



## BITUMEN & ASPHALT

Asphalt, also called bituminous conglomerate, is a fundamental material of road construction field. The main area of usage of bituminous mixtures is in road construction. Bituminous mixtures consist of essentially two ingredients, aggregate and binder. The major difference between asphalt and concrete is that bitumen and bituminous materials are used as binder in asphalt.

Due to the ever increasing intensity of today's traffic conditions there is a demand for higher levels of performance from roads. As a result, the testing of the asphalt needs to look not only at the constituent mix but the performance characteristics as well.

Analysis and design tests of bituminous mixtures, bitumen and bituminous tests, asphalt and road quality tests are provided for engineering firms and construction companies to produce, inspect and evaluate the paving materials to ensure the strength, physical and mechanical performance and durability towards safe application and use.

## CONTENTS

CENTRIFUGE EXTRACTORS.....	74	PRESSURE FILTER .....	113
REFLUX EXTRACTORS.....	74	BINDER RECOVERY APPARATUS, VACUUM PUMP METHOD.....	114
SOLVENT RECOVERY STILL.....	75	HOT EXTRACTION METHOD SOLUBLE BINDER CONTENT .....	114
LARGE SIZE HEAVY DUTY VACUUM PYKNOMETER (YALE PYKNOMETER).....	76	HOT EXTRACTOR SET (PAPER FILTER METHOD).....	115
CORE DRILLING MACHINE (Petrol Engine) .....	77	NON-NUCLEAR ASPHALT DENSITY GAUGE .....	116
CORE DRILLING MACHINE ON TRAILER (Petrol Engine).....	78	NON-NUCLEAR ASPHALT DENSITY GAUGE, TOUCH SCREEEN.....	117
VIBRATING HAMMER.....	79		
ASPHALT MIXERS.....	80		
MANUAL MARSHALL COMPACTORS.....	81		
AUTOMATIC MARSHALL COMPACTOR, EN .....	81		
AUTOMATIC MARSHALL COMPACTOR, ASTM .....	82		
MARSHALL MOULDS .....	83		
UNIVERSAL EXTRUDER.....	83		
MARSHALL STABILITY TEST MACHINE WITH LOAD RING .....	84		
DIGITAL MARSHALL STABILITY TEST MACHINE .....	85		
DIGITAL MARSHALL STABILITY TEST MACHINE (TOUCH SCREEN).....	86		
CBR & MARSHALL TESTING MACHINE WITH LOAD RING .....	89		
CBR & MARSHALL & UNAXIAL TESTING MACHINE .....	90		
CBR & MARSHALL & UNAXIAL TESTING MACHINE (TOUCH SCREEN) .....	92		
WATER BATHS.....	96		
BITUMEN PENETROMETER .....	97		
AUTOMATIC BITUMEN PENETROMETER .....	97		
BITUMEN OVEN FOR ROLLING THIN-FILM OVEN TEST (RTFOT).....	99		
BITUMEN OVEN FOR THIN-FILM OVEN & LOSS ON HEATING TEST (TFOT).....	100		
WATER IN BITUMINOUS MATERIALS TEST SET (DEAN-STARK METHOD).....	100		
ABA - ASPHALT BINDER ANALYZER .....	101		
DUCTILITY TESTING MACHINE .....	102		
AUTOMATIC RING AND BALL SOFTENING POINT APPARATUS .....	103		
RING AND BALL SOFTENING POINT APPARATUS .....	104		
RATE OF SPREAD SPRING BALANCE.....	105		
APPARATUS FOR DISTILLATION OF CUT-BACK ASPHALT .....	105		
CLEVELAND FLASH AND FIRE POINT TESTER.....	106		
TAG CLOSED-CUP FLASH POINT TESTER .....	106		
SAYBOLT VISCOMETER .....	107		
ENGLER VISCOMETER .....	107		
AUTOGRAPHIC RECORDING TRAVELLING BEAM DEVICE.....	108		
SOLUBILITY TEST SET.....	109		
MOT STRAIGHT EDGE .....	109		
BENKELMAN BEAM DEVICE.....	110		
PLATE BEARING EQUIPMENT .....	110		
ASPHALT MIXTURE MAXIMUM THEORY DENSITY METER.....	111		
VIALIT PLATE (BINDER ADHESION) TEST .....	112		
DEPOT TRAY TEST SET .....	112		
BOTTLE ROLLER APPARATUS .....	113		

## HİRA TESTING EQUIPMENT

### CENTRIFUGE EXTRACTORS

STANDARDS: EN 12697-1 Clause B.1.5; EN 13108, ASTM D2172, AASHTO T164 A

Used for the determination of bitumen percentage in bituminous mixtures.

It consists of a removable precision machined rotor bowl, housed in a cylindrical aluminum box.

They are driven by an electric motor fitted with AC drive (inverter) with the double function of speed control up to 3600 rpm. Regardless of the frequency (50 or 60 Hz) and electrical breaking.

The centrifuge can be set for the automatic speed ramp up to 3600 rpm and will stop in 10-15 seconds.

The control panel includes: Start/Stop button and speed control knob.

Two models are available with 1500 g and 3000 g capacity.

The Centrifuge Extractors are supplied with aluminum Bowl and Cover and Filter Papers.



HR-AS1505

#### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1500	Centrifuge Extractor	1500	65x45x55	35	220 V, 50-60 Hz, 1 ph
HR-AS1505	Centrifuge Extractor	3000	65x45x55	35	220 V, 50-60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS1500/1	Filter Paper for HR-AS1500 (Pack of 50)
HR-AS1500/2	Rotating Bowl and Cover for HR-AS1500
HR-AS1505/1	Filter Paper for HR-AS1505 (Pack of 50)
HR-AS1505/2	Rotating Bowl and Cover for HR-AS1505



HR-AS1505/1

### REFLUX EXTRACTORS

STANDARDS: ASTM D2172, AASHTO T 164-B

Used for the quantitative determination of bitumen in hot-mixed paving mixtures and pavement samples. The bitumen content is calculated by difference from the weight of extracted aggregates, moisture content and ash from aliquot part of the extract.

The Reflux Extractor is available in two, 1000 g and 4000 g capacity models.

The apparatus comprises a cylindrical glass jar, two wire mesh cones with interlocking frames, a water condenser with inlet/outlet tubes, hot plate and 50 filter papers.



HR-AS1525/4



HR-AS1525

## Technical Specifications:

Product Code	Product Name	Capacity (gr)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1520	Reflux Extractor Test Set, 1000 gr	1000	26x26x62	10	220 V, 50-60 Hz, 1 ph
HR-AS1525	Reflux Extractor Test Set, 4000 gr	4000	26x26x62	12	220 V, 50-60 Hz, 1 ph

## Spare Parts & Accessories:

Product Code	Product Name	Capacity (gr)	Dimensions (cm)	Weight (kg)
HR-AS1520/1	Reflux Extractor Glass Jar	1000	Ø 15 x 46	6
HR-AS1520/2	Reflux Extractor Condenser	1000	---	---
HR-AS1520/3	Reflux Extractor Wire Mesh Cone	500	---	---
HR-AS1520/4	Filter Paper (pack of 50)	---	Ø 30	---
HR-AS1520/5	Iron Wire Gauze for HR-AS1520	---	12x12	---
HR-AS1525/1	Reflux Extractor Glass Jar	4000	Ø 22 x 46	8
HR-AS1525/2	Reflux Extractor Condenser	4000	---	---
HR-AS1525/3	Reflux Extractor Wire Mesh Cone	2000	---	---
HR-AS1525/4	Filter Paper (pack of 50)	---	Ø 40	---
HR-AS1525/5	Iron Wire Gauze for HR-AS1525	---	16x16	---
HR-G1010	Single Hot Plate. Thermostat Controlled	---	30x30x20	2,5

## SOLVENT RECOVERY STILL

The efficient and compact unit, easy to install, is totally self-contained. It is provided of two tanks: one for the clean solvent and one for the dirty solvent and of a water coolant system which only needs to be connected to a water tap.

The inside of the containers are stainless steel for low corrosion and long life time. Two liquid levels to see the volume of clean and dirty solvents.

Capacity is 10 liters/h.

Electrical heater and water cooling system.

Supplied with 10m plastic tube, tube clamps, sieve insert 0.6 mm opening and one lid.

