof cover and automatic thermal overload protection



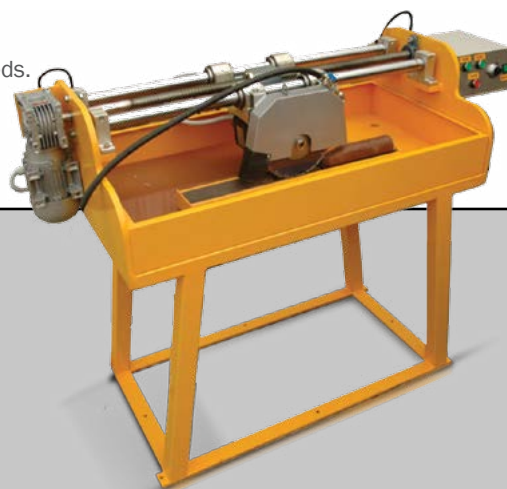
#### SUPPLIED WITH

- Cutting Blade

	B-062/S	B-062/M
Blade Diameter	Ø 350 mm	Ø 450 mm
Blade Model	B-062/CB350	B-062/CB450
Cutting Length	470 mm	420 mm
Max. Specimen Height	105 mm	155 mm

### CORE CUTTING MACHINE (RM-063)

- Used to cut core samples.
- The distance of the disc is adjustable according to the user's needs.



#### TECHNICAL SPECIFICATIONS

- Disc diameter: Maximum 230 mm.
- Supplied with water pump for cooling.

## LABORATORY OVEN (G-030)



Laboratory Oven - 250 lt (G-030/250)

## TECHNICAL SPECIFICATIONS

- Digital Thermostat & Indicator Fitted With overheat thermostat
- Temp max : 200 °C (392 °F) (PID control)
- Interior chamber : Stainless Steel
- Exterior : Powder Coated or Stainless Steel
- Insulation : Thick mineral wool
- Airflow : Forced convection
- Power Supply : 220 - 240 V / 50 - 60 Hz



Laboratory Oven - 400 lt (G-030/400)

## MINING, COAL, IRON & STEEL

### ■ SAMPLE SPLITTER (G-080)

- Designed to halve/divide aggregates, soils, sands and gravel into two representative halves.
- Made of powder coated enameled steel.

### ● TECHNICAL SPECIFICATIONS

- Please see pages 48, 156



### ■ SIEVE (B-040) ISO 3310:1 • ASTM E11 • BS 410

- All Sieves are made of stainless steel woven wire and frame that meet international specifications.
- The sieve aperture is clearly marked on the metallic label.
- Our sieves are of the highest quality to ensure consistent fit, accurate, specifications and durable construction.
- The sieves are available in two diameters (200 mm) and (300 mm).
- Cover and pan should be ordered separately.

### ● TECHNICAL SPECIFICATIONS

- Please see pages 39





## ■ SIEVE SHAKER (G-041)

- Please see Page 38 for more details.



## ■ ELECTROMECHANICAL SIEVE SHAKER (G-041/DA)

- Please see Page 39 for more details.



## ■ MULTI-DECK GRADING MACHINE (M-042)

- Used specially in mining labs where large quantities of sieving is required.
- Two sieves with decks, each of 300 x 500 mm size, and the openings are 10 mm and 5 mm unless otherwise specified during the order.
- Plastic boxes, as collectors, are supplied for each deck.

### ● TECHNICAL SPECIFICATIONS

- Equipped with pan at the bottom.
- Adjustable sieving angle.
- 380 V / 50 Hz



## MINING, COAL, IRON & STEEL

### FLOTATION MACHINE (M-050)

- Stirrer can be infinitely variable between 50 – 2600 rpm, supplied with digital indicator for speed
- Mechanism to lower/lift the stirring head
- Flotation cells are made of stainless steel with capacities 1, 2, 3 and 4 liters
- The base and support column are made of cast aluminum

#### TECHNICAL SPECIFICATIONS

- Adjustable stirring Frequency (50 - 2600 rpm)
- Two flotation stirrers are supplied with the machine:
  - Stainless steel stirrer
  - Polymer stirrer
- Capable of working with 250 – 2000 g of sample
- 220 - 240 V / 50 - 60 Hz

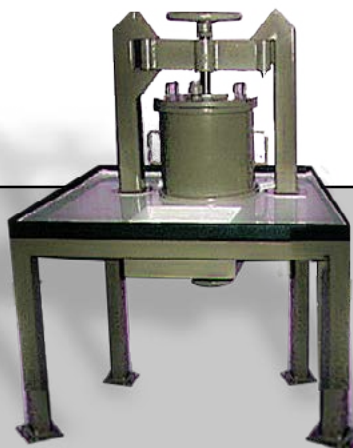


### PRESSURE FILTER (M-053)

- DENVER type Pressure Filter
- Made of stainless steel with a volume of
- Maximum Pressure: 8 kg/cm<sup>2</sup>
- Supplied with air pressure regulator, gauge, valve and filter pack

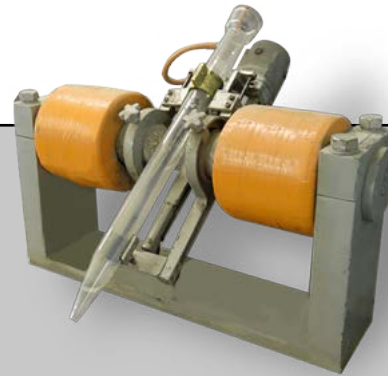
#### TECHNICAL SPECIFICATIONS

- Made of stainless steel
- Maximum Pressure: 8 kg/cm<sup>2</sup>



## ■ MAGNETIC SEPARATOR : DAVIS TUBE TYPE (M-074)

- Consisting of a powerful electromagnetic field intensity
- The angle of the table is adjustable
- Tube moves forward and backward while rotating
- Supplied with collector



### ● TECHNICAL SPECIFICATIONS

- Wet magnetic separation method
- Adjustable angle

## ■ MAGNETIC SEPARATOR : DRUM TYPE (M-075)

- Used to concentrate the fine material with high magnetism
- Consisting of a frame, magnetic drum, mineral box, watering pipe and feeding box.
- Supplied with collector



### ● TECHNICAL SPECIFICATIONS

- Wet separation method

## MINING, COAL, IRON & STEEL

### ■ PELLET PRESS (M-002)

- Used for forming high-quality pellets for XRF analysis
- Fully automatic with LCD indicator
- Controlling the pressure force, it also determines the time of build-up of force during pressing
- Even difficult materials are pressed perfectly performing pellets with smooth surface

- LCD indicator:
  - Calibration function (password-protected)
  - Maximum load and time are set
  - Overload protection
- Application examples:
  - Cement, gypsum, ores, raw materials, slag ... etc.

#### ● TECHNICAL SPECIFICATIONS

- Fully automatic with LCD indicator
- Capacity: 300 kN (30 tons)
- 220 - 240 V / 50 - 60 Hz



### ■ PELLET STRENGTH TESTER (M-003)

- Fully automatic, LCD indicator
- Used to test the strength of pellets
- Can test 60 pcs in a row
- The height is measured before the test
- The average of 60 tests is determined and the test results detects if failure described in the standards
- The graph of each pellet testing is available if required

#### ● TECHNICAL SPECIFICATIONS

- Fully automatic, LCD indicator
- Can test 60 pcs in a row
- 220 - 240 V / 50 - 60 Hz



## GRADING and WEIGHING SYSTEM (M-041/ETS)

- Used wherever accepting the ore to the factory
- There are 4 functions in the system:

### Lifting the sample:

- Capacity of the crane winch is 2000 kg
- Travel beam of the winch is limited by switchers
- Manual controlling device of the winch to be used by operator

### Feeding:

- The bigbag is filled to the feeding tank by using the crane
- The feeding tank is carried on to the sieving system
- The bottom door is opened hydraulically by the operator

### Grading:

- Grading is done by the 3 deck screening
- Each size is collected in the collector

### Weighing:

- Different sizes of the materials are weighed by the platform scale



### The system is complete with:

- Platform scale with 2000 kg capacity (digital)
- Crane winch and supporting system with control unit
- Three deck grading machine with each deck 1000 x 2000 mm size
- Feeding tank with capacity of 1500 kg with hydraulic bottom door
- Trolleys made of steel construction (4 pcs)



### SHATTER INDICES TESTER (M-015)

- Used to determine the resistance to breakage after dropping the sample with specified conditions mentioned in standards
- The box has a lifting mechanism by pulleys and 2 door hinged lengthwise with a latch for rapid opening
- Rigid base plate with 4 sides preventing loss of coke



### TECHNICAL SPECIFICATIONS

- Equipped with pulleys and hinged doors
- Rigid base plate with 4 sides preventing loss of coke

## ■ HARDGROVE GRINDABILITY INDEX TESTER (M-195)

- Used to determine the HGI (Hardgrove Grindability Index) of coal
- Supplied with abrasive spheres (8 ea)
- Weight set is supplied with the machine

### ● TECHNICAL SPECIFICATIONS

- Digital numerator for setting the revolution of the machine and automatically stopping after desired revolution
- 220 - 240 V / 50 - 60 Hz



## ■ ABRASION and CRUMBLING INDEX TESTER (M-191)

- Used to determine the resistance to abrasion and crumbing of the iron ores, such as pellet and sinter form
- The drum rotates 200 revolutions with 15 kg of sample
- Supplied with 2 test sieves
- Collector at the bottom to collect shredded materials

### ● TECHNICAL SPECIFICATIONS

- The drum rotates 200 revolutions with 15 kg of sample
- Collector at the bottom to collect shredded materials
- 220 - 240 V / 50 - 60 Hz



## MINING, COAL, IRON & STEEL

### ■ UNIVERSAL TENSILE and COMPRESSION TESTER (UTM-001)

#### ● TENSILE TESTING

- Fully Automatic - PC Controlled
- Hydraulically operated grippers by 2 independent auxiliary cylinders controlled by separated hydraulic valves
- Upper mobile crosshead driven up/down by a separated motor adjusting the distance between upper and lower grips with electronic distance meter
- Available models:
  - 300 kN (30 tons)
  - 600 kN (60 tons)
  - 1000 kN (100 tons)
  - 2000 kN (200 tons)
- Height: 210 cm only.
- Print of Stress/Strain Diagram and Test Results.



