Cement

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 articles, consistency, soundness, setting time, heat of hydration, inorganic chemical analysis, loss on ignition, air content and strength.
Fineness Blaine Air Apparatus

DESCRIPTION:
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.

It comprises of a stainless steel cell, perforated disc and plunger. A U-tube glass manometer is fitted to the steel stand. Manometer Liquid, 250 ml. The set is complete with rubber aspirator and a pack of 100 pcs filter paper.

TECHNICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>220x170x470 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>8 kg</td>
</tr>
</tbody>
</table>

Automatic Blaine Apparatus

DESCRIPTION:
The Automatic Blaine Apparatus provides more accuracy and precision than provided by the manual Blaine Apparatus. Calibration of this unit is done using a cement sample reference, such as NIST 114q.

TECHNICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>170x300x410 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>4.6 kg</td>
</tr>
<tr>
<td>Unit runs at</td>
<td>230 V/50 Hz</td>
</tr>
</tbody>
</table>

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

ORDERING:
CM 0101
Fineness Blaine Air Apparatus complete set

ACCESSORIES:
CM 0102
Manometer Liquid, 250 ml
CM 0103
Test Stand
CM 0104
Rubber Aspirator
CM 0105
Cell with Perforated Disc and Plunger
CM 0106
Plastic Funnel
CM 0107
Filter Paper, 100 pcs.
CM 0108
U Manometer Tube

EN 196; DIN 1164; BS 4550; ASTM C 204

To obtain the most accurate results, the test should be performed in a temperature controlled environment. Unit includes: the unit with an electric pump and time registration; filter papers (12.8mm, 1000pk; fill oil (50ml); Plug; thermometer; brush and funnel.

ORDERING:
CM 0109
Blaine apparatus with PC control
CM 0109-1
Blaine apparatus semi automatic
**Le Chatelier Mold**

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

Two or three molds are required for each test. To perform the test, a water bath is also required.

The kit includes all accessories to perform the test to verify the conformity of the molds.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th></th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Le chatelier mold</td>
<td>0.9 kg</td>
</tr>
</tbody>
</table>

**Le Chatelier Water Bath**

**DESCRIPTION:**
Le Chatelier Water Bath is used with Le Chatelier molds for the determination of the soundness of cement paste fly ash for concrete and lime.

The internal chamber and the insulated exterior case of the bath are manufactured from stainless steel. The Bath is capable of reaching boiling point in 30 minutes by using two heater units. There is a timer on Chatelier Water Bath which is used to set the time for reaching the boiling point.

After that time the temperature of water is regulated by using one heater unit to converse energy.

Supplied complete with a removable rack to hold up to 10 molds. A cover is also supplied as standard.

**TECHNICAL SPECIFICATIONS:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>210x470x290 mm</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>8 kg</td>
</tr>
<tr>
<td>Power</td>
<td>1250 W</td>
</tr>
</tbody>
</table>

**ORDERING:**
CM 0110  Le Chatelier Mold
CM 0111  Le Chatelier Mold, Pack of 6 units
CM 0112  Le Chatelier soundness kit
CM 0113  Glass plates, 50 mm sq.
CM 0114  100 g weights

**MAIN FEATURES:**
- Accurate temperature control
- Made from high quality stainless

**ACCESSORIES:**
CM 0115  Le Chatelier Water Bath
CM 0116  Removable rack
CM 0117  Stainless steel cover

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Le Chatelier Flask, Specific Gravity

**DESCRIPTION:**
The Chatelier Flask is used to determine the specific gravity of hydraulic cement, dust, sand and other fine materials. The body holds approximately 250ml. The oval bulb in the neck holds 17ml.
The volume below the bulb is graduated from 0 to 1.0ml in 0.1ml subdivisions, with an additional 0.1 subdivision below the 0 and above the 1.0ml mark. The neck is graduated from 18 to 24ml in 0.1ml subdivisions above the bulb (white graduations).

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>100x100x300 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>0.1 kg</td>
</tr>
</tbody>
</table>

Cement Flow Table

**DESCRIPTION:**
There are two models of the Cement Flow Table, Both are used for determining the consistency of mortar, lime and cement specimens. The manual hand operated model is fitted with a hand wheel. While the motor operated model is driven by a motor speed reducer through a mechanical coupling at the rate of 1 revolution per second. The number of drops is preset on a counter and the machine stops automatically at the end of the cycle.

