



## CEMENT

Cement is an inorganic material largely used in the construction industry, both on site and during the production of semi-manufactured products.

By mixing with water, the cement becomes a paste with adhesive properties: for this reason, it is considered a hydraulic binder and properly defined as hydraulic cement. This paste is generally used as a binder with solid inert materials such as sand, gravel and small rocks to produce the mortar and to prepare different types of concrete.

The most important use of cement is the production of concrete and mortar, which are the combination of cement and an aggregate to form a strong building material that is durable in the face of normal environmental effects.



## CONTENTS

BLAINE AIR PERMEABILITY APPARATUS .....	298
DIGITAL SEMI-AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS.....	298
AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS.....	299
BULK & PACKAGED CEMENT SAMPLER .....	299
BULK DENSITY OF CEMENT.....	300
AIR CONTENT METER.....	300
BULK DENSITY OF LIME.....	300
DROPPING BALL APPARATUS .....	301
FLOW CONE SET .....	301
MUD BALANCE .....	302
MARSH FUNNEL VISCOMETER SET .....	302
VICAT TEST SET.....	303
AUTOMATIC VICAT TEST SET .....	303
GILLMORE APPARATUS .....	304
FLOW CHANNEL TEST APPARATUS (FUNNEL GROOVE).....	304
LE CHATELIER FLASK.....	305
LE CHATELIER TEST SET .....	305
PAT TEST (SOUNDNESS OF HYDRATED LIME AND GYPSUM PLASTERS) .....	305
LE CHATELIER WATER BATH .....	306
WATER RETENTION APPARATUS .....	306
FINENESS TEST SPRAY APPARATUS .....	307
CEMENT AUTOCLAVE.....	307
LENGTH CHANGE (SHRINKAGE AND EXPANSION).....	308
PLUNGER PENETRATION APPARATUS.....	309
CALCIMETER.....	309
CEMENT FLOW TABLES .....	310
MANUEL MORTAR MIXER.....	311
AUTOMATIC MORTAR MIXER .....	311
CEN REFERENCE SAND .....	312
CEMENT MOULDS .....	312
JOLTING TABLE APPARATUS.....	314
VIBRATING MACHINE .....	314
CURING CABINETS.....	315
TRANSVERSE DEFORMATION JIG.....	315
CEMENT COMPRESSION / FLEXURAL TEST MACHINE.....	316
CEMENT COMPRESSION / FLEXURAL TEST MACHINE (TOUCH SCREEN) .....	320

## BLAINE AIR PERMEABILITY APPARATUS

STANDARDS: EN 196-6, ASTM C204, ASSHTO T153

Used to determine the fineness of Portland cement in terms of the specific surface expressed as total surface area in square centimeters per gram of cement.

Supplied complete with a U-Tube Glass Manometer with valve which is fitted to the steel stand, Stainless steel Test Cell with Perforated Disc and Plunger, 250 ml Manometric Liquid, Rubber Aspirator Bulb, 100 pieces Filter Paper Discs and 100 mm Plastic Funnel.

Calibration Sand and Reference Cement should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE8000	Blaine Air Permeability Apparatus	30x20x55	7

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE8000/1	U-Tube Glass Manometer
HR-CE8000/2	Cell with Perforated Disc and Plunger
HR-CE8000/3	Manometric Liquid, 250 ml
HR-CE8000/4	Rubber Aspirator Bulb
HR-CE8000/5	Filter Paper, Pack of 100
HR-CE8000/6	Filter Paper, Pack of 1000
HR-CE8010/7	Calibration Sand, 2 x 100 ml
HR-CE8000/7	Reference Cement, 5 gr
HR-G0314	Plastic Funnel, 100 mm



HR-CE8000

## DIGITAL SEMI-AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS

STANDARDS: EN 196-6, ASTM C204, ASSHTO T153

Used to determine the fineness of Portland cement in terms of the specific surface expressed as total surface area in square centimeters per gram of cement.

The Digital Semi-Automatic Blaine Permeability Apparatus has 3 sensors. Can be monitored the test easily thanks to LED screen which works with this 3 sensors.

The device is controlled using a button.

Supplied complete with a U-Tube Glass Manometer, Stainless steel Test Cell with Perforated Disc and Plunger, 250 ml Manometric Liquid and 500 pieces Filter Paper Discs.

Calibration Sand and Reference Cement should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE8005	Digital Semi-Automatic Blaine Air Permeability Apparatus	25x25x35	15

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE8005/1	U-Tube Glass Manometer
HR-CE8005/2	Cell with Perforated Disc and Plunger
HR-CE8005/3	Manometric Liquid, 250 ml
HR-CE8005/4	Filter Paper, Pack of 500
HR-CE8010/7	Calibration Sand, 2 x 100 ml
HR-CE8000/7	Reference Cement, 5 gr



HR-CE8005

## AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS

STANDARDS: EN 196-6, ASTM C204, ASSHTO T153

The Automatic Blaine Air Permeability Apparatus is used to determine particle size of powder materials such as portland cement and lime in terms of their specific surface according to the Blaine technique.

The microprocessor-controlled Automatic Blaine Air Permeability Apparatus is with a manometer column operates with 1 cell.

After entering the properties of the sample into the control unit, the device performs the test automatically and the results can be transferred to the computer via a USB.

Supplied complete with U-Tube Glass Manometer, 1 bottle of Filling Oil, 500 pieces Filter Paper Discs and a tamper.

Dust Filter Paper, Calibration Sand and Reference Cement should be ordered separately.



HR-CE8010

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE8010/1	U-Tube Glass Manometer
HR-CE8010/2	Stainless Steel Cell
HR-CE8010/3	Filling Oil, 1 bottle
HR-CE8010/4	Filter Paper, Pack of 500
HR-CE8010/5	Dust Filter Paper, Pack of 100
HR-CE8010/6	Tamper
HR-CE8010/7	Calibration Sand, 2 x 100 ml
HR-CE8000/7	Reference Cement, 5 gr

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE8010	Automatic Blaine Air Permeability Apparatus	50x40x45	15	220 V, 50-60 Hz, 1 ph

## BULK & PACKAGED CEMENT SAMPLER

STANDARDS: EN 196-7, ASTM C183, ASSHTO T127

Bulk Cement Sampler is used to sample cement in bulk storages or shipment. Brass made, it consists of two concentric tubes with slots. Inside tube volume is 3 liters approx.

Packaged Cement Tube Sampler is used to sample cement homogeneously from cement bags.



HR-CE2000



HR-CE2005

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE2000	Bulk Cement Sampler	40x1500	5
HR-CE2005	Packaged Cement Tube Sampler	32x1050	3

## HİRA TESTING EQUIPMENT

### BULK DENSITY OF CEMENT

STANDARDS: ASTM C191, ASTM C110

Bulk Density of Cement Apparatus is used for the measurement of the apparent density (bulk density) of powders and non-cohesive materials.

It consists of Sieve Funnel with Tripod, 1 liter capacity Unit Weight Measure, Medium Rigid Spatula, 40 cm Straight Edge and Medium Round Aluminium Scoop.

The discharge hole of the funnel has 8 mm dia.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE2100	Bulk Density of Cement Apparatus	35x52	6

#### Spare Parts & Accessories:

Product Code	Product Name
HR-CE2100/1	Sieve Funnel with Tripod
HR-A0714	Unit Weight Measure, 1 liter
HR-G0706	Rigid Spatula, Medium
HR-S6675	Straight edge. 40 cm
HR-G0621	Round Aluminum Scoop, Medium



HR-CE2100

### AIR CONTENT METER

STANDARDS: EN 459-2, EN 413-2, EN 1015-7

These apparatus have been designed to determine the air content in cement mortar, cement paste, and lime mortar.

Made from cast aluminum. The test pot 1 lt 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.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9020	Air Content Meter	Ø20x32	3,5



HR-CE9020

### BULK DENSITY OF LIME

STANDARDS: EN 459-2, DIN 1060

Bulk Density of Lime Apparatus allows a sample to fall from a known height into a volumetric container.

