

cement equipment



Cement production process

Cement is one of the ancient raw materials used in construction. It is uncertain where it was first discovered that a combination of hydrated non-hydraulic lime and a pozzolan produces a hydraulic mixture (e.g., Portland cement) harden because of hydration chemical reactions that occur independently of the mixture's water content; they can harden even underwater or when constantly exposed to wet weather.

Cement is essentially a binder that binds other materials together, Modern cements are manufactured by a chemical process.

Raw materials are crushed, ground and blended before being heated in a rotary kiln until they combine chemically. The clinker from the kiln is then ground with gypsum to form Portland cement.

Different types of cement with different strengths and characteristics can be produced depending on the composition and quality of clinker, fly ash, silica fume, retarders, water proofers, colouring agents and other additives used in the mix.

It is essential to test the physical and chemical parameters of each cement batch produced and to identify the unique characteristics of each composition.

Such parameters include specific surface and gravity of cement particles, consistency, soundness, setting time, heat of hydration, inorganic chemical analysis, loss on ignition, air content and strength.

Geotechnical Testing Equipment

Fineness Blaine Air Apparatus

Standards: BS 1377:2, EN 196-6, 459-2, 13286-44, BS 4359-2, ASTM C204

The Blaine Air Apparatus is used to determine the particle size of Portland cement, limes and similar powders expressed in terms of their specific surface.

Comprises:

It comprises of a stainless steel cell, perforated disc and plunger. A U-tube glass manometer is fitted to the steel stand. The set is complete with rubber aspirator and filter paper.

CM 0101

Blaine Air Apparatus

Accessories:

CM 0102

Manometer Tube

CM 0103

Reference Cement

CM 0104

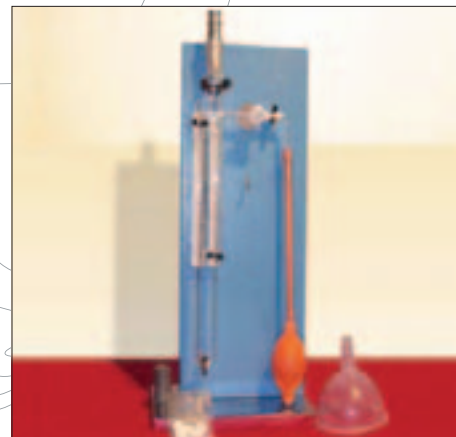
Filter Paper (pack of 100)

CM 0105

Cell with perforated disc

CM 0106

Manometer liquid bottle 250 mm



Specific Gravity Le Chatelier Flask

Standards: EN 196-6, ASTM C188, AASHTO T133

The Chatelier Flask is used to determine the specific gravity of hydraulic cement and lime.

Glass flask 250ml capacity, with graduated neck from 0 to 1 ml and from 18 to 24 ml in 0.1 ml graduation with accuracy of 0.05 ml.

CM 0107

Le Chatelier Flask



Cement Flow Table

Standards: BS 4551-1, 3892-1, EN 459-2, 1015-3 1015-9, 13395-1

The Flow Table is used for determining consistency of mortar, lime and cement specimens. The table is 300mm dia., 10mm top height. The one made of brass has dimensions of 100mm base dia. x 70mm top dia. x 60mm high.

CM 0108

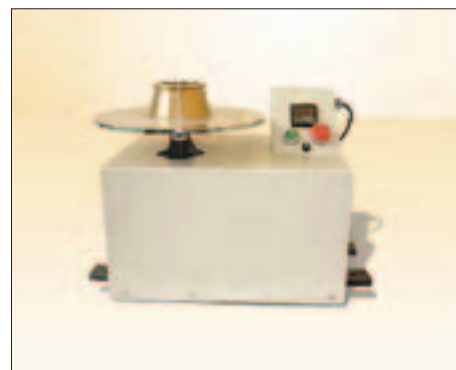
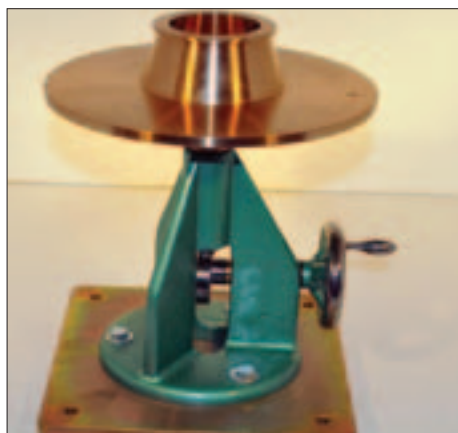
Manual Cement Flow Table, BS, EN