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1535	Solvent Recovery Still	32x40x65	25	220 V, 50-60 Hz, 1 ph

## Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-AS1535/1	Circulation Pump	220 V, 50-60 Hz, 1 ph
HR-AS1535/2	Plastic Water Bucket	---



HR-AS1535



## HIRA TESTING EQUIPMENT

### LARGE SIZE HEAVY DUTY VACUUM PYKNOMETER (YALE PYKNOMETER)

#### THEORETICAL MAXIMUM SPECIFIC GRAVITY OF UNCOMPACTED BITUMINOUS PAVING MIXTURES (RICE-TEST)

STANDARDS: ASTM D2041, EN 12697-5, EN 13108, AASHTO T209, T283

It is utilized for a rapid determination of asphalt content, bulk specific gravity of aggregates and the maximum theoretic specific gravity of bituminous uncompact road mixtures and the percent air voids in compacted mixtures.

There are two models of Vacuum Pyknometer as Stainless Steel or Transparent made. Both of models are supplied with Transparent Plexiglas cover, valve and gauge.

Complete With Vacuum Pyknometer, Vibro-Deaerator, Vacuum Pump, 1,5 m tubing for vacuum, Vacuum Gauge and Filter Flask 250 ml.

Vibro-Deaerator is time controlled. To vibrate the pyknometer for the evacuation for the air. This unit can be used also as a sieve shaker.

Vacuum Pump is Portable, oil type, complete with 1,5 m tubing for vacuum.

Air Drying Unit and Silica Gel should be ordered separately.



HR-AS1550/2



HR-AS1560/1

#### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1550	Vacuum Pyknometer Test Set, Stainless Steel	10 lt	51x51x82	40	220 V, 50 Hz, 1 ph
HR-AS1550/60Hz	Vacuum Pyknometer Test Set, Stainless Steel	10 lt	51x51x82	40	220 V, 60 Hz, 1 ph
HR-AS1560	Vacuum Pyknometer Test Set, Transparent	10 lt	51x51x82	35	220 V, 50 Hz, 1 ph
HR-AS1560/60Hz	Vacuum Pyknometer Test Set, Transparent	10 lt	51x51x82	35	220 V, 60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name	Capacity	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1550/1	Vacuum Pyknometer, Stainless Steel	10 lt	Ø 30 x 45	8	---
HR-AS1560/1	Vacuum Pyknometer, Transparent	10 lt	Ø 30 x 45	5	---
HR-G0500	Vibro-Deaerator	---	51x51x37	24	220 V, 50 Hz, 1 ph
HR-G0500/60Hz	Vibro-Deaerator	---	51x51x37	24	220 V, 60 Hz, 1 ph
HR-G0800	Vacuum Pump	51 lt/min. - 2 Pa	29x13x23	6,6	220 V, 50-60 Hz, 1 ph
HR-G0815	Tubing for Vacuum	1,5 m	---	---	---
HR-G0816	Vacuum Gauge Manometer	1000 mbar	Ø 6,3	0,15	---
HR-G0080	Filter Flask	250 ml	19x19x31	0,2	---
HR-AS1550/2	Air Drying Unit	500 g	---	---	---
HR-G0935	Silica Gel, 1 kg	1 kg	---	1	---

## CORE DRILLING MACHINE (PETROL ENGINE)

STANDARDS: EN 12697-27

Compact and portable HR-AS1575 Core Drilling Machine is designed to cut cores up to 150 mm diameter from concrete, asphalt and similar hard construction materials.

These drilling machines are extremely robust, heavy duty, compact and reliable. The sliding group is rectified so as to assure a very soft and accurate drilling movement.

Built in water swivel to cool the diamond bit.

The robust steel base is equipped with wheels for easy site displacements, together with four levelling and stabilizing feet.

All working and moving parts are plated for rust protection.

The motor assembly comprises a 6.5 hp petrol engine. A ball screw mechanism enables close control of the drilling pressure and rapid return when drilling is completed.

The machine comprises a vertical support column which carries the drill head/ motor assembly.

The equipment is supplied complete with base unit, motor swivel attachment.

Strap wrench, Spanner, s and Core Extractors should be ordered separately.



HR-AS1575



HR-AS1607

HR-AS1606

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1600	Core Bit, Ø 50 mm	Ø 5 x 45	2
HR-AS1601	Core Bit, Ø 75 mm	Ø 7,5 x 45	2,5
HR-AS1602	Core Bit, Ø 100 mm	Ø 10 x 45	3
HR-AS1603	Core Bit, Ø 150 mm	Ø 15 x 45	5
HR-AS1606	Core Extractor, Ø 100 mm	30x25x25	2
HR-AS1607	Core Extractor, Ø 150 mm	30x25x25	3
HR-G0780	Strap wrench	---	---
HR-G0781	Spanner	---	---

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Engine Power (hp)
HR-AS1575	Core Drilling Machine (Petrol Engine)	50x85x120	105	6,5

## HİRA TESTING EQUIPMENT

### CORE DRILLING MACHINE ON TRAILER (PETROL ENGINE)

STANDARDS: EN 12697-27

Core Drilling Machine on trailer is designed to cut cores up to 150 mm diameter from asphalt, concrete and other similar hard construction material.

These drilling machines are extremely robust, heavy duty, compact and reliable. The sliding group is rectified so as to assure a very soft and accurate drilling movement.

Built in water swivel to cool the diamond bit.

The machine comprises a vertical support column which carries the drill head/ motor assembly.

All working and moving parts are plated for rust protection.

The motor assembly comprises a 6.5 Hp petrol engine. A ball screw mechanism enables close control of the drilling pressure and rapid return when drilling is completed.

The drilling machine is installed in a trailer for fast and precise sampling on-site. 100 lt water tank provides continuous spraying during drilling to protect diamond core. The two-wheeler taut liner trailer is fully equipped with brake lamps/hazard flashers/retro reflectors conforming to road traffic regulations. The trailer is designed with a space to be used for storing the core samples. The two fixing legs are robustly designed for improved stabilization.

Strap wrench, Spanner, Core Bits and Core Extractors should be ordered separately.

#### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1600	Core Bit, Ø 50 mm	Ø 5 x 45	2
HR-AS1601	Core Bit, Ø 75 mm	Ø 7,5 x 45	2,5
HR-AS1602	Core Bit, Ø 100 mm	Ø 10 x 45	3
HR-AS1603	Core Bit, Ø 150 mm	Ø 15 x 45	5
HR-AS1606	Core Extractor, Ø 100 mm	30x25x25	2
HR-AS1607	Core Extractor, Ø 150 mm	30x25x25	3
HR-G0780	Strap wrench	---	---
HR-G0781	Spanner	---	---



HR-AS1606



HR-AS1607

HR-AS1603



HR-AS1602

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Engine Power (hp)
HR-AS1580	Core Drilling Machine On Trailer	160x260x200	290	6,5

## VIBRATING HAMMER

STANDARDS: EN 12697-9, 12697-10, 12697-32, BS 598:10, BS 1377:4, 1924:2

The HR-AS2335 Vibratory Compactor Set is used to prepare the moulded test specimens of bituminous mixtures in loose state by using the vibratory compaction technique. Such specimens are used to determine maximum density as described EN 12697- 5, bulk density as described in EN 12697-6, void characteristics as described in EN 12697-8, reference density as described in EN 12697-9 or compactability as described in EN 12697-10 for a bituminous mixtures.

The HR-AS2335 Vibratory Compactor Set consists of a Vibrating Hammer, Supporting Frame, Small and Large Tamping Foots and 300 mm Shank.

P.R.D.(percentage refusal density) Split mould is vertically split on one side, foreseen of clamp attachment to the base plate, plated against corrosion, is utilized for determining the degree of compaction of bituminous pavements, for quality control purpose.

The split mould and base plate should be ordered separately.

The set is also used for compaction of proctor and CBR soil specimens.

Vibrating Hammer has double insulated motor, trigger handle, for asphalt compaction in percentage refusal density test.

Supporting Frame for Vibrating Hammer; the sliding mass has a total weight (including hammer and tamping foot) of 37 kg as requested by EN standards. Steel made, plated against corrosion.



### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2335	Vibratory Compactor Set	51x30x112	75	220 V, 50-60 Hz, 1ph



HR-AS2335/3

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2335/1	Vibrating Hammer	11x43x27	7	220 V, 50-60 Hz, 1ph
HR-AS2335/2	Supporting Frame for Vibrating Hammer	51x30x112	45	---
HR-AS2335/3	P.R.D.(Percentage Refusal Density) Split Mould	Ø 10 x 15	12	---
HR-AS2335/4	Small Tamping Foot, Ø 102 mm	Ø 10,2	---	---
HR-AS2335/5	Large Tamping Foot, Ø 146 mm	Ø 14,6	---	---
HR-AS2335/6	Shank, 300 mm Long for Tamping Foot	30	---	---



# HİRA TESTING EQUIPMENT

## ASPHALT MIXERS

STANDARDS: EN 12697-35

This mixers has been designed to mix bituminous samples for compaction tests, Marshall and tensile splitting test and for other tests where uniformity is required.

Thanks to the planetary action this mixer ensures a complete and uniform mixing.

