



## AGGREGATES

Aggregates are the most used materials in all fields of the construction industry to produce bituminous mixture, concrete, mortars to be used in structures, fill materials, railway ballast etc. For this reason, International Standards require several and precise tests on their properties.

In the majority of cases the EN Standards correspond to other reference Standards as for example ASTM and AASHTO and, apart from a few exceptions there is almost no difference in the specification of test apparatus.

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## SPEEDY MOISTURE TESTER

STANDARDS: ASTM D4944, AASHTO T217

Field conditions dust, pulp mixture and the soil, sand, clay, aggregate and other granular materials quickly and accurately detect moisture content.

Moisture within the sample, as a result of reaction with calcium carbide acetylene gas occurs. The resulting pressure caused by gas, dial indicator is determined as the percent moisture content.

Within a few minutes into the issue determines the moisture content of the sample.

Complete with Precision Scale, measuring spoons and cups, 1 box of calcium carbide reagent and cleaning brush.



HR-A0350

**Technical Specifications:**

Product Code	Product Name	Capacity (gr)	Moisture Range (%)	Dimensions (cm)	Weight (kg)
HR-A0350	Speedy Moisture Tester	20	0-20	51x38x20	10
HR-A0350/1	Calcium carbide reagent (500 gr)	---	---	---	---

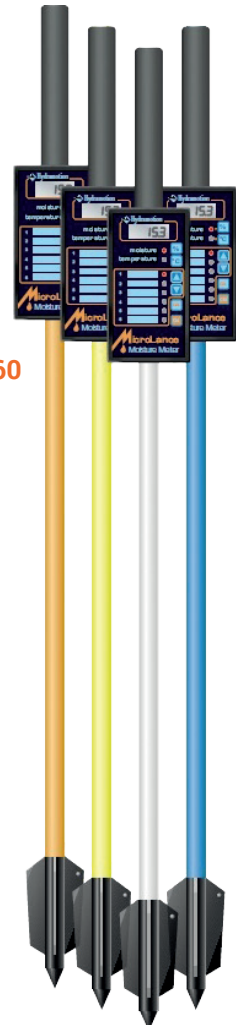
## MOISTURE METER MICROLANCE

This electronic tester measures and visualizes directly on the display the moisture percentage and temperature of sands, aggregates, building materials, minerals and mixes up to max. dia of 10 mm by simply inserting the crucible tip.

For quick, convenient, on-site moisture measurement from small batches to hundreds of tons.

Instant spot read out or average of whole load.

No sample preparation, chemicals, balances or ovens etc.



HR-A0360

**Technical Specifications:**

Product Code	HR-A0360	
Product Name	Moisture Meter Microlance	
	Moisture	Temperature
Range	0 - 25%	-20 to 60 °C
Resolution	±0.1%	0.1 °C
Accuracy	±0.5% of reading	<0.5 °C
Measuring Depth	1000 mm	
Measurement Response	2 seconds	
Material Selections	6 (user configurable)	
Dimensions	12x12x120 cm	
Power Requirements	4 x 1.5 V AA alkaline cells (or equivalent)	
Weight	1500 gr	

## DESICCATORS

Complete with perforated porcelain plate.



HR-G0221



HR-G0223

Technical Specifications:

Product Code	Product Name	Diameter (cm)	Dimensions (cm)	Weight (kg)
HR-G0220	Non-Vacuum Desiccator	Ø 21	31x31x25	3,5
HR-G0221	Non-Vacuum Desiccator	Ø 24	34x34x30	3,5
HR-G0222	Non-Vacuum Desiccator	Ø 30	40x40x35	3,5
HR-G0223	Vacuum Desiccator	Ø 21	31x31x25	3,5
HR-G0224	Vacuum Desiccator	Ø 24	34x34x30	3,5
HR-G0225	Vacuum Desiccator	Ø 30	40x40x35	3,5
HR-G0229	Safety Cage	---	---	2

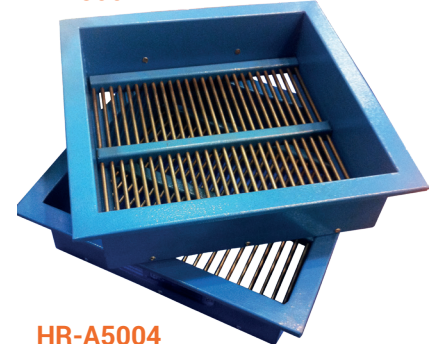
## GRID SIEVES

STANDARDS: EN 933-3

Used to determine the flakiness index of the aggregates. Consists of electrostatic painted frame and 5 mm diameter stainless steel bars.

50 mm aperture Sieve is not supplied with Complete Set and should be ordered separately.

HR-A5001



HR-A5004

Technical Specifications:

Product Code	Product Name	Aperture (mm)	Dimensions (cm)	Weight (kg)
HR-A5001	Grid Sieve	2,5	34x32x8	4
HR-A5002	Grid Sieve	3,15	34x32x8	4
HR-A5003	Grid Sieve	4	34x32x8	4
HR-A5004	Grid Sieve	5	34x32x8	4
HR-A5005	Grid Sieve	6,3	34x32x8	4
HR-A5006	Grid Sieve	8	34x32x8	4
HR-A5007	Grid Sieve	10	34x32x8	4
HR-A5008	Grid Sieve	12,5	34x32x8	4
HR-A5009	Grid Sieve	16	34x32x8	4
HR-A5010	Grid Sieve	20	34x32x8	4
HR-A5011	Grid Sieve	25	34x32x8	4
HR-A5012	Grid Sieve	31,5	34x32x8	4
HR-A5013	Grid Sieve	40	34x32x8	4
HR-A5014	Grid Sieve	50	34x32x8	4
HR-A5000/S	Grid Sieve Set	Complete Set	34x32x104	52

## FLAKINESS SIEVES

STANDARDS: BS 812

Used to determine if aggregate is flaky; i.e. if thickness is less than 0,6 of nominal size.