#### ● COMPRESSION TESTING

- Fully Automatic.
- Graphical - LCD Data Acquisition Control System.
- Automatic Load Rate upon Sample Type.
- Stops Automatically, when Test is completed.
- Real time graph indication.
- Total Load and also Per Area are given.
- Test results can be transferred to computer to be printed or from the thermal printer.
- Different units are available.
- **Please see page 121 for more details**
- Calibration done easily on 5 pts.
- Manual Control is available.
- If weight of sample entered, Unit Weight is determined.
- Rigid Frame.
- Upper and Lower Platens in accordance with international Specifications.
- Upper Seating for Homogeneous Loading.
- 220 - 240 V / 50 - 60 Hz

## ■ COMPRESSION TESTER for IRON/STEEL (M-001/LCD)

- Used for determining the strength of iron/steel samples by compressing it vertically
- Fully automatic, controlled by computer
- Used to determine the length change by compression
- Built on 4 columns
- Special upper and lower platens
- Automatic cut-off in the door is opened
- The LCD indicator, during the test, shows the following:
  - Load/ shortening graph
  - Special application if shortening: 1/2 or 1/3
  - The length change is readable with 0.01 mm
  - Stopping at desired travel or force
- The data transferred to computer and all sample data is recorded
- Automatic stopping when test is completed



## ● TECHNICAL SPECIFICATIONS

- Fully automatic, controlled by computer
- Built on 4 columns
- Special upper and lower platens
- Automatic stopping when test is completed
- 220 - 240 V / 50 - 60 Hz

## MINING, COAL, IRON & STEEL

### STEEL SHEET SAMPLING MACHINE (M-043)

- Used to take samples from metal sheets up to 2 mm thick
- Hydraulic system with capacity of 1000 kN
- Supplied with two moulds that can take samples with diameters of 57.3 mm and 64.5 mm
- The system has a safety valve for overload
- Equipped with safety guard door that stops the machine once opened



### TECHNICAL SPECIFICATIONS

- Capacity: 1000 kN
- Equipped with safety guard door
- 380 V (3 phase)



## ALUMINUM SAMPLING MACHINE (M-062)

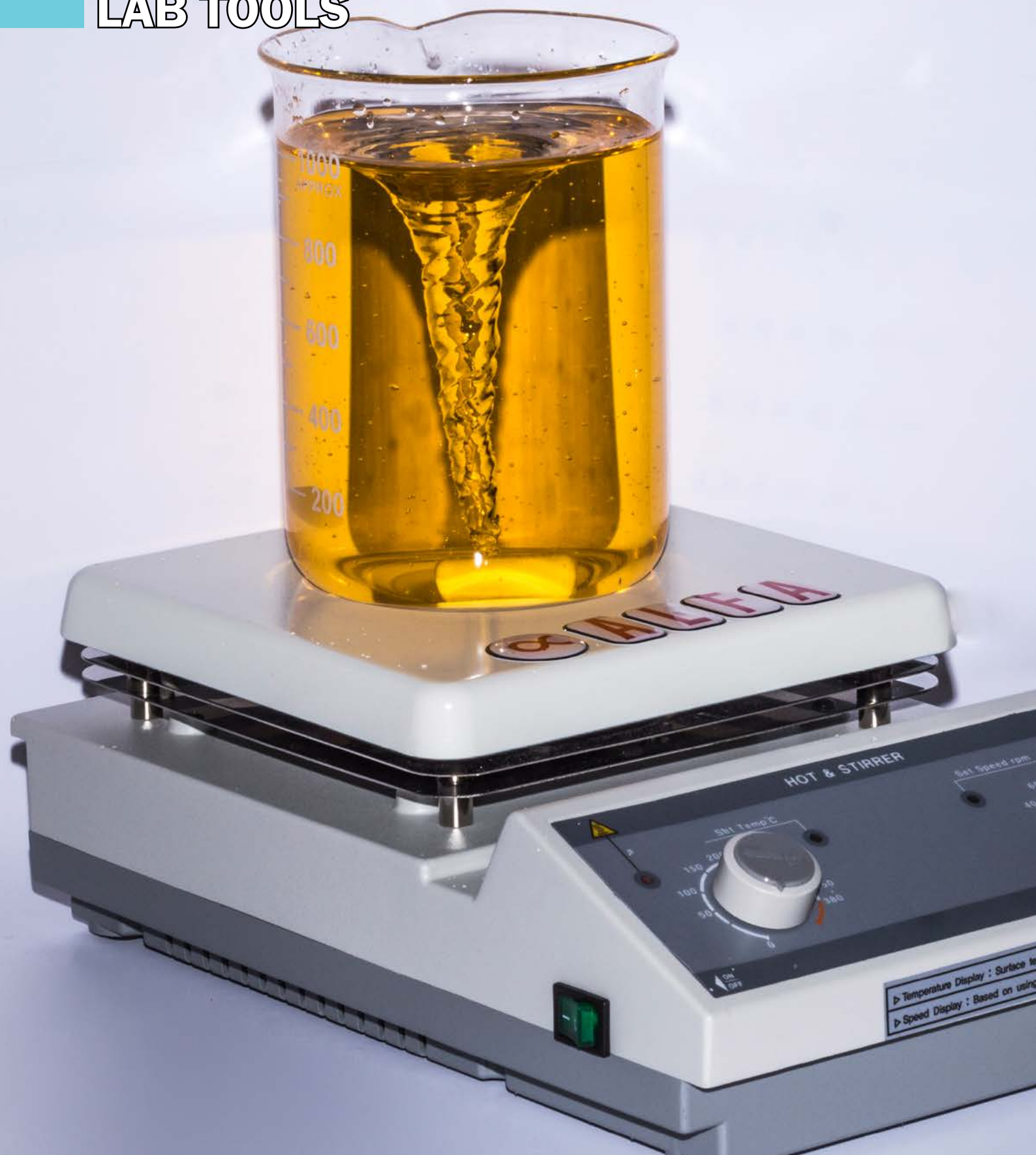
- Used to prepare circular samples from aluminum ingots for XRF analysis
- Fully automatic, with 3 functions:
  - Drilling
  - Polishing
  - Cutting
- Ingot is placed on the support system and all the a/m functions are done automatically in a short time by an operator
- The sample taken has a desired diameter and thickness with smooth surface



### TECHNICAL SPECIFICATIONS

- Fully automatic, with 3 functions:
  - Drilling
  - Polishing
  - Cutting
- Ingot is placed on the support system and all the a/m functions are done automatically in a short time by an operator

# LAB TOOLS



## INDEX

Item	Code	Page
Compressor	GL-01	310
Vacuum Pump	GL-02	310
Scoop	GL-03	310
Air Dryer / Gun	GL-04	310
Ph Meter	GL-05	311
Stopwatch	GL-06	311
Timer	GL-07	311
Lab Trolley	GL-08	311
Digital Caliper	GL-09	312
Steel Ruler	GL-10	312
Hotplate	GL-11	312
Trowel	GL-12	313
Hammer	GL-13	313
Rubber Mallet	GL-14	313
Density Spoon	GL-15	313
Tool Kit	GL-16	314
Spatula	GL-17	314
Wire Brush	GL-18	314
Hair Brush	GL-19	314
Moisture Tin	GL-20	315
Double-Ended Brush	GL-21	315
Mixing Bowl	GL-22	315
Basic Calculator	GL-23/B	315
Scientific Calculator	GL-23/S	316
Wash Bottle	GL-24	316
Gloves	GL-25	316
Pipette	GL-26	317
Tape Meter	GL-27	317
Hydrometer	GL-28	317
Plastic Funnel	GL-29	318
Shovel	GL-30	318
Glass Stirring Rod	GL-31	318
Rubber Blower Bulb	GL-32	318
Chisel	GL-33	319
Scissors	GL-34	319
Magnetic Holder	GL-35	319
Feeler Strip Set	GL-36	319
Bunsen Burner	GL-37	320
Glass Plate	GL-38	320
Ladle	GL-39	320
Wheel Barrow	GL-40	320
Large Log Book	GL-41	321

## LAB TOOLS

Item	Code	Page
A4 Clipboard	GL-42	321
Cross-Section Paper	GL-43	321
Sample Can - 1 lt	GL-44	321
Sample Can - 10 lt	GL-45	322
Trimming Knife	GL-46	322
Straight Edge - 300 mm	GL-47	322
Tong	GL-48	322
Hand-Held GPS	GL-49	323
Digital Laser Distance Meter	GL-50	323
Density Pick	GL-51	323
Geological Hammer	GL-52	323
Absorbant Cloth	GL-53	324
Porcelain Crucible	GL-54	324
Gooch Crucible	GL-55	324
Platinum Crucible	GL-56	324
Glass Marking Pen	GL-57	325
Quartering Canvas	GL-58	325
Plastic Bucket	GL-59	325
Water Quality Test Kit	GL-60	325
Claw Hammer	GL-61	326
Tube Brush	GL-62	326
Evaporating Dish	GPP	326
Mortar and Pestle	GHT	326
Sample Tray	GNT	327
Unit Weight Measures	BAK	327
Glass Beaker	GCB	328
Plastic Beaker	GPB	328
Glass Measuring Cylinder	GCM	329
Plastic Measuring Cylinder	GPM	329
Erlenmeyer Flask	GCCF	330
Filter Flask	GCOF	330
Volumetric Flask	GCVF	331
Glass Funnel	GCH	331
Pycnometer, Gay-Lussac	GCP/GL	332
Pycnometer, Bottle-Type	GCP/B	332
Pycnometer, Hubbard-Carmick	GCP/HC	333
Specific Gravity Pycnometer	G-103	333
Petri Dish	GCPD	334
Test Bottle	GCS	334
Burette	GGBR	335
Desiccator	GCD	335
Thermometer	GTx	336



## LAB TOOLS

### COMPRESSOR (GL-01)



**GL-01/08-025**

8 bars / 25 liters

**GL-01/08-050**

8 bars / 50 liters

### VACUUM PUMP (GL-02)



**GL-02/S/051**

Single Stage  
51 lt/min

**GL-02/S/100**

Single Stage  
100 lt/min

**GL-02/D/128**

Dual-Stage  
128 lt/min

### SCOOP (GL-03)



**GL-03/S**

Small

**GL-03/M**

Medium

**GL-03/L**

Large

**GL-03/XL**

X-Large

### AIR DRYER (GL-04)



**GL-04/H**

Hot Air Gun

**GL-04/W**

Warm Air Dryer

### PH METER (GL-05)



GL-05/P	GL-05/B	GL-05/IP
Pocket-Type	Bench-Type	Indication Paper

### STOP WATCH (GL-06)



### TIMER (GL-07)



### LABORATORY TROLLEY (GL-08)





## LAB TOOLS

### CALIPER (GL-09)



Length	Mechanical	Digital
150 mm	GL-09/M/150	GL-09/D/150
200 mm	○	GL-09/D/200
300 mm	GL-09/M/300	GL-09/D/300
500 mm	GL-09/M/500	GL-09/D/500

### STEEL RULER (GL-10)



GL-10/030	GL-10/050	GL-10/100
30 cm	50 cm	100 cm

### HOTPLATE (GL-11)



GL-011/S1	GL-011/S2	GL-011/MS	GL-011/L/30	GL-011/L/45	GL-011/L/60
Ø 17 cm	Ø 17 cm	-	30 x 30 cm	35 x 45 cm	40 x 60 cm
Single Place	Two-Place	w/ Magnetic Stirrer	Rectangular	Rectangular	Rectangular
220 - 240 V / 50 - 60 Hz					