Consisting of a hopper, 1 liter cylindrical container and spring loaded trap.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE2125	Bulk Density of Lime Apparatus	15x15x40	5



HR-CE2125



## DROPPING BALL APPARATUS

STANDARDS: BS 4551-1, 6463-4

Used to measure the consistency of cement mortars, Dropping Ball Apparatus allows 25 mm diameter acrylic ball to fall freely from a standard height of 250 mm into a specimen of mortar contained into a brass ring mould, and the surface of which has been carefully prepared.

The depth of the ball penetration into the mortar gives the specimen consistency.

The instrument comprises a Dropping Device mounted on a Stand, Acrylic Ball, Ø 100 x 25 mm Mould.

The base of the stand is machined. Chromed finishing.

Ball Penetration Measuring Device should be ordered separately. It formed by a tripod on which a dial gauge 30 x 0,01 mm is mounted. A device to adjust the height of the dial in relation to the tripod is also included. Chromed finishing.

### Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-CE2150	Dropping Ball Apparatus	8

### Spare Parts & Accessories:

Product Code	Product Name	Weight (kg)
HR-CE2150/1	Stand	---
HR-CE2150/2	Acrylic Ball	---
HR-CE2150/3	Mould, Ø100 x 25 mm	---
HR-CE2150/4	Ball Penetration Measuring Device	1

HR-CE2150



## FLOW CONE SET

STANDARDS: EN 445

Used for viscosity and fluidity determinations of mortars, muds, grouts, fluid materials, etc.

The apparatus comprises a metal stand supporting the stainless steel cone having inside dimensions of Ø150 mm inside upper dia. x 280 mm height. When fit with the 10 mm nozzle the total height is 350 mm.

The Flow Cone Set is supplied complete with Cone, Stand Fitting Bush, Ø 150 mm, 1.5 mm opening Sieve, 1 Lt Plastic Beaker and Ø10 mm Nozzle.

It can also be fit with other Ø8, Ø9, Ø11 and Ø13 mm nozzles should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9030	Flow Cone Set	250x250x600	10

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9030/1	Flow Cone Apparatus	---	---
HR-CE9030/2	Stand and Fitting Bush	---	---
HR-CE9030/3	Sieve, 1.5 mm opening	Ø 150	---
HR-CE9030/4	Ø 8 mm Nozzle	Ø 8	---
HR-CE9030/5	Ø 9 mm Nozzle	Ø 9	---
HR-CE9030/6	Ø 10 mm Nozzle	Ø 10	---
HR-CE9030/7	Ø 11 mm Nozzle	Ø 11	---
HR-CE9030/8	Ø 13 mm Nozzle	Ø 13	---
HR-G0280	Plastic Beaker, 1 Lt	100x100x135	0,2

HR-CE9030

HR-CE9030/4  
HR-CE9030/5  
HR-CE9030/7  
HR-CE9030/8



# HİRA TESTING EQUIPMENT

## MUD BALANCE

The mud balance provides a simple, practical method for the accurate determination of mud density.

The item's durable construction makes it ideal for field use.

Its high-impact plastic case protects the balance during transport while providing a secure base for the balance during use.

The mud balance meets all the requirements of the API standard procedures for testing water base drilling fluids, oil base drilling fluids and oil well cements.

The constant volume cup is affixed to one end of the graduate arm and the counter-weight on the opposite end.

The balance consists of a base and graduated arm with cup, lid, knife edge, rider, built-in spirit level and counter-weight, carrying case.



HR-CE9050

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9050	Mud Balance	550x110x100	1

## MARSH FUNNEL VISCOMETER SET

STANDARDS: ISO 2431

Utilized for viscosity determination on drilling muds and fluid materials.

Orifice opening 4,7 mm Half part of the funnel mouth is foreseen of sieving cloth 2 mm mesh.

Plastic break-resistant made.

Supplied complete with 1 lt Plastic Measuring Cup.



HR-CE9040

### Technical Specifications:

Product Code	Product Name	Top Dia. (mm)	Nozzle Length (mm)	Int. Dia. (mm)	Total Length (mm)	Weight (kg)
HR-CE9040	Marsh Funnel Viscometer Set	150	50	5	355	0,75

### Spare Parts & Accessories:

Product Code	Product Name	Top Dia. (mm)	Nozzle Length (mm)	Int. Dia. (mm)	Total Length (mm)	Weight (kg)
HR-CE9040/1	Marsh Funnel Viscometer	150	50	5	355	0,5
HR-CE9040/2	Plastic Measuring Cup, 1 lt	---	---	---	---	0,25

## VICAT TEST SET

STANDARDS: EN 196-3, 480-2, ASTM C187, C191, AASHTO T129, T131

Used for determination of setting time and consistency of cement by Vicat Method.

The EN Test set consist of a Vicat Frame, EN Vicat Mould, Initial and Final Needles, Consistency Plunger, Glass Plate and Glass Thermometer.

The ASTM Test set consist of a Vicat Frame, ASTM Vicat Mould, ASTM Needle, Consistency Plunger, Glass Plate and Glass Thermometer.

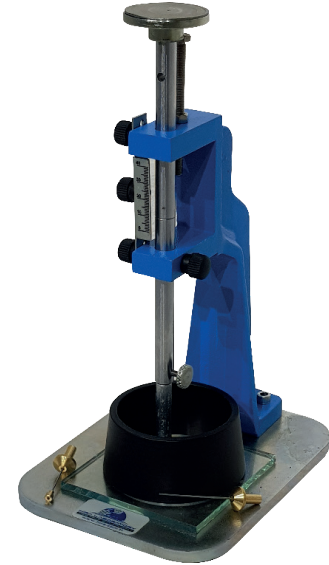
700 g Additional Weight should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9100	Vicat Test Set, EN	16x20x32	3,5
HR-CE9105	Vicat Test Set, ASTM	16x20x32	3,5

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9100/1	Vicat Frame	160x200x320	2,5
HR-CE9100/2	Vicat Mould, EN	Ø 70/80 x 40	0,3
HR-CE9100/3	Initial Needle, EN	Ø 1,13	0,1
HR-CE9100/4	Final Needle, EN	Ø 1,13	0,1
HR-CE9100/5	Consistency Plunger	Ø 10x50	0,1
HR-CE9100/6	Glass Plate	Ø 120	0,1
HR-CE9100/7	Additional Weight, EN	---	0,700
HR-G0391	Glass Thermometer, max. 110°C	30x30x300	0,1
HR-CE9105/1	Vicat Mould, ASTM	Ø 60/70 x 40	0,3
HR-CE9105/2	Vicat Needle, ASTM	Ø 1	0,1



HR-CE9100

## AUTOMATIC VICAT TEST SET

STANDARDS: EN 196-3, 13279-2, 480-2; ASTM C191, C187

Automatic Vicat Apparatus is used for determination of setting time and consistency of cement/mortar/gypsum by Vicat Method.

The Automatic Vicat Apparatus can be programmed up to 4 different test types and can be stored 10 tests. These test values can be printed from the PC port or transferred to the computer.

The penetration measure is read by a sensor with 0,1 mm resolution.

The Automatic Vicat Apparatus has usb port for PC connection and Display for data input and graphic/test report.

The EN Test set consist of Automatic Vicat Device, EN Vicat Mould, Initial Needle and Software.

The ASTM Test set consist of Automatic Vicat Device, ASTM Vicat Mould, ASTM Needle and Software.

Needle Cleaning Device and Thermostatic Bath is available as an optional and should be ordered separately.

Conical penetration needle Ø8x50 mm and 100 g Probe to make gypsum tests following EN, DIN Specifications should be ordered separately.

Other accessories should be ordered separately.



# HİRA TESTING EQUIPMENT

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9120	Automatic Vicat Test Set, EN	36x62x58	42	220 V, 50-60 Hz, 1ph
HR-CE9123	Automatic Vicat Test Set, ASTM	36x62x58	42	220 V, 50-60 Hz, 1ph

## Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9120/1	Automatic Vicat Apparatus	360x620x580	40
HR-CE9120/2	Vicat Mould, EN	Ø 70/80 x 40	0,3
HR-CE9120/3	Initial Needle, EN	Ø 1,13	0,1
HR-CE9120/4	Final Needle, EN	Ø 1,13	0,1
HR-CE9120/5	Consistency Plunger	Ø 10x50	0,1
HR-CE9120/6	Glass Plate	Ø 120	0,1
HR-CE9120/7	Additional Weight, EN	---	0,700
HR-CE9120/8	Needle Cleaning Apparatus	---	---
HR-CE9123/1	Vicat Mould, ASTM	Ø 60/70 x 40	0,3
HR-CE9123/2	Vicat Needle, ASTM	Ø 1	0,1
HR-CE9120/9	Software	---	---
HR-CE9120/10	Thermostatic Bath	---	---
HR-CE9120/11	Conical Penetration Needle	Ø 8x50	---
HR-CE9120/12	Probe	---	0,1



HR-CE9120

## GILLMORE APPARATUS

STANDARDS: ASTM C91, C141, C266, AASHTO T154

Gillmore Apparatus is used to determine the setting time of cement.