Each sieve made from heavy gauge steel sheets in dimensions specified in the standards and coated with electrostatic paint.



### Technical Specifications:

Product Code	Product Name	Slot Size (mm)	Dimensions (cm)	Weight (kg)
HR-A5101	Flakiness Sieve	4.9 x 30	30x22x8	1.6
HR-A5102	Flakiness Sieve	7.2 x 40	32x24x8	1.7
HR-A5103	Flakiness Sieve	10.2 x 50	34x26x8	1.8
HR-A5104	Flakiness Sieve	14.4 x 60	36x26x8	2
HR-A5105	Flakiness Sieve	19.7 x 80	39x28x8	2.2
HR-A5106	Flakiness Sieve	26.3 x 90	42x30x8	2.7
HR-A5107	Flakiness Sieve	33.9 x 100	47x32x8	3.0
HR-A5100/S	Flakiness Sieve Set	Complete Set	47x32x56	15

## SAMPLE SPLITTERS (RIFFLE BOXES)

STANDARDS: EN 933-3, ASTM C136

Used for the precise division into two representative portions of materials such as: aggregates, sand, gravel and similar.

Electrostatically painted and they are supplied with two collecting pans.



### Technical Specifications:

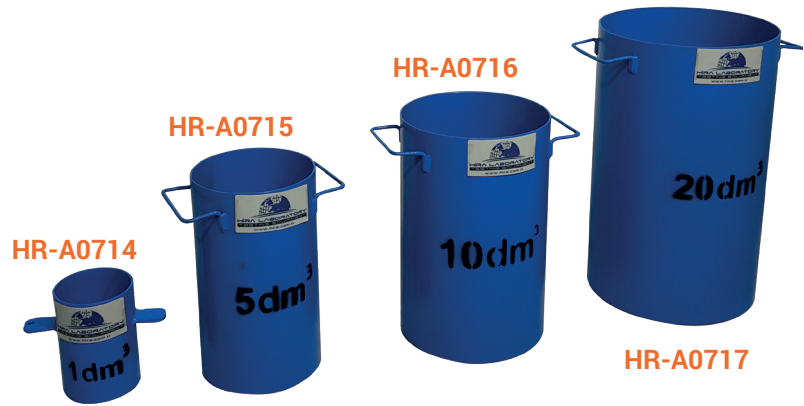
Product Code	Product Name	Aperture (mm)	Number of Slots	Dimensions (cm)	Weight (kg)
HR-A0700	Riffle Box	7	12	13x18x18	2
HR-A0701	Riffle Box	10	12	15x20x25	4,5
HR-A0702	Riffle Box	13	12	20x25x35	6
HR-A0703	Riffle Box	15	12	20x29x35	6,5
HR-A0704	Riffle Box	19	10	22x31x40	11
HR-A0705	Riffle Box	20	10	23x32x42	11
HR-A0706	Riffle Box	25	10	25x35x42	12
HR-A0707	Riffle Box	30	10	23x42x45	15
HR-A0708	Riffle Box	38	8	32x43x57	16
HR-A0709	Riffle Box	45	8	32x45x59	20
HR-A0710	Riffle Box	50	8	32x50x60	27
HR-A0711	Riffle Box	64	8	36x60x60	32
HR-A0712	Riffle Box	75	8	37x70x60	35

## BULK DENSITY MEASURES

STANDARDS: EN 1097-3, ASTM C29-97

Used to determine the loose bulk density and voids of aggregates.

Bulk Density Measures are manufactured from heavy gauge steel and coated against corrosion.



### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)
HR-A0714	Bulk Density Measure	1	10x10x13	1,7
HR-A0715	Bulk Density Measure	5	16x16x25	6
HR-A0716	Bulk Density Measure	10	20x20x31	9
HR-A0717	Bulk Density Measure	20	26x26x36,5	12,5

## LARGE CAPACITY SAMPLE SPLITTER

Large Capacity Sample Splitter is used to obtain the representative samples in required quantity for the related tests from the aggregates parts which comes to laboratory.

Widths of Slots are adjustable between 12,5 mm with 100 mm.

Large Capacity Sample Splitter consist of three parts;

- Carrier,
- Splitter,
- Collecting pan

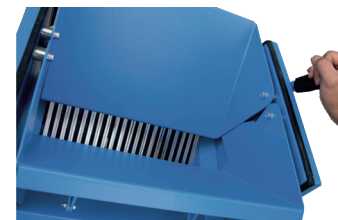
All parts are manufactured from steel and electrostatic painted.

Large Capacity Sample Splitter splits the sample to two equal volumes.

Large Capacity Sample Splitter has been designed so that no samples remain on the surfaces during operation.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-M4000	Large Capacity Sample Splitter	82x52x110	55



## HİRA TESTING EQUIPMENT



### FLAKINESS (THICKNESS) GAUGE

STANDARD: BS 812

To verify if aggregate is flaky; i.e. if its thickness is less than 0.6 of its nominal size.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0730	Flakiness (Thickness) Gauge	31x13x1	0,4



HR-A0730

### LENGTH GAUGE

STANDARDS: BS 812

Used to determine the elongation index of aggregates: i.e. if length is more than 1.8 of nominal size.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0732	Length Gauge	37x7x7	0,8



HR-A0732

### SHAPE INDEX CALIPER

STANDARDS: EN 933-4, 933-5, 933-7

For measuring the length/thickness ratio of individual particles.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0734	Shape Gauge	45x15x5	0,4



HR-A0734

### LOS ANGELES ABRASION MACHINE

STANDARDS: EN 1097-2, 12697-17, 12697-43, ASTM C131, AASHTO T96

Los Angeles Abrasion Machine is used for determination of aggregates resistance to fragmentation. The machine consists of an electronic control unit and a rolled steel drum having an inside diameter of  $(711 \pm 5)$  mm and internal length  $(508 \pm 5)$  mm. The drum is rotated at a speed of between 31 and 33 r.p.m.