CM 0109

Manual Cement Flow Table, ASTM

CM 0110

Automatic Cement Flow Table, BS/EN



CM 0111

Automatic Cement Flow Table, ASTM

CM 0112

Flow Mould

CM 0113

Tamping Rod

Le Chatelier Mould

Standards: BS 6463; EN 196-3, 459-2, EN ISO 9597

Le Chatelier method determines the soundness of cements and limes by using the expansion test with Le chatelier moulds according to the relevant standard.

Comprises:

The mould consists of a spring tensioned split cylinder 30 mm internal diameter x 30 mm high with two indicator stems which

measure 150 mm from the points to the centre line of the cylinder and O-ring. Standard weight 100 g \pm 10 g and two glass plate are supplied complete with the mould.

CM 0114

Le Chatelier Mould complete



Le Chatelier Water Bath

Standards: EN 196-3, 459-2

The Chatelier Water Bath is use with Le Chatelier moulds for the determination of the soundness of cement paste.

Comprises:

The Water Bath comes complete with removable rack to hold twelve moulds and cover. Build in digital Thermostat controller to regulate the water

temperature from ambient to boiling point.

CM 0115

Le Chatelier Water Bath complete



Vicat Apparatus

Standards: EN 196-3, 13454-2, ASTM C187, C191, AASHTO T129, T131

The Vicant Apparatus is used for determining setting time and consistency of cement by Vicat Method.

Comprises:

The test set comprises of Vicat Frame, Vicat Mould, Initial and Final needles, glass plate and consistency plunger.

CM 0116

Vicat Frame Complete

CM 0117

Initial Set Needle 1.13 mm dia, EN

CM 0118

Final Set Needle 1.13 mm dia, EN

CM 0119

Initial Set Needle 1 mm dia, ASTM

CM 0120

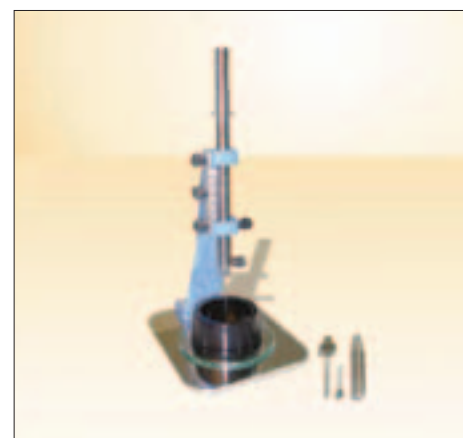
Vicat Mould, EN

CM 0121

Vicat Mould, ASTM

CM 0122

Consistency Plunger



Geotechnical Testing Equipment

Automatic Vicat Apparatus

Standards: EN 196-3:2005, 13279-2, 480-2, ASTM C187, C191, BS 4550, AASHTO T129, T131

The Automatic Vicat Apparatus is designed and manufactured using the most recent and sophisticated technology, it is used for the initial and final setting time determination of cements or mortar pastes.

The apparatus is manufactured with anticorrosion components to be used in places with humidity up to 90% and 20°C.

The entire test is made in a fully automatic way and gives a very precise and repeatable result with controlled temperature as required by EN Specifications.

The results are printed on the incorporated printer and this eliminates the manual operations of installing and zeroing the paper graph on the drum.

The use of the appliance is extremely simplified by the guiding menu that is available in different languages.

CM 0123

Automatic Vicat Apparatus Complete with EN and ASTM Initial and Final needles, Consistency Plunger, 1 x EN and ASTM Mould and Glass Plate.