The machine is provided with a variable speed drive allowing to set a wide range of speeds.

A timer allows to select the mixing time or the continuous mixing.

The bituminous mix must be prepared at prescribed temperature for this reason the mixer can equipped with thermostatically controlled heater.

The mixer is supplied complete with suitable capacity bowl and the beater.

Electric heater should be ordered separately.



HR-AS1625/1



HR-AS1625

### Technical Specifications:

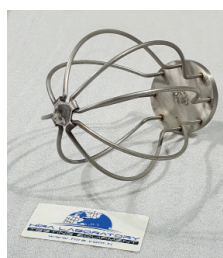
Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1625	Asphalt Mixer	5	30x55x65	55	220 V, 50-60 Hz, 1 ph
HR-AS1630	Asphalt Mixer	10	70x75x80	75	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1625/1	Bowl for HR-AS1625	5	---	---	---
HR-AS1625/2	Beater for HR-AS1625	---	---	---	---
HR-AS1625/3	Electric Heater for HR-AS1625	---	Ø 25x30	5	220 V, 50-60 Hz, 1 ph
HR-AS1630/1	Bowl for HR-AS1630	10	---	---	---
HR-AS1630/2	Beater for HR-AS1630	---	---	---	---
HR-AS1630/3	Electric Heater for HR-AS1630	---	Ø 30x35	7	220 V, 50-60 Hz, 1 ph



HR-AS1630



HR-AS1630/2



HR-AS1630/1



HR-AS1630/3



## MANUAL MARSHALL COMPACTORS

STANDARDS: ASTM D6926, D5581, AASHTO T245 (for HR-AS1700)

Manual Marshall Compactor is used to compress the Marshall samples manually.

The trip mechanism is arranged so that the sliding hammer falls at the same distance for every blow.

Manual Marshall Compactor is used to compact Marshall Specimens with hand, manually. The sliding weight is  $4536 \pm 9$  gr and dropped by the user from a height of  $457 \pm 3$  mm manually.

The assembly consists of a compaction hammer, wooden compaction pedestal, support rod to hold the hammer in perpendicular position and mould holder.

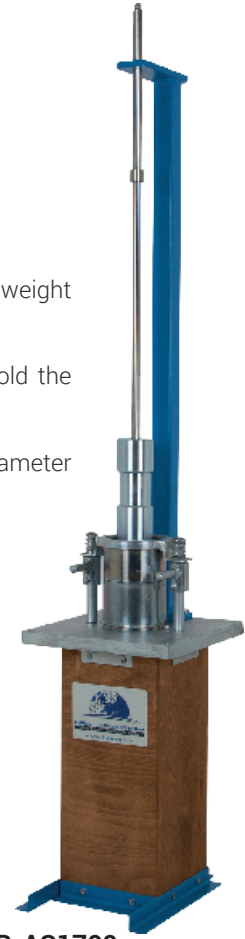
2 models are available. HR-AS1700 is used for 4" diameter moulds and HR-AS1705 is used for 6" diameter moulds.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1700	Manual Marshall Compactor Set (4")	35x40x160	50
HR-AS1710	Manual Marshall Compactor Set (6")	35x40x160	56

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1700/1	Compaction Hammer for HR-AS1700	10x10x11	8
HR-AS1701	Wooden Compaction Pedestal	35x40x160	42
HR-AS1705	Compaction Hammer (BS)	10x10x11	8
HR-AS1710/1	Compaction Hammer for HR-AS1710	10x10x11	14



HR-AS1700

## AUTOMATIC MARSHALL COMPACTOR, EN

STANDARDS: EN 12697-10, EN 12697-30

This ruggedly constructed machine has been designed to eliminate the laborious process of hand compaction.

The apparatus automatically compacts the sample and stops after the preset number of blows.

The mould is held in position by a quick and practical clamping device. The trip mechanism is arranged so that the sliding hammer falls at the same distance for every blow. The compactor includes the laminate hardwood block and vibrated concrete base  $45 \times 45 \times 20$  cm.

All moving parts are protected with safety guard, which stops automatically the compactor when opened, and the control panel is fit with an emergency stop red button, all conforming to CE prescriptions.

The drive mechanism lifts the  $4550 \text{ g} \pm 20$  gr compaction hammer, plated against corrosion, to the height of  $460 \text{ mm} \pm 3$  mm allows free fall.

Soundproof Safety Cabinet is available as optional and should be ordered separately.

### Technical Specifications:

Product Code	HR-AS1750	HR-AS1750/60Hz
Product Name	Automatic Marshall Compactor	
Blows frequency	50 blows in 55/60 s	
Sliding mass weight (g)	$4535 \pm 15$	
Free fall height (mm)	$457 \pm 5$	
Overall dimensions (cm)	$55 \times 192 \times 55$	
Weight (kg)	265	
Power Supply	220 V, 50 Hz, 1 ph	220 V, 60 Hz, 1 ph



HR-AS1750

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS1750/1	Soundproof Safety Cabinet

## HİRA TESTING EQUIPMENT

### AUTOMATIC MARSHALL COMPACTOR, ASTM

STANDARDS: ASTM D1559, ASTM D 6926, AASHTO T245

This ruggedly constructed machine has been designed to eliminate the laborious process of hand compaction.

The apparatus automatically compacts the sample and stops after the preset number of blows.

The mould is held in position by a quick and practical clamping device. The trip mechanism is arranged so that the sliding hammer falls at the same distance for every blow. The compactor includes the laminate hardwood block.

All moving parts are protected with safety guard, which stops automatically the compactor when opened, and the control panel is fit with an emergency stop red button.

There are 2 models designed for 4" and 6" dia. Marshall molds.

In the model for 4" dia. Marshall molds, The drive mechanism lifts the 4536 g  $\pm$  9 gr compaction hammer, plated against corrosion, to the height of 457mm  $\pm$  3 mm allows free fall.

In the model for 6" dia. Marshall molds, The drive mechanism lifts the 10205 g  $\pm$  10 gr compaction hammer, plated against corrosion, to the height of 457mm  $\pm$  3 mm allows free fall.

Soundproof Safety Cabinet is available as optional and should be ordered separately.

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS1755/2	Compaction Hammer for HR-AS1755
HR-AS1760/2	Compaction Hammer for HR-AS1760
HR-AS1750/1	Soundproof Safety Cabinet for HR-AS1755
HR-AS1760/1	Soundproof Safety Cabinet for HR-AS1760



**HR-AS1755**

#### Technical Specifications:

Product Code	HR-AS1755	HR-AS1755/60Hz	HR-AS1760	HR-AS1760/60Hz
Product Name	Automatic Marshall Compactor			
Suitable Sample Dia.	4"		6"	
Blows frequency	60 blows in 60 s			
Sliding mass weight (g)	4536 ±9		10205 ± 10	
Free fall height (mm)	457 ±3			
Overall dimensions (cm)	55x190x55		60x195x70	
Weight (kg)	127		140	
Power Supply	220 V, 50 Hz, 1 ph	220 V, 60 Hz, 1 ph	220 V, 50 Hz, 1 ph	220 V, 60 Hz, 1 ph

## MARSHALL MOULDS

STANDARDS: EN 12697-10, 12697-30, ASTM D1559, D6926, D5581; AASHTO T245

The Marshall Compaction Moulds are used to produce the Marshall specimens with automatic or manual compactors.

Complete with base plate, mould body and collar. Marshall Mould is made of Steel and plated against corrosion.

### Technical Specifications:

Product Code	Product Name	Standard	Dimensions	Weight (kg)
HR-AS1770	Marshall Mould Set	EN	Ø 101,6 mm	3,7
HR-AS1775	Marshall Mould Set	ASTM	4"	3,7
HR-AS1780	Marshall Mould Set	ASTM	6"	6
HR-AS1785	Marshall Storage Plate for 6 pcs. for 4"specimens	EN, ASTM	25x50x7 cm	6

### Spare Parts & Accessories:

Product Code	Product Name	Standard	Dimensions	Weight (kg)
HR-AS1770/1	Mould Body for HR-AS1770	EN	Ø 101,6 mm	1,3
HR-AS1770/2	Base plate for HR-AS1770	EN	Ø 120 x 170 mm	1,5
HR-AS1770/3	Collar for HR-AS1770	EN	Ø 101,6 mm	0,9
HR-AS1775/1	Mould Body for HR-AS1775	ASTM	4"	1,3
HR-AS1775/2	Base plate for HR-AS1775	ASTM	Ø 120 x 170 mm	1,5
HR-AS1775/3	Collar for HR-AS1775	ASTM	4"	0,9
HR-AS1780/1	Mould Body for HR-AS1780	ASTM	6"	2,2
HR-AS1780/2	Base plate for HR-AS1780	ASTM	Ø 175 x 210 mm	2,5
HR-AS1780/3	Collar for HR-AS1780	ASTM	6"	1,3
HR-AS1790	Filter paper for HR-AS1770 & HR-AS1775	ASTM	4"	---
HR-AS1795	Filter paper for HR-AS1780	ASTM	6"	---



HR-AS1795



HR-AS1790

## UNIVERSAL EXTRUDER

STANDARDS: EN 12697-30, 13286-2, 13286-47; AASTHO T245, T134, T180, T193; ASTM D1559, D698, D1557, D1883; BS 598-107, 1377-4, 1924-2

Used to extrude samples having dia. 4", 6", 100 mm and 150 mm. It can therefore extrude CBR, Marshall and Proctor specimens.