The machine is equipped with automatic counter, which allows stopping when the preset number of revolutions is completed. There is a tray supplied with machine for easy discharge of specimen.

Los Angeles device with Sound proof (security) cabinet is available. Manufactured from sheet steel, internally lined with sound-proofing material for noise reduction, conforming to CE safety directives. When opening the cabinet's door during Los Angeles working, a micro switch automatically stops the rotation of the drum.

Locking Mechanism is also available as optional and (should be factory installed) should be ordered separately. Locking mechanism of the drum helps the user when filling the samples and lock the door nuts.

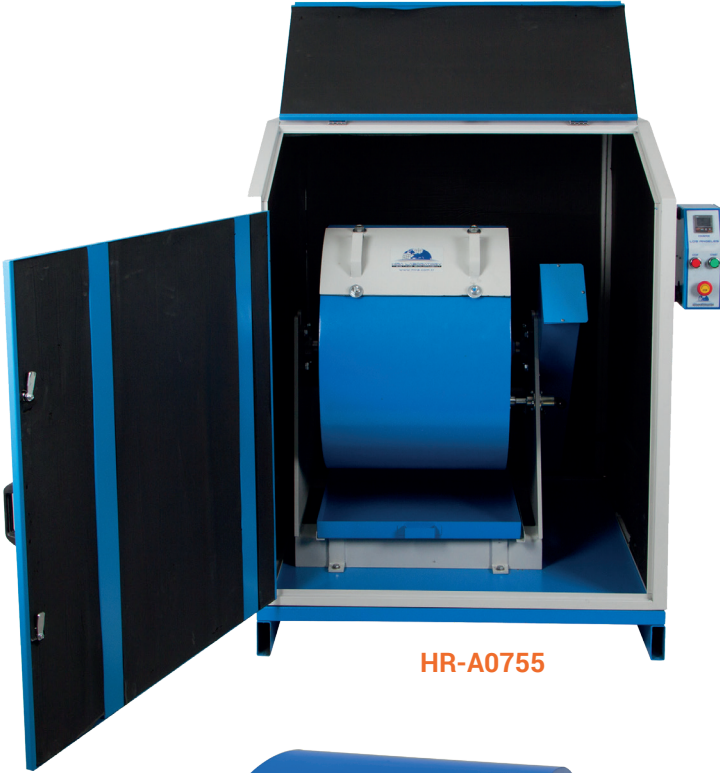
Abrasive charges should be ordered separately according to the standards.



HR-A0750

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0750	Los Angeles Abrasion Machine	100x90x100	400	220 V, 50 Hz, 1 ph
HR-A0750/60Hz	Los Angeles Abrasion Machine	100x90x100	400	220 V, 60 Hz, 1 ph
HR-A0755	Los Angeles Abrasion Machine with Safety Cabinet	110X115X125	500	220 V, 50 Hz, 1 ph
HR-A0755/60Hz	Los Angeles Abrasion Machine with Safety Cabinet	110X115X125	500	220 V, 60 Hz, 1 ph



HR-A0755



HR-A0755



HR-A0750 with HR-A0765



HR-A0760 & HR-A0761



HR-A0765

## Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0765	Locking Mechanism	---	---
HR-A0760	Set of 12 Abrasive Charges, ASTM, UNI, CNR	Approx. Ø 4,7	0,390-0,445 (Total 5 ± 0,025)
HR-A0761	Set of 11 Abrasive Charges, EN	Ø 4,5 - 4,9	0,400-0,445 (Total 4,690-4,860)



## HİRA TESTING EQUIPMENT

### MICRO-DEVAL TESTING MACHINE

STANDARDS: EN 1097-1

Micro Deval Testing Machine used to determine the resistance to wear of 25-50 mm size aggregates. The machine consists of a steel frame, two rotating bars with capacity of 4 cylinders. Device is equipped with two stainless steel cylinders, and 25 kg of Ø10 mm stainless steel balls and automatic digital counter which allows machine to stop automatically at the preset number of revolutions.

Stainless steel Ø200\*154 mm drums are rotating at speed of 100 (±5) r.p.m.



HR-A0770

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0770	Micro-Deval Testing Machine	64x120x35	150	220 V, 50 Hz, 1 ph
HR-A0770/60Hz	Micro-Deval Testing Machine	64x120x35	150	220 V, 60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0770/1	Stainless Steel Drum	Ø 200x154	---
HR-A0770/3	Stainless Steel Drum	Ø 200x400	---
HR-A0770/2	Micro-Deval Abrasion Charges	Ø 10	25

### AGGREGATE IMPACT VALUE APPARATUS

STANDARDS: BS 812

Used to determine the impact value of aggregates and select them for a given application. The machine has a trip-action hammer release, blow counter device. Manufactured from plated steel against the corrosion. The counter fitted to the machine automatically records the number of blows delivered to the sample. Supplied complete with 75 mm diameter \* 50 mm cylindrical measure and steel tamping rod.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0780	Aggregate Impact Value	45x35x85	51,5



HR-A0780

## NORDIC ABRASION TESTING MACHINE

STANDARDS: EN 1097-9; UNI 8520-13-16

Nordic Abrasion Machine has been developed for testing the resistance of aggregates to wear by abrasion from studded tyres. The test is performed on natural or artificial stones and aggregates between 11.2 mm and 16.0 mm.