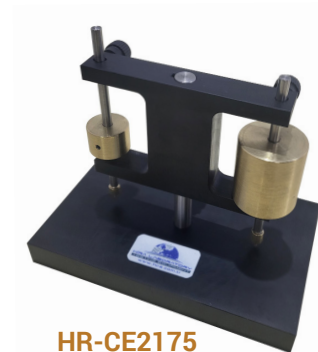
Vertical support shaft has a device to maintain the horizontal arms in alignment. Support assembly is adjustable in position. The two steel weights needles are calibrated to meet specifications. Needle points made from stainless steel. The Initial Setting Needle has Ø 2,12 mm and weight of 113 g, while the Final Setting Needle has Ø 1,06 mm and weight of 453,6 g.

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE2175	Gillmore Apparatus	30x10x30	3

## Spare Parts & Accessories:

Product Code	Product Name	Dia. (mm)	Weight (g)
HR-CE2175/1	Initial Setting Needle	2,12	113
HR-CE2175/2	Final Setting Needle	1,06	453,6



HR-CE2175

## FLOW CHANNEL TEST APPARATUS (FUNNEL GROOVE)

STANDARDS: EN 13395-2, UNI 8997

Used to determine the consistency of the expansion premixed cement mortars for anchorages, mixed with water, classified of super-fluid type.

## Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-CE2200	Funnel Groove	20



HR-CE2200

## LE CHATELIER FLASK

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

Used to determine the relative density (specific gravity) of hydraulic cement, ground granulated blast-furnace slag and fly ash for concrete, filler aggregates and lime.

The glass flask has a 250ml capacity.

The neck is graduated from 0 to 1 ml and from 18 to 24 ml with divisions of 0,1 ml.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9125	Le Chatelier Flask	10x10x30	0,5

HR-CE9125



## LE CHATELIER TEST SET

STANDARDS: EN 196-3, 450-1, 459-2; EN ISO 9597

The soundness of cements and limes is determined using the expansion test with Le Chatelier moulds according to the relevant standard.

The mould consists of a spring tensioned split cylinder  $\varnothing 30 \times 30$  mm with two indicator stems which measure 150 mm from the points to the center line of the cylinder and O ring.

The Le Chatelier Test Set is supplied with 3 pieces Le Chatelier Moulds, 6 pieces 50x50 mm Glass Plates, 300 gr Weight, 3 pieces 100 gr Weight, 70 gr Tamping Rod, Steel Ruler and Carrying Case.



HR-CE9135

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (g)
HR-CE9135/1	Glass Plate	50x50	50
HR-CE9135/2	300 gr Weight	---	300
HR-CE9135/3	100 gr Weight	---	100
HR-CE9135/4	Tamping Rod	$\varnothing 17$	70
HR-G0476	Steel Ruler	300	10
HR-CE9135/5	Carrying Case	340x290x80	500

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (g)
HR-CE9130	Le Chatelier Mould	$\varnothing 30 \times 30$	30
HR-CE9135	Le Chatelier Test Set	340x290x80	2000

## PAT TEST (SOUNDNESS OF HYDRATED LIME AND GYPSUM PLASTERS)

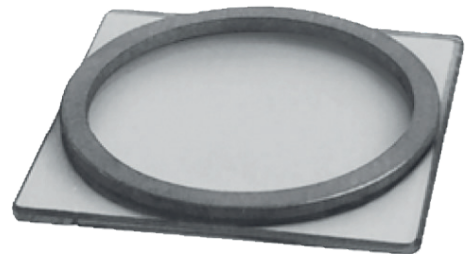
STANDARDS: EN 459-1, BS 1191, BS 890

Utilized for the determination of the soundness of hydrated lime, gypsum and building plasters.

Consisting of a Brass Ring Mould,  $\varnothing 100 \times 5$  mm.

The mould has an inside taper of 5°.

Supplied complete with Glass Base Plate. To carry out one test, three moulds are required.



HR-CE2225

### Technical Specifications:

Product Code	Product Name
HR-CE2225	Pat Test Apparatus

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE2225/1	Brass Ring Mould
HR-CE2225/2	Glass Base Plate

## HİRA TESTING EQUIPMENT

### LE CHATELIER WATER BATH

STANDARDS: EN 196-3, 450-1, 459-2, EN ISO 9597

Constructed with stainless steel inside chamber and exterior case in painted steel sheet, it can hold up to 12 Le Chatelier moulds in the removable rack, supplied with the bath.

The bath reaches the boiling point in approx. 30 minutes.

Now an original device keeps the bath temperature at the boiling point, by avoiding the water evaporation and assuring that Le Chatelier moulds remain covered by the water during all the test execution.

For use with Le Chatelier moulds for the determination of the soundness of cement paste.

Complete with a removable rack to hold up to 12 Le Chatelier moulds.

An adjustable digital controller for the immersion heater regulates the water temperature from ambient to boiling point.

Le Chatelier Moulds are should be ordered separately.



HR-CE9150

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9150	Le Chatelier Water Bath	25x50x30	10	220 V, 50-60 Hz, 1 ph

### WATER RETENTION APPARATUS

STANDARDS: ASTM C91, ASTM C110, ASTM C1506, ASTM C207

Water Retention Apparatus is used in specification tests of masonry cement and physical testing of quicklime and hydrated lime. This test method provides a means for determining the ability of mortars and plasters to retain water under suction. Test results may be used to determine compliance with specifications. The results obtained using this test method can be used to compare the relative ability of mortars and plasters to retain water under suction.

The apparatus complete with: stand, water aspirator, vacuum regulator, vacuum gauge, three-way stopcock, metal perforated dish, glass funnel, rubber gasket, pack of filter paper and erlenmayer the whole assembled on stand.

The vacuum pump with tubing for vacuum are not included and should be ordered separately.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9170	Water Retention Apparatus	40x40x82	8

#### Yedek Parça & Aksesuarlar:

Product Code	Product Name
HR-CE9170/1	Water aspirator
HR-CE9170/2	Vacuum Regulator
HR-CE9170/3	Vacuum gauge Manometer, 1 mbar
HR-CE9170/4	Stopcock, Three-way
HR-CE9170/5	Metal perforated dish
HR-CE9170/6	Glass funnel
HR-CE9170/7	Filter paper, 15 cm dia. Pack of 100.
HR-CE9170/8	Rubber gasket
HR-G0082	Nuche Erlenmayer, 1000 ml
HR-G0800	Vacuum Pump
HR-G0815/1	Tubing for Vacuum, 3 m



HR-CE9170

## FINENESS TEST SPRAY APPARATUS

STANDARDS: EN 451-2; ASTM C430, D1514; AASHTO T192

Fineness Test Spray Apparatus is effective for any wet sieving operations for determining the fineness of fly ash and easily connects to a standard male hose spigot outlet or faucet with the Hose Connector accessory.

The apparatus comprises of a spray nozzle  $\varnothing$  17.5 mm with 17 holes  $\varnothing$  0.5 mm oriented and spaced to conform to the standards. The apparatus is equipped with pressure gauge and fittings for connection to the water supply.

Hose Connector, Fineness Test Sieve, Two-Piece Nickel Plated Wet-Wash Sieve Frame (2" dia.) and 0.045 mm (No. 325) Stainless Mesh 2" Replacement Disc should be ordered separately.