The extruder is actuated by a 50 kN hydraulic jack, having ram travel of 130 mm + 90 mm screw.

Supplied complete with adaptors.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1800	Universal Extruder	Ø 30 x 54	30



HR-AS1800

## HİRA TESTING EQUIPMENT

### MARSHALL STABILITY TEST MACHINE WITH LOAD RING

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245

The HR-AS5005 50 kN Capacity Marshall Stability Test Machine with Load Ring is used to determine the maximum load and flow values of bituminous mixtures. The machine comprises of a robust and compact two column frame with adjustable upper cross beam. The unit is a bench mounting compression frame with motor and worm gear housed within the base unit.

Platen rate is 50.8 mm/min also maintained under load thanks to an overpowered electric motor.

For safety, the up and down travel of the lower platen is limited the use of limit switches. The machine can be hand operated by a lateral hand wheel for calibration purposes.

The Marshall Stability Test Machine with Load Ring is supplied complete with 50 kN capacity Load Ring with 0,01 mm resolution Analog Dial gauge, 30 x 0,01 mm Dial Gauge and Breaking Head (Stability Mould) for Ø 4" Marshall samples.

Breaking Head (Stability Mould) for Ø 6" Marshall samples, Indirect Tensile Splitting Device for Ø 4" Marshall samples, Indirect Tensile Splitting Device for Ø 6" Marshall samples, Loading Strips, Ø 100 mm, for Tensile Splitting Device, Loading Strips, Ø 160 mm, for Tensile Splitting Device and Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") & Ø 150 mm (6") samples should be ordered separately.



HR-AS5005

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS5005	Marshall Stability Test Machine with Load Ring	47x61x95	89	220 V, 50 Hz, 1 ph
HR-AS5005/60Hz	Marshall Stability Test Machine with Load Ring	47x61x95	89	220 V, 60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/1	Breaking Head (Stability Mould) for Ø 4" Marshall samples
HR-AS5000/2	Breaking Head (Stability Mould) for Ø 6" Marshall samples
HR-G5003	Load Ring, 50 kN capacity with 0,01 mm resolution Analog Dial gauge
HR-G0876	Dial Gauge, 30 x 0,01 mm
HR-AS5000/3	Indirect Tensile Splitting Device for Ø 4" Marshall samples
HR-AS5000/4	Indirect Tensile Splitting Device for Ø 6" Marshall samples
HR-AS5000/5	Loading Strips, Ø 100 mm, for Tensile Splitting Device
HR-AS5000/6	Loading Strips, Ø 160 mm, for Tensile Splitting Device
HR-AS5000/7	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") samples
HR-AS5000/10	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 150 mm (6") samples



HR-AS5000/7



## DIGITAL MARSHALL STABILITY TEST MACHINE

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245, AASHTO T283

The HR-AS5000 50 kN Capacity Digital Marshall Stability Test Machine is used to determine the maximum load and flow values of bituminous mixtures.

The machine comprises of a robust and compact two column frame with adjustable upper cross beam. The unit is a bench mounting compression frame with motor and worm gear housed within the base unit. It is designed to operate with the minimum of maintenance.

Platen rate is 50.8 mm/min also maintained under load thanks to an overpowered electric motor.

For safety, the up and down travel of the lower platen is limited the use of limit switches. Rapid adjustment of the platen is controlled using the up and down buttons on the digital readout unit. The measuring system consists of a 50 kN capacity Load cell fitted to the upper cross beam to read stability values and the 25 mm Displacement Sensor fitted to the Breaking Head.

Supplied complete with LCD Marshall Control Unit, 50 kN capacity Load Cell, 25 x 0.01 mm Linear potentiometric displacement transducer with holder, Breaking Head (Stability Mould) for Ø 4" Marshall samples.

Breaking Head (Stability Mould) for Ø 6" Marshall samples, Indirect Tensile Splitting Device for Ø 4" Marshall samples, Indirect Tensile Splitting Device for Ø 6" Marshall samples, Loading Strips, Ø 100 mm, for Tensile Splitting Device, Loading Strips, Ø 160 mm, for Tensile Splitting Device and Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") & Ø 150 mm (6") samples should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS5000	Digital Marshall Stability Test Machine	47x61x95	89	220 V, 50 Hz, 1 ph
HR-AS5000/60Hz	Digital Marshall Stability Test Machine	47x61x95	89	220 V, 60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/F	Marshall Stability Test Frame, 50 kN capacity
HR-G0981	Load cell, 50 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-AS5000/8	LCD Marshall Control Unit
HR-AS5000/1	Breaking Head (Stability Mould) for Ø 4" Marshall samples
HR-AS5000/2	Breaking Head (Stability Mould) for Ø 6" Marshall samples
HR-AS5000/3	Indirect Tensile Splitting Device for Ø 4" Marshall samples
HR-AS5000/4	Indirect Tensile Splitting Device for Ø 6" Marshall samples
HR-AS5000/5	Loading Strips, Ø 100 mm, for Tensile Splitting Device
HR-AS5000/6	Loading Strips, Ø 160 mm, for Tensile Splitting Device
HR-AS5000/7	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") samples
HR-AS5000/10	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 150 mm (6") samples



HR-AS5000



HR-AS0500/1 & HR-G0981  
HR-G0995 & HR-AS5000/1



HR-AS5000/7



## HİRA TESTING EQUIPMENT



### DIGITAL MARSHALL STABILITY TEST MACHINE WITH H-TOUCH PRO MAX MARSHALL CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245, AASHTO T283

The HR-AS5000/TS 50 kN Capacity Digital Marshall Stability Test Machine is used to determine the maximum load and flow values of bituminous mixtures.

The machine comprises of a robust and compact two column frame with adjustable upper cross beam. The unit is a bench mounting compression frame with motor and worm gear housed within the base unit. It is designed to operate with the minimum of maintenance.

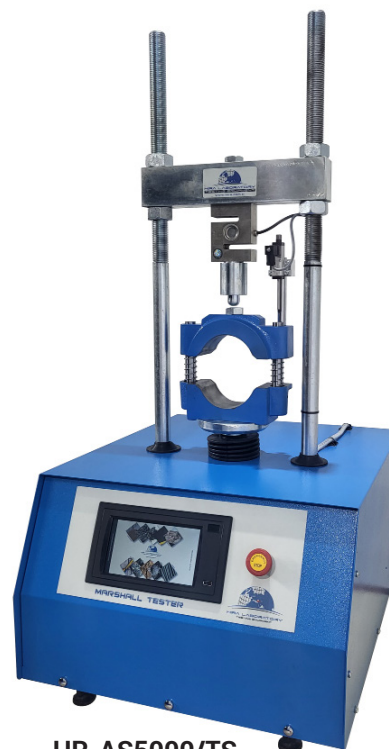
Platen rate is 50.8 mm/min also maintained under load thanks to an overpowered electric motor.

For safety, the up and down travel of the lower platen is limited the use of limit switches. Rapid adjustment of the platen is controlled using the up and down buttons on the digital readout unit.

The measuring system consists of a 50 kN capacity Load cell fitted to the upper cross beam to read stability values and the 25 mm Displacement Sensor fitted to the Breaking Head.

Supplied complete with HİRATEST H-Touch Pro Max Marshall Control Unit, 50 kN capacity Load Cell, 25 x 0.01 mm Linear potentiometric displacement transducer with holder, Breaking Head (Stability Mould) for Ø 4" Marshall samples, HİRATEST H-GUI Marshall Software and LAN Connection Cable.

Breaking Head (Stability Mould) for Ø 6" Marshall samples, Indirect Tensile Splitting Device for Ø 4" Marshall samples, Indirect Tensile Splitting Device for Ø 6" Marshall samples, Loading Strips, Ø 100 mm, for Tensile Splitting Device, Loading Strips, Ø 160 mm, for Tensile Splitting Device and Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") & Ø 150 mm (6") samples should be ordered separately.