The test consists of a rotating aggregate in a drum containing steel abrasive balls and water. The machine consists of an electronic control unit and a rolled stainless steel drum having an internal diameter of 206.5 mm, internal length of 335 mm and thickness of 6 mm. The drum is rotated at a speed of  $90 \pm 3$  r.p.m. 3 wings are installed inside of the drum to allow the balls and aggregates to be mixed properly.

The abrasion loss rate of aggregates is calculated after the specified number of revolutions stated in the relevant standard.

11,1 mm diameter steel balls ( 3.5 kg.) should be ordered separately.

The Nordic Abrasion Machine is supplied complete with  $\varnothing$  15 mm, 7 kg Steel Balls.



HR-A0850

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0850/1	Steel Balls	$\varnothing$ 15	7
HR-A0850/2	Steel Balls	$\varnothing$ 11.1	3,5

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0850	Nordic Abrasion Machine	72x40x65	70	220 V, 50 Hz, 1 ph
HR-A0850/60Hz	Nordic Abrasion Machine	72x40x65	70	220 V, 60 Hz, 1 ph

## SAND ABSORPTION (ABRAHAM CONE) SET

STANDARDS: EN 1097-6, BS 812, ASTM C127-C128

Used in determining the specific gravity and absorption of fine aggregates.

Apparatus is manufactured from plated steel for protection against corrosion.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0725	Sand Absorption Cone and Tamper	9x9x18	0,5
HR-A0725/1	Sand Absorption Cone	---	0,3
HR-A0725/2	Tamper Rod	---	0,2



HR-A0725

# HİRA TESTING EQUIPMENT



## AGGREGATE CRUSHING VALUE APPARATUS

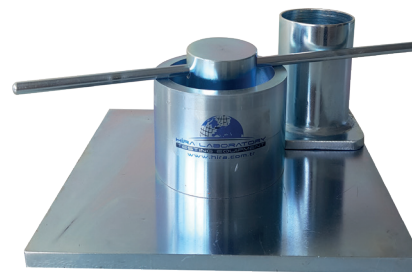
STANDARDS: BS 812:110

Aggregate crushing value provides a relative measure of the resistance of an aggregate to crushing under a gradually applied compressive load.

Consists of Ø150 mm steel cylinder, plunger, base plate, tamping rod Ø16 x 600 mm and measure Ø115 x 180 mm deep. Used for aggregate passing 12.7 mm and retained by 9,52 mm sieve.

Consists of Ø75 mm steel cylinder, plunger, base plate, tamping rod Ø8 x 300 mm and measure Ø57 x 90 mm deep. Used for aggregates smaller than 9,52 mm.

All parts are powder coated or galvanized.



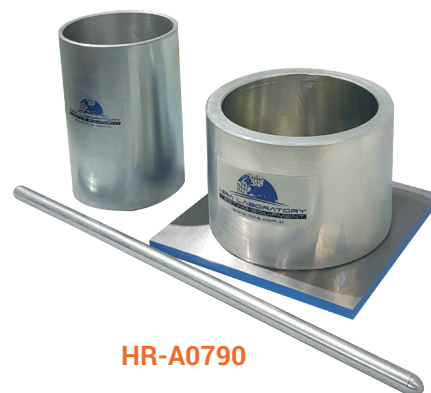
**HR-A0785**

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0785	Aggregate Crushing Value (ACV) Set, Ø 75 mm	120x120x350	8,5
HR-A0790	Aggregate Crushing Value (ACV) Set, Ø 150 mm	250x250x600	32

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0785/1	Steel Cylinder for HR-A0785	Ø 75	1,5
HR-A0785/2	Base Plate for HR-A0785	---	4
HR-A0785/3	Plunger for HR-A0785	---	1,5
HR-A0785/4	Cylindrical Measure for HR-A0785	Ø 57 x 90	0,750
HR-G0762	Tamping Rod for HR-A0785	Ø 8 x 300	0,750
HR-A0790/1	Steel Cylinder for HR-A0790	Ø 150	6
HR-A0790/2	Base Plate for HR-A0790	---	16
HR-A0790/3	Plunger for HR-A0790	---	6
HR-A0790/4	Cylindrical Measure for HR-A0790	Ø 115 x 180	2,5
HR-G0763	Tamping Rod for HR-A0790	Ø 16 x 600	0,950



**HR-A0790**

## SAND EQUIVALENT TEST SET

STANDARDS: EN 933-8, ASTM D2419, AASTHO T176

Sand Equivalent Test Set is used to determine the fines of aggregates.

The Sand Equivalent Test Set complete with siphon assembly (irrigator tube with valve, rubber stopper, siphon tube and hose, blow tube), weighted foot assembly, funnel, measuring can, 5 lt capacity sand jar, 300 mm Steel Ruler and a carrying case.

Supplied with two Sand Equivalent Measuring Two Graduated Cylinder for EN Model and two Sand Equivalent Measuring Graduated Cylinder for ASTM Model.



**HR-A0805**



HR-A0810

### Spare Parts & Accessories:

Product Code	Product Name	Standard
HR-A0805/1	Measuring cylinder	EN
HR-A0810/1	Measuring cylinder	ASTM
HR-A0805/2	Siphon Assembly	EN, ASTM
HR-A0805/3	Weighted foot Assembly	EN, ASTM
HR-G0476	Steel Ruler, 300 mm	EN, ASTM
HR-G0314	Funnel	EN, ASTM
HR-G0610	Measuring Can, Ø 55 x 35 mm	EN, ASTM
HR-S5710	5 lt Capacity Sand Jar	EN, ASTM
HR-A0805/4	Carrying Case	---

### Technical Specifications:

Product Code	Product Name	Standard	Dimensions (cm)	Weight (kg)
HR-A0805	Sand Equivalent Test Set	EN	45x55x15	4,6
HR-A0810	Sand Equivalent Test Set	ASTM	45x55x15	4,6

## SAND EQUIVALENT SHAKERS

STANDARDS: EN 933-8, ASTM D2419, AASTHO T176

The unit provides a constant uniform shaking with automatic cycle test. Provides shaking action at the specified rate and stroke.