### TROWEL (GL-12)



### HAMMER (GL-13)



GL-13/10	GL-13/15	GL-13/20	GL-13/30
1 kg	1.5 kg	2 kg	3 kg

### RUBBER Mallet (GL-14)



### DENSITY SPOON (GL-15)



## LAB TOOLS

### TOOL KIT (GL-16)

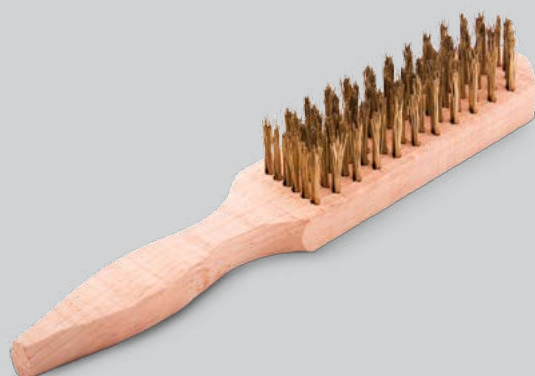


### SPATULA (GL-17)



GL-17/S	GL-17/M	GL-17/L	GL-17/CW
100 mm	150 mm	200 mm	Chattaway

### WIRE BRUSH (GL-18)



### HAIR BRUSH (GL-19)



GL-19/1	GL-19/2	GL-19/3	GL-19/4
No: 1	No: 2	No: 3	No: 4

### MOISTURE TIN (GL-20)



GL-20/S	GL-20/M	GL-20/L
Ø 55 x 35 mm	Ø 70 x 45 mm	Ø 80 x 80 mm

### DOUBLE-ENDED BRUSH (GL-21)



### MIXING BOWL (GL-22)



GL-22/12	GL-22/20	GL-22/28
Ø 12 cm	Ø 20 cm	Ø 28 cm

### BASIC CALCULATOR (GL-23/B)



LAB TOOLS

SCIENTIFIC CALCULATOR (GL-23/S)



WASH BOTTLE (GL-24)



GL-24/0250

250 ml

GL-24/0500

500 ml

GL-24/1000

1000 ml

HEAT RESISTANT GLOVES (GL-25/H)



RUBBER GLOVES (GL-25/R)





### PIPETTE (GL-26)



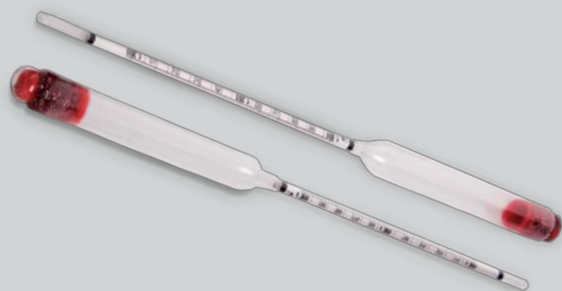
GL-26/05	GL-26/10	GL-26/25	GL-26/50
5 ml	10 ml	25 ml	50 ml

### TAPE METER (GL-27)



GL-27/03	GL-27/05	GL-27/10
3 m	5 m	10 m

### HYDROMETER (GL-28)



Code	Range
GL-28/1011	1,000 - 1,100 g/ml
GL-28/1112	1,100 - 1,200 g/ml
GL-28/1213	1,200 - 1,300 g/ml
GL-28/1314	1,300 - 1,400 g/ml
GL-28/1415	1,400 - 1,500 g/ml
GL-28/1516	1,500 - 1,600 g/ml
GL-28/1617	1,600 - 1,700 g/ml
GL-28/1718	1,700 - 1,800 g/ml
GL-28/1819	1,800 - 1,900 g/ml
GL-28/1920	1,900 - 2,000 g/ml

LAB TOOLS

**FUNNEL (GL-29)**

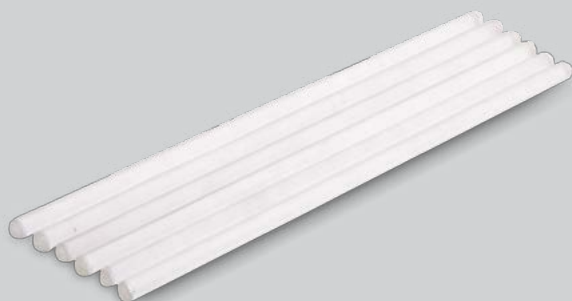


GL-29/04	GL-29/08	GL-29/10
Ø 40 mm	Ø 80 mm	Ø 100 mm

**SHOVEL (GL-30)**



**GLASS STIRRING ROD (GL-31)**



**RUBBER BLOWER BULB (GL-32)**



### CHISEL (GL-33)



GL-33/P	GL-33/F
Point Chisel	Flat Chisel

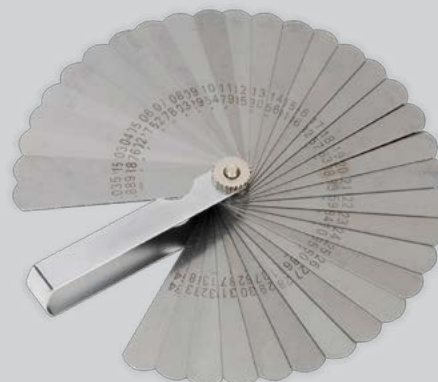
### SCISSORS (GL-34)



### MAGNETIC HOLDER (GL-35)



### FEELER STRIP SET (GL-36)



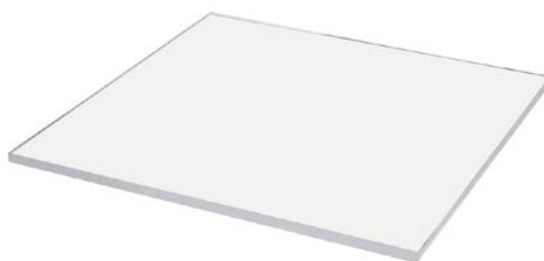
## LAB TOOLS

### BUNSEN BURNER (GL-37)



GL-37	GL-37/B	GL-37/T	GL-37/WG
Set	Burner	Tripod	Wire Gauze

### GLASS PLATE (GL-38)



GL-38/3	GL-38/5
300 x 300 mm	500 x 500 mm

### LADLE (GL-39)



### WHEEL BARROW (GL-40)



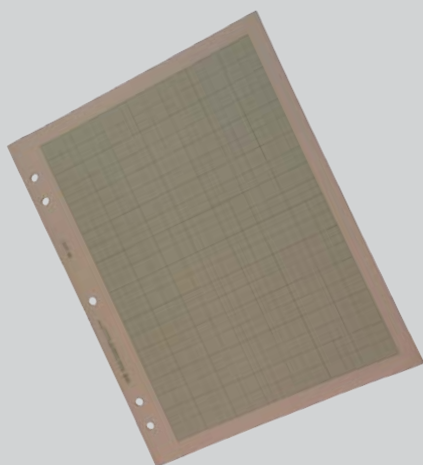
**LARGE LOG BOOK (GL-41)**



**A4 CLIPBOARD (GL-42)**



**CROSS-SECTION PAPER (GL-43)**



**SAMPLE CAN - 1 lt (GL-44)**





LAB TOOLS

**SAMPLE CAN - 10 lt (GL-45)**



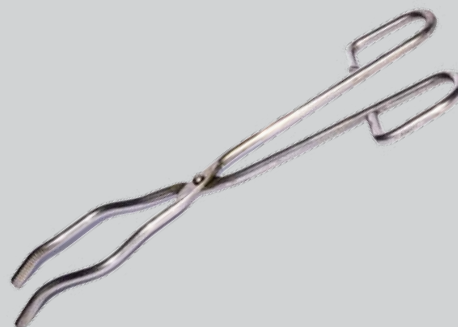
**TRIMMING KNIFE (GL-46)**



**STRAIGHT EDGE (GL-47)**



**TONG (GL-48)**



### HAND-HELD GPS (GL-49)



### DIGITAL LASER DISTANCE METER (GL-50)



### DENSITY PICK (GL-51)



### GEOLOGICAL HAMMER (GL-52)



LAB TOOLS

**ABSORBANT CLOTH (GL-53)**



**PORCELAIN CRUCIBLE (GL-54)**



**GOOCH CRUCIBLE (GL-55)**



GL-55/30	GL-55/50
30 ml	50 ml

**PLATINUM CRUCIBLE (GL-56)**



### GLASS MARKING PEN (GL-57)



### QUARTERING CANVAS (GL-58)



### PLASTIC BUCKET (GL-59)



**GL-59/20**

20 lt

**GL-59/30**

30 lt

### WATER QUALITY TEST KIT (GL-60)



LAB TOOLS

**CLAW HAMMER (GL-61)**



**TUBE BRUSH (GL-62)**



**EVAPORATING DISH (GPP)**



GPP/05	GPP/08	GPP/10	GPP/12
Ø 5 cm	Ø 8 cm	Ø 10 cm	Ø 12 cm

**MORTAR AND PESTLE (GHT)**





## SAMPLE TRAY (GNT)

Code	Size	Dimensions (mm)
GNT/XS	X Small	200 x 300 x 40
GNT/S	Small	230 x 330 x 40
GNT/M	Medium	260 x 380 x 40
GNT/L	Large	280 x 430 x 40
GNT/XL	X Large	300 x 480 x 40



## UNIT WEIGHT MEASURES (BAK)



Code	Capacity
BAK/01	1 lt
BAK/03	3 lt
BAK/05	5 lt
BAK/07	7 lt
BAK/10	10 lt
BAK/14	14 lt
BAK/15	15 lt
BAK/28	28 lt
BAK/30	30 lt

## LAB TOOLS

### GLASS BEAKER (GCB)

Code	GCB/0100	GCB/0250	GCB/0600	GCB/1000
Capacity	100 ml	250 ml	600 ml	1000 ml



### PLASTIC BEAKER (GPB)

Code	GPB/0100	GPB/0250	GPB/0500	GPB/1000
Capacity	100 ml	250 ml	500 ml	1000 ml



## GLASS MEASURING CYLINDER (GCM)

Code	Capacity
GCM/0050	50 ml
GCM/0100	100 ml
GCM/0250	250 ml
GCM/0500	500 ml
GCM/1000	1000 ml
GCM/2000	2000 ml



## PLASTIC MEASURING CYLINDER (GPM)

Code	Capacity
GPM/0050	50 ml
GPM/0100	100 ml
GPM/0250	250 ml
GPM/0500	500 ml
GPM/1000	1000 ml
GPM/2000	2000 ml



## LAB TOOLS

### ERLENMEYER (Conical) FLASK (GCCF)

GCCF/0050	GCCF/0100	GCCF/0150	GCCF/0250	GCCF/0300	GCCF/0500	GCBJ/1000	GCCF/2000	GCCF/5000
50 ml	100 ml	150 ml	250 ml	300 ml	500 ml	1000 ml	2000 ml	5000 ml



### FILTER (Büchner) FLASK (GCFF)

GCFF/0250	GCFF/0500	GCBJ/1000	GCFF/2000
250 ml	500 ml	1000 ml	2000 ml



## VOLUMETRIC FLASK (GCVF)

GCVF/0010	GCVF/0025	GCVF/0050	GCVF/0100	GCVF/0250	GCVF/0500	GCBJ/1000	GCVF/2000	GCVF/5000
10 ml	25 ml	50 ml	100 ml	250 ml	500 ml	1000 ml	2000 ml	5000 ml



## GLASS FUNNEL (GCH)

GCH/075	GCH/100
Ø 75 mm	Ø 100 mm





## LAB TOOLS

### SPECIFIC GRAVITY PYCNOMETER (Gay-Lussac) (GCP/GL)

Code	GCP/0025	GCP/0050	GCP/0100	GCP/0500	GCP/1000	GCP/2000
Capacity	25 ml	50 ml	100 ml	500 ml	1000 ml	2000 ml