HR-AS5000/TS

#### H-TOUCH PRO MAX MARSHALL CONTROL UNIT

HİRATEST H-Touch Pro Max Marshall Control Unit is designed to control Marshall Test Machine to perform by processing of data from displacement transducers which are fitted to the machine.

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

The Unit can perform Marshall tests as a stand-alone without the use of a PC or with the HİRATEST H-GUI Marshall Software and a PC. Control of machine, acquisition of load and displacement data in real time are provided by the unit.

The unit has easy to use menu options.

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 and see all the data while the test running.

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

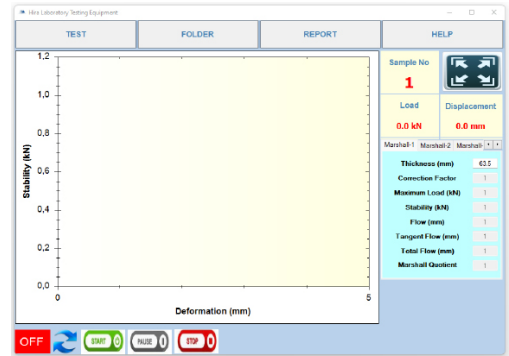
- Flow and stability values are automatically calculated and saved,
- Ability to perform displacement-controlled tests
- Real time display of test graph
- 2 analog channels for load cell and displacement sensors
- Multi-language support (English, French, Spanish, Turkish)
- Real-time date/time
- Test results display and memory management interface
- Calibration function for channels
- Programmable digital gain adjustment for load-cell and potentiometric sensors, voltage and current transmitters
- Closed loop PID for steady pace rate
- Connection and control feature via Ethernet
- Free computer software for test control and enhanced report output



HR-AS5000/8/TS

## Hardware

- Permanent storage capacity up to 10 0000 test results
- 1/256000 dot resolution for each channel
- 10 data acquisition per second (at sample rate) on each channel
- 2 fully customizable analog channels with 24-bit ADC and PGA-FPGA circuit
- Ethernet port for computer connection
- 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
- Choice of three unit systems: kN, ton or lb
- Additional memory support up to 32 GB via external USB flash drive
- Support for -optionally supplied- integrated thermal printer
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive



## Software

HIRATEST H-GUI Marshall Software has been designed for Marshall stability tests in accordance with EN 12697-34, ASTM D 1559, D5581, D 6927, AASHTO T 245, NF P98-0251-2 indirect tensile tests in accordance with EN 12697-23 EN 12697-12 (method A), ASTM 6931, AASHTO T283.

The software includes control of machine, acquisition of load and displacement data, generating and saving reports.

Test type is selected in the software and then the sample height is entered as the test parameter. It automatically calculates correction factor coming from the standards with respect to specimen thickness. The stability value is calculated regarding this factor.

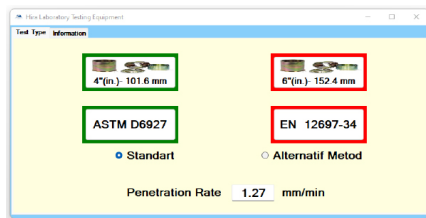
The software continuously updates load and displacement until the end of test. When the test is completed, the sharpest slope of the graph is calculated. The sharpest slope is shifted 1.5 mm to the right side of the graph and the intersection between 2nd slope and original test data is recorded as the stability value for the test. The horizontal distance between the intersection of first slope and X axis and intersection of test data with 2nd slope is recorded as "flow" value.

The report includes all results for 4 samples. The user can see 4 of the results on the same screen for easy comparison.

Marshall Stability and Flow of Asphalt Mixtures							
Company							
Project							
Address							
Bitumen Content							
Marshall Description							
Marshall No. Test Temperature							
Test Date							
Average Marshall Stability							
	Thickness (mm)	Correction Factor	Minimum Load (kN)	Stability (kN)	Flow (mm)	Marshall Q <sub>1</sub> (kN/mm)	
Sample 1							
Sample 2							
Sample 3							
Sample 4							
Average							
Tested By:				Approved By:			

## Main Features of H-GUI Marshall Software

- Multi-language support and user interface
- Refreshing Experiment Graphic Displays on the Screen in Real Time
- Able to save frequently used texts in memory and recall them when necessary
- Modification of test machine parameters using the software



HR-AS0500/1 & HR-G0981  
HR-G0995 & HR-AS5000/1

# HİRA TESTING EQUIPMENT

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS5000/TS	Digital Marshall Stability Test Machine	47x61x95	89	220 V, 50 Hz, 1 ph
HR-AS5000/60Hz/TS	Digital Marshall Stability Test Machine	47x61x95	89	220 V, 60 Hz, 1 ph

## Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/F	Marshall Stability Test Frame, 50 kN capacity
HR-G0981	Load cell, 50 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-AS5000/8/TS	H-Touch Pro Max Marshall Control Unit
HR-AS5000/9	H-GUI Marshall Software
HR-AS5000/1	Breaking Head (Stability Mould) for Ø 4" Marshall samples
HR-AS5000/2	Breaking Head (Stability Mould) for Ø 6" Marshall samples
HR-AS5000/3	Indirect Tensile Splitting Device for Ø 4" Marshall samples
HR-AS5000/4	Indirect Tensile Splitting Device for Ø 6" Marshall samples
HR-AS5000/5	Loading Strips, Ø 100 mm, for Tensile Splitting Device
HR-AS5000/6	Loading Strips, Ø 160 mm, for Tensile Splitting Device
HR-AS5000/7	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 100 mm (4") samples
HR-AS5000/10	Indirect Tensile Test Jig for Compacted Bituminous Samples with 30x0,01 mm Analog Dial Gauge for Ø 150 mm (6") samples



**HR-AS5000/7**

## CBR & MARSHALL TESTING MACHINE WITH LOAD RING

CBR & Marshall Testing Machine with Load Ring is used to make CBR and Marshall Tests.

The device is composed of a robust and compact two column frame with adjustable upper cross beam driven by an electromechanical ram with a maximum capacity of 50 kN.

The frame has 50 kN capacity. Three test speeds are provided 1.0 mm/min for BS CBR Tests, 1.27 mm/min for ASTM/EN/AASHTO CBR Tests and 50.8 mm/min for Marshall Tests.

Three models are available according the Dial Gauge.

The HR-AS0505 Analog Model is supplied complete with 50 kN Load Ring with 0,01 mm resolution Analog Dial Gauge.

The HR-AS0510 Digital Model is complete with 50 kN Load Ring with 0,01 mm resolution Digital Dial Gauge.

The HR-AS0515 Digital Model is complete with 50 kN Load Ring with 0,001 mm resolution Digital Dial Gauge.

The other Test Accessories should be ordered separately according to the test. Penetration Piston for CBR Tests and Breaking Head for Marshall Tests should be ordered separately.

### Technical Specifications:

Product Code	HR-AS0505	HR-AS0510	HR-AS0515
Product Name	CBR & Marshall Testing Machine with Load Ring		
Type	Analog Dial Gauge	Digital Dial Gauge	Digital Dial Gauge
Dial Gauge Resolution (mm)	0,01	0,01	0,001
Test Speed (mm/min)	Can be selected as 1.0 & 1.27 & 50.8		
Capacity (kN)	50		
Dimensions (cm)	40x65x110		
Weight (kg)	100		
Power Supply	220 V, 50-60 Hz, 1 ph		

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS0505/1	CBR & Marshall Testing Frame
HR-G5003	Load Ring, 50 kN capacity with 0,01 mm resolution Analog Dial gauge
HR-G5013	Load Ring, 50 kN capacity with 0,01 mm resolution Digital Dial gauge
HR-G5008	Load Ring, 50 kN capacity with 0,001 mm resolution Digital Dial gauge

### Marshall Test Systems

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245

Should be used with Breaking Head Stability Mould for 4" (101,6 mm) or 6" (152,4 mm) Marshall Samples and Adaptor for Breaking Head to perform Marshall Tests.

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/1	Breaking Head Stability Mould for 4" (101,6 mm) Marshall Samples
HR-AS5000/2	Breaking Head Stability Mould for 6" (152,4 mm) Marshall Samples

### CBR Test Systems

STANDARDS: EN 13286-47, BS 1377:4, ASTM D1883, AASHTO T193, NF P94-078, UNI CNR 10009

Should be used with CBR Penetration Piston to perform CBR Tests.

### Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/1	CBR Penetration piston, used to perform CBR Tests



HR-AS0505/1 & HR-G5003  
HR-AS5000/1



HR-AS0505/1 & HR-G5003  
HR-S5000/1 & HR-G0876



## HİRA TESTING EQUIPMENT

### CBR & MARSHALL & UNAXIAL TESTING MACHINE

CBR & Marshall & Uniaxial Testing Machine is used to make CBR, Marshall and Uniaxial Unconfined Compressive Tests.