HR-CE8600 with accessories

### Technical Specifications:

Product Code	Product Name
HR-CE8600	Fineness Test Spray Apparatus

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE8600/1	Hose Connector
HR-CE8600/2	Fineness Test Sieve
HR-CE8600/3	Two-Piece Nickel Plated Wet-Wash Sieve Frame (2" dia.)
HR-CE8600/4	0.045 mm (No. 325) Stainless Mesh 2" Replacement Disc

## CEMENT AUTOCLAVE

STANDARDS: ASTM C151, C490; UNE 7207

The Autoclave is designed to perform expansion tests on cement specimens.

It consists of a high pressure boiler with internal dimensions  $\varnothing$  154x430 mm height, to accept a rack for holding 10 specimens. The heating system is achieved by electric resistances.

The Autoclave Complete with a pressure gauge, temperature regulator, control switches and safety valve.

The Cement Autoclave is supplied complete with 10 samples capacity Specimen Rack.

Two Gang Shrinkage mould and Length Comparators should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9600	Cement Autoclave	40x37x90	40	220 V, 50 Hz, 1 ph



HR-CE9600



# HİRA TESTING EQUIPMENT

## LENGTH CHANGE (SHRINKAGE AND EXPANSION)

STANDARDS: EN 12808-4, EN 1367-4, EN 12617-4, ASTM C151, C490

Used to measure the length variations of mortar specimens after autoclave soundness tests.

It also measures the linear shrinkage/expansion of specimens having different dimensions.

The set consists of Length Measuring Frame, Steel Mould according to the related standard, Steel Inserts for mould (pack of 10) and Reference Rod. The set is available in four models; with 0,01 mm Analogue Dial Gauge, with 0.01 mm Digital Dial Gauge, with 0.001 mm Digital Dial Gauge and Heidenhain Digital Readout Unit with 30x0,0001 mm Length Measuring Sensor which can be connected to Length Measuring Frames.

40x40x160 mm Three Gang Mould, complete with steel inserts, used for the determination of linear shrinkage of cement mortar. Made from hardness steel.

25x25x285 mm Two Gang Prism Mould, complete with steel inserts, used for the determination of linear shrinkage of cement mortar.

Length Comparator; the top beam is adjustable to suit the specimen's length.

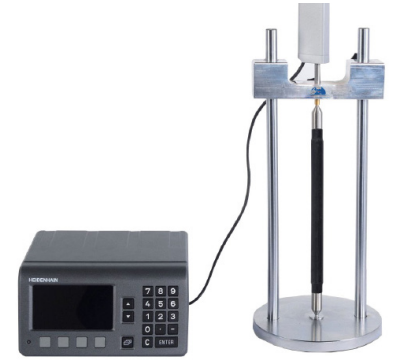
Analog Dial Indicator; 10 x 0,01 mm division.

### Technical Specifications:

Product Code	Product Name
HR-CE0905/AS	Analog Drying Shrinkage Set with HR-CE9000/T & HR-G0875
HR-CE0915/DS	Digital Drying Shrinkage Set with HR-CE9000/T & HR-G0877
HR-CE0905/DS	Digital Drying Shrinkage Set with HR-CE9000/T & HR-G0879
HR-CE0910/AS	Analog Drying Shrinkage Set with HR-CE9010 & HR-G0875
HR-CE0920/DS	Digital Drying Shrinkage Set with HR-CE9010 & HR-G0877
HR-CE0910/DS	Digital Drying Shrinkage Set with HR-CE9010 & HR-G0879
HR-CE0913/DS	Digital Drying Shrinkage Set with HR-CE9000/T & HR-G0890
HR-CE0914/DS	Digital Drying Shrinkage Set with HR-CE9010 & HR-G0890



HR-A0905 with HR-G0877



HR-A0905 with HR-G0890

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9000/T	Three Gang Mould, 40x40x160 mm	300x190x70	12
HR-CE9000/1	Steel Insert for HR-CE9000/T (Pack of 10)	---	---
HR-CE9000/2	Reference Rod, 160 mm	160	---
HR-CE9010	Two Gang Prism Mould, 25x25x285 mm	90x340x40	4
HR-CE9010/1	Steel Insert for HR-CE9010 (Pack of 10)	---	---
HR-CE9010/2	Reference Rod, 305 mm	305	---
HR-A0905	Length Comparator	180x180x450	6
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm	---	---
HR-G0877	Digital Dial Indicator, 12.7 x 0,01 mm	---	---
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm	---	---
HR-G0890	Heidenhain Digital Readout Unit with Length Measuring Sensor	---	---



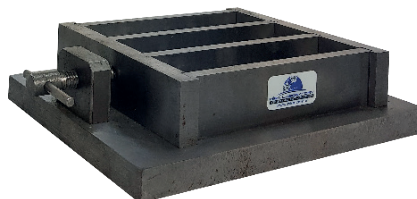
HR-CE9010



HR-CE9010/2



HR-CE9010/1



HR-CE9000/T



HR-A0905 with HR-G0875



## PLUNGER PENETRATION APPARATUS

STANDARDS: EN 459-2, EN 413-2, EN 1015-4

Used to determine the consistency of fresh mortar, lime and masonry cement.

Consisting of a steel base with recess to house the test cup and the vertical column holding the penetration plunger assembly. The height of drop is 100 mm and the weight of plunger assembly is 90 g.

Supplied complete with Ø8 x 7 cm Test Cup and Tamper.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9230	Plunger Penetration Apparatus	20x20x70	8

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE9230/1	Test cup	Ø 8 x 7	---
HR-CE9230/2	Tamper	---	---



HR-CE9230

## CALCIMETER

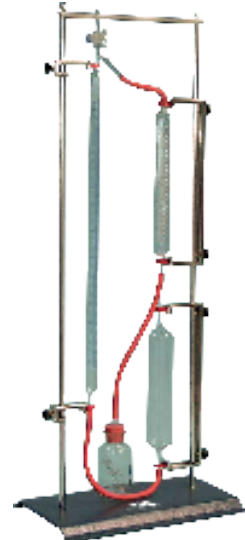
Calcimeter is used to determine the Carbonate content  $\text{CaCO}_3$  in Limestone and Lime Marl.

It consist of a glass container in which the reaction between the calcium carbonate present in the product and a solution of hydrochloridric acid takes place. The gased product is collected and measured by a device connected to the container.

As the volume of the produced gas ( $\text{Co}_2$ ) is in relation to the  $\text{CaCo}_2$  amount contained in the material, it is possible to calculate the percentage of  $\text{CaCo}_3$ .

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-CE2250	Calcimeter	30x20x110	12



HR-CE2250

## CEMENT FLOW TABLES

STANDARDS: EN 459-2, 1015-3, ASTM C230

Used for determining consistency of mortar, lime and cement specimens.

Manual and motorized two models are available.

The hand operated model is fitted with a hand wheel.

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.

EN Model, the table is manufactured from stainless steel and Ø300 mm.

The cone made of brass has dimensions of 100mm base dia. x 70mm top dia. x 60mm high.

ASTM Model; the table is manufactured from bronze and Ø254 mm.

The cone made of brass has dimensions of 100 mm base dia. X 70 mm top dia. X 50 mm height.

Both models are supplied complete with flow mould and tamper.

### Technical Specifications:

Product Code	Product Name	Operated	Table dia. (mm)	Drop Height (mm)	Dimensions (mm)	Weight (kg)	Power Supply
HR-CE9200	Cement Flow Table, EN	Hand	Ø 300	10	260x260x27	13	---
HR-CE9205	Cement Flow Table, ASTM	Hand	Ø 254	12,7	260x260x27	13	---
HR-CE9215	Motorized Cement Flow Table, EN	Motorized	Ø 300	10	470x360x350	36	220 V, 50 Hz, 1 ph
HR-CE9215/60Hz	Motorized Cement Flow Table, EN	Motorized	Ø 300	10	470x360x350	36	220 V, 60 Hz, 1 ph
HR-CE9220	Motorized Cement Flow Table, ASTM	Motorized	Ø 254	12,7	470x360x350	36	220 V, 50 Hz, 1 ph
HR-CE9220/60Hz	Motorized Cement Flow Table, ASTM	Motorized	Ø 254	12,7	470x360x350	36	220 V, 60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-CE9200/1	Cement Flow Mould, EN	100x70x60
HR-CE9200/2	Tamper, 250 gr, EN	Ø 40x200
HR-CE9205/1	Cement Flow Mould, ASTM	100x70x50
HR-CE9205/2	Tamper, Hardwood, ASTM	13x25x150



HR-CE9200



HR-CE9215

## MANUEL MORTAR MIXER

STANDARDS: EN 196-1, EN 196-3, EN 413-2, EN 459-2, EN 480-1, 1015-2, 12617-4, EN ISO 679, ASTM C187, C305, AASHTO T129, T131, T162

The mixer has been designed to mix mortars and cement pastes primarily to the requirements of standards. The user can choose speeds easily by using switch fitted to the machine. The mixing time can be adjusted from the digital timer on the front control panel.