### SPECIFIC GRAVITY PYCNOMETER (Bottle-Type) (GCP/B)

Code	GCP/0025	GCP/0050	GCP/0100	GCP/0500	GCP/1000	GCP/2000
Capacity	25 ml	50 ml	100 ml	500 ml	1000 ml	2000 ml



## SPECIFIC GRAVITY PYCNOMETER (Hubbard-Carmick) (GCP/HC)

Code	GCP/0025	GCP/0050	GCP/0100	GCP/0500	GCP/1000	GCP/2000
Capacity	25 ml	50 ml	100 ml	500 ml	1000 ml	2000 ml



## SPECIFIC GRAVITY PYCNOMETER (G-103)

BS 177-3 • BS 812

- Cone discharge diameter : 10 mm



## LAB TOOLS

### PETRI DISH (GCPD)

Code	Capacity
GCPD/080	Ø 80 mm
GCPD/100	Ø 100 mm
GCPD/120	Ø 120 mm



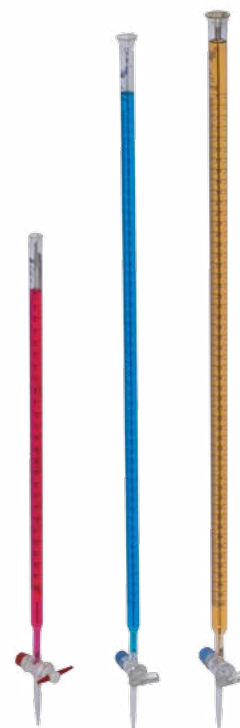
### TEST BOTTLE (GCS)

Code	Capacity
GCS/0500	500 ml
GCS/1000	1000 ml
GCS/2000	2000 ml



## BURETTE (GCBR)

Code	Capacity
GCBR/0025	25 ml
GCBR/0050	50 ml
GCBR/0100	100 ml



## DESICCATOR (GCD)



Code	GCD/200	GCD/240	GCD/300	GCD/200-V	GCD/240-V	GCD/300-V
Diameter	200 mm	240 mm	300 mm	200 mm	240 mm	300 mm
Vacuum	-	-	-	Vacuum	Vacuum	Vacuum

## LAB TOOLS

### DIAL THERMOMETER (GTI)



GTI/300

GTI/070

<b>Code</b>	GTI/070	GTI/300
<b>Range</b>	-40 to +70 °C	0 to 300 °C

Dial Thermometer (GTI)

### MAX-MIN THERMOMETER (GTMM)



**Code**

GTMM/50

**Capacity**

-50 to +50 °C

Max-Min Thermometer (GTMM)

### NON-CONTACT (LASER) INFRARED THERMOMETER (GTL)



Non-Contact Infrared Thermometer (GTL)

### THERMO-HYGROMETER (GTHM)

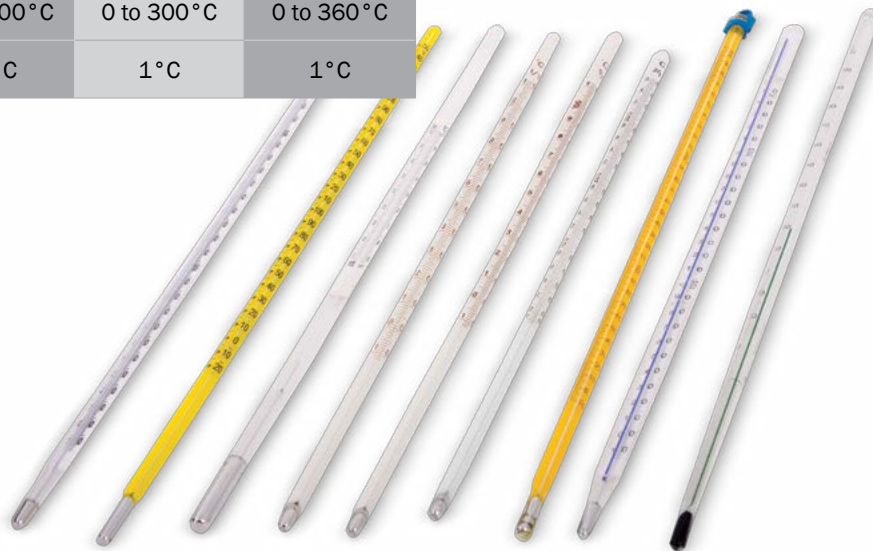


Thermo-Hygrometer (GTHM)



## GLASS THERMOMETER (GTC)

Code	GTC/100	GTC/200	GTC/300	GTC/360
Range	0 to 100 °C	0 to 200 °C	0 to 300 °C	0 to 360 °C
Graduation	1 °C	1 °C	1 °C	1 °C



Glass Thermometer (GTC)

## DIGITAL THERMOMETER (GTD)

Code	GTD/300
Range	-50 °C to +300 °C



Digital Thermometer (GTD)

# MOBILE LAB





## INDEX

## MOBILE LABORATORY

Item	Code	Page
Mobile Laboratory	ML	338



## MOBILE LABORATORY





## MOBILE LABORATORY (ML-001)

- We can offer a complete line of Mobile Laboratory with special design to meet all possible environments such as cold or tropical climate.

The main types are:

- Container
- Trailer Mounted
- Van Mounted



## FACILITIES

- Office / Bedroom section
- Lighting & Electric sockets
- Electric generator
- Air Conditioning / Aspirator Fan
- Water Tank, WC & Sink







# INDEX

## INDEX

## INDEX

Item	Page
Analytical Index	252
Code Index	262



## INDEX

### ANALYTICAL INDEX

## A

Item	Code	Page
A4 Clipboard	GL-42	321
Abrasion and Crumbling Index Tester	M-191	301
Abrasion Tester (Boehme), Dorry	AG-199	171
Abrasion Tester for Natural Stones and Concrete Tiles	AG-197	170
Abrasion Tester, Los Angeles	AG-191	167
Abrasion Tester, Micro-Deval	AG-195	173
Abrasive Charges for AG-191	AG-191/AC	169
Absorbant Cloth	GL-53	324
Aggregate Crushing Value	AG-210	174
Aggregate Impact Value	AG-220	175
Aggregate Shape Gauge	AG-036	157
Aggregate Soundness Test Set	AG-042	161
Air Dryer / Gun	GL-04	310
Air Entrainment Meter	B-320/B	99
Air Permeability Apparatus, Blaine	C-035	139
Air Permeability Apparatus, Digital Blaine	C-035/D	139
Aluminum Sampling Machine	M-062	305
Anvil, Testing	B-117	111
Asphalt Oven with Rotating Shelves (TFO)	A-030/TFO	244
Asphalt Pavemix	A-850	275
Asphalt Roller Compactor	A-830	268
Asphalt Shear-Box Compactor	A-845	274
Asphalt Shear-Box Compactor	A-845	274
Auger, Soil	T-305	189
Autoclave Expansion Tester	C-070	138
Automatic Cement Mixer	C-050/A	147
Automatic Grinding Machine	B-199	81
Automatic Marshall Compactor	A-015	233
Automatic Mortar Mixer	C-050/A	147
Automatic Ring and Ball (Softening Point) Apparatus	A-472/A	243
Automatic Softening Point (Ring and Ball) Apparatus	A-472/A	243
Automatic Soil Compactor	T-055	191
Automatic Triaxial Tester, Fully	T-333/A	213
Automatic Vicat Apparatus	C-090/A	141
Bacon Sampler (Thief Method)	A-028	238
Balance, Electronic	ET	44
Balance, Electronic	HT	44
Ball Penetration Apparatus, Kelly	B-022	96
Balloon Density Apparatus	T-067	185
Bar (Grid) Sieve Set	AG-038	159
Basic Calculator	GL-23/B	315

## B

## ANALYTICAL INDEX

## B

Item	Code	Page
Basket, Density	G-100/WB	46
Bath, Le Chatelier	G-040/06	149
Bath, Water	G-040	37, 234
Beam Mould	B-017	86
Beams, Flexural Apparatus for Concrete	B-003/BFA	76
Bending Beam Rheometer	A-810	260
Bending Beam Rheometer	A-813	262
Benkelman Beam Apparatus	A-068	237
Bits, Core	B-061/X	83
Bitumen Content Oven (Ignition Method)	A-030/IGN	246
Bitumen Penetrometer	A-090	235
Bitumen Penetrometer, Semi-Automatic	A-090/SA	235
Blaine Air Permeability Apparatus	C-035	139
Blaine Air Permeability Apparatus, Digital	C-035/D	139
Bleeding Test Set, Concrete	B-028	93
Boehme Abrasion Tester (Dorry)	AG-199	171
Breaking Head, Marshall	A-001/BH	230
Bulk Cement Slotted Tube Sampler	C-029	151
Bulk Resistivity Tester, Concrete	B-510	114
Bunsen Burner	GL-37	320
Burette	GCBR	335

## C

Calibration Weights	CW	50
Caliper Apparatus, Proportional	AG-037	161
Capping Pad	B-016	80
Capping Retainer	B-016/CR	80
Capping Set, Cylinder	B-015	80
Casagrande Apparatus (Liquid Limit)	T-030	178
CBR Equipment	T-01x	200
CBR Tester, Field	T-001/F	198
CBR Tester, Laboratory - Digital	T-001/D	199
CBR Tester, Laboratory - LCD	T-001/LCD	197
CBR Tester, Laboratory - Load-Ring	T-001/LR	199
CBR/Marshall Testing Machine	AT-001	128
Cement Compression and Flexural Tester	C-001/LCD	133
Cement Flow Table	C-021	145
Cement Flow Table, Motorized	C-021/M	144
Cement Mixer	C-050	146
Cement Mixer, Automatic	C-050/A	147
Cement Mould	C-011	135
Cement Slotted Tube Sampler, Bulk	C-029	151
Cement Tube Sampler, Packaged	C-028	151

## INDEX

### ANALYTICAL INDEX

## C

Item	Code	Page
Cement Vibrating Machine	C-126	136
Centrifuge Extractor	A-031	239
Chisel	GL-33	319
Claw Hammer	GL-61	326
Cleveland Open Cup method (Flash and Fire Point Apparatus)	A-470	238
Climatic Chamber	G-035/CC	34
Compacting Factor Apparatus	B-185	98
Compaction Determination Apparatus	T-065	185
Compaction Hammer, Vibratory (Kango Hammer)	T-129	202
Compactor, Asphalt Roller	A-830	268
Compactor, Asphalt Shear-Box	A-845	274
Compactor, Automatic Marshall	A-015	233
Compactor, Automatic Soil	T-055	191
Compactor, Gyratory	A-825	266
Compactor, Manual Marshall	A-016	232
Comparator, Digital Length	C-018	150
Comperssion Tester for Iron/Steel	M-001/LCD	303
Compression and Flexural Tester, Cement	C-001/LCD	133
Compression Jig	C-011/CJ	134
Compression Tester	B-001	55
Compression Tester	B-004	55
Compression Tester, Universal Tensile	UTM-001	121, 302
Compression Tester, Universal Tensile	UTM-001	121, 302
Compressometer	B-003/CM	74
Compressor	GL-01	310
Concrete Bleeding Test Set	B-028	93
Concrete Bulk Resistivity Tester	B-510	114
Concrete Flow Table (700 x 700 mm)	B-024/EN	90
Concrete Flow Table (Ø 762 mm)	B-024/ASTM	90
Concrete Initial Set Penetrometer - Dial Model	B-308	101
Concrete Penetrometer	B-135	100
Concrete Pipe Testing Machine	B-008	79
Concrete Pocket Penetrometer - Pen-Type	B-304	101
Concrete Resistivity Tester, Wireless	B-520	116
Concrete Surface Resistivity Tester	B-515	115
Concrete Test Hammer	B-110	111
Concrete Test Hammer (Proceq), Digital	B-110/D/P	110
Concrete Water Impermeability Tester	B-245	104
Cone Penetrometer (Liquid Limit)	T-090	179
Consistometer, Vebe	B-130	97
Consolidation, Oedometer	T-210	206