Accessories:

CM 0124

Consistency Plunger

CM 0125

Initial needle, 1.13 mm dia EN

CM 0126

Final needle, 1.13 mm dia EN

CM 0127

Initial needle, 1 mm dia ASTM

CM 0128

Final needle, 1 mm dia ASTM

CM 0129

Needle Cleaning Device

CM 0130

Windows Software and RS232 Cable

CM 0131

Printer Paper Rolls, pack of 10

CM 0132

Mould Tank



CM 0133

Thermostatically-controlled Heating/Cooling System, for testing samples under water as per EN 196-3.

Cement Shrinkage Test

Standards: EN 1367- 4, EN 12617- 4, ASTM C151, C490, BS 1881:5, 6073

The Cement Shrinkage Test is used to determine the accelerated soundness (autoclave method) and length changes of 40x40x160 mm and other sizes of cement prisms.

Comprises:

The set comprises of length measuring frame, two or three gang steel mould according to the related standard, steel inserts for moulds and reference rod.

CM 0134

Drying, Shrinkage, Length Comparator with adjustable-height beam

CM 0135

Dial gauge 0,002mmx10mm

CM 0136

Digital dial gauge 0.001mmx20 mm

CM 0137

Reference Rod 160mm EN12617-4

CM 0138

Reference Rod 305 mm ASTM C490

CM 0139

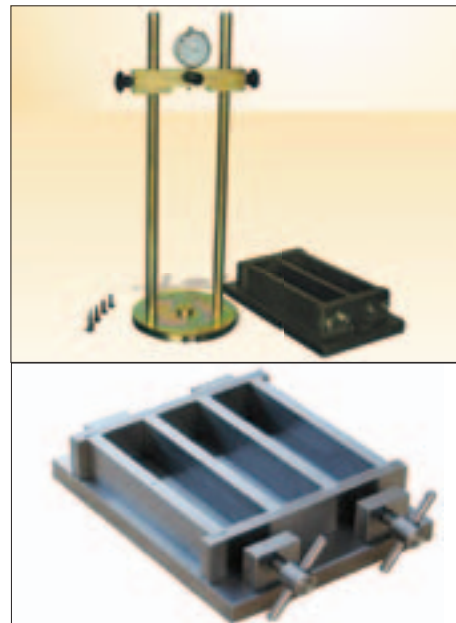
Three Gang Prism Mould 40x40x-160mm to EN12617-4

CM 0140

Two Gang Prism Mould 25x25x285 mm to ASTM C490

CM 0141

Steel Inserts, 10 pieces



Autoclave Apparatus

Standards: ASTM C151, ASTM C141, AASHTO T107

The Autoclave Apparatus used for accelerated soundness tests on cement.

It provides high pressure steam up to 25 Bar to help cure the cement specimens.

Comprises :

The Autoclave is made of high pressure steam chamber of dimension 114 mm ID x 406,4mm Stainless steel chamber with bolted steel cover, which is enclosed in eat insulated metal housing.

Double scale indication pressure gauge with thermostat regulator and safety valve automatically shut off with beep reminding after sterilization.

CM 0142

Autoclave Apparatus Complete

Spares:

CM 0143

O-ring Lid Sealing Gasket

CM 0144

Specimen Rack



Heat of Hydration Apparatus

Standards: BS 4550, ASTM C186

This Apparatus is required for determining the heat of hydration of cement as expressed in calories per gram.

Comprises:

A wide mouthed double walled vacuum flask with a cork stopper 38 mm thick and an insulated container for flask.

A beckman thermometer held tightly by the cork stopper in such a way as to avoid accidental contact with stirrer blades and a reading lens.

To facilitate removal, the cork stopper is divided into two halves.

A constant speed stirrer (Double-bladed propeller type) extending to within 38 mm from the bottom of the flask.

A funnel (Gooch Type) with a stem of 6 mm inner dia and a body approx 25 mm long and 25 mm dia is fitted to the cork stopper for introducing the sample.