The device is composed of a robust and compact two column frame with adjustable upper cross beam driven by an electromechanical ram.

Two models are available as 50 kN and 100 kN capacity.

The testing speed can be set between 0,001 mm/min to 51mm/min.

The speed setting of the loading plate is controlled from the digital readout unit. For safety, the up and down travel of the lower platen is limited the use of limit switches.

The measuring system consists of a 50 kN or 100 kN capacity load cell according to capacity of frame fitted to the upper cross beam to read stability values and the 25 mm Displacement Sensor fitted to the column.

Supplied complete with LCD CBR & Marshall & Uniaxial Control Unit, 50 kN or 100 kN capacity Load Cell according to capacity of frame, 25 x 0.01 mm Linear potentiometric displacement transducer with holder.

The other Test Accessories should be ordered separately according to the test. Compression Platens with ball seating assembly for Uniaxial Tests, Penetration Piston for CBR Tests and Breaking Head for Marshall Tests should be ordered separately.

#### Technical Specifications:

Product Code	HR-AS0500	HR-AS0501
Product Name	CBR & Marshall & Uniaxial Testing Machine	
Test Speed	0,001 - 51 mm/min	
Capacity (kN)	50	100
Dimensions (cm)	47x70x110	52X72X110
Weight (kg)	100	110
Power Supply	220 V, 50-60 Hz, 1 ph	

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS0500/1	CBR & Marshall & Uniaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Uniaxial Frame, 100 kN
HR-G0981	Load Cell, 50 kN capacity
HR-G0982	Load Cell, 100 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-E9000	LCD CBR & Marshall & Uniaxial Control Unit

### UNIAXIAL TEST SYSTEMS

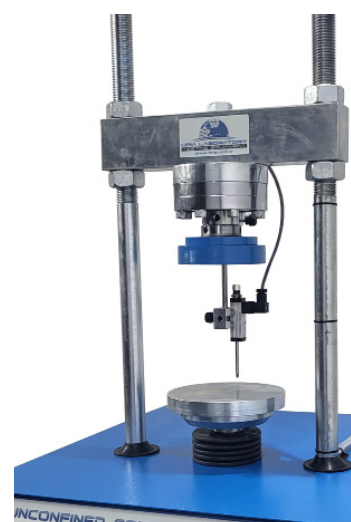
STANDARDS: ASTM D2166, AASHTO T208

Compression Platens, used to perform uniaxial and unconfined compression tests.

Supplied complete with ball seating assembly.

#### Spare Parts & Accessories:

Product Code	Product Name
HR-S1010	Compression Platens with ball seating assembly





## CBR TEST SYSTEMS

STANDARDS: EN 13286-47, BS 1377:4, ASTM D1883, AASHTO T193, NF P94-078, UNI CNR 10009

Should be used with CBR Penetration Piston to perform CBR Tests.

### Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/1	CBR Penetration piston, used to perform CBR Tests



**HR-AS0500/1 & HR-G0981**  
**HR-G0995 & HR-AS5000/1**



**HR-AS0500/1 & HR-G0981**  
**HR-G0995 & HR-S5000/1**  
**HR-S5100**

## MARSHALL TEST SYSTEMS

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245

Should be used with Breaking Head Stability Mould for 4" (101,6 mm) or 6" (152,4 mm) Marshall Samples and Adaptor for Breaking Head to perform Marshall Tests.

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/1	Breaking Head Stability Mould for 4" (101,6 mm) Marshall Samples
HR-AS5000/2	Breaking Head Stability Mould for 6" (152,4 mm) Marshall Samples

# HİRA TESTING EQUIPMENT



## CBR & MARSHALL & UNIAXIAL TESTING MACHINE WITH H-TOUCH PRO MAX CBR & MARSHALL & UNIAXIAL CONTROL UNIT (TOUCH SCREEN)

CBR & Marshall & Uniaxial Testing Machine is used to make CBR, Marshall and Uniaxial Unconfined Compressive Tests.

The device is composed of a robust and compact two column frame with adjustable upper cross beam driven by an electromechanical ram.

Two models are available as 50 kN and 100 kN capacity.

The testing speed can be set between 0,001 mm/min to 51mm/min.

The speed setting of the loading plate is controlled from the digital readout unit. For safety, the up and down travel of the lower platen is limited the use of limit switches.

The measuring system consists of a 50 kN or 100 kN capacity load cell according to capacity of frame fitted to the upper cross beam to read stability values and the 25 mm Displacement Sensor fitted to the column.

Supplied complete with HİRATEST H-Touch Pro Max CBR & Marshall & Uniaxial Control Unit, 50 kN or 100 kN capacity Load Cell according to capacity of frame, 25 x 0.01 mm Linear potentiometric displacement transducer with holder, HİRATEST H-GUI CBR & Marshall & Uniaxial Software and LAN Connection Cable.

The other Test Accessories should be ordered separately according to the test. Compression Platens with ball seating assembly for Uniaxial Tests, Penetration Piston for CBR Tests and Breaking Head for Marshall Tests should be ordered separately.



### H-TOUCH PRO MAX CBR & MARSHALL & UNIAXIAL CONTROL UNIT

HİRATEST H-Touch Pro Max CBR & Marshall & Uniaxial Control Unit is designed to control of data from displacement transducers which are fitted to the machine.

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

The Unit can perform CBR & Marshall & Uniaxial tests as a stand-alone without the use of a PC or with the HİRATEST H-GUI CBR & Marshall & Uniaxial Software and a PC. Control of machine, acquisition of load and displacement data in real time are provided by the unit.

The unit has easy to use menu options.

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 and see all the data while the test running.

### Main Features of H-Touch Pro Max CBR & Marshall & Uniaxial Control Unit

- Calculates corrected CBR value at 2.5 and 5 mm in CBR Tests.
- The digital unit saves the load value at user defined displacement values such as 0.625, 1.25, 1.875, 2.5, 3.75, 5, 7.5, 10, 13 mm in CBR Tests.
- The % CBR at 2.5 mm and % CBR at 5 mm is also automatically calculated and saved in CBR Tests.
- Flow and stability values are automatically calculated and saved in Marshall Tests,
- The unconfined compressive strength (qu) value and the undrained shear strength (cu) value of cohesive soils are obtained.
- Ability to perform displacement-controlled tests
- Real time display of test graph
- 2 analog channels for load cell and displacement sensors
- Multi-language support (English, French, Spanish, Turkish)
- Real-time date/time
- Test results display and memory management interface
- Calibration function for channels
- Programmable digital gain adjustment for load-cell and potentiometric sensors, voltage and current transmitters
- Closed loop PID for steady pace rate
- Connection and control feature via Ethernet
- Free computer software for test control and enhanced report output



HR-E9000/TS

## Hardware

- Permanent storage capacity up to 10 0000 test results
- 1/256000 dot resolution for each channel
- 10 data acquisition per second (at sample rate) on each channel
- 2 fully customizable analog channels with 24-bit ADC and PGA-FPGA circuit
- Ethernet port for computer connection
- 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
- Choice of three unit systems: kN, ton or lb
- Additional memory support up to 32 GB via external USB flash drive
- Support for -optionally supplied- integrated thermal printer
- 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 CBR & Marshall & Uniaxial Software has been designed for CBR & Marshall & Uniaxial Tests.

The software includes control of machine, acquisition of load and displacement data, generating and saving reports.

### • For CBR Tests;

The software prepares a summary result for the user that will only need some specific loads such as at 0.625, 1.25, 1.875, 2.5, 3.125, 3.75, 4.375, 5, 7.5, 10 and 13 mm.

The software continuously updates load, stress and displacement till the end of test. Software can automatically draw the best tangent line and perform the upward concave correction as suggested by ASTM D 1883. The corrected stress values are then calculated respect to this offset.

The CBR value at 2.5mm and 5.0mm are calculated by using the standard load values at those penetrations.

### • For Marshall Tests;

Test type is selected in the software and then the sample height is entered as the test parameter. It automatically calculates correction factor coming from the standards with respect to specimen thickness. The stability value is calculated regarding this factor.

The software continuously updates load and displacement until the end of test. When the test is completed, the sharpest slope of the graph is calculated. The sharpest slope is shifted 1.5 mm to the right side of the graph and the intersection between 2nd slope and original test data is recorded as the stability value for the test. The horizontal distance between the intersection of first slope and X axis and intersection of test data with 2nd slope is recorded as "flow" value.

The report includes all results for 4 samples. The user can see 4 of the results on the same screen for easy comparison.