Supplied complete with built in timer that stops the shaker at the end of the test.

Two models are available HR-A0815 without Security Cabinet and HR-A0820 with Security Cabinet.

When opening cabinet's door during shaker working, a micro switch automatically stops the machine.



HR-A0815



HR-A0820



HR-A0805/1



HR-A0810/1

# HİRA TESTING EQUIPMENT



Standard	EN	ASTM
Horizontal Movement Cycle	200 mm ±10 mm 90±3/30 sec.	203,2 mm ±1 mm 175±2/min.



**HR-A0820**

**Technical Specifications:**

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0815	Sand Equivalent Shaker	22x60x32	25	220 V, 50 Hz, 1 ph
HR-A0815/60Hz	Sand Equivalent Shaker	22x60x32	25	220 V, 60 Hz, 1 ph
HR-A0820	Sand Equivalent Shaker with Security Cabinet	37x94x47	36	220 V, 50 Hz, 1 ph
HR-A0820/60Hz	Sand Equivalent Shaker with Security Cabinet	37x94x47	36	220 V, 60 Hz, 1 ph

## COLOUR STANDARD CHART (ORGANIC IMPURITIES TEST SET)

STANDARDS: ASTM C 40, AASHTO T 21

Determines presence of injurious organic compounds in sands used in cement mortar or concrete.

Test serves as warning that further tests of sands are necessary before they can be approved for use.

Glass Bottle and Sodium Hydroxide should be ordered separately.



**HR-A0915**

**Technical Specifications:**

Product Code	Product Name
HR-A0915	Colour Standard Chart



**HR-A0915/1 & HR-G0916**

**Spare Parts & Accessories:**

Product Code	Product Name
HR-A0915/1	Glass Bottle, 500 ml capacity
HR-A0915/2	Glass Bottle, 1000 ml capacity
HR-G0916	Sodium Hydroxide, NaOH, 1 kg

## METHYLENE BLUE TEST SET

STANDARDS: EN 933-9

Methylene Blue Test Set is used for determining clay content in the fines fraction of the aggregates.

Set consists of 400/600 r.p.m. Electric stirrer, complete with Ø75 mm stirring propeller, support base for stirrer, 50 ml glass burette, burette holder, support base for burette, Ø125 mm Filter Papers (pack of 100), Ø8\*300 mm glass rod, 2000 ml capacity plastic beaker, 100 gr methylene blue and 500 gr kaolinite.

Digital Methylene Blue Test Set is also available. This model is fitted with digital timer which can be pre-set for any duration up to 999 minutes.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0400	Methylene Blue Test Set	50x87x27	15	220 V, 50-60 Hz, 1 ph
HR-A0405	Digital Methylene Blue Test Set	50x87x27	15	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0400/1	Electric Stirrer, 400/600 r.p.m.	Ø 7,5	---
HR-G0926	Kaolinite	---	0,5
HR-A0400/2	Burette holder	---	0,25
HR-A0400/3	Burette stand	---	0,25
HR-A0400/4	Burette clamp	---	0,25
HR-A0400/5	Methylene blue	---	0,1
HR-A0400/6	Filter paper (pack of 100)	Ø 12,5	0,1
HR-G0182	Glass Burette, 50 ml	5x5x82	0,25
HR-G0293	Plastic Beaker with handle, 2000 ml	11x11x15	1
HR-G0216	Glass Rod	Ø 0,8*30	0,1



HR-A0400

## END OVER END SHAKER

STANDARDS: BS 1377:2, EN 1997-2

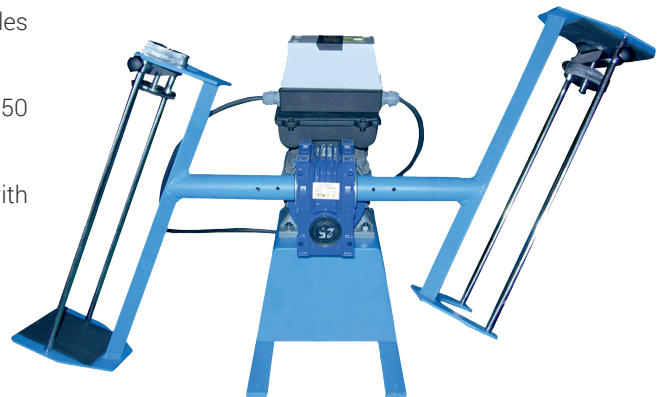
This method applies for soils containing up to 10% of particles retained on a 37.5 mm sieve.

End-over-end shakers is used to rotate two gas jars at approx. 50 r.p.m.

1 lt capacity Gas Jar is made of glass and supplied complete with rubber bung and glass cover.

### Spare Parts & Accessories:

Product Code	Product Name
HR-A0800/1	1 lt capacity Gas Jar
HR-A0800/2	Rubber Bung
HR-A0800/3	Glass Cover



HR-A0800

### Technical Specifications:

Product Code	Product Name	Power Supply
HR-A0800	End Over End Shaker	220 V, 50 Hz, 1 ph
HR-A0800/60Hz	End Over End Shaker	220 V, 60 Hz, 1 ph

# HİRA TESTING EQUIPMENT



## SPECIFIC GRAVITY FRAME (BOUYANCY BALANCE SYSTEM)

STANDARDS: EN 1097-6, 12390-7

Used in conjunction with a suitable electronic balance for specific gravity determination of fresh and hardened concrete and aggregates.