CM 0145

Heat of Hydration Apparatus Complete

Accessories:

CM 0146

Vacuum Dewar Flask

CM 0147

Beckman Thermometer, range 6°C ±0.01°C

CM 0148

Glass Filling Funnel



Geotechnical Testing Equipment

Automatic Mortar Mixer

Standards: EN 196-1, 196-3, 413-2, 459-2

The Automatic mixer is perfect to mix mortars and cement material according to the required standards.

The mixer is very rigid and durable with a planetary motion for its paddle.

The mixer is electronically controlled; it has two different speeds that can be operated either on manual or automatic program mode.

Thirty seconds after starting the mix the sand is automatic discharged into the mixing bowl.

CM 0149

Automatic Mortar Mixer

CM 0150

Automatic Sand dispenser

CM 0151

Mixing Bowl 5 Ltr, Stainless Steel complies with EN 196

CM 0152

Paddle, stainless steel complies with EN 196

CM 0153

Scraper



Automatic Digital Mortar Mixer

Standards: EN 196-1, 196-3, 413-2, 459-2, ASTM C305



Automatic Digital Mortar Mixer is perfect to mix mortars and cement material according to the required standards.

The mixer is has the latest technology with a programmable mixing cycles conforming to EN 196-1, EN 196-3 and ASTM C305.

It has Acoustic signal synchronised with cycle steps, complete with automatic sand dispenser and Ergonomic and safe design.

CM 0154

Automatic Digital Mortar Mixer complete including sand, cement and water dispenser.

CM 0155

Mixing Bowl 5 Ltr, Stainless Steel complies with EN 196

CM 0156

Paddle, stainless steel complies with EN 196

CM 0157

Scraper



Manual Mortar Mixer

Standards: EN 196-1, EN 196-3, EN 413-2, EN 459-2

The Manual mixer is a basic mortar and cement mixer according to the required standards.

The mixer is controlled by an on/off switch. It has two different speeds that can be operated on manual mode.

CM 0158

Manual Mortar Mixer

CM 0159

Mixing Bowl 5 Ltr, Stainless Steel complies with EN 196

CM 0160

Paddle, stainless steel complies with EN 196

CM 0161

Scraper



Flame Photometer

Standards: EN196-21;ASTM C114

The Flame Photometer is a device used in inorganic chemical analysis to determine the concentration of certain metal ions, among them sodium, potassium, lithium, Barium and calcium.

In principle, it is a controlled flame test with the intensity of the flame colour quantified by photoelectric circuitry.

The instrument is fitted with automatic flame failure detection for user safety, making it ideal for use in laboratory, industrial sites and educational applications.

CM 0162

Flame Photometer supplied complete with Na, K, Ba, Ca and Li filters, connecting hoses and clips, compressor plug and drain trap



Muffle Furnace, Loss on Ignition

Standards: EN 196-2, EN 459-2, BS 1016:4, ASTM D2361, D2795

The Muffle Furnaces are widely used for determining various properties of construction materials such as the Loss on Ignition.

Vertical lift door directs heat away from user and saves counter space. A safety interlock switch disconnects power when the door is open.

Vertical lift door has maximum access with minimum head room for easy loading and unloading.