Two models are available EN or ASTM model each is manufactured according to standard specification.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Product code</th>
<th>CM 0118 / CM 0118-1</th>
<th>CM 0119 / CM 0119-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table diameter</td>
<td>254 mm</td>
<td>500 mm</td>
</tr>
<tr>
<td>Cone base/top diameter</td>
<td>100.0 mm / 70.0 mm</td>
<td>100.0 mm / 70.0 mm</td>
</tr>
<tr>
<td>Cone Height</td>
<td>50.0 mm</td>
<td>50.0 mm</td>
</tr>
<tr>
<td>Drop Height</td>
<td>12.7 mm</td>
<td>12.7 mm</td>
</tr>
<tr>
<td>Dimensions</td>
<td>260x260x270 mm</td>
<td>470x360x350 mm</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>13 kg</td>
<td>36 kg</td>
</tr>
<tr>
<td>Power</td>
<td>180 W (Motorized)</td>
<td>180 W (Motorized)</td>
</tr>
</tbody>
</table>

EN 196-6, 450-1, 15617-1; ASTM C110, C128, C188; C989; AASHTO T133

ORDERING:
CM 0118
Specific Gravity Le Chatelier Flask

ASTM C230; EN 459-2, 1015-3, 1015-9, 13395-1; BS 4551-1, 3892-1

MAIN FEATURES:
- The models are manufactured from high quality brass

ORDERING:
CM 0119
Cement Flow Table ASTM
CM 0120
Motorized Cement Flow Table ASTM, 220-240 V 50 Hz
CM 0119-1
Cement Flow Table EN
CM 0120-1
Motorized Cement Flow Table EN 220-240 V 50 Hz

ACCESSORIES:
CM 0121
Cement Flow Mold ASTM
CM 0121-1
Tamper ASTM
CM 0122
Cement Flow Mold EN
CM 0123
Tamper EN
**Vicat Apparatus**

**DESCRIPTION:**
Vicat Apparatus is used for determining setting time and consistency of cement by Vicat Method.

The Vicat Apparatus set is complete with:
Initial Set Needle, Final set needle, Vicat mold, Vicat Thermometer, Glass Plate and a consistency Plunger.

**ORDERING:**
CM 0124
Vicat Apparatus complete set.

**ACCESSORIES:**
CM 0125
Initial Set Needle 1.13 mm dia., EN

CM 0125-1
Final Set Needle 1.13 mm dia., EN

CM 0125-2
Initial Set Needle 1 mm dia., ASTM

CM 0126 Vicat Mold, EN
CM 0126-1 Vicat Mold, ASTM
CM 0126-2 Vicat Thermometer,
CM 0126-3 Glass Plate,
CM 0126-4 Consistency Plunger

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>150x220x318 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

**Automatic Vicat Apparatus**

**DESCRIPTION:**
The Automatic Vicat Apparatus, is used to determine the setting time and consistency of the cement mortar by using vicat method. The penetration depth is measured by a sensor with 0.1mm resolution.

Along with hardening process development the penetration depth decreases, when it matches some thresholds pre-defined by Standards initial and final setting times are measured and recorded.

The entire test is made in a fully automatic cycle and provides precise and repeatable results. The results are then printed on the integrated printer.


**ORDERING:**
EN 196-3; 13454-2; ASTM C187; C191; AASHTO T129; T131

**MAIN FEATURES:**
- Transfer each single control or function of the Vicat on the PC
- Verify in real time each phase of the test
- Automatically download the final results

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>300x555x610 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>56 kg</td>
</tr>
<tr>
<td>Power</td>
<td>200 W</td>
</tr>
</tbody>
</table>
**Automatic Vicat Apparatus**

**ORDERING:**
- CM 0127
  Automatic Vicat Apparatus complete set
- CM 0127-3
  Initial needle, 1.13 mm dia ASTM
- CM 0127-4
  Final needle, 1.13 mm dia ASTM
- CM 0127-5
  Needle cleaning Device
- CM 0128
  Windows Software and RS232 Cable
- CM 0129
  Printer Paper rolls, pack of 10

**ACCESSORIES:**
- CM 0128
  Consistency plunger
- CM 0127-1
  Initial needle, 1.13 mm dia EN
- CM 0127-2
  Final needle, 1.13 mm dia EN

**Plunger Penetration Apparatus**

**DESCRIPTION:**
The Plunger Penetration Apparatus is used to determine the consistency of fresh mortar, lime and masonry cement.