## ANALYTICAL INDEX

## C

Item	Code	Page
Constant Head Permeability Set	T-250/CH	205
Conversion Frame for T-001/F	T-001/F/CF	198
Core Bits	B-061/X	83
Core Cutting Machine	RM-063	280, 292
Core Cutting Machine	RM-063	280, 292
Coring Machine	B-061	83
Coring Machine (Portable)	A-066	251
Coring Machine (Trailer Mounted)	A-065	250
Correction Time and Workable Life Apparatus	C-096	142
Corrosion Mapping Device, Half-Cell	B-505	113
Corrosion Rate Tester, Rebar	B-525	117
Cover Meter (Proceq)	B-050/P650	109
Crack Detection Microscope	B-250	105
Cradle	G-100/C	46
Cross-Section Paper	GL-43	321
Crusher, Cylindrical	G-415	286
Crusher, Hammer	M-440	287
Crusher, Jaw	G-412/S	284
Crusher, Jaw (Large Capacity)	G-412/L	285
Crushing Value, Aggregate	AG-210	174
Cube Mould	B-011	86
Curing Tank	B-140	88
Cutting Machine, Core	RM-063	280, 292
Cutting Machine, Universal	B-062	82, 292
Cutting Machine, Universal	B-062	82, 292
Cylinder Capping Set	B-015	80
Cylinder Mould	B-010	86
Cylindrical Crusher	G-415	286

## D

Davis Tube Type Magnetic Separator	M-074	297
Density / Moisture Gauge, Nuclear	EZ-121	195, 253
Density / Moisture Gauge, Nuclear	EZ-121	195, 253
Density Apparatus, Balloon	T-067	185
Density Basket	G-100/WB	46
Density Gauge, Electrical	EDG	194
Density Pick	GL-51	323
Density Spoon	GL-15	313
Density Test Set, Relative	T-045	208
Desiccator	GCD	335
Dial Indicator	DI	50
Dial Thermometer	GTI	336
Digital Blaine Air Permeability Apparatus	C-035/D	139

## INDEX

### ANALYTICAL INDEX

## D

Item	Code	Page
Digital Caliper	GL-09	312
Digital Concrete Test Hammer (Proceq)	B-110/D/P	110
Digital Laser Distance Meter	GL-50	323
Digital Length Comparator	C-018	150
Digital Point Load Apparatus	RM-120	278
Digital Point Load Apparatus w/ Load Cell	RM-120/LC	278
Digital Thermometer	GTD	337
Direct Shear Tester	T-220	210
Disc Mill	G-420	289
Disc Mill, Planetary	M-434	291
Disc Mill, Vibratory	G-430	290
Distillation Unit, Emulsion	A-450	241
Distillation Unit, Water	G-045	36
Dorry Abrasion Tester (Boehme)	AG-199	171
Double-Ended Brush	GL-21	315
Drum Type Magnetic Separator	M-075	297
Drum-Type Mixer	B-121	84
Ductility Mould	A-440/xM	255
Ductility Tester	A-440	255
Ductility Tester, Force	A-440/F	254
Dynamic Penetrometer, Lightweight	T-300/LW	184
Dynamic Penetrometer, TRL	T-300/TRL	184
Dynamic Shear Rheometer	A-820	264

## E

Electrical Density Gauge	EDG	194
Electromagnetic Sieve Shaker	G-041	38, 295
Electromagnetic Sieve Shaker	G-041	38, 295
Electromechanical Sieve Shaker	G-041/DA	38, 295
Electromechanical Sieve Shaker	G-041/DA	38, 295
Electromechanical Tensile Tester	UTM-001/EM	127
Electronic Balance	ET	44
Electronic Balance	HT	44
Elongation Index (Length) Gauge	AG-034	160
Emulsion Distillation Unit	A-450	241
Erlenmeyer Flask	GCCF	330
Evaporating Dish	GPP	326
Expansion Tester, Autoclave	C-070	138
Extractor, Centrifuge	A-031	239
Extractor, Reflux	A-035	239
Extruder, Sample	T-020	201
Extruder, Sample	A-020	232
Extruder, Universal	T-025	201

## ANALYTICAL INDEX

## F

Item	Code	Page
Falling Head Permeability Set	T-250/FH	205
Feeler Strip Set	GL-36	319
Field CBR Tester	T-001/F	198
Filter Flask	GCFF	330
Filter Paper	FP	237
Flakiness / Thickness Index Gauge	AG-032	160
Flakiness Sieve Set	AG-030	158
Flash and Fire Point Apparatus By Cleveland Open Cup method	A-470	238
Flask, Le Chatelier	C-022	148
Flexural and Compression Tester, Cement	C-001/LCD	133
Flexural Apparatus for Concrete Beams	B-003/BFA	76
Flexural Frame	B-001/FF	76
Flexural Jig	C-011/FJ	134
Flexural Testing Machine	B-003/LCD	77
Flotation Machine	M-050	296
Flow Cone Apparatus, Grout	C-024	152
Flow Cone Test Set, SCC Slump	B-021	92
Flow Table (700 x 700 mm), Concrete	B-024/EN	90
Flow Table (Ø 762 mm), Concrete	B-024/ASTM	90
Flow Table, Cement	C-021	145
Flow Table, Motorized Cement	C-021/M	144
Force Ductility Tester	A-440/F	254
Fraass Breaking Point Apparatus	A-465	252
Freeze and Thaw Cabinet	G-035/FT	34
Fully Automatic Triaxial Tester	T-333/A	213
Funnel, Marsh	C-015	153
Furnace, Muffle	G-050	35

## G

Geological Hammer	GL-52	323
Gillmore Apparatus	C-095	143
Glass Beaker	GCB	328
Glass Funnel	GCH	331
Glass Marking Pen	GL-57	325
Glass Measuring Cylinder	GCM	329
Glass Plate	GL-38	320
Glass Stirring Rod	GL-31	318
Glass Thermometer	GTC	337
Gloves	GL-25	316
Gooch Crucible	GL-55	324
Grading and Weighing System	M-041/ETS	299
Grid (Bar) Sieve Set	AG-038	159
Grindability Index Tester, Hardgrove	M-195	301

## INDEX

### ANALYTICAL INDEX

	Item	Code	Page
<b>G</b>	Grinding Machine, Automatic	B-199	81
	Grout Flow Cone Apparatus	C-024	152
	Gyratory Compactor	A-825	266
<b>H</b>	Hair Brush	GL-19	314
	Half-Cell Corrosion Mapping Device	B-505	113
	Hammer	GL-13	313
	Hammer Crusher	M-440	287
	Hammer, Rock Classification	RM-110	281
	Hand Vane Tester	T-175	183
	Hand-Held GPS	GL-49	323
	Hardgrove Grindability Index Tester	M-195	301
	High-Capacity Screen Shaker	G-043	43
	Hi-Low Detector (Travelling Beam Apparatus)	A-069	236
	Hotplate	GL-11	312
	Hydrometer	GL-28	317
	Hydrometer Set	T-251	42, 204
	Hydrometer Set	T-251	42, 204
<b>I</b>	Ignition Oven (Bitumen Content Determination)	A-030/IGN	246
	Impact Value, Aggregate	AG-220	175
	Impermeability Tester, Concrete Water	B-245	104
	Impurities Set, Organic	AG-240	162
	Indicator, Dial	DI	50
	Indirect Splitting Tensile Device	A-001/IT	230
	Initial Set Penetrometer - Dial Model, Concrete	B-308	101
<b>J</b>	Jaw Crusher	G-412/S	284
	Jaw Crusher (Large Capacity)	G-412/L	285
	Jig, Compression	C-011/CJ	134
	Jig, Flexural	C-011/FJ	134
	Jolting Table	C-125	137
	J-Ring Apparatus	B-027	95
<b>K</b>	Kango Hammer (Vibratory Compaction Hammer)	T-129	202
	Kelly Ball Penetration Apparatus	B-022	96
	Kinematic Viscometer	A-435	242
	K-Slump Tester	B-031	96
	Lab Trolley	GL-08	311
<b>L</b>	Laboratory CBR Tester - Digital	T-001/D	199
	Laboratory CBR Tester - LCD	T-001/LCD	197
	Laboratory CBR Tester - Load-Ring	T-001/LR	199
	Laboratory Oven	G-030	31, 293
	Laboratory Oven	G-030	31, 293
	Ladle	GL-39	320

## ANALYTICAL INDEX

L

Item	Code	Page
Large Log Book	GL-41	321
Large-Capacity Sample Splitter	G-081	49, 157
Large-Capacity Sample Splitter	G-081	49, 157
L-Box Apparatus	B-026	94
Le Chatelier Bath	G-040/06	149
Le Chatelier Flask	C-022	148
Le Chatelier Mould	C-023	148
Le Chatelier Soundness Test Set	C-025	149
Length Comparator, Digital	C-018	150
Length Gauge (Elongation Index)	AG-034	160
Level Indicator, Water	T-470	192
Lightweight Dynamic Penetrometer	T-300/LW	184
Linear Shrinkage Mould (Cement)	C-017	135
Linear Shrinkage Mould, (Soil)	T-039	181
Liquid Limit Device (Casagrande Method)	T-030	178
Liquid Limit Device (Cone Penetrometer Method)	T-090	179
Load Cell	LC	51
Load Ring	LR	51
Los Angeles Abrasion Tester	AG-191	167
Magnesium Sulphate Test Set	AG-042	161
Magnetic Holder	GL-35	319
Magnetic Separator - Davis Tube Type	M-074	297
Magnetic Separator - Drum Type	M-075	297
Manual Marshall Compactor	A-016	232
Marsh Funnel	C-015	153
Marshall Breaking Head	A-001/BH	230
Marshall Compactor, Automatic	A-015	233
Marshall Compactor, Manual	A-016	232
Marshall Mixer	A-050	248
Marshall Mould	A-010	230
Marshall Stability Tester - Digital	A-001/D	231
Marshall Stability Tester - LCD	A-001/LCD	229
Marshall Stability Tester - Load-Ring	A-001/LR	231
Marshall Water Bath	G-040	37, 234
Marshall/CBR Testing Machine	AT-001	128
Metal, Curing Tank	B-140/M	89
Methylene Blue Set	AG-041	163
Micro-Deval Abrasion Tester	AG-195	173
Microscope, Crack Detection	B-250	105
Microwave Oven	G-030/MW	36
Mill, Disc	G-420	289