CM 0163

Muffle Furnace, 4.2 liters cap. 1200 C temp

CM 0164

Muffle Furnace, 7.5 liters cap. 1200 C temp

CM 0165

Muffle Furnace, 15 liters cap. 1200 C temp

CM 0166

Muffle Furnace, 22 liters cap. 1200 C temp



Geotechnical Testing Equipment

Vibrating Machine

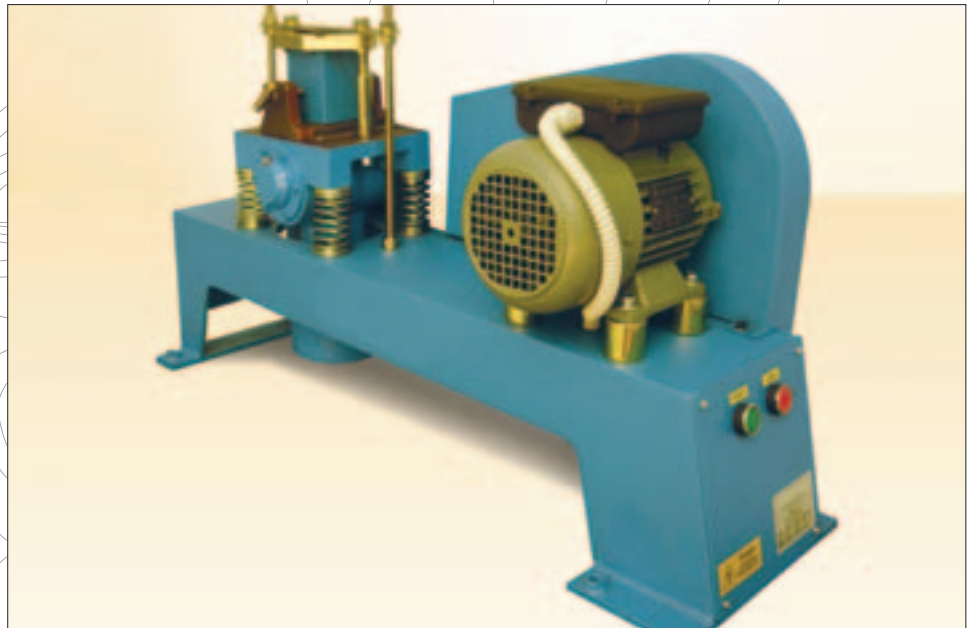
Standards: BS 4550

The Vibrating Machine is perfect for the preparation and compaction of 70.7 mm mortar cube specimens.

The vibrating shaft of the machine allows each sample to be vibrated at 12000 cycles per minute. Fitted with setting timer the vibrating machine can stop automatically when set time is completed.

CM 0167

Vibrating Machine



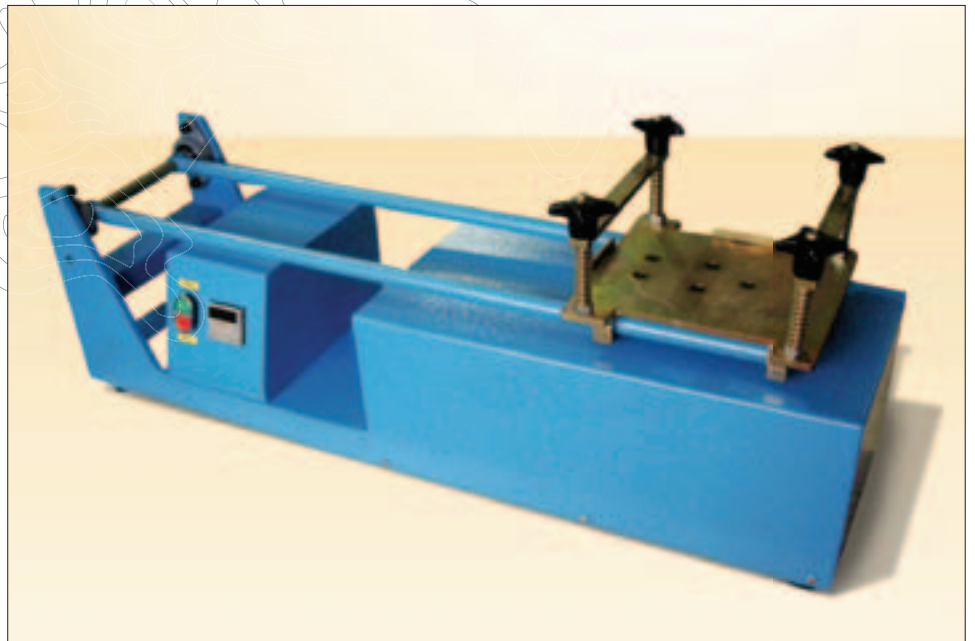
Jolting Table

Standards: EN 196-1

Jolting table is used for mould compacting of 40.1x40x160 mm cement specimens and consists of mould table seated on a rotating cam driven at 60 revolutions per minute. The Jolting Table is 15.0 mm drop equipped with counter which provides automatic shut off at end of preset drop numbers. Rapid mould lock and release system allows easy and quick operation.