The plunger penetration apparatus consist of steel base, test cup, vertical column holding the penetration plunger assembly. The height of the drop is 100 mm and the weight of the plunger assembly is 90g.

Supplied complete with test cup and tamper, both made from an-iodized aluminum.

**Gillmore Apparatus**

**DESCRIPTION:**
The Gillmore Apparatus is used to determine the setting time of cement.

The apparatus consist of two horizontal arms which carry two weight steel needles that are calibrated to meet the specifications.

The initial needle has 2.12mm dia and weight of 113g, while the final setting needle has 1.06mm dia. and weight of 453.6g

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200x50x250 mm</td>
<td>2.5 kg</td>
</tr>
</tbody>
</table>

**ORDERING:**
- CM 0128
  Plunder Penetration Apparatus complete
- CM 0133
  Test cup
- CM 0134
  Tamper

**EN 196-3; 13454-2; ASTM C187; C191; AASHTO T129; T131**

**EN 413-2; 459-2; 1015-4; DIN 4211**

**ASTM C91; C141; C266; C1398; AASHTO T154**

**ORDERING:**
- CM 0135
  Gillmore Apparatus
**Dropping Ball Apparatus**

**DESCRIPTION:**
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 mold 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 mold. The base of the stand is machined with a chrome finish.

**Cement Shrinkage Apparatus**

**DESCRIPTION:**
Cement Shrinkage Test Machine Length Comparators are used to determine the length changes on different type of cement prism.

The set consists of a length measuring frame with measuring device attached to it. There are 2 models available either with dial gauge or with transducer and data logger.

Cement Shrinkage test set comprise of main apparatus, and reference rods.

Steel inserts, Reference rod and molds should be ordered separately according to standard.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>250x250x450 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>8 kg</td>
</tr>
</tbody>
</table>

**ORDERING:**

**CM 0136**
Dropping Ball apparatus

**CM 0137**
Ball penetration measuring device with dial gauge 25x0.01mm

**CM 0138**
Cement Shrinkage Test Set with dial gauge

**CM 0139**
Cement Shrinkage Test Set with transducer

**CM 0140**
Digital Dial gauge 0.001 mm x 20 mm

**CM 0141**
Reference Rod 160 mm
EN 12617-4

**CM 0141-1**
Reference Rod 205 mm EN1367-4

**CM 0142**
Reference Rod 305 mm
ASTM C490

**CM 0143**
Three gang Prism mold 40x40x160 mm EN 12617-4

**CM 0143-1**
Three gang Prism mold 50X50X200mm

**CM 0144**
Two gang Prism mold 25x25x285 mm to ASTM C490

**CM 0145**
Steel inserts, 10 pieces

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**BS 4551; 6463-4**
**Water Retention Apparatus**

**DESCRIPTION:**
Used for determining the water retention value of cement and lime.

Two models available:
One fitted with aspirator pump and analog vacuum gauge with regulator.

The other with a portable vacuum pump and digital vacuum gauge with regulator.

**Bulk Density of Cement**

**DESCRIPTION:**
Used to determine the Bulk Density of Cement powder and non-cohesive materials.

It consists of a sieve funnel with tripod, a unit weight measure 1 liter capacity, spatulas, straight-edge and aluminum scoop.

**Autoclave Apparatus**

**DESCRIPTION:**
The Autoclave Apparatus is used to perform expansion tests on cement specimens caused by hydration of CaO and MgO. This is done by determining the volume constancy of mortar prism samples.

Test bars are exposed to high-pressure steam compartment, which accept a sample holder for 10 specimens.

The specimens can be tested cementanlisly at a maximum pressure of 360 psi (25 bar) and a max temperature of (250°C).

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Weight</th>
<th>8 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>230 V/50-60 Hz/1ph</td>
</tr>
</tbody>
</table>

**ORDERING:**
- **CM 0148**  Water Retention Apparatus with aspirator pump vacuum regulator.
- **CM 0149**  Water Retention Apparatus with vacuum pump digital vacuum regulator.