To be used with a suitable electronic balance fitted with an under –hook facility.

The lower part of the frame incorporates a moving platform, which carries the water tank allowing the test specimens to be weighed in both air and water.

The balance is not included in the test set and must be ordered separately. Any type of electronic balance fitted with under-bench weighing facility can be used.

Specific Gravity Test Set complete with Specific Gravity Frame, Density Basket, Cradle and Density Tank.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0500	Specific Gravity Test Set	40x50x98	25



HR-C0500

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0500/1	Specific Gravity Frame	40x50x98	25
HR-C0500/2	Cradle	23x13x20	2,5
HR-C0500/3	Density Tank	28x38x30	0,300
HR-C0500/4	Density Tank	40x40x30	0,350
HR-G4040	Density Basket, 2 mm	Ø20x20	1,5



HR-C0500/2

## DENSITY BASKET

STANDARDS: ASTM C88, C127, AASHTO T85, BS 812:2

Used for specific gravity tests, stainless steel made.



HR-G4039

HR-G4044

HR-G4043

HR-G4041

HR-G4049

HR-G4051

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Aperture (mm)	Weight (kg)
HR-G4039	Density Basket	Ø 200 x 200	3,35 (No.6)	1,3
HR-G4040	Density Basket	Ø 200 x 200	2	1,3
HR-G4041	Density Basket	Ø 250 x 250	3,35 (No.6)	1,5
HR-G4042	Density Basket	Ø 200 x 180	2 (No.10)	1,2
HR-G4043	Density Basket	Ø 120 x 160	3,35 (No.6)	0,5
HR-G4044	Density Basket	Ø 120 x 160	1,7 (No.12)	0,5
HR-G4045	Density Basket	Ø 120 x 160	0,600 (No.30)	0,5
HR-G4046	Density Basket	Ø 120 x 160	2,36 (No.8)	0,5
HR-G4047	Density Basket	Ø 200 x 200	9,5 (3/8")	1,3
HR-G4048	Density Basket	Ø 230 x 260	4,00 (No.5)	1,5
HR-G4049	Density Basket	Ø 95 x 120	1,18 (No.16)	0,3
HR-G4050	Density Basket	Ø 95 x 120	0,600 (No.30)	0,3
HR-G4051	Density Basket	Ø 65 x 80	0,150 (No.100)	0,2

\*\*\*For different size, please contact with our company.

## PYKNOMETER METHOD (SPECIFIC GRAVITY BOTTLE, GAY LUSSAC TYPE)

STANDARDS: EN 1097-7, BS 812, BS 1377:2, ASTM D854, AASHTO T100

Pyrex glass, complete with capillary tube stopper; to determine the particle density and specific gravity of filler in fine aggregates.

### Technical Specifications:

Product Code	Product Name	Capacity (ml)	Dimensions (cm)	Weight (kg)
HR-G0040	Pyknometer (Gay Lussac Type)	25	Ø 4x4x9	0,05
HR-G0041	Pyknometer (Gay Lussac Type)	50	Ø 5x5x10	0,05
HR-G0042	Pyknometer (Gay Lussac Type)	100	Ø 6x6x12	0,05
HR-G0043	Pyknometer (Gay Lussac Type)	250	Ø 10x10x15	0,1
HR-G0044	Pyknometer (Gay Lussac Type)	500	Ø 11x11x20	0,1
HR-G0045	Pyknometer (Gay Lussac Type)	1000	Ø 15x15x22	0,2



## PYKNOMETER (BOTTLE TYPE)

STANDARDS: EN 1097-6

Pyrex glass, complete with stopper; used to determine the voids and bulk density of aggregates.

Double Edged and Capillary Tubed Funnel should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Capacity (ml)	Dimensions (cm)	Weight (kg)
HR-G0050	Pyknometer (Bottle Type)	500	Ø 13x13x27	0,7
HR-G0051	Pyknometer (Bottle Type)	1000	Ø 15x15x27	0,9
HR-G0052	Pyknometer (Bottle Type)	2000	Ø 18x18x33	1,25
HR-G0053	Pyknometer (Bottle Type)	3000	Ø 20x20x34	1,35
HR-G0054	Pyknometer (Bottle Type)	5000	Ø 25x25x40	1,6
HR-G0055	Funnel	---	Ø 5,5x5,5x27	0,2



## PYKNOMETER (GLASS JAR TYPE)

STANDARDS: BS 812:2, 1377-2; ASTM C128, D854; AASHTO T84

The Pyknometer is used for the determination of the relative density and water absorption for aggregates of maximum 10 mm size.

Glass Jar Type Pyknometer is glass made. Supplied with a metal cone.

### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)
HR-G0060	Pyknometer (Glass Jar Type)	1	10x10x20	0,5



HR-G0060



## ABRASION BOHME TESTER

STANDARDS: EN 1338, 1339, 1340, EN 13892-3, EN 14157

The instrument measures a volume loss in a specimen under abrasion test and it's used in tests such as: - paving stones - concrete slabs - slabs made of natural rocks - natural stone slabs.

The apparatus is basically composed of cast iron horizontal disc with a speed of  $30 \pm 1$  rpm and a diameter of 750mm furnished of a 200mm test track to position a specimen.

Control panel with digital revolutions counter with automatic stop after 22 rotations.

Abrasive Sand is must be ordered separately.