CM 0168

Jolting Table



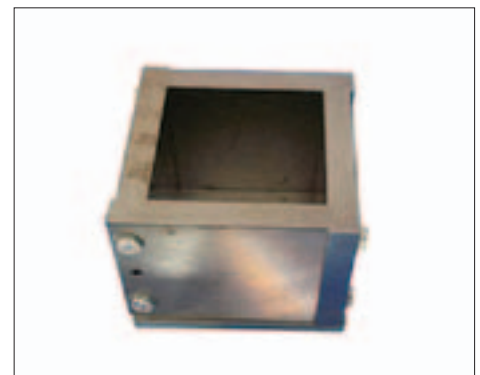
70.7 mm Cube Mould

Standards: EN 196-1, ASTM C109, BS 4550

The 70.7 mm moulds have been manufactured from steel in the relevant British Standard and all internal surfaces are machined. Supplied complete with baseplate. All dimensions and specifications comply with the related standards.

CM 0169

70.7 mm Cube Mould



Three Gang Mould

Standards: BS 3892-1, 4551-1, EN 196-1, 413-2, 459-2, 1744-1, 1015-10,11, 13454-2.

The 40.1x40x160 mm Three Gang Mould is manufactured of steel with hardness over HV400 the surface is heat treated to comply with the related standards.

CM 0170

Three Gang Mould 40.1x40x160 mm

CM 0171

Feeding Hopper

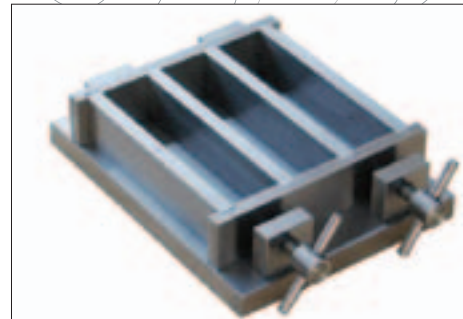
CM 0172

Scraper double-ended

CM 0173

Standard Reference Sand.

EN 196-1 2006, 1350 gram per Bag



Three Gang Cube Mould

Standards: BS 1881-131, ASTM C109, EN 196-1

The 50x50x50 mm Three Gang Cube Mould is manufactured of cast iron, all internal surfaces are machined.

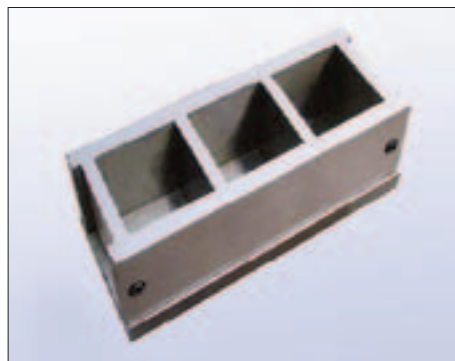
All dimensions and specifications comply with the related standards.

CM 0174

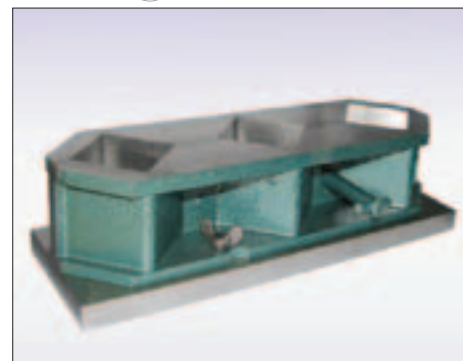
Three Gang Cube Mould

This cast iron three gang mould is a diagonal arrangement 50mm mortar cube moulds with a detachable brass base plate.

Wing nut clamps lock the mould to the base while stainless steel



thumbscrews secure the halves tightly together. Large screed off upper surface area makes this mould a preferred choice.