**Bulk Density of Cement Apparatus**

**ORDERING:**
- **CM 0150**  Bulk Density of Cement Apparatus

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Overall Dimensions</th>
<th>350x350x520 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

**Autoclave Apparatus**

**MAIN FEATURES:**
- Pressure gauge 0 - 25 Bar
- Specimen rack 10 samples max.
- Digital temperature regulator 0 – 225 C

**ORDERING:**
- **CM 0151**  Autoclave Apparatus complete

**ACCESSORIES:**
- **CM 0152**  O-ring lid sealing gasket
- **CM 0153**  Specimen Rack
- **CM 0154**  Lid sealing gasket

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam chamber</td>
<td>114 mmID X 406.4 mm</td>
</tr>
<tr>
<td>Overall Weight</td>
<td>55 Kg</td>
</tr>
</tbody>
</table>
Heat of Hydration Apparatus

**MAIN FEATURES:**
- Resolution 0.001°C
- Displays saves and prints Delta T min max and mean value
- PT100 probe measuring range -40 to +300°C

**ORDERING:**
CM 0155
Heat of Hydration Apparatus complete.

**ACCESSORIES:**
CM 0156
Beckman centesimal glass mercury thermometer

CM 0157
Digital Thermometer. Resolution: 0.01°C. Complete with probe

CM 0157-1
Digital Thermometer. Resolution: 0.001°C.  
- Memory for 10000 readings  
- Displays, stores and prints: min, max, mean values, delta T  
- Alarm if limit values are exceeded  
- Battery operated

CM 0157-2
Propeller, conforming to ASTM C186 Specifications

CM 0157-3
Propeller, conforming to EN 196-8 Specifications.

CM 0157-4
Paraffin wax with melting point 55°C to coat the glass parts which are in contact with the hydrofluoric acid.

CM 0157-5
Dewar flask

CM 0158-6
Filler glass funnel

**DESCRIPTION:**
This Apparatus is used to determine the heat of hydration of low heat cement as expressed in calories per gram. When Portland or hydraulic cement is mixed with water, heat is generated as a result of the exothermic reaction. The heat generated by cement’s hydration raises the temperature of concrete and this temperature rise causes expansion while concrete is hardening.

The apparatus consists of a Dewar flask housed in an insulated box, an electric stirrer, a filler funnel and a high resolution thermometer.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>300x200x650 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>13 kg</td>
</tr>
</tbody>
</table>
Langavant calorimeter for heat of hydration of cement

DESCRIPTION:
Langavant method consists of introducing a fresh cement specimen into a isolated Dewar flask and monitoring the temperature changes within the specimen during the first early days.

After a certain time, the heat of hydration of the cement content in the sample is equal to the sum of the heat accumulated in the flask and the heat emitted to the environment during the test period.

The temperature of the mortar is compared with the temperature of a inert sample placed in a reference calorimeter flask.

The amount of heat achieved by the cement mortar is mainly dependent on the nature thereof, and may reach values between 10 °C and 50 °C.

The amount of heat is expressed in joules per gram of cement.

ORDERING:
CM 0159
Langavant calorimeter for heat of hydration of cement complete set

ACCESSORIES:
CM 0160
Set of 2 isolated calorimeter bottles
CM 0161
Set of 2 temperature probes type Pt-100, with 3 threads
CM 0162
Set of 50 disposable mortar box.
CM 0163
Electronic console, with 4 measuring channels, and RS232 output interface for connecting up to 4 calorimeter bottles to the PC.

TECHNICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>300x200x650 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>13 kg</td>
</tr>
</tbody>
</table>

It consist of 2 isolated calorimeter bottles set 2 temperature probes type PT-100 set with 3 threads, 50 disposable mortar box set and an electronics console with 4 measuring channels, and RS232 output interface for connecting up to 4 calorimeter bottles to the PC.
The Automatic Mortar Mixer is used to combine mortars and cement pastes to the requirement of standards. The mixing paddle has a planetary motion and is operated by a motor. The motor has microprocessor based speed and preset programs to meet all listed EN and ASTM standards, custom designed programs or manual mode.

In high speed the paddle revolves at the rate of 285 rpm. with a planetary motion of 125 rpm. The user can choose the speeds easily by using the switch fitted to the machine.


**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>300x555x610 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>56 kg</td>
</tr>
<tr>
<td>Power</td>
<td>200 W</td>
</tr>
</tbody>
</table>

**ORDERING:**

CM 0164
Manual Mortar Mixer 5ltr

CM 0164-1
Manual Mortar Mixer 10ltr
**Flame photometer**

**DESCRIPTION:**
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 color 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.