M



## INDEX

### ANALYTICAL INDEX

	Item	Code	Page
M	Mill, Planetary Disc	M-434	291
	Mill, Vibratory Disc	G-430	290
	Mini-Slump Set	C-020	136
	Min-Max Thermometer	GTMM	336
	Mixer, Automatic Cement	C-050/A	147
	Mixer, Automatic Mortar	C-050/A	147
	Mixer, Cement	C-050	146
	Mixer, Drum-Type	B-121	84
	Mixer, Marhsall	A-050	248
	Mixer, Mortar	C-050	146
	Mixer, Pan-Type	B-120	85
	Mixing Bowl	GL-22	315
	Mobile Laboratory	ML	341
	Modified Proctor Set	T-050	190
	Moisture / Temperature Tester	T-462	192
	Moisture Tester, Speedy (Universal Carbide Tester)	T-068	193
	Moisture Tin	GL-20	315
	Mortar and Pestle	GHT	326
	Mortar Mixer	C-050	146
	Mortar Mixer, Automatic	C-050/A	147
	MOT Straight Edge	A-047	236
	Motorized Casagrande Apparatus (Liquid Limit)	T-030/M	178
	Motorized Cement Flow Table	C-021/M	144
	Motorized Liquid Limit Device (Casagrande Method)	T-030/M	178
	Mould, Beam	B-017	86
	Mould, Cement	C-011	135
	Mould, Cube	B-011	86
	Mould, Cylinder	B-010	86
	Mould, Ductility	A-440/xM	255
	Mould, Le Chatelier	C-023	148
	Mould, Linear Shrinkage (Cement)	C-017	135
	Mould, Linear Shrinkage (Soil)	T-039	181
	Mould, Marshall	A-010	230
	Mud Balance	C-014	153
	Muffle Furnace	G-050	35
N	Natural Stones and Concrete Tiles Abrasion Tester	AG-197	170
	Noise Reduction Cabinet for AG-191	AG-191/SPC	169
	Non-Contact Thermometer	GTL	336
	Nuclear Density / Moisture Gauge	EZ-121	195, 253
O	Nuclear Density / Moisture Gauge	EZ-121	195, 253
	Oedometer, Consolidation	T-210	206

## ANALYTICAL INDEX

O

Item	Code	Page
Organic Impurities Set	AG-240	162
Oven, Laboratory	G-030	31, 293
Oven, Laboratory	G-030	31, 293
Oven, Microwave	G-030/MW	36
Packaged Cement Tube Sampler	C-028	151
Pan-Type Mixer	B-120	85
Particle Charge Tester	A-460	252
Pavemix, Asphalt	A-850	275
Pellet Press	M-002	298
Pellet Strength Tester	M-003	298
Penetration Apparatus, Kelly Ball	B-022	96
Penetration Apparatus, Plunger	C-094	142
Penetrometer - Dial Model, Concrete Initial Set	B-308	101
Penetrometer - Dial Model, Soil	T-308	182
Penetrometer - Pen-Type, Concrete Pocket	B-304	101
Penetrometer - Pen-Type, Soil Pocket	T-304	182
Penetrometer, Bitumen	A-090	235
Penetrometer, Concrete	B-135	100
Penetrometer, Lightweight Dynamic	T-300/LW	184
Penetrometer, Semi-Automatic Bitumen	A-090/SA	235
Penetrometer, Soil Proctor	T-310	183
Penetrometer, TRL Dynamic	T-300/TRL	184
Permeability Set, Constant Head	T-250/CH	205
Permeability Set, Falling Head	T-250/FH	205
Petri Dish	GCPD	334
Ph Meter	GL-05	311
Pipe Testing Machine, Concrete	B-008	79
Pipette	GL-26	317
Planetary Disc Mill	M-434	291
Plastic Beaker	GPB	328
Plastic Bucket	GL-59	325
Plastic Funnel	GL-29	318
Plastic Limit Set	T-035	180
Plastic Measuring Cylinder	GPM	329
Plastic, Curing Tank	B-140/P	88
Platform Scale	EB	45
Platinum Crucible	GL-56	324
Plunger Penetration Apparatus	C-094	142
Pocket Penetrometer - Pen-Type, Concrete	B-304	101
Pocket Penetrometer - Pen-Type, Soil	T-304	182
Point Load Apparatus, Digital	RM-120	278

## INDEX

### ANALYTICAL INDEX

	Item	Code	Page
<b>P</b>	Poker Vibrator	B-128	87
	Porcelain Crucible	GL-54	324
	Portable Coring Machine	A-066	251
	Pressure Aging Vessel	A-800	256
	Pressure Filter	M-053	296
	Proctor Penetrometer, Soil	T-310	183
	Proctor Set, Modified	T-050	190
	Proctor Set, Standard	T-050	190
	Proportional Caliper Apparatus	AG-037	161
	Pull-Off Tester	B-105	102
	Pull-Out Tester	B-106	103
	Pycnometer, Specific Gravity	G-103	46, 333
	Pycnometer, Vacuum	A-490	247
<b>Q</b> <b>R</b>	Quartering Canvas	GL-58	325
	Rapid Chloride Permeability Tester	B-500	112
	Rebar Corrosion Rate Tester	B-525	117
	Rebar Detector (Bosch)	B-050/B	105
	Rebar Detector (Proceq)	B-050/P+	108
	Recovery Apparatus, Solvent	A-042	240
	Reflux Extractor	A-035	239
	Relative Density Test Set	T-045	208
	Resistivity Tester, Concrete Bulk	B-510	114
	Resistivity Tester, Concrete Surface	B-515	115
	Resistivity Tester, Wireless Concrete	B-520	116
	Retainer, Capping	B-016/CR	80
	Rheometer, Bending Beam	A-810	260
	Rheometer, Bending Beam	A-813	262
	Rheometer, Dynamic Shear	A-820	264
	Ring and Ball (Softening Point) Apparatus	A-472	243
	Ring and Ball (Softening Point) Apparatus, Automatic	A-472/A	243
	Rock Classification Hammer	RM-110	281
	Rock Compression Tester	RM-001	279
	Roller Compactor, Asphalt	A-830	268
	Rolling Thin Film Oven (RTFO)	A-030/RTFO	245
	Rotational Viscometer	A-823	265
	Rubber Blower Bulb	GL-32	318
	Rubber Mallet	GL-14	313
<b>S</b>	Sample Can - 1 lt	GL-44	321
	Sample Can - 10 lt	GL-45	322
	Sample Extruder	T-020	201
	Sample Extruder	A-020	232

## ANALYTICAL INDEX

## S

Item	Code	Page
Sample Splitter	G-080	48, 156, 294
Sample Splitter	G-080	48, 156, 294
Sample Splitter	G-080	48, 156, 294
Sample Splitter, Large-Capacity	G-081	49, 157
Sample Splitter, Large-Capacity	G-081	49, 157
Sample Tray	GNT	327
Sampler, Bacon (Thief Method)	A-028	238
Sampler, Bulk Cement Slotted Tube	C-029	151
Sampler, Packaged Cement Tube	C-028	151
Sampler, Soil Surface	T-058	188
Sand Absorption Cone and Tamper	AG-200	46, 172
Sand Absorption Cone and Tamper	AG-200	46, 172
Sand Cone Set	T-061	186
Sand Equivalent Shaker	AG-040/SS	164
Sand Equivalent Test Set	AG-040	165
Sand Replacement Test Set	T-061	186
Saybolt Viscometer	A-430	242
SCC Slump Flow Cone Test Set	B-021	92
Scientific Calculator	GL-23/S	316
Scissors	GL-34	319
Scoop	GL-03	310
Screen Shaker, High-Capacity	G-043	43
Semi-Automatic Bitumen Penetrometer	A-090/SA	235
Separator, Magnetic - Davis Tube Type	M-074	297
Separator, Magnetic - Drum Type	M-075	297
Shaker, Electromagnetic Sieve	G-041	38, 295
Shaker, Electromagnetic Sieve	G-041	38, 295
Shaker, Electromechanical Sieve	G-041/DA	39, 295
Shaker, Electromechanical Sieve	G-041/DA	39, 295
Shaker, High-Capacity Screen	G-043	43
Shaker, Sand Equivalent	AG-040/SS	164
Shape Gauge, Aggregate	AG-036	157
Shatter Indices Tester	M-015	300
Shear Tester, Direct	T-220	210
Shear-Box Compactor, Asphalt	A-845	274
Shovel	GL-30	318
Shredder Machine	M-407	288
Shrinkage Limit Set	T-037	181
Shrinkage Mould, Linear (Cement)	C-017	135
Shrinkage Mould, Linear (Soil)	T-039	181
Sieve	SV	39, 294

## INDEX

### ANALYTICAL INDEX

## S

Item	Code	Page
Sieve	SV	39, 294
Sieve Segregation Test Set	B-023	93
Sieve Shaker, Electromagnetic	G-041	38, 295
Sieve Shaker, Electromagnetic	G-041	38, 295
Sieve Shaker, Electromechanical	G-041/DA	39, 295
Sieve Shaker, Electromechanical	G-041/DA	39, 295
Skid Resistance Tester	AG-190	172
Slab Testing Machine	B-007	78
Slake Durability Tester	RM-130	280
Slotted Tube Sampler, Bulk Cement	C-029	151
Slump Flow Cone Test Set, SCC	B-021	92
Slump Set	B-020	91
Smart Tracker (Multi-Wheels)	A-840	272
Softening Point (Ring and Ball) Apparatus	A-472	243
Soil Auger	T-305	189
Soil Compactor, Automatic	T-055	191
Soil Penetrometer - Dial Model	T-308	182
Soil Pocket Penetrometer - Pen-Type	T-304	182
Soil Proctor Penetrometer	T-310	183
Soil Surface Sampler	T-058	188
Solubility Tester	A-438	240
Solvent Recovery Apparatus	A-042	240
Soundness Test Set, Aggregate	AG-042	161
Soundness Test Set, Le Chatelier	C-025	149
Spatula	GL-17	314
Specific Gravity Frame	G-100	47
Specific Gravity Pycnometer	G-103	46, 333
Specific Gravity Pycnometer	G-103	46, 333
Specific Gravity Pycnometer, Bottle-Type	GCP/B	332
Specific Gravity Pycnometer, Gay-Lussac	GCP/GL	332
Specific Gravity Pycnometer, Hubbard-Carmick	GCP/HC	333
Speedy Moisture Tester (Universal Carbide Tester)	T-068	193
Splitter, Large-Capacity Sample	G-081	49, 157
Splitter, Large-Capacity Sample	G-081	49, 157
Splitter, Sample	G-080	48, 156, 294
Splitter, Sample	G-080	48, 156, 294
Splitter, Sample	G-080	48, 156, 294
Splitting Tensile Apparatus	B-003/ST	74
Splitting Tensile Device, Indirect	A-001/IT	230
Stability Tester, Marshall - Digital	A-001/D	231
Stability Tester, Marshall - LCD	A-001/LCD	229