2 speeds are defined on the device. The user can choose speed 1 (the paddle revolves at a rate of 140 rpm with a planetary motion of 62 rpm) and speed 2 (the paddle revolves at a rate of 285 rpm with a planetary motion of 125 rpm) and prepare the cement sample according to the standards.

The mixer is supplied complete with bowl and the beater.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9250	Manuel Mortar Mixer	35x50x55	45	220 V, 50-60 Hz, 1 ph
HR-CE9252	Manuel Mortar Mixer	75x80x85	45	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE9250/1	Bowl, 5 lt
HR-CE9250/2	Beater for HR-CE9250, EN
HR-CE9250/3	Beater for HR-CE9250, ASTM
HR-CE9252/1	Bowl, 10 lt
HR-CE9252/2	Beater for HR-CE9252, EN
HR-CE9252/3	Beater for HR-CE9252, ASTM



HR-CE9250/1



HR-CE9250/2

HR-CE9250



## AUTOMATIC MORTAR MIXER

STANDARDS: EN 196-1, EN 196-3, EN 413-2, EN 459-2, EN 480-1, 1015-2, 12617-4, EN ISO 679, ASTM C187, C305, AASHTO T129, T131, T162

The mixer has been designed to mix mortars and cement pastes primarily to the requirements of standards.

The mixing paddle has a planetary motion and is driven by a motor with a microprocessor based speed and preset programs to meet all listed EN and ASTM standards, custom designed programs or manual mode.

The mode button is used for the fast selection of different programs.

The mixing paddle revolves at a rate of 140 rpm with a planetary motion of 62 rpm in low speed. In high speed, the paddle revolves at the rate of 285 rpm with a planetary motion of 125 rpm.

An automatic sand dispenser is supplied with the machine and the sand is automatically discharged.

Custom design allows 6 programs to be set by the operator, where the motor speed, sand dispenser position and duration of the mix can be set.

The Automatic Programmable Mortar Mixer is supplied complete with bowl and the beater.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9255	Automatic Mortar Mixer	35x50x75	55	220 V, 50-60 Hz, 1 ph
HR-CE9257	Automatic Mortar Mixer	75x80x105	75	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name
HR-CE9250/1	Bowl, 5 lt
HR-CE9250/2	Beater for HR-CE9255, EN
HR-CE9250/3	Beater for HR-CE9255, ASTM
HR-CE9250/1	Bowl, 10 lt
HR-CE9250/2	Beater for HR-CE9257, EN
HR-CE9250/3	Beater for HR-CE9257, ASTM



HR-CE9255

## HİRA TESTING EQUIPMENT

### CEN REFERENCE SAND

STANDARDS: EN 196-1

CEN Standard sand is a natural sand, which is siliceous particularly its finest fractions.

It is clean, the particles are generally isometric and rounded in shape. It is dried, screened and prepared in a modern workshop which offers every guarantee in terms of quality and consistency.

The sand is packaged in bags each containing 1350±5 g.

Reference sand size is 0,08±2 mm.



HR-CE9285

#### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (gr)
HR-CE9285	CEN Reference Sand	270x130x30	1350

#### Technical Specifications:

Square mesh Size (mm)	Cumulative Retained (%)
0,08	99 ± 1
0,16	87 ± 5
0,5	67 ± 5
1	33 ± 5
1,6	7 ± 5
2	0

### CEMENT MOULDS

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

Used to produce the mortar specimens for compression and flexural tests.

Made from steel, stainless steel or hard plastic, it conforms to the above mentioned Specifications.

All dimensions and specifications comply with the related standards.

Feed Hopper is used for filling 40x40x160 mm cement moulds. Made from cast aluminum.

Cover plate and tamper for HR-CE9550 & HR-CE9555 Models should be ordered separately.

Short Spreader, Long Spreader and Straightedge for HR-CE900X Models should be ordered separately.

Steel Inserts and Reference Rods should be ordered separately.



HR-CE9000



HR-CE9300



HR-CE9500

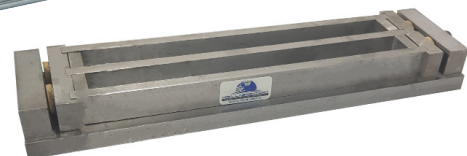


HR-CE9400

HR-CE9010/2



HR-CE9010/1



HR-CE9010

## Technical Specifications:

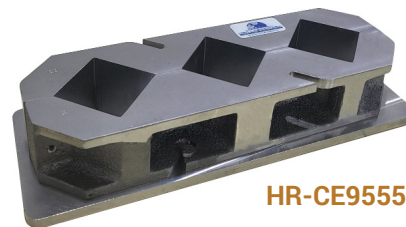
Product Code	Product Name	Standard	Ext. Dimensions (mm)	Weight (kg)
HR-CE9000	Three Gang Steel Mould, 40x40x160 mm	ASTM	300x190x70	11
HR-CE9001	Three Gang Steel Mould, 40.1x40x160 mm	EN	300x190x70	11
HR-CE9000/T	Three Gang Steel Mould, 40.1x40x160 mm, HV 400	EN	300x190x70	11
HR-CE9400	Three Gang Steel Cube Mould, 50x50x50 mm	ASTM	110x230x60	4,5
HR-CE9405	Three Gang Steel Cube Mould, 2"x2"x2"	ASTM	120x250x70	5
HR-CE9410	Three Gang Steel Cube Mould, 40x40x40 mm	---	100x220x50	3,5
HR-CE9015	Three Gang Steel Cube Mould, 25x25x285 mm	---	390x145x45	7
HR-CE9010	Two Gang Steel Prism Mould, 25x25x285 mm	ASTM	390x100x45	4,5
HR-CE9500	One Gang Steel Cube Mould, 70,7 mm	BS	100x125x90	3,5
HR-CE9550	Three Gang Stainless Steel Cube Mould, 50x50x50 mm	ASTM	110x230x60	9
HR-CE9555	Three Gang Stainless Steel Cube Mould, 2"x2"x2"	ASTM	120x250x70	10
HR-CE9560	One Gang Stainless Steel Cube Mould, 70,7 mm	BS	100x125x90	7
HR-CE9570	Three Gang Hard Plastic Cube Mould, 50x50x50 mm	ASTM	110x230x60	1
HR-CE9571	Three Gang Hard Plastic Cube Mould, 2"x2"x2"	ASTM	120x250x70	1
HR-CE9572	One Gang Hard Plastic Cube Mould, 70,7 mm	BS	100x125x90	0,8
HR-CE9573	Three Gang Hard Plastic Cube Mould, 40x40x40 mm	---	100x220x50	0,9
HR-CE9574	Three Gang Hard Plastic Cube Mould, 25x25x285 mm	---	390x100x45	1
HR-CE9575	Two Gang Hard Plastic Prism Mould, 25x25x285 mm	ASTM	390x145x45	0,8

## Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-CE9000/1	Steel Insert for HR-CE9000. (Pack of 10)	---	---
HR-CE9000/2	Reference Rod, 160 mm	160	---
HR-CE9300	Feed Hopper for HR-CE9000	210x200x40	2
HR-CE9010/1	Steel Insert for HR-CE9010 (Pack of 10)	---	---
HR-CE9010/2	Reference Rod, 305 mm	305	---
HR-CE9000/5	Short Spreader for HR-CE900X Models	---	---
HR-CE9000/6	Long Spreader for HR-CE900X Models	---	---
HR-CE9000/7	Straightedge for HR-CE900X Models	---	---
HR-CE9550/1	Cover Plate for HR-CE9550 & HR-CE9555 Models	---	---
HR-CE9550/2	Tamper, for HR-CE9550 & HR-CE9555 Models	---	---



HR-CE9555 & HR-CE9550/1 & HR-CE9550/2



HR-CE9555



HR-CE9570



## JOLTING TABLE APPARATUS

STANDARDS: EN 196-1, EN ISO 679

Used to compact cement mortar prisms 40x40x160 mm in the three gang mould containing cement specimens. The apparatus, consists of a table holding the mould, seated on a rotating cam driven at 60 r.p.m.