**TECHNICAL SPECIFICATIONS:**

| Dimensions | 420x360x300 mm |
| Weight (approx.) | 8 kg |

**Muffle Furnace**

**DESCRIPTION:**
The Muffle Furnaces are widely used for determining various properties of construction materials such as the loss of 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.

**MAIN FEATURES:**

- It is front loading for easy operation
- Double skin constructed to maintain a cool outer case.
- Temperature control by a PID digital system.
- Available in several sizes.

**ORDERING:**

- CM 0173 Muffle furnace, 1100°C, 3L
- CM 0174 Muffle furnace, 1100°C, 8.2L
- CM 0175 Muffle furnace, 1100°C, 13L
- CM 0176 Muffle furnace, 1100°C, 22L
- CM 0177 Muffle furnace, 1100°C, 39L
- CM 0178 Muffle furnace, 1300°C, 8.6L
Vibrating Machine

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th></th>
<th>CM 0173</th>
<th>CM 0174</th>
<th>CM 0175</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Dimensions</strong></td>
<td>125x200x115 mm</td>
<td>200x300x133 mm</td>
<td>225x360x183 mm</td>
</tr>
<tr>
<td><strong>External Dimensions</strong></td>
<td>340x470x430 mm</td>
<td>440x620x510 mm</td>
<td>500x890x610 mm</td>
</tr>
<tr>
<td><strong>Weight (approx.)</strong></td>
<td>20 kg</td>
<td>28 kg</td>
<td>58 kg</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>1.8 KW</td>
<td>1.8 KW</td>
<td>1.8 KW</td>
</tr>
<tr>
<td><strong>Temperature controller</strong></td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
</tr>
<tr>
<td><strong>Max. Temperature</strong></td>
<td>1100 °C</td>
<td>1100 °C</td>
<td>1100 °C</td>
</tr>
<tr>
<td><strong>Temperature deviation at set point</strong></td>
<td>± 2°C</td>
<td>± 2°C</td>
<td>± 2°C</td>
</tr>
<tr>
<td><strong>Heat Up time to Max. temperature</strong></td>
<td>50 min</td>
<td>65 min</td>
<td>50 min</td>
</tr>
<tr>
<td><strong>Internal Volume</strong></td>
<td>3 L</td>
<td>8.2 L</td>
<td>13 L</td>
</tr>
<tr>
<td><strong>Phase</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>CM 0176</th>
<th>CM 0177</th>
<th>CM 0178</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Dimensions</strong></td>
<td>275x500x155 mm</td>
<td>315x515x225 mm</td>
<td>180x310x155 mm</td>
</tr>
<tr>
<td><strong>External Dimensions</strong></td>
<td>600x890x610 mm</td>
<td>650x550x580 mm</td>
<td>510x750x640 mm</td>
</tr>
<tr>
<td><strong>Weight (approx.)</strong></td>
<td>58 kg</td>
<td>74 kg</td>
<td>39 kg</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>3 KW</td>
<td>6 KW</td>
<td>2.9 KW</td>
</tr>
<tr>
<td><strong>Temperature controller</strong></td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
</tr>
<tr>
<td><strong>Max. Temperature</strong></td>
<td>1100 °C</td>
<td>1100 °C</td>
<td>1300 °C</td>
</tr>
<tr>
<td><strong>Temperature deviation at set point</strong></td>
<td>± 2°C</td>
<td>± 2°C</td>
<td>± 2°C</td>
</tr>
<tr>
<td><strong>Heat Up time to Max. temperature</strong></td>
<td>50 min</td>
<td>75 min</td>
<td>50 min</td>
</tr>
<tr>
<td><strong>Internal Volume</strong></td>
<td>22 L</td>
<td>39 L</td>
<td>8.6 L</td>
</tr>
<tr>
<td><strong>Phase</strong></td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Vibrating Machine**

**DESCRIPTION:**
The Vibrating Machine is used for the preparation and compaction of 70.7mm mortar cube specimens.

The mold table is mounted on four springs attached to an eccentric shaft which allows each sample to be vibrated at 12000 cycles per minute. There is a timer on it to preset time and it stops automatically in every 120 seconds.