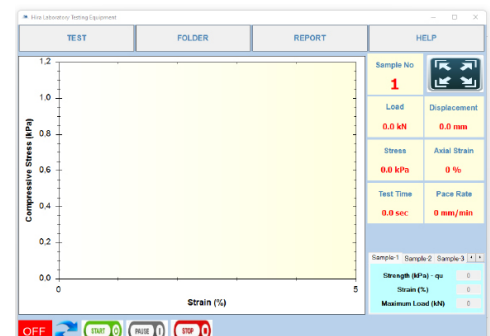
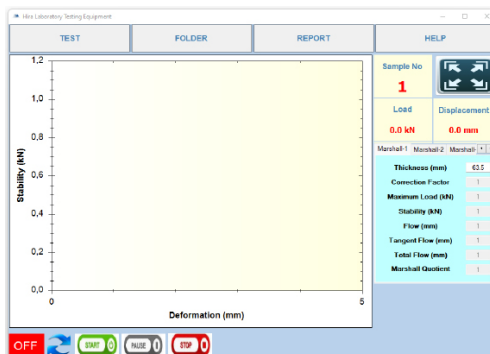
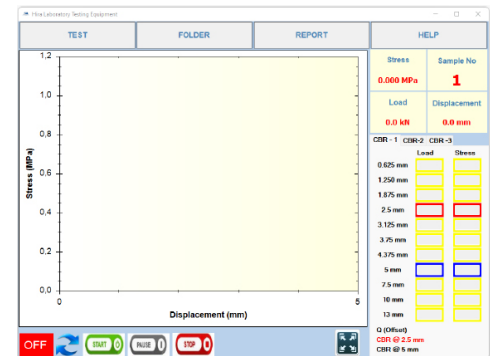
### • For Uniaxial Unconfined Compressive Tests;

The software continuously updates load, stress, strain and displacement till the end of test.

The unconfined compressive strength ( $q_u$ ) value and the undrained shear strength ( $c_u$ ) value of cohesive soils are obtained.

## Main Features of H-GUI CBR & Marshall & Uniaxial Software

- Multi-language support and user interface
- Refreshing Experiment Graphic Displays on the Screen in Real Time
- Able to save frequently used texts in memory and recall them when necessary
- Modification of test machine parameters using the software



# HİRA TESTING EQUIPMENT

## Technical Specifications:

Product Code	HR-AS0500/TS	HR-AS0501/TS
Product Name	CBR & Marshall & Uniaxial Testing Machine	
Test Speed	0,001 - 51 mm/min	
Capacity (kN)	50	100
Dimensions (cm)	47x70x110	52X72X110
Weight (kg)	100	110
Power Supply	220 V, 50-60 Hz, 1 ph	

## Spare Parts & Accessories:

Product Code	Product Name
HR-AS0500/1	CBR & Marshall & Uniaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Uniaxial Frame, 100 kN
HR-G0981	Load Cell, 50 kN capacity
HR-G0982	Load Cell, 100 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-E9000/TS	H-Touch Pro Max CBR & Marshall & Uniaxial Control Unit
HR-E9000/1	H-GUI CBR & Marshall & Uniaxial Software

## UNIAXIAL TEST SYSTEMS

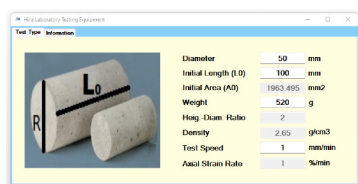
STANDARDS: ASTM D2166, AASHTO T208

Compression Platens, used to perform uniaxial and unconfined compression tests.

Supplied complete with ball seating assembly.

## Spare Parts & Accessories:

Product Code	Product Name
HR-S1010	Compression Platens with ball seating assembly

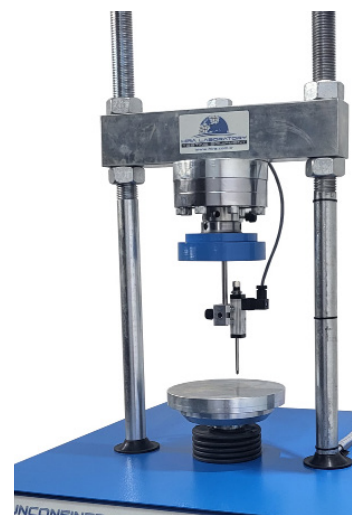


California Bearing Ratio Test Report

Company Name	
Project Name	
Location	
Depth	
Material Description	
Test ID	
Test Date	

	0.625	1.25	1.875	2.5	3.125	3.75	4.375	5	5.625	6.25	6.875	7.5	8.125	8.75	9.375	10	CBR
Sample 1	Stress																
	Load																
Sample 2	Stress																
	Load																
Sample 3	Stress																
	Load																

Tested By: \_\_\_\_\_ Approved By: \_\_\_\_\_



HR-AS0500/1 & HR-G0981  
HR-G0995 & HR-S1010

## CBR TEST SYSTEMS

STANDARDS: EN 13286-47, BS 1377:4, ASTM D1883, AASHTO T193, NF P94-078, UNI CNR 10009

Should be used with CBR Penetration Piston to perform CBR Tests.

California Bearing Ratio Test Report

Company Name	
Project Name	
Location	
Depth	
Material Description	
Test ID	
Test Date	

	0.625	1.25	1.875	2.5	3.125	3.75	4.375	5	5.625	6.25	6.875	7.5	8.125	8.75	9.375	10	CBR
Sample 1	Stress																
	Load																
Sample 2	Stress																
	Load																
Sample 3	Stress																
	Load																

Tested By: \_\_\_\_\_ Approved By: \_\_\_\_\_

## Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/1	CBR Penetration piston, used to perform CBR Tests

Hira Laboratory Testing Equipment

Test Type: Information

ASTM D1883

EN 13286-47

BS 1377

Piston Diameter: 50 mm

Penetration Rate: 1.27 mm/min

Zero Suppression: 0 kN

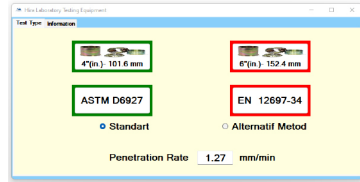


HR-AS0500/1 & HR-G0981  
HR-G0995 & HR-S5000/1  
HR-S5100

## MARSHALL TEST SYSTEMS

STANDARDS: EN 12697-34, 12697-23, 12697-12, 13108, ASTM D1559, AASHTO T245

Should be used with Breaking Head Stability Mould for 4" (101,6 mm) or 6" (152,4 mm) Marshall Samples and Adaptor for Breaking Head to perform Marshall Tests.



Marshall Stability and Flow of Asphalt Mixtures						
Company						
Project						
Address						
Bitumen Content						
Material Description						
Marshall Test Temperature						
Test Date						
Average Bulk Density						
Sample	Thickness (mm)	Correction Factor	Maximum L. (N)	Stability (kN)	Flow (mm)	Marshall Q <sub>1</sub> (kN/mm)
Sample 1						
Sample 2						
Sample 3						
Sample 4						
Average						
Tested By:			Approved By:			



### Spare Parts & Accessories:

Product Code	Product Name
HR-AS5000/1	Breaking Head Stability Mould for 4" (101,6 mm) Marshall Samples
HR-AS5000/2	Breaking Head Stability Mould for 6" (152,4 mm) Marshall Samples

HR-AS0500/1 & HR-G0981  
HR-G0995 & HR-AS5000/1



# HİRA TESTING EQUIPMENT

## WATER BATHS

STANDARDS: EN 12697-27, ASTM D1559, AASHTO T245, AASHTO T283

Water baths are fully double walled stainless steel made with high quality stone wool insulation. The specimens are held by a shelf spaced from the bottom.

Working temperature is ambient to  $99.9\text{ }^{\circ}\text{C} \pm 0.1\text{ }^{\circ}\text{C}$ .

Complete with digital thermostat and electric stirrer "for continuous water recirculation", ensuring a constant and uniform temperature.

Water bath with cooling unit is also available. Working temperature is ambient to  $+5\text{ to }70\text{ }^{\circ}\text{C} \pm 0.1\text{ }^{\circ}\text{C}$ .

Depending on the capacity of the water bath, cooling unit can be under or near the water bath.