The drop height is 15 mm.

The machine is equipped with a digital counter which provides automatic shut off at end of preset drop numbers. Rapid mould 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 mould 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.

Jolting Table Apparatus with Soundproof Safety Cabinet is also available. The cabinet is lined internally with soundproofing material to reduce sound level conforming to CE directives.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE9275	Jolting Table Apparatus	35x105x50	55	220 V, 50 Hz, 1 ph
HR-CE9275/60Hz	Jolting Table Apparatus	35x105x50	55	220 V, 60 Hz, 1 ph
HR-CE9280	Jolting Table Apparatus with Soundproof Safety Cabinet	50x145x60	125	220 V, 50 Hz, 1 ph
HR-CE9280/60Hz	Jolting Table Apparatus with Soundproof Safety Cabinet	50x145x60	125	220 V, 60 Hz, 1 ph



HR-CE9275

## VIBRATING MACHINE

STANDARDS: BS 4550

Vibrating Machine for 70.7 mm Cube Moulds is used for the preparation and compaction of 70.7 mm mortar cube specimens.

The mould is mounted on a vibration platform with excentric mechanism which allows each sample to be vibrated at 12000 cycles per minute.

The machine is supplied complete with Control Panel with Timer.

70.7 mm Cube Mould should be ordered separately.



HR-CE2275

### Technical Specifications:

Product Code	Product Name	Excentric Shaft Rotation	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE2275	Vibrating Machine	12000 r.p.m	45x65x85	100	220 V, 50 Hz, 1ph
HR-CE2275/60Hz	Vibrating Machine	12000 r.p.m	45x65x85	100	220 V, 60 Hz, 1ph

## CURING CABINETS

STANDARDS: EN 196-1, ISO 679

Curing Cabinet is used for curing of cement, concrete cubes or other mortar specimens.

It can be used for curing cement specimens within the mould or after removing from the mould.

Step Controlled (10 programs) Curing Cabinet with LCD Touch Screen provides  $20 \pm 1^\circ\text{C}$  temperature and over 95% RH humidity for cement specimens.

Internal chamber and racks are made of stainless steel. The temperature is maintained at  $20 \pm 1^\circ\text{C}$  by a immersion heater and refrigerator unit which are supplied complete with cabinet. The cabinet is equipped with a digital control unit which controls and monitors the temperature.

The humidity is maintained from 95% to saturation by water nebulizers and is also monitored on the digital control unit.



HR-CE9300

### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Power Supply
HR-CE7000	Curing Cabinet Step Controlled (10 programs)	120	220 V, 50-60 Hz, 1 ph
HR-CE7010	Curing Cabinet Step Controlled (10 programs)	250	220 V, 50-60 Hz, 1 ph
HR-CE7020	Curing Cabinet Step Controlled (10 programs)	500	220 V, 50-60 Hz, 1 ph
HR-CE7030	Curing Cabinet Step Controlled (10 programs)	750	220 V, 50-60 Hz, 1 ph
HR-CE7040	Curing Cabinet Step Controlled (10 programs)	1000	220 V, 50-60 Hz, 1 ph

## TRANSVERSE DEFORMATION JIG

STANDARDS: EN 12004

Specially designed for transverse deformation testing of tile adhesives and grouts in conformance with the stringent requirements of EN 12004. Design base on standard specifies the methods for determining characteristics for adhesives used in internal and external installation of ceramic tiles. Ceramic tile adhesives can be used also for other kinds of tiles (natural and agglomerated stones, etc.) if they do not adversely affect the stones.

The set is complete with 6 pieces Rectangular frame mould for specimen to EN12004, internal dimensions 280 x 45 mm, 5 mm thickness (Template A), 6 pieces capacity Pressure plate (Mould) for specimens to EN 12004, dimensions 300mm x 45 mm, 3 mm thickness (Template B) and 6 pieces 10 kg weight with two handles for preparation of specimen to EN12004.



HR-CE4500

### Technical Specifications:

Product Code	Product Name	Int. Dimensions (mm)	Weight (kg)
HR-CE4500	Transverse Deformation Jig	400x600x350	74

### Spare Parts & Accessories:

Product Code	Product Name	Int. Dimensions (mm)	Weight (kg)
HR-CE4500/1	Rectangular frame mould, 6 pieces	280x45x5	1,5
HR-CE4500/2	Pressure plate (Mould), 6 pieces capacity	300x45x3	5
HR-CE4500/3	10 kg weight with two handles, , 6 pieces	---	10

## HİRA TESTING EQUIPMENT

### CEMENT COMPRESSION / FLEXURAL TEST MACHINE

STANDARDS: EN 196-1, 459-2, 1015-11, 13454-2, EN ISO 679, ASTM C109, C348, C349, BS 3892-1, 4551-1

The Automatic Cement Compression and Flexure Machine have been designed for testing the flexure of the mortar prisms 40x40x160 mm and the compression on the 40x40mm pieces of prisms after the flexure test or 50x50 mm and 70,7 mm mortar cubes.

These machines also meet the requirements of CE norms for safety and health of the operator.

Compression and flexure jigs, distance pieces, and also removable transparent front-rear safety doors (should be factory installed) should be ordered separately.

The Automatic Cement Compression and Flexure Testing Machines allow less experienced operators to perform the tests.

The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Choosing the compression or flexure frame by using valve.
- Choosing Capacity of the frame (to call calibration values of the required load cell)
- Use load cell switch frame or compression side (up/down)
- Pressing the START button on the control unit.
- The machine automatically starts the rapid approach; switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

#### **The Automatic Cement Compression and Flexural Testing Machines consist of;**

- Very rigid two column single or double chamber Load Frames,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Upper Platen (with ball seating assembly),
- Lower Platen,
- Loading Cylinder Assembly & Limit Switch for safety,
- Software and Ethernet Cable.

#### **Cement Compression & Flexural Load Frames**

15 kN and 250 kN high quality load cells are used on frames to provide high accuracy in load measuring. Both frames are fitted with round platens with Ø165 mm and these should be used together with suitable flexure and compression jigs.

#### **Upper Platens**

Manufactured from high quality steel which is hardened (more than HRC 53), smoothed and finished.

The roughness value for the surface texture of machine and auxiliary platens are 3,2 µm. the movable design.

#### **Distance Pieces**

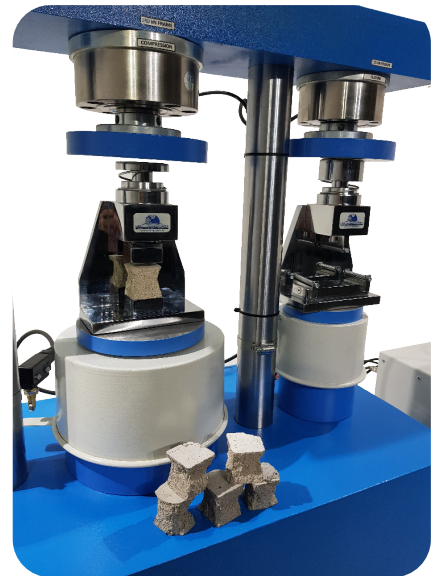
Due to the modular design of the frames any sample with suitable size, load and pace rate can be test on both chambers by decreasing the distance between platens.

#### **Loading Cylinder Assembly & Limit Switch**

All frames have a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

The maximum ram stroke is 50 mm, a limit switch is fitted to prevent over travel of the ram which cuts the power to the pump.

There is a low friction coaxial PTFE seal between the cylinder and the piston fitted to the cylinder.





## HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

### Hydraulic Power Pack

Automatic Hydraulic Power Pack, dual stage, controlled by digital readout and control unit is designed to supply the required oil to the load frames for loading.

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 0,05 to 2.4 kN/sec with an accuracy of  $\pm 5\%$ . A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

HR-CE4000



### Dual Stage Pump

The dual stage pump is formed by two groups;

1. Low pressure gear pump
2. High pressure radial piston pump

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, while a low delivery, high pressure radial piston pump is used for test execution. The rapid approach facility shortens the time interval from piston start until the upper platen touches to the specimen. This excellent feature helps to save a lot of time when a large number of specimens are going to be tested.

### Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter. The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Maximum capacity is 400 bar.



### Distribution Block

A distribution block is used to control the oil flow direction supplied by the dual stage pump, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer, Low pressure gear pump and High pressure radial piston pump.

### Load Cell

15 kN and 250 kN high quality load cells are used on frames to provide high accuracy in load measuring.

This property allows high accuracy at very low sample failures. (Class 1 at 2,5 kN to 250 kN)

### Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.



### Digital Readout and Control Unit

The unit is designed to control the machine and processing of data from load-cells and pressure transducers which are fitted to the machine.

All the operations of the unit is controlled from the front panel consisting of a LCD display and function keys.

The unit has easy to use menu options.

Digital graphic display unit loading rate of the time of Testing and load values can be monitored.

Digital graphic display is able to draw real-time "Load vs. Time", or "Stress vs. Time" graphics.

### Software

Sample, company, laboratory and test values can be entered in the programme.

Load-time graphic, test reports and sample reports can be taken.

### Main Features

- Pace rate control from 0,05 kN/sec to 2,4 kN/sec depending on piston size.
- Can control 2 frames
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- 10 data per second sample rate for each channel
- RS-232 serial port connecting for computer interface
- LCD display
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

### Technical Specifications:

CEMENT COMPRESSION / FLEXURAL TEST MACHINE			
Model	HR-CE2500	HR-CE1500	
Test Type	Compression	Flexure	Compression
Capacity (kN)	250	15	250
Class 1 Measuring Range (kN)	2.5 to 250	0.5 to 15	2.5 to 250
The roughness value for texture of loading and auxiliary platens ( $\mu\text{m}$ )	$\leq 3.2$	$\leq 3.2$	$\leq 3.2$
Lower Platen Dimensions (mm)	165	165	165
Upper Platen Dimensions (mm)	165	165	165
Maximum Vertical Clearance Between Platens (mm)	250	250	250
Piston Diameter (mm)	160	80	160
Maximum Piston Movement (mm)	50	50	50
Horizontal Clearance (mm)	300	200	300
Power (W)	750	750	
Oil Capacity (lt)	25	25	
Maximum Working Pressure (bar)	125 bar	30 bar	125 bar

### Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value



## Technical Specifications:

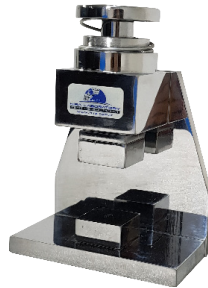
Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE1500	15/250 kN Automatic Cement Flexure/Compression Testing Machine	100x50x150	350	220 V, 50-60 Hz, 1 ph
HR-CE2500	250 kN Automatic Cement Compression Testing Machine	85x50x150	300	220 V, 50-60 Hz, 1 ph

## Spare Parts & Accessories:

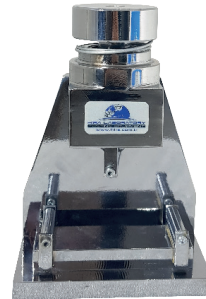
Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE1500/1	15/250 kN Cement Flexure/Compression Testing Frame	64x50x150	250	---
HR-CE2500/1	250 kN Cement Compression Testing Frame	50x50x150	200	---
HR-CE1525	Flexure Jig Assembly to test 40x40x160 mm mortar prisms	15x15x18	11	---
HR-CE1526	Compression Jig Assembly to test 50 mm (2") mortar cubes	15x15x18	12	---
HR-CE1527	Compression Jig Assembly to test 40x40x40 mm mortar prisms	15x15x18	12	---
HR-CE1528	Compression Jig Assembly BS, to test 70,7 mm mortar cubes	15x13x19	9	---
HR-CE4000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-CE4001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-CE4002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-CE4003	Software	---	---	---
HR-CE4200	Distance Piece	Ø 15 x 1,5	---	---
HR-CE4201	Distance Piece	Ø 15 x 3	---	---
HR-CE4202	Distance Piece	Ø 15 x 5	---	---
HR-CE4203	Distance Piece	Ø 15 x 9	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---



**HR-CE1528**



**HR-CE1527**



**HR-CE1525**

## **CEMENT COMPRESSION / FLEXURAL TEST MACHINE WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)**

STANDARDS: EN 196-1, 459-2, 1015-11, 13454-2, EN ISO 679, ASTM C109, C348, C349, BS 3892-1, 4551-1

The Automatic Cement Compression and Flexure Machine have been designed for testing the flexure of the mortar prisms 40x40x160 mm and the compression on the 40x40mm pieces of prisms after the flexure test or 50x50 mm and 70,7 mm mortar cubes.

These machines also meet the requirements of CE norms for safety and health of the operator.

Compression and flexure jigs, distance pieces, and also removable transparent front-rear safety doors (should be factory installed) should be ordered separately.

The Automatic Cement Compression and Flexure Testing Machines allow less experienced operators to perform the tests.

The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Choosing the compression or flexure frame by using valve.
- Choosing Capacity of the frame (to call calibration values of the required load cell)
- Use load cell switch frame or compression side (up/down)
- Pressing the START button on the control unit.
- The machine automatically starts the rapid approach; switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

### **The Automatic Cement Compression and Flexural Testing Machines consist of;**

- Very rigid two column single or double chamber Load Frames,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Upper Platen (with ball seating assembly),
- Lower Platen,
- Loading Cylinder Assembly & Limit Switch for safety,
- H-GUI Software and Ethernet Cable.

### **Cement Compression & Flexural Load Frames**

15 kN and 250 kN high quality load cells are used on frames to provide high accuracy in load measuring. Both frames are fitted with round platens with Ø165 mm and these should be used together with suitable flexure and compression jigs.

#### **Upper Platens**

Manufactured from high quality steel which is hardened (more than HRC 53), smoothed and finished.

The roughness value for the surface texture of machine and auxiliary platens are 3,2 µm. the movable design.

#### **Distance Pieces**

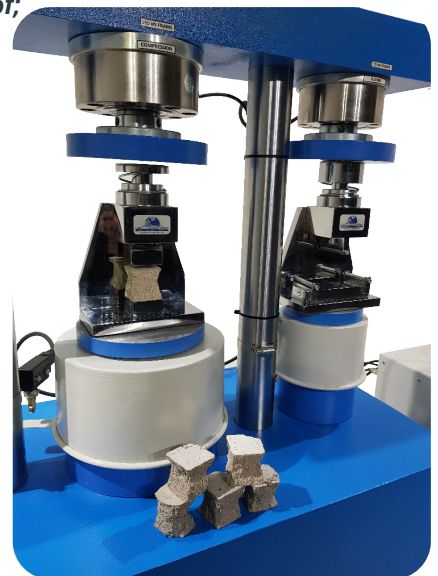
Due to the modular design of the frames any sample with suitable size, load and pace rate can be test on both chambers by decreasing the distance between platens.

#### **Loading Cylinder Assembly & Limit Switch**

All frames have a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

The maximum ram stroke is 50 mm, a limit switch is fitted to prevent over travel of the ram which cuts the power to the pump.

There is a low friction coaxial PTFE seal between the cylinder and the piston fitted to the cylinder.



## HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

### Hydraulic Power Pack

Automatic Hydraulic Power Pack, dual stage, controlled by H-Touch Pro Max Control Unit is designed to supply the required oil to the load frames for loading.

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 0,05 to 2.4 kN/sec with an accuracy of  $\pm 5\%$ . A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

HR-CE4000/TS



### Dual Stage Pump

The dual stage pump is formed by two groups;

1. Low pressure gear pump
2. High pressure radial piston pump

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, while a low delivery, high pressure radial piston pump is used for test execution. The rapid approach facility shortens the time interval from piston start until the upper platen touches to the specimen. This excellent feature helps to save a lot of time when a large number of specimens are going to be tested.

### Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter. The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Maximum capacity is 400 bar.



### Distribution Block

A distribution block is used to control the oil flow direction supplied by the dual stage pump, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer, Low pressure gear pump and High pressure radial piston pump.