**TECHNICAL SPECIFICATIONS:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>450x650x850 mm</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>80 kg</td>
</tr>
<tr>
<td>Eccentric Shaft Rotation</td>
<td>12000 r.p.m</td>
</tr>
<tr>
<td>Power</td>
<td>1100 W</td>
</tr>
</tbody>
</table>

**MAIN FEATURES:**
- The simple design of the machine facilitates easy assembly and dismantling of the cube molds.

**ORDERING:**
- CM 0179
  - Vibrating Machine

**ACCESSORIES:**
- CM 0180
  - Set of springs
- CM 0192
  - Cube Mold 70.7 mm

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**Jolting Table Apparatus**

**DESCRIPTION:**
Jolting Table Apparatus is used for compacting cement specimens in 40x40x160mm prism mold.

The Jolting apparatus consists of mold 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 mold lock and release system allows easy and quick operation.

The supporting frame of the machine has been designed to ensure precise dimensions, table flatness, correct centering of the three gang mold on the table.

The motor and gearbox assembly is enclosed in a protective housing, which promotes user safety (the moving parts are inaccessible) and long life for the gearbox. Feed Hopper is used for filling Three Gang Molds placed on Jolting Table. Three Gang Mold, Feed Hopper and Soundproof Safety Cabinet should be ordered separately.

<table>
<thead>
<tr>
<th>TECHNICAL SPECIFICATIONS:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>1050x350x500 mm</td>
</tr>
<tr>
<td><strong>Weight (approx.)</strong></td>
<td>55 kg</td>
</tr>
<tr>
<td><strong>Motor Speed</strong></td>
<td>60 r.p.m</td>
</tr>
<tr>
<td><strong>Drop Height</strong></td>
<td>15 mm</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>250 W</td>
</tr>
</tbody>
</table>

**MAIN FEATURES:**
- The simple design of the machine facilitates easy assembly and dismantling of the prism molds.

**ORDERING:**
- **CM 0181** Jolting Table Apparatus

**ACCESSORIES:**
- **CM 0182** Prism mold 40x40x160 mm
- **CM 0183** Feed hopper
- **CM 0184** Glass plate
- **CM 0185** Sound proof safety cabinet
- **CM 0186** Standard reference sand. EN 196-1, 1350 gram per bag
**Prism Mold**

**DESCRIPTION:**
The Prism Mold is manufactured of steel with hardness over HV400 the surface is heat treated to comply with the related standards.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM 0182 40x40x160 mm</td>
<td>8.6 Kg</td>
</tr>
<tr>
<td>CM 0183 50x50x200 mm</td>
<td>8 Kg</td>
</tr>
<tr>
<td>CM 0187 25x25x250 mm</td>
<td>6 Kg</td>
</tr>
<tr>
<td>CM 0187-1 75x75x254 mm</td>
<td>9 Kg</td>
</tr>
<tr>
<td>CM 0187-2 25x25x285 mm</td>
<td>6 Kg</td>
</tr>
</tbody>
</table>

**Three Gang Cube Mold 50x50x50**

**DESCRIPTION:**
The Three Gang Cube Mold is manufactured of cast iron, all internal surfaces are machined. All the dimensions and specifications comply with the related standards.

CM 0189 This cast iron three gang mold is diagonal arrangement 50 mm mortar cube, molds with a detachable brass base plate.

Wing nut clamp lock the mold to the base while stainless steel thumbscrews secure the halves tightly together.

Large screed of upper surface area makes this mold a preferred choice.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>CM 0189</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3 Kg</td>
</tr>
</tbody>
</table>

**Briquette Mold**

**DESCRIPTION:**
The briquette mold is used for casting cement briquettes for tensile strength testing. Manufactures of brass it is a two part split mold with thumb screws for quick assembling and dismantling of the mold.

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

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Product code</th>
<th>CM 0191</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>25.4x25.4 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>2 Kg</td>
</tr>
</tbody>
</table>

**ACCESSORIES:**

CM 0188 Steel inserts 6pcs
CM 0183 Feed hopper
CM 0188-1 Standard reference sand. EN 196-1 2006, 1350 gram per bag

**ORDERING:**

CM 0182 Prism mold 3 Gangs, 40x40x160mm
CM 0182-1 Prism mold 3 Gangs, 50x50x200mm
CM 0187 Prism mold 2 Gangs, 25x25x250mm
CM 0187-1 Prism mold 2 Gangs, 75x75x254mm
CM 0187-2 Prism mold 2 Gangs, 25x25x285mm

**ORDERING:**

CM 0189 Three Gang Cube Mold 50x50x50 Brass
CM 0190 Three gang Cube Mold 50x50x50 Stainless steel

**ORDERING:**

CM 0191 Briquette Mold

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## Cube Mold 70.7 mm

**DESCRIPTION:**
The 70.7 molds have been manufactured from steel. All internal surfaces are machined.

Supplied complete with baseplate. All dimensions and specifications comply with the related standards.