## ANALYTICAL INDEX

## S

Item	Code	Page
Stability Tester, Marshall - Load-Ring	A-001/LR	231
Standard Proctor Set	T-050	190
Steel Ruler	GL-10	312
Steel Sheet Sampling Machine	M-043	304
Stopwatch	GL-06	311
Straight Edge - 300 mm	GL-47	322
Straight Edge, MOT	A-047	236
Surface Resistivity Tester, Concrete	B-515	115
Surface Sampler, Soil	T-058	188

## T

Table, Vibrating	B-125	87
Tape Meter	GL-27	317
Temperature / Moisture Tester	T-462	192
Tensile and Compression Tester, Universal	UTM-001	121, 302
Tensile and Compression Tester, Universal	UTM-001	121, 302
Tensile Tester, Electromechanical	UTM-001/EM	127
Test Bottle	GCS	334
Test Hammer (Proceq), Digital Concrete	B-110/D/P	110
Test Hammer, Concrete	B-110	111
Testing Anvil	B-117	111
Thermal Printer	B-003/TP	74
Thermo-Hygrometer	GTHM	336
Thermometer	GTx	336
Thickness / Flakiness Index Gauge	AG-032	160
Timer	GL-07	311
Tong	GL-48	322
Tool Kit	GL-16	314
Trailer Mounted Coring Machine	A-065	250
Travelling Beam Apparatus (Hi-Low Detector)	A-069	236
Triaxial Tester, Fully Automatic	T-333/A	213
Trimming Knife	GL-46	322
TRL Dynamic Penetrometer	T-300/TRL	184
Trowel	GL-12	313
Tube Brush	GL-62	326
Tube Sampler, Bulk Cement Slotted	C-029	151
Tube Sampler, Packaged Cement	C-028	151

## U

Ultrasonic Pulse Velocity Tester	B-048/M	106
Ultrasonic Pulse Velocity Tester (Proceq)	B-048/P	107
Unconfined Compression Tester	T-201	209
Unit Weight Measures	BAK	327
Unitracker (Single Wheel)	A-835	270
Universal Carbide Tester (Speedy Moisture Tester)	T-068	193

## INDEX

### ANALYTICAL INDEX

	Item	Code	Page
U	Universal Cutting Machine	B-062	82, 292
	Universal Cutting Machine	B-062	82, 292
	Universal Extruder	T-025	201
	Universal Tensile and Compression Tester	UTM-001	121, 302
	Universal Tensile and Compression Tester	UTM-001	121, 302
	Universal Testing Machine	ULF-001	129
	U-Shape Box Apparatus	B-029	92
	UV Weather and Aging Cabinet	G-035/UV	34
V	Vacuum Degassing Oven	A-805	258
	Vacuum Pump	GL-02	310
	Vacuum Pycnometer	A-490	247
	Vane Tester, Hand	T-175	183
	Vebe Consistometer	B-130	97
	V-Funnel Apparatus	B-025	94
	Vibrating Machine, Cement	C-126	136
	Vibrating Table	B-125	87
	Vibrator, Poker	B-128	87
	Vibratory Compaction Hammer (Kango Hammer)	T-129	202
	Vibratory Disc Mill	G-430	290
	Vibro-Deairator for A-490	A-490/VD	247
	Vicat Apparatus	C-090	140
	Vicat Apparatus, Automatic	C-090/A	141
	Viscometer, Kinematic	A-435	242
	Viscometer, Rotational	A-823	265
	Viscometer, Saybolt	A-430	242
	Volumetric Flask	GCVF	331
W	Waltz Container	B-132	96
	Wash Bottle	GL-24	316
	Water Bath	G-040	37, 234
	Water Content in Bituminous Materials Test Set	A-455	241
	Water Distillation Unit	G-045	36
	Water Impermeability Tester, Concrete	B-245	104
	Water Level Indicator	T-470	192
	Water Quality Test Kit	GL-60	325
	Weights, Calibration	CW	50
	Wheel Barrow	GL-40	320
	Wire Brush	GL-18	314
	Wireless Concrete Resistivity Tester	B-520	116
	Workable Life and Correction Time Apparatus	C-096	142

## CODE INDEX

Code	Item	Page
A-001/BH	Marshall Breaking Head	230
A-001/D	Marshall Stability Tester - Digital	231
A-001/IT	Indirect Splitting Tensile Device	230
A-001/LCD	Marshall Stability Tester - LCD	229
A-001/LR	Marshall Stability Tester - Load-Ring	231
A-010	Marshall Mould	230
A-015	Automatic Marshall Compactor	233
A-016	Manual Marshall Compactor	232
A-020	Sample Extruder	232
A-028	Bacon Sampler (Thief Method)	238
A-030/IGN	Bitumen Content Oven (Ignition Method)	246
A-030/RTFO	Rolling Thin Film Oven (RTFO)	245
A-030/TFO	Asphalt Oven with Rotating Shelves (TFO)	244
A-031	Centrifuge Extractor	239
A-035	Reflux Extractor	239
A-042	Solvent Recovery Apparatus	240
A-047	MOT Straight Edge	236
A-050	Marshall Mixer	248
A-065	Coring Machine (Trailer Mounted)	250
A-066	Coring Machine (Portable)	251
A-068	Benkelman Beam Apparatus	237
A-069	Travelling Beam Apparatus (Hi-Low Detector)	236
A-090	Bitumen Penetrometer	235
A-090/SA	Semi-Automatic Bitumen Penetrometer	235
A-430	Saybolt Viscometer	242
A-435	Kinematic Viscometer	242
A-438	Solubility Tester	240
A-440	Ductility Tester	255
A-440/F	Force Ductility Tester	254
A-440/xM	Ductility Mould	255
A-450	Emulsion Distillation Unit	241
A-455	Water Content in Bituminous Materials Test Set	241
A-460	Particle Charge Tester	252
A-465	Fraass Breaking Point Apparatus	252
A-470	Flash and Fire Point Apparatus By Cleveland Open Cup method	238
A-472	Ring and Ball (Softening Point) Apparatus	243
A-472/A	Automatic Ring and Ball (Softening Point) Apparatus	243
A-490	Vacuum Pycnometer	247
A-490/VD	Vibro-Deairator for A-490	247
A-800	Pressure Aging Vessel	256
A-805	Vacuum Degassing Oven	258

## INDEX

### CODE INDEX

Code	Item	Page
A-810	Bending Beam Rheometer	260
A-813	Bending Beam Rheometer	262
A-820	Dynamic Shear Rheometer	264
A-823	Rotational Viscometer	265
A-825	Gyratory Compactor	266
A-830	Asphalt Roller Compactor	268
A-835	Unitracker (Single Wheel)	270
A-840	Smart Tracker (Multi-Wheels)	272
A-845	Asphalt Shear-Box Compactor	274
A-850	Asphalt Pavemix	275
AG-030	Flakiness Sieve Set	158
AG-032	Thickness / Flakiness Index Gauge	160
AG-034	Length Gauge (Elongation Index)	160
AG-036	Aggregate Shape Gauge	157
AG-037	Proportional Caliper Apparatus	161
AG-038	Grid (Bar) Sieve Set	159
AG-040	Sand Equivalent Test Set	165
AG-040/SS	Sand Equivalent Shaker	164
AG-041	Methylene Blue Set	163
AG-042	Aggregate Soundness Test Set	161
AG-190	Skid Resistance Tester	172
AG-191	Los Angeles Abrasion Tester	167
AG-191/AC	Abrasive Charges for AG-191	169
AG-191/SPC	Noise Reduction Cabinet for AG-191	169
AG-195	Micro-Deval Abrasion Tester	173
AG-197	Abrasion Tester for Natural Stones and Concrete Tiles	170
AG-199	Dorry Abrasion Tester (Boehme)	171
AG-200	Sand Absorption Cone and Tamper	46, 172
AG-210	Aggregate Crushing Value	174
AG-220	Aggregate Impact Value	175
AG-240	Organic Impurities Set	162
AT-001	CBR/Marshall Testing Machine	128
B-001	Compression Tester	55
B-001/FF	Flexural Frame	76
B-003/BFA	Flexural Apparatus for Concrete Beams	76
B-003/CM	Compressometer	74
B-003/LCD	Flexural Testing Machine	77
B-003/ST	Splitting Tensile Apparatus	74
B-003/TP	Thermal Printer	74
B-004	Compression Tester	55
B-007	Slab Testing Machine	78

## CODE INDEX

Code	Item	Page
B-008	Concrete Pipe Testing Machine	79
B-010	Cylinder Mould	86
B-011	Cube Mould	86
B-015	Cylinder Capping Set	80
B-016	Capping Pad	80
B-016/CR	Capping Retainer	80
B-017	Beam Mould	86
B-020	Slump Set	91
B-021	SCC Slump Flow Cone Test Set	92
B-022	Kelly Ball Penetration Apparatus	96
B-023	Sieve Segregation Test Set	93
B-024/ASTM	Concrete Flow Table (Ø 762 mm)	90
B-024/EN	Concrete Flow Table (700 x 700 mm)	90
B-025	V-Funnel Apparatus	94
B-026	L-Box Apparatus	94
B-027	J-Ring Apparatus	95
B-028	Concrete Bleeding Test Set	93
B-029	U-Shape Box Apparatus	92
B-031	K-Slump Tester	96
B-048/M	Ultrasonic Pulse Velocity Tester	106
B-048/P	Ultrasonic Pulse Velocity Tester (Proceq)	107
B-050/B	Rebar Detector (Bosch)	105
B-050/P+	Rebar Detector (Proceq)	108
B-050/P650	Cover Meter (Proceq)	109
B-061	Coring Machine	83
B-061/X	Core Bits	83
B-062	Universal Cutting Machine	82, 292
B-105	Pull-Off Tester	102
B-106	Pull-Out Tester	103
B-110	Concrete Test Hammer	111
B-110/D/P	Digital Concrete Test Hammer (Proceq)	110
B-117	Testing Anvil	111
B-120	Pan-Type Mixer	85
B-121	Drum-Type Mixer	84
B-125	Vibrating Table	87
B-128	Poker Vibrator	87
B-130	Vebe Consistometer	97
B-132	Waltz Container	96
B-135	Concrete Penetrometer	100
B-140	Curing Tank	88
B-140/M	Metal, Curing Tank	89