HR-A2510

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A2510	Abrasion Bohme Tester	150x100x85	275	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Weight (kg)
HR-A2510/1	Abrasive Sand	50

## ABRASION TESTER FOR NATURAL STONES AND CONCRETE

STANDARDS: EN 1338, 1341, 1342, 1343, EN 14157

Abrasion Tester used to determine the resistance to abrasion and wear of natural stones and concrete products by measuring the length of a groove produced on the specimen surface by disc with thickness of 70 mm that rotates at controlled speed and makes a constant pressure on the specimen. A charge of abrasive material must be interposed between the disc and the specimen.

The abrasion wheel rotates at a speed of 75 rpm. The machine is equipped with digital counter which stops machine at the preset number of revolutions.

The abrasive corundum sand and calibration (Boulonnaise) marble are optional.

### Spare Parts & Accessories:

Product Code	Product Name	Weight (kg)
HR-A2520/1	Abrasive corundum sand	50
HR-A2520/2	Abrasive corundum sand	1
HR-A2520/3	Calibration (Boulonnaise) Marble	---

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A2520	Abrasion Tester for Natural Stones and Concrete	65x70x200	190	380 V, 50-60 Hz, 3 ph



HR-A2520

## ABRASION TESTER FOR BRICKS AND GLAZED TILES

STANDARDS: EN 102, EN 12808-2, ISO 10545-6

Same to model HR-A2520 but with disc thickness of 10 mm. Suitable for bricks and ceramic glazed tiles.

Abrasive corundum sand and mould (for EN 12808-2) should be optional.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A2525	Abrasion Tester for Bricks and Glazed Tiles	65x70x200	190	380 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Weight (kg)
HR-A2525/1	Mould (for EN 12808-2)	---
HR-A2520/1	Abrasive corundum sand	50
HR-A2520/2	Abrasive corundum sand	1



## MAGNESIUM / SODIUM SULPHATE TEST

STANDARDS: EN 1367-2, 13450; ASTM C88

Magnesium Sulphate and Sodium Sulphate Tests are used for determining the soundness of aggregates when subjected to weathering action such as freezing and thawing cycles. Only the specific products are listed below. It should be noted that other equipment like ovens, sieves, balances etc. are also required to perform these tests.

Sodium Sulphate can be used instead of Magnesium Sulphate according to the ASTM standard.

HR-G0234 Hydrometer 1100- 1200 g/ml is required for the test with Sodium Sulphate Test.

Homogenous temperature distribution can be obtained with water circulation pump that makes feedback. Temperature controller is a microprocessor type and control process has digital display that can.

Magnesium/Sodium Sulphate Test Water Bath can be used as general purpose water bath at 15 °C - 60 °C with  $\pm 1.0$  °C accuracy.

Magnesium/Sodium Sulphate Test Water Bath should be ordered separately.

Magnesium Sulphate Test Set complete with, 2 pieces Plastic Lever Lid Container  $\varnothing 255 \times 235$  mm,  $\varnothing 120 \times 160$  mm, 3,35 (No.6) mm density basket,  $\varnothing 95 \times 120$  mm, 0,600 (No.30) mm density basket, Hydrometer 1200-1300 g/ml and 1 kg Magnesium Sulphate.

Sodium Test Set complete with 2 pieces Plastic Lever Lid Container  $\varnothing 255 \times 235$  mm,  $\varnothing 120 \times 160$  mm, 1,7 (No.12) mm density basket,  $\varnothing 120 \times 160$  mm, 0,600 (No.30) mm density basket, Hydrometer 1100-1200 g/ml, 1 kg Sodium Sulphate.

Other options and accessories should be ordered separately.



## Spare Parts &amp; Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A3005/1	Lever Lid Container, Plastic, EN/ASTM	Ø 25,5 x 23,5	0,25
HR-A3005/2	Lever Lid Container, Plastic, EN	Ø 31,5 x 30,5	0,25
HR-G0234	Hydrometer, 1100-1200 g/ml, ASTM	3x3x30	0,1
HR-G0235	Hydrometer, 1200-1300 g/ml, EN/ASTM	3x3x30	0,1
HR-G0918	Sodium Sulphate, ASTM	---	1
HR-G0933	Magnesium Sulphate, EN/ASTM	---	1

Product Code	Product Name	Test Type	Dimensions (mm)	Aperture (mm)	Weight (kg)
HR-G4043	Density Basket	Magnesium Sulphate	Ø 120 x 160	3,35 (No.6)	0,5
HR-G4049	Density Basket	Magnesium Sulphate	Ø 95 x 120	1,18 (No.16)	0,3
HR-G4050	Density Basket	Magnesium Sulphate	Ø 95 x 120	0,600 (No.30)	0,3
HR-G4051	Density Basket	Magnesium Sulphate	Ø 65 x 80	0,150 (No.100)	0,2
HR-G4044	Density Basket	Sodium Sulphate	Ø 120 x 160	1,7 (No.12)	0,5
HR-G4045	Density Basket	Sodium Sulphate	Ø 120 x 160	0,600 (No.30)	0,5
HR-G4047	Density Basket	Sodium Sulphate	Ø 200 x 200	9,5 (3/8")	1,3

\*\*\*For different size, please contact with our company.



HR-A3005



HR-A3010



HR-A3000

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A3005	Magnesium Sulphate Test Set	30x30x25	3	---
HR-A3010	Sodium Sulphate Test Set	30x30x25	3	---
HR-A3000	Magnesium/Sodium Sulphate Test Water Bath	65x55x100	60	220 V, 50-60 Hz, 1 ph

## DETERMINATION OF DRYING SHRINKAGE

STANDARDS: EN 1367-4, BS 812:102

The test is developed on concretes of fixed mix proportions and aggregates of 20mm max size.