CM 0175

Three Gang Cube Mould with simple cube release mechanism

Briquette Mould

Standards: BS 4550

The Briquette Mould is used for casting cement briquettes for tensile strength testing. Manufactured of brass it is a two part split mould with thumb screws for quick assembling and dismantling of the mould.

The minimum cross section of the briquettes cast is 25.4 mm x 25.4 mm. Supplied complete with a steel base plate.

CM 0176

Briquette Mould



Geotechnical Testing Equipment

Plunger Penetration Apparatus, Consistency of Masonry Cement

Standards: EN 413-2, 459-2, 1015-4, DIN 4211

The plunger penetration apparatus is used to determine the consistency of fresh mortar, lime and masonry cement.

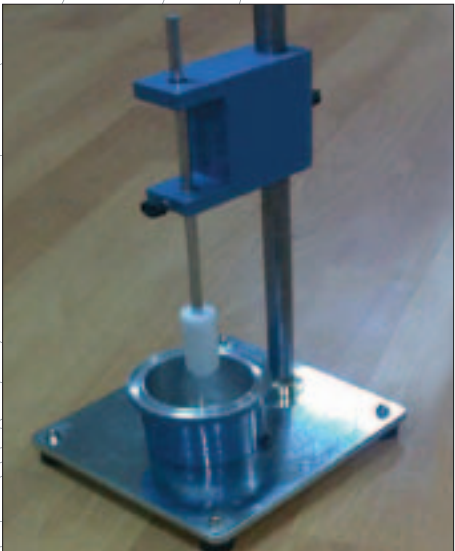
The base is foreseen of a device to locate the test cup.
The height of the drop can be accurately adjusted to 100 mm.

Supplied complete with test cup and tamper, both made from anodized aluminium. dimension 200x200x700 mm

CM 0177
Plunger Penetration Apparatus complete

Spares:

CM 0178
Test cup
CM 0179
Tamper



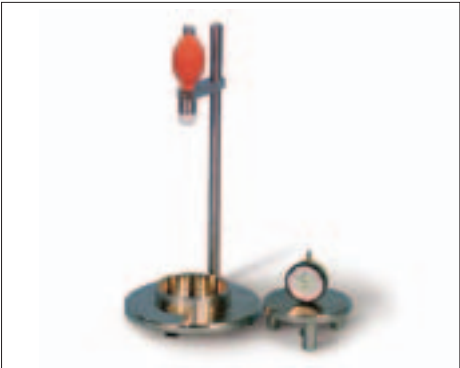
Dropping ball apparatus

Standards: BS 4551-1, 6463-4

The dropping ball apparatus is used to measure the consistency of cement mortars, this allows a 25mm diameter acrylic ball to fall freely from a standard height of 250mm into a brass ring mould containing a mortar specimen with a carefully prepared surface. The depth of the ball penetration into the mortar gives the specimen consistency.

The apparatus consists of a dropping device mounted on a stand, acrylic ball and a 100mm diameter x 25mm deep mould. The base of the stand is machined with a Chrome finish.

CM 0180
Dropping Ball Apparatus
CM 0181
Ball Penetration measuring Device with dial gauge 25 x 0.01 mm



Gillmore Apparatus

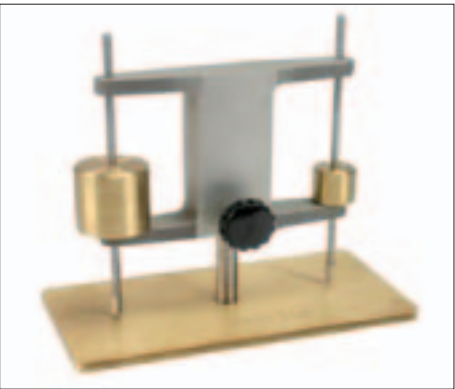
Standards: ASTM C91, C141, C266 AASHTO T154

The Gillmore apparatus is used to determine the setting time of cement. Vertical support shaft has a device to maintain the horizontal arms in alignment.