## INDEX

### CODE INDEX

Code	Item	Page
B-140/P	Plastic, Curing Tank	88
B-185	Compacting Factor Apparatus	98
B-199	Automatic Grinding Machine	81
B-245	Concrete Water Impermeability Tester	104
B-250	Crack Detection Microscope	105
B-304	Concrete Pocket Penetrometer - Pen-Type	101
B-308	Concrete Initial Set Penetrometer - Dial Model	101
B-320/B	Air Entrainment Meter	99
B-500	Rapid Chloride Permeability Tester	112
B-505	Half-Cell Corrosion Mapping Device	113
B-510	Concrete Bulk Resistivity Tester	114
B-515	Concrete Surface Resistivity Tester	115
B-520	Wireless Concrete Resistivity Tester	116
B-525	Rebar Corrosion Rate Tester	117
BAK	Unit Weight Measures	327
C-001/LCD	Cement Compression and Flexural Tester	133
C-011	Cement Mould	135
C-011/CJ	Compression Jig	134
C-011/FJ	Flexural Jig	134
C-014	Mud Balance	153
C-015	Marsh Funnel	153
C-017	Linear Shrinkage Mould (Cement)	135
C-018	Digital Length Comparator	150
C-020	Mini-Slump Set	136
C-021	Cement Flow Table	145
C-021/M	Motorized Cement Flow Table	144
C-022	Le Chatelier Flask	148
C-023	Le Chatelier Mould	148
C-024	Grout Flow Cone Apparatus	152
C-025	Le Chatelier Soundness Test Set	149
C-028	Packaged Cement Tube Sampler	151
C-029	Bulk Cement Slotted Tube Sampler	151
C-035	Blaine Air Permeability Apparatus	139
C-035/D	Digital Blaine Air Permeability Apparatus	139
C-050	Cement Mixer	146
C-050/A	Automatic Cement Mixer	147
C-070	Autoclave Expansion Tester	138
C-090	Vicat Apparatus	140
C-090/A	Automatic Vicat Apparatus	141
C-094	Plunger Penetration Apparatus	142
C-095	Gillmore Apparatus	143

## CODE INDEX

Code	Item	Page
C-096	Workable Life and Correction Time Apparatus	142
C-125	Jolting Table	137
C-126	Cement Vibrating Machine	136
CW	Calibration Weights	50
DI	Dial Indicator	50
EB	Platform Scale	45
EDG	Electrical Density Gauge	194
ET	Electronic Balance	44
EZ-121	Nuclear Density / Moisture Gauge	195, 253
FP	Filter Paper	237
G-030	Laboratory Oven	31, 293
G-030/MW	Microwave Oven	36
G-035/CC	Climatic Chamber	34
G-035/FT	Freeze and Thaw Cabinet	34
G-035/UV	UV Weather and Aging Cabinet	34
G-040	Water Bath	37, 234
G-040/06	Le Chatelier Bath	149
G-041	Electromagnetic Sieve Shaker	38, 295
G-041/DA	Electromechanical Sieve Shaker	38, 295
G-043	High-Capacity Screen Shaker	43
G-045	Water Distillation Unit	36
G-050	Muffle Furnace	35
G-080	Sample Splitter	48, 156, 294
G-081	Large-Capacity Sample Splitter	49, 157
G-100	Specific Gravity Frame	47
G-100/C	Cradle	46
G-100/WB	Density Basket	46
G-103	Specific Gravity Pycnometer	46, 333
G-412/L	Jaw Crusher (Large Capacity)	285
G-412/S	Jaw Crusher	284
G-415	Cylindrical Crusher	286
G-420	Disc Mill	289
G-430	Vibratory Disc Mill	290
GCB	Glass Beaker	328
GCBR	Burette	335
GCCF	Erlenmeyer Flask	330
GCD	Desiccator	335
GCFF	Filter Flask	330
GCH	Glass Funnel	331
GCM	Glass Measuring Cylinder	329
GCP/B	Specific Gravity Pycnometer, Bottle-Type	332

## INDEX

### CODE INDEX

Code	Item	Page
GCP/GL	Specific Gravity Pycnometer, Gay-Lussac	332
GCP/HC	Specific Gravity Pycnometer, Hubbard-Carmick	333
GCPD	Petri Dish	334
GCS	Test Bottle	334
GCVF	Volumetric Flask	331
GHT	Mortar and Pestle	326
GL-01	Compressor	310
GL-02	Vacuum Pump	310
GL-03	Scoop	310
GL-04	Air Dryer / Gun	310
GL-05	Ph Meter	311
GL-06	Stopwatch	311
GL-07	Timer	311
GL-08	Lab Trolley	311
GL-09	Digital Caliper	312
GL-10	Steel Ruler	312
GL-11	Hotplate	312
GL-12	Trowel	313
GL-13	Hammer	313
GL-14	Rubber Mallet	313
GL-15	Density Spoon	313
GL-16	Tool Kit	314
GL-17	Spatula	314
GL-18	Wire Brush	314
GL-19	Hair Brush	314
GL-20	Moisture Tin	315
GL-21	Double-Ended Brush	315
GL-22	Mixing Bowl	315
GL-23/B	Basic Calculator	315
GL-23/S	Scientific Calculator	316
GL-24	Wash Bottle	316
GL-25	Gloves	316
GL-26	Pipette	317
GL-27	Tape Meter	317
GL-28	Hydrometer	317
GL-29	Plastic Funnel	318
GL-30	Shovel	318
GL-31	Glass Stirring Rod	318
GL-32	Rubber Blower Bulb	318
GL-33	Chisel	319
GL-34	Scissors	319

## CODE INDEX

Code	Item	Page
GL-35	Magnetic Holder	319
GL-36	Feeler Strip Set	319
GL-37	Bunsen Burner	320
GL-38	Glass Plate	320
GL-39	Ladle	320
GL-40	Wheel Barrow	320
GL-41	Large Log Book	321
GL-42	A4 Clipboard	321
GL-43	Cross-Section Paper	321
GL-44	Sample Can - 1 lt	321
GL-45	Sample Can - 10 lt	322
GL-46	Trimming Knife	322
GL-47	Straight Edge - 300 mm	322
GL-48	Tong	322
GL-49	Hand-Held GPS	323
GL-50	Digital Laser Distance Meter	323
GL-51	Density Pick	323
GL-52	Geological Hammer	323
GL-53	Absorbant Cloth	324
GL-54	Porcelain Crucible	324
GL-55	Gooch Crucible	324
GL-56	Platinum Crucible	324
GL-57	Glass Marking Pen	325
GL-58	Quartering Canvas	325
GL-59	Plastic Bucket	325
GL-60	Water Quality Test Kit	325
GL-61	Claw Hammer	326
GL-62	Tube Brush	326
GNT	Sample Tray	327
GPB	Plastic Beaker	328
GPM	Plastic Measuring Cylinder	329
GPP	Evaporating Dish	326
GTC	Glass Thermometer	337
GTD	Digital Thermometer	337
GTHM	Thermo-Hygrometer	336
GTI	Dial Thermometer	336
GTL	Non-Contact Thermometer	336
GTMM	Min-Max Thermometer	336
GTx	Thermometer	336
HT	Electronic Balance	44
LC	Load Cell	51

## INDEX

### CODE INDEX

Code	Item	Page
LR	Load Ring	51
M-001/LCD	Comperssion Tester for Iron/Steel	303
M-002	Pellet Press	298
M-003	Pellet Strength Tester	298
M-015	Shatter Indices Tester	300
M-041/ETS	Grading and Weighing System	299
M-043	Steel Sheet Sampling Machine	304
M-050	Flotation Machine	296
M-053	Pressure Filter	296
M-062	Aluminum Sampling Machine	305
M-074	Magnetic Separator - Davis Tube Type	297
M-075	Magnetic Separator - Drum Type	297
M-191	Abrasion and Crumbling Index Tester	301
M-195	Hardgrove Grindability Index Tester	301
M-407	Shredder Machine	288
M-434	Planetary Disc Mill	291
M-440	Hammer Crusher	287
ML	Mobile Laboratory	341
RM-001	Rock Compression Tester	279
RM-063	Core Cutting Machine	280, 292
RM-110	Rock Classification Hammer	281
RM-120	Digital Point Load Apparatus	278
RM-120/LC	Digital Point Load Apparatus w/ Load Cell	278
RM-130	Slake Durability Tester	280
SV	Sieve	39, 294
T-001/D	Laboratory CBR Tester - Digital	199
T-001/F	Field CBR Tester	198
T-001/F/CF	Conversion Frame for T-001/F	198
T-001/LCD	Laboratory CBR Tester - LCD	197
T-001/LR	Laboratory CBR Tester - Load-Ring	199
T-01x	CBR Equipment	200
T-020	Sample Extruder	201
T-025	Universal Extruder	201
T-030	Liquid Limit Device (Casagrande Method)	178
T-030/M	Motorized Liquid Limit Device (Casagrande Method)	178
T-035	Plastic Limit Set	180
T-037	Shrinkage Limit Set	181
T-039	Linear Shrinkage Mould, (Soil)	181
T-045	Relative Density Test Set	208
T-050	Standard Proctor Set	190
T-055	Automatic Soil Compactor	191



## CODE INDEX

Code	Item	Page
T-058	Soil Surface Sampler	188
T-061	Sand Cone Set	186
T-065	Compaction Determination Apparatus	185
T-067	Balloon Density Apparatus	185
T-068	Universal Carbide Tester (Speedy Moisture Tester)	193
T-090	Liquid Limit Device (Cone Penetrometer Method)	179
T-129	Vibratory Compaction Hammer (Kango Hammer)	202
T-175	Hand Vane Tester	183
T-201	Unconfined Compression Tester	209
T-210	Oedometer, Consolidation	206
T-220	Direct Shear Tester	210
T-250/CH	Constant Head Permeability Set	205
T-250/FH	Falling Head Permeability Set	205
T-251	Hydrometer Set	42, 204
T-300/LW	Lightweight Dynamic Penetrometer	184
T-300/TRL	TRL Dynamic Penetrometer	184
T-304	Soil Pocket Penetrometer - Pen-Type	182
T-305	Soil Auger	189
T-308	Soil Penetrometer - Dial Model	182
T-310	Soil Proctor Penetrometer	183
T-333/A	Fully Automatic Triaxial Tester	213
T-462	Moisture / Temperature Tester	192
T-470	Water Level Indicator	192
ULF-001	Universal Testing Machine	129
UTM-001	Universal Tensile and Compression Tester	121, 302
UTM-001/EM	Electromechanical Tensile Tester	127



## This image shows a full page of blank, lined paper. It features approximately 28 evenly spaced horizontal grey lines across its entire width, providing a guide for handwriting or typing. The paper itself is a clean, off-white color.



NOTES

Lined area for notes, consisting of 30 horizontal lines.

[illegible]

## ● **DISCLAIMER**

ALFA makes every effort to maintain the accuracy and quality of the information provided on this Catalogue. However, ALFA cannot guarantee and assumes no legal liability or responsibility for the accuracy or completeness of the information provided. The information provided in this catalogue are subjected to change at any time and without a prior notice. The information contained on this catalogue is for general guidance only. You should neither act, nor refrain from action, on the basis of any such information. You should take appropriate professional advice on your particular circumstances because the application of our equipment may vary depending on particular circumstances.

## ● **COPYRIGHT**

The copyright of all content on this catalogue is owned by ALFA. No part of this catalogue may be changed, reproduced, stored in or transmitted on any website or medium without the prior written permission of ALFA. Requests to republish any material must be sent to ([info@alfatestusa.com](mailto:info@alfatestusa.com)).





TESTING EQUIPMENT

[www.alfatestusa.com](http://www.alfatestusa.com)

**215 ARENA ST.**

**EL SEGUNDO, CA 90245**

**USA**

**Tel : +1 310 987 52 52**

**Mail : [info@alfatestusa.com](mailto:info@alfatestusa.com)**

**Web : [www.alfatestusa.com](http://www.alfatestusa.com)**