### Load Cell

15 kN and 250 kN high quality load cells are used on frames to provide high accuracy in load measuring.

This property allows high accuracy at very low sample failures. (Class 1 at 2,5 kN to 250 kN)

### Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.



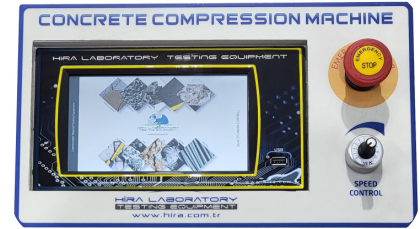
# HİRA TESTING EQUIPMENT



## Digital Readout and Control Unit

HİRATEST H-Touch Pro Max Control Unit is designed to control the automatic compressive, flexural and splitting tensile strength tests of construction materials such as concrete, cement mortar, masonry units, paving blocks, roofing tiles by processing of data from load-cells, pressure transducers or displacement transducers which are fitted to the machine.

All the operations of H-Touch Pro Max Control Unit are controlled from the front panel color resistive of TFT-LCD Touchscreen display and function keys.



**HR-CE4002/TS**

It displays all menu option listings simultaneously, allowing the operator to access the required option in a seamless manner to activate the option or enter a numeric value to set the test parameters.

H-Touch PRO Max Control Unit enable simultaneously display machine status, test values, warnings during operation and test graphs such as load-time or load-displacement curves in real time.

Digital graphic display of the unit is able to draw real-time "Load vs. Time" or "Stress vs. Time" graphics.

## Main Features of H-Touch Pro Max Control Unit of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm<sup>2</sup>- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian...)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

## Hardware

- 2 fully customizable analog channels with 24-bit ADC and PGA-FPGA circuit
- 800x480 pixel and 65535 color resolution TFT-LCD touchscreen
- 33 Hz control loop
- 32 Bit, 120 MHz ARM CORTEX M3 micro-PROcessor (CPU) for data acquisition
- 32 Bit, 400 MHz ARM CORTEX M3 micro-PROcessor (CPU) for data display
- Additional memory support up to 32 GB via external USB flash drive
- Support for -optionally supplied- integrated thermal printer
- Real time display of test graph
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive



## Software

HİRATEST H-GUI Software has been designed for data acquisition, processing controlling, presentation and reporting compressive, flexural and splitting tensile strength tests of construction materials such as concrete, cement mortar, masonry units, paving blocks, roofing tiles with appropriate Automatic Compression/Flexure Testing Machines and also with a computer.

The Automatic Compression Machine can be controlled (Start, Stop commands) by a computer with the HİRATEST H-GUI Software free of charge.

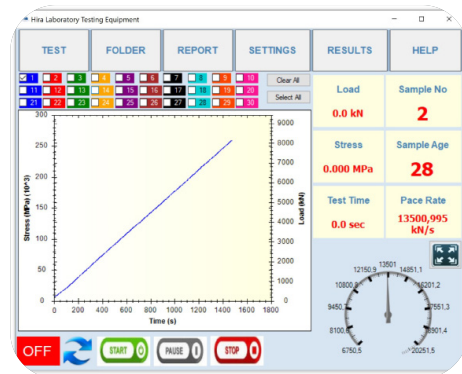
The advanced functions for database management provide an easy navigation of all saved data.

Test parameters can be set and details about the test carried out such as Test Type, Sample Type, Report details, Customer details, Sample details and other information required can be entered in the software.

This informations and "Load vs. Time" or "Stress vs. Time" graphics can be seen and printed out on the Test Report.

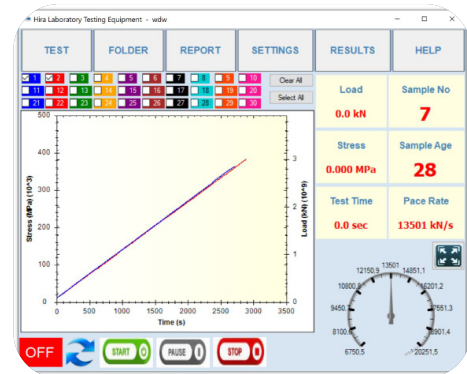
### Following tests can be done with the HİRATEST H-GUI Software;

- Compressive Strength of Concrete Cylinders / Cubes
- Flexural Strength of Concrete Beams
- Compressive Strength of Cement Mortars
- Flexural Strength of Cement Mortars
- Tensile Splitting Strength of Concrete Paving Blocks
- Tensile Splitting Strength of Concrete Cylinders / Cubes
- Flexural Strength of Roofing Tiles
- Flexural Strength of Concrete Kerbs
- Compressive Strength of Masonry Units.



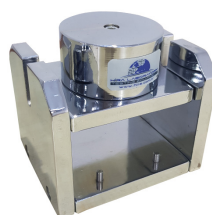
### Main Features of H-GUI Software;

- Multi-language support and customizable user interface
- 30 Tests Results, Graphics and Properties Storage Capacity in One Test File
- Exporting test results to database
- Advanced test graphical interface
- Option to store and recall test information
- Modification of test machine parameters using the software
- Able to save frequently used texts in memory and recall them when necessary
- Exporting reports and graphs
- Flexible report and graph formats

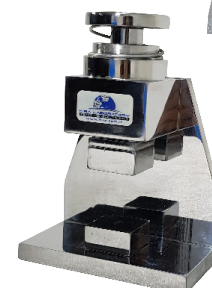


### Main Features of the device

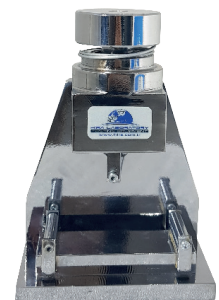
- Pace rate control from 0,05 kN/sec to 2,4 kN/sec depending on piston size.
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a load cell
- Hydraulic pump with dual stage for rapid approach
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report



HR-CE1528



HR-CE1527



HR-CE1525

## Technical Specifications:

CEMENT COMPRESSION / FLEXURAL TEST MACHINE			
Model	HR-CE2500/TS	HR-CE1500/TS	
Test Type	Compression	Flexure	Compression
Capacity (kN)	250	15	250
Class 1 Measuring Range (kN)	2.5 to 250	0.5 to 15	2.5 to 250
The roughness value for texture of loading and auxiliary platens ( $\mu\text{m}$ )	$\leq 3.2$	$\leq 3.2$	$\leq 3.2$
Lower Platen Dimensions (mm)	165	165	165
Upper Platen Dimensions (mm)	165	165	165
Maximum Vertical Clearance Between Platens (mm)	250	250	250
Piston Diameter (mm)	160	80	160
Maximum Piston Movement (mm)	50	50	50
Horizontal Clearance (mm)	300	200	300
Power (W)	750	750	
Oil Capacity (lt)	25	25	
Maximum Working Pressure (bar)	125 bar	30 bar	125 bar

## Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE1500/TS	15/250 kN Automatic Cement Flexure/Compression Testing Machine	100x50x150	350	220 V, 50-60 Hz, 1 ph
HR-CE2500/TS	250 kN Automatic Cement Compression Testing Machine	85x50x150	300	220 V, 50-60 Hz, 1 ph

## Spare Parts &amp; Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-CE1500/1	15/250 kN Cement Flexure/Compression Testing Frame	64x50x150	250	---
HR-CE2500/1	250 kN Cement Compression Testing Frame	50x50x150	200	---
HR-CE1525	Flexure Jig Assembly to test 40x40x160 mm mortar prisms	15x15x18	11	---
HR-CE1526	Compression Jig Assembly to test 50 mm (2") mortar cubes	15x15x18	12	---
HR-CE1527	Compression Jig Assembly to test 40x40x40 mm mortar prisms	15x15x18	12	---
HR-CE1528	Compression Jig Assembly BS, to test 70,7 mm mortar cubes	15x13x19	9	---
HR-CE4000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-CE4001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-CE4002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-CE4003/TS	H-GUI Software	---	---	---
HR-CE4200	Distance Piece	$\emptyset 15 \times 1,5$	---	---
HR-CE4201	Distance Piece	$\emptyset 15 \times 3$	---	---
HR-CE4202	Distance Piece	$\emptyset 15 \times 5$	---	---
HR-CE4203	Distance Piece	$\emptyset 15 \times 9$	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