Support assembly is adjustable in position. The two steel weights needles are calibrated to meet Specifications.

Needle points are from stainless steel. The initial setting needle has dia.2,12 mm and weight of 113 g, while the final setting needle has dia.1,06 mm and weight of 453,6 g.

CM 0182
Gillmore Apparatus



Humidity Curing Cabinet

Standards: BS 3892-1, EN 196-1 459-2

The Humidity Curing Cabinet is used for curing cement test samples.

The curing cabinet provides $50 \pm 0.5^{\circ}\text{C}$ temperature and 98% humidity for cement specimens by an immersion heater and refrigerator unit which are supplied complete with the cabinet.

The internal chamber and racks are made of stainless steel.

The cabinet is equipped with digital control unit to monitor the temperature and humidity and recording chart.

Specification

Capacity:	320 Litres
External Size:	66 x 64 x 175 cm
Internal size:	49 x 51 x 127 cm
Temp range:	$+5.0^{\circ}\text{C}$ to $+60^{\circ}\text{C}$
Fluctuation:	$\pm 0.2^{\circ}\text{C}$
Variation:	$\pm 0.5^{\circ}\text{C}$
Recorded chart:	7 day
Temperature:	$0 - 50^{\circ}\text{C}$
Humidity:	$0 - 100\% \text{ RH}$
shelves:	10 shelves

CM 0183

Humidity Curing Cabinet

CM 0184

Recording Chart



Air Content Meter for Mortar, Masonry Cement and Lime

Standards: EN 459-2



The Air content meter for mortar is designed to determine the air content in cement mortar, cement paste and lime mortar.

Made from cast aluminium, the test pot one litre capacity and the upper part are air-tight sealed by means of two quick action spring clamps.

The whole is connected to a dial gauge directly indicating the air entrainment in percentage, with range $0 - 50\%$.

A built-in operated air pump is also included. The push-buttons TEST and CORRECTION are arranged to perform the test in a simple and quick system.

CM 0185

Manual Air Content Meter,
1 Lt Capacity

CM 0186

Motorised Air Content Meter,
1 Lt Capacity, with an electric
mini-compressor to keep the air
pressure constant

Geotechnical Testing Equipment

Cement Compression and Flexural Machine

Standards: EN 196-1, 196-3, 413-2, 459-2, ASTM C305



The Cement Compression and Flexural Machine 25/250 KN is Fully Automatic and has been designed for testing the compression on the 50x50x50 mm cube moulds, 40x40mm and the flexural on the 40.1x40 x160 mm prism moulds according to the related standards.

The machine consist of very rigid two column frame with double test chamber, automatic closed loop controlled hydraulic power pack and LCD graphic digital control and readout unit.

Very silent power pack can load a specimen between 1 kN/sec to 20 kN/sec.

On the dual stage pump high delivery low pressure pump is used for rapid approach and low delivery high pressure radial piston pump is used for test execution.

On all power packs maximum pressure valve is used to avoid machine overloading.

CM 0187

Semi Automatic Digital Cement Compression and Flexural Machine 25/250KN

CM 0188

Full Automatic Digital Cement Compression and Flexural Machine 25/250KN

CM 0189

Semi Automatic Digital Cement Compression 250KN

CM 0190

Full Automatic Digital Cement Compression 250KN

Accessories:

CM 0191

Compression Jig Assembly for EN 196-1

CM 0192

Compression Jig Assembly for ASTM C109

CM 0193

Flexure Jig Assembly for EN 196-1

CM 0194

Flexure Jig Assembly for ASTM C109



Cement Compression and Flexural

Standards: EN 196-1, 196-3, 413-2, 459-2, ASTM C305

On both frame the load is measured by load cell to get accurate test results. The machine is supplied with safety doors and can test samples up to 250KN.

The LCD graphics data acquisition and controls system is designed to control the machine and processing of data from load cells.

The digital graphic display allows real time load vs time graph. At the end of the test cycle, the results can be stored in memory (up to 250 test results) or downloaded to a PC using the software format.