The set consists of Length Measuring Frame, Steel Mould according to the related standard, Steel Inserts for mould and Reference Rod. The set is available in three models; with 0,01 mm Analogue Dial Gauge, with 0.01 mm Digital Dial Gauge and with 0.001 mm Digital Dial Gauge.

Prism Mould, 50x50x200 mm, three gang, complete with steel inserts, to determine the thermal properties and weathering of aggregates in drying shrinkage of concrete.

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

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

Digital Dial Indicator has two alternatives as 12.7 x 0,01 mm or 12.7 x 0,001 mm resolution.

### Technical Specifications:

Product Code	Product Name
HR-A0905/AS	Analog Drying Shrinkage Complete Set with HR-G0875
HR-A0910/DS	Digital Drying Shrinkage Complete Set with HR-G0877
HR-A0905/DS	Digital Drying Shrinkage Complete Set with HR-G0879



HR-A0905 with HR-G0875

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A1000	Prism Mould, 50x50x200 mm	33x7x22	15
HR-A1000/1	Steel Insert for HR-A1000 (Pack of 10)	---	---
HR-A1000/2	Reference Rod	20,5	---
HR-A0905	Length Comparator	18x18x45	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-A0905 with HR-G0877



HR-A1000 with  
HR-A1000/1 & HR-A1000/2

## ALKALI-SILICA REACTION BATH

STANDARDS: CANADA CSA-A23.2-25A

HR-A0925 Alkali-Silica Reaction Bath is used to keep 25x25x285 mm concrete samples in NaOH (sodium hydroxide) at a specified temperature. The temperature can be adjusted from ambient to 100 °C using a digital thermostat with 1 °C accuracy.

Temperature can also be monitored by an external 1°C accuracy PT 100 sensor placed in the water. The bath is completely made of stainless steel and has glass cover.

Samples are placed on a special rack where each sample stays independent from each other in a vertical position. The bath is also equipped with an electronic water level indicator which gives an alarm when the water level is lower than required.

The device is used to determine the potential alkali reactivity of cement-aggregate combinations (mortar-bar method). This mould is also used for determining the length change of hardened cement paste, mortar and concrete.

By removing the special rack, Aggregate Reaction Bath can also be used as a general purpose water bath.

Length Comparator, Analog or Digital Dial Gauge, Two Gang Prism Shrinkage Mould, Steel Inserts and Reference Rod should be ordered separately.



**HR-A0925**



**HR-CE9010**



**HR-A0905 with HR-G0875**

**HR-A0905 with HR-G0877**

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-A0925	Alkali-Silica Reaction Bath with holding 36 samples	55x100x80	70	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0905	Length Comparator	18x18x45	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-CE9010	Two Gang Prism Shrinkage Mould, 25x25x285 mm	33x19x7	4
HR-CE9010/1	Steel Insert for HR-CE9010 (Pack of 10)	---	---
HR-CE9010/2	Reference Rod	30,5	---

## FREEZING AND THAWING CHAMBERS

STANDARDS: EN 1338, 1339, 1340, 1367-6, 12371, 13748-2, CEN/TS 12390-9

Used for the determination of resistance to freezing and thawing by providing freezing / thawing in air/water.

Freezing and Thawing Chamber can holding at constant temperature, heating and cooling at desired speeds, water intake and water discharge operations. There is a discharge valve for discharging operations.

3 models are available. Freezing and Thawing Chamber on Air, Freezing on Air and Thawing on Water Chamber and Freezing on Water and Thawing on Water Chamber.

Freezing and Thawing Chamber; automatically stops all operations when the end of the set cycle. If it is required to stay at a specified temperature at the end of the cycle, this can be done by adding to program before the program starts.

In the water thawing step; the water intake moment, the waiting period in water, the water discharge moment can be defined as parameters, each of which is a different step.

The cabin has a cover at the top and equipped with a piston pusher. The water intake tank is stand-alone.

The control unit is electronic and equipped with digital display with 0.1°C temperature resolution.

Software for data transfer to a computer is supplied complete with the cabinet, and data can be monitored during the tests.



HR-G6005

### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Power Supply
HR-G6000	Freezing and Thawing Chamber on Air	250	220 V, 50-60 Hz, 1 ph
HR-G6000/AW	Freezing on Air and Thawing on Water Chamber	250	220 V, 50-60 Hz, 1 ph
HR-G6005	Freezing and Thawing Chamber on Air	500	220 V, 50-60 Hz, 1 ph
HR-G6005/AW	Freezing on Air and Thawing on Water Chamber	500	220 V, 50-60 Hz, 1 ph
HR-G6005/W	Freezing on Water and Thawing on Water Chamber	500	220 V, 50-60 Hz, 1 ph
HR-G6010	Freezing and Thawing Chamber on Air	750	380 V, 50-60 Hz, 3 ph
HR-G6010/AW	Freezing on Air and Thawing on Water Chamber	750	380 V, 50-60 Hz, 3 ph
HR-G6010/W	Freezing on Water and Thawing on Water Chamber	750	380 V, 50-60 Hz, 3 ph
HR-G6015	Freezing and Thawing Chamber on Air	1000	380 V, 50-60 Hz, 3 ph

Technical Specifications	Freezing and Thawing on Air	Freezing on Air and Thawing on Water & Freezing on Water and Thawing on Water
Temperature Range (Moisture free)	-20 + 25°C	-20 + 60°C / 0 + 60°C
Temperature Resolution	± 0,1°C	± 0,1°C
Power Supply	230 V, 50 Hz	230 V, 50 Hz
Controller	Step Controlled PLC	Step Controlled PLC
Internal Surface Material	Stainless Steel	Stainless Steel
External Surface Material	Steel with Electrostatic Powder Paint	Steel with Electrostatic Powder Paint