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th></th>
<th>CM 0192</th>
<th>CM 0193</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>75x75x75 mm</td>
<td>100x125x90 mm</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>0.5 kg</td>
<td>3.5 kg</td>
</tr>
</tbody>
</table>

## Air Content Meter for Mortar, Masonry Cement and Lime

**DESCRIPTION:**
The Air Content Meter for mortar is designed to determine the air content in cement mortar, cement paste and lime mortar.

Made from cast aluminum, the test pot one liter capacity and the upper part 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.

**TECHNICAL SPECIFICATIONS:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>320 mm high, 20 mm dia.</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>3.5 kg</td>
</tr>
</tbody>
</table>

**EN 196-1; ASTM C109; BS 4550**

**ORDERING:**

- **CM 0192**
  70.7mm Cube Mold

- **CM 0193**
  Three Gangs, 70.7mm Cube Mold

**EN 459-2; EN 413-2; EN 1015-7**

**ORDERING:**

- **CM 0194**
  Mortar, Manual Air Content Meter 1 ltr.

- **CM 0195**
  Motorized Mortar Air Content Meter, 1 ltr. With an electric mini-compressor to keep the air pressure constant.

- **CM 0196**
  Motorized Mortar Air Content Meter, 0.75 ltr. With an electric mini-compressor to keep the air pressure constant.

**ACCESSORIES:**

- **CM 0197**
  Mini Compressor
Humidity Curing Cabinet

DESCRIPTION:
The humidity curing cabinet is used for curing cement test samples.

The curing cabinet provides from -25°C to +70°C temperature and up to 98% humidity of 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.

TECHNICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th></th>
<th>CM 0198</th>
<th>CM 0199</th>
<th>CM 0200</th>
<th>CM 0201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Interior volume</td>
<td>130 L</td>
<td>370 L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (mm)</td>
<td>450</td>
<td>500</td>
<td>580</td>
<td>1250</td>
</tr>
<tr>
<td>Shelf Dimension</td>
<td>460</td>
<td></td>
<td>570</td>
<td></td>
</tr>
<tr>
<td>Height (mm)</td>
<td>520</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Interior Shelves</td>
<td>2</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Main door</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Energy consumption at 37°C</td>
<td>1.55 kWh/h</td>
<td>1.92 kWh/h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TEMPERATURE RANGE: -25/+70°C / 0/+70°C
TEMPERATURE FLUCTUATION: ±0.1°C
HUMIDITY RANGE: 10 to 98% RH
HUMIDITY FLUCTUATION: ≤ 3 ± % RH

Controller: Cycle monitoring touch screen programmer
Program: 1
Steps: 20
Exterior and Interior Structure: White plastic coated galvanized steel or Stainless steel AISI 304
Insulation: CFC and HCFC free
Door: Reversible self closing door with magnetic gaskets plug
Grids: Removable and height adjustable plastic-coated steel
Type alarm: Audio-visual
Alarm parameter: Hot temperature
Security device: Safety device with manual reset class 1 (DIN 12880)

EN 196-1, 1367-1, 12390-2, 12371, 13383-2, 1324, 12004, 1348, 1346, 1308, 12002; ASTM 2247-11, ASTM C581-03, ASTM D 2247-11, ASTM E 104-02

ORDERING:
CM 0198
Constant Climate Chamber PRO Series 130 ltr
CM 0199
Constant Climate Chamber limited series 130 ltr
CM 0200
Constant Climate Chamber PRO Series 370 ltr
CM 0201
Constant Climate Chamber limited series 370 ltr

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Cement Compression and Flexural Machine

DESCRIPTION:
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 40.1x40x160 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.

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.

TECHNICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Product Code</th>
<th>CM 0202</th>
<th>CM 0203</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Type</td>
<td>Full-Auto compression</td>
<td>Semi-Auto compression</td>
</tr>
<tr>
<td>Capacity</td>
<td>250 kN</td>
<td>250 kN</td>
</tr>
<tr>
<td>Class 1 Measuring range</td>
<td>25 to 250 kN</td>
<td>25 to 250 kN</td>
</tr>
<tr>
<td>The roughness value for texture of loading and auxiliary platens</td>
<td>≤ 3.2 μm</td>
<td>≤ 3.2 μm</td>
</tr>
<tr>
<td>Lower Platen dimensions</td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td>Upper Platen dimensions</td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td>Maximum vertical clearance between platen</td>
<td>263 mm</td>
<td>263 mm</td>
</tr>
<tr>
<td>Piston diameter</td>
<td>160 mm</td>
<td>160 mm</td>
</tr>
<tr>
<td>Maximum piston movement</td>
<td>50 mm</td>
<td>50 mm</td>
</tr>
<tr>
<td>Horizontal clearance</td>
<td>300 mm</td>
<td>300 mm</td>
</tr>
<tr>
<td>Power</td>
<td>550 W</td>
<td>550 W</td>
</tr>
<tr>
<td>Oil capacity</td>
<td>20 L</td>
<td>20 L</td>
</tr>
<tr>
<td>Maximum working pressure</td>
<td>125 bar</td>
<td>125 bar</td>
</tr>
<tr>
<td>Rapid approach rate</td>
<td>50 mm/min</td>
<td>50 mm/min</td>
</tr>
<tr>
<td>Dimensions</td>
<td>760x500x1650 mm</td>
<td>760x500x1650 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>395 kg</td>
<td>250 kg</td>
</tr>
</tbody>
</table>

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.

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### Cement Compression and Flexural Machine

**TECHNICAL SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>CM 0204</th>
<th>CM 0205</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Type</strong></td>
<td>Full-Auto compression</td>
<td>Semi-Auto compression</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>250/25 kN</td>
<td>250/25 kN</td>
</tr>
<tr>
<td><strong>Class 1 Measuring range</strong></td>
<td>2.5-25 kN / 25-250 kN</td>
<td>2.5-25 kN / 25-250 kN</td>
</tr>
<tr>
<td><strong>The roughness value for texture of loading and auxiliary platens</strong></td>
<td>≤ 3.2 μm</td>
<td>≤ 3.2 μm</td>
</tr>
<tr>
<td><strong>Lower Platen dimensions</strong></td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td><strong>Upper Platen dimensions</strong></td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td><strong>Maximum vertical clearance between platens</strong></td>
<td>263 mm</td>
<td>263 mm</td>
</tr>
<tr>
<td><strong>Piston diameter</strong></td>
<td>160 mm</td>
<td>160 mm</td>
</tr>
<tr>
<td><strong>Maximum piston movement</strong></td>
<td>50 mm</td>
<td>50 mm</td>
</tr>
<tr>
<td><strong>Horizontal clearance</strong></td>
<td>300 mm</td>
<td>300 mm</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>550 W</td>
<td>550 W</td>
</tr>
<tr>
<td><strong>Oil capacity</strong></td>
<td>20 L</td>
<td>20 L</td>
</tr>
<tr>
<td><strong>Maximum working pressure</strong></td>
<td>30 bar / 125 bar</td>
<td>30 bar / 125 bar</td>
</tr>
<tr>
<td><strong>Rapid approach rate</strong></td>
<td>50 mm/min / 80 mm/min</td>
<td>50 mm/min / 80 mm/min</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>1050x500x1650 mm</td>
<td>1050x500x1650 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>410 kg</td>
<td>250 Kg</td>
</tr>
</tbody>
</table>

**ORDERING:**

- **CM 0202**
  - Full Automatic Cement Compression Testing Machines 250 kN
- **CM 0203**
  - Semi Automatic Cement Compression Testing Machines 250 kN
- **CM 0204**
  - Full Automatic Cement Compression & Flexural Testing Machines 250/25 kN
- **CM 0205**
  - Semi Automatic Cement Compression & Flexural Testing Machines 250/25 kN

**ACCESSORIES:**

- **CM 0206**
  - Flexural jig assembly 40x40x160 mm EN 196-1
- **CM 0207**
  - Flexural jig assembly 40x40x160 mm ASTM C109
- **CM 0208**
  - Compression jig assembly for EN 196-1
- **CM 0209**
  - Compression jig assembly for ASTM C109