**HR-G1505**

### Technical Specifications:

Product Code	Product Name	Capacity (lt)	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Temperature Range ( $^{\circ}\text{C}$ )
HR-G1500	Water Bath with Circulation System	15	16x33x30	30x52x37	14	Ambient to 99.9
HR-G1505	Water Bath with Circulation System	30	16x51x30	30x69x37	17	Ambient to 99.9
HR-G1510	Water Bath with Circulation System	48	16x65x55	30x82x58	24	Ambient to 99.9
HR-G1525	Water Bath with cooling device	15	16x33x30	63x40x60	25	+5 to 70
HR-G1530	Water Bath with cooling device	30	16x51x30	63x40x76	35	+5 to 70
HR-G1535	Water Bath with cooling device	48	16x65x55	65x62x90	45	+5 to 70

### Technical Specifications:

Temperature Sensor	Fe - Const
Control System	PID & MP
Temperature Resolution	$\pm 0.1\text{ }^{\circ}\text{C}$
Pump Capacity	5 lt
Int. Surface Material	Stainless Steel
Ext. Surface Material	Steel with Electrostatic Powder Paint
Power Supply	220 V, 50-60 Hz, 1 ph



**HR-G1530**

### BITUMEN PENETROMETER

STANDARDS: EN 1426, ASTM D5, AASHTO T49

Used to determine the consistency of a bituminous sample under fixed conditions of load, time and temperature. The penetration is expressed in distance of tenths of millimeters vertically penetrated by a standard needle.

Penetration is measured with digital gauge 0,01 mm resolution.

The Bitumen Penetrometer is supplied with stop and release push button, automatic zero timer set, penetration needle, transfer dish and 6 penetration tins 55x35 mm dia.

Mirror with articulate holder is available to make easy the surface contact between the needle and the sample and should be ordered separately.

The other accessories should be ordered separately.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS1925	Semi-Automatic Digital Bitumen Penetrometer	20x30x50	10	220 V, 50-60 Hz, 1 ph



#### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Standards
HR-AS1925/1	Penetration Needle	---	0,0025	EN 1426, ASTM D5, AASHTO T49
HR-AS1925/2	Transfer Dish for HR-AS1925 & HR-AS1950	---	---	---
HR-G0610	Moisture content tin	Ø 5,5 x 3,5	0,02	---
HR-G0608	Moisture content tin	Ø 7 x 4,5	0,03	---
HR-AS1925/7	Mirror with adjustable holder	---	---	---
HR-AS1925/3	One-Quarter Scale Cone and Shaft for Lubricating Grease	---	---	ASTM D1403 & ASTM D1831
HR-AS1925/4	One-Half Scale Cone and Shaft for Lubricating Grease	---	---	ASTM D1403 & ASTM D1831
HR-AS1925/5	Brass Penetrometer Cone for Lubricating Grease and Petrolatum	---	---	ASTM D 217 & ASTM D 937
HR-AS1925/6	Resilience Ball Penetration Tool	---	---	ASTM D5329

### AUTOMATIC BITUMEN PENETROMETER

STANDARDS: EN 1426, ASTM D5, AASHTO T49, ISO 3997, IP 49

Used to determine the consistency of a bituminous sample under fixed conditions of load, time and temperature. Penetration is expressed in tenths of a millimeter through which the standard needle penetrates vertically.

The penetration depth of the needle is determined with electronic measuring system, which is separated from the plunger during the test, this allows the free guidance of the plunger which virtually eliminates friction during the test.

The frame with levelling screws and spirit level consists of a digital control unit with touch screen, an anodised aluminum base plate with centering guide, magnifying lens and low voltage illuminator mounted on flexible arms.

At the start of each experiment, the measuring system is automatically reset. The cone is lowered so that the tip of the cone just touches the surface of the sample by pressing up and down arrows on the screen with fast and slow motion option. In this process, magnifying glass and led lamp help the user. The penetrometer allows the cone to free fall into the sample for the specific set time interval which can be set on display by user. Free fall time can be selected between 0 - 999 seconds. Using the joystick, the needle position can be adjusted precisely with the help of the magnifying glass and ultra-bright LED lamp on the device. The test result is displayed on the digital screen. 5 tests are made and the average is taken automatically.

Needle holder can be easily disassembled and reassembled for weight calibration.



## HİRA TESTING EQUIPMENT

The penetrometer is supplied with penetration needle, transfer dish and 6 penetration tins 55x35 mm dia.

Water Bath (with Cooling unit or without Cooling unit), Thermometer (IP38 or ASTM 17C or 63C) required for the test and the other accessories should be ordered separately.

Water bath dish with incorporated thermostatic coil, to be connected to the Water Bath. It keeps the temperature of the bitumen sample directly on the penetrometer, by avoiding to transfer it. Water bath dish should be ordered separately.



### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Measuring Range (mm)	Resolution (mm)	Power Supply
HR-AS1950	Automatic Digital Bitumen Penetrometer	35x33x80	24	0-50	0,01	220 V, 50-60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Standards
HR-AS1925/1	Penetration Needle	---	0,0025	EN 1426, ASTM D5, AASHTO T49
HR-AS1925/2	Transfer Dish for HR-AS1925 & HR-AS1950	---	---	---
HR-G0610	Moisture content tin	Ø 5,5 x 3,5	0,02	---
HR-G0608	Moisture content tin	Ø 7 x 4,5	0,03	---
HR-AS1925/7	Mirror with adjustable holder	---	---	---
HR-AS1925/3	One-Quarter Scale Cone and Shaft for Lubricating Grease	---	---	ASTM D1403 & ASTM D1831
HR-AS1925/4	One-Half Scale Cone and Shaft for Lubricating Grease	---	---	ASTM D1403 & ASTM D1831
HR-AS1925/5	Brass Penetrometer Cone for Lubricating Grease and Petrolatum	---	---	ASTM D 217 & ASTM D 937
HR-AS1925/6	Resilience Ball Penetration Tool	---	---	ASTM D5329
HR-G1500	Water Bath with Circulation System, 15 Lt capacity	16x33x30	14	---
HR-G1525	Water Bath with cooling device, 15 Lt capacity	63x40x60	25	---
HR-AS1950/1	Water bath dish with incorporated thermostatic coil	Ø 15,1x9	---	---
HR-G1385	IP38 Thermometer, 23 – 27 °C	3x3x30	0,1	---
HR-G1398	ASTM 17C Thermometer, 19 – 27 °C	3x3x30	0,1	ASTM 17C
HR-G1412	ASTM 63C Thermometer, -8 - (+32) °C	3x3x30	0,1	ASTM 63C

## BITUMEN OVEN FOR ROLLING THIN-FILM OVEN TEST (RTFOT)

STANDARDS: EN 12607-1, ASTM D2872-12, AASHTO T240

Utilized to measure the air and heat effect on a moving film of asphaltic semisolid materials. External frame and internal chamber are stainless steel made with insulated fiberglass intermediate chamber.

Provided of large glass door of inspections.

The oven must be connected to a suitable air pressure supply.

The Control System is digital PID controller and time adjusted. The device is circulated. There is a rotating engine (15 rpm/min), vertical platform and air input for compressor. Flow meter is available for adjustable air flow.

Rolling Thin Film Oven's front cover is made from duplex glass. Internal Surface Material is Stainless Steel and External Surface Material is Sheet Iron with Electrostatic Powder Paint.

Supplied complete with precision digital thermostat to maintain 163 °C temperature, ventilation device, set of eight 64 mm x 140 mm glass containers.

8 bar, 25 lt capacity Air Pressure Pump should be ordered separately.



HR-AS2000



HR-G0825



HR-AS2000/1

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2000	Bitumen Oven for Rolling Thin-Film Oven Test (RTFOT)	75x85x100	85	220 V, 50 -60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2000/1	Glass Sample Tins. (Pack of 8)	6,4x14	0,5	---
HR-G0825	Air pressure Pump, 8 bar, 25 lt	60x30x60	30	220 V, 50 -60 Hz, 1 ph



## HİRA TESTING EQUIPMENT

### BITUMEN OVEN FOR THIN-FILM OVEN & LOSS ON HEATING TEST (TFOT)

STANDARDS: EN 12607-2, EN 13303, ASTM D6, D1754, AASHTO T47, T179

Used for determining the loss in mass of oil and asphaltic / bituminous compounds when heated with the loss on heating test method.

The internal chamber is made of stainless steel and the door has a panel window. The external surface is electrostatic painted.

Oven has double wall insulation with fiberglass.

The oven is equipped of a dual safety thermostat to prevent accidental over-heating.

Oven has a working temperature ambient to 200 °C, Digital PID controller and circulation fan.

Rotating shelf and sample cups should be ordered separately according to the test type.



HR-AS2100



HR-G0601/S



HR-AS2100/1

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2100	Bitumen Oven for Thin-Film Oven & Loss on Heating Test (TFOT)	60x45x70	60	220 V, 50-60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Standards
HR-AS2100/1	Rotating Shelf for Loss on Heating Test	300	EN 13303 & ASTM D 6 & AASHTO T47
HR-AS2100/2	Rotating Shelf for Thin Film Oven Test	300	EN 12607-2 & ASTM D1754 & AASHTO T179
HR-G0610/S	Moisture Content Tin. (Pack of 9)	Ø 55 x 35	---
HR-G0601/S	Moisture Content Tin. (Pack of 4)	Ø 140 x 9,5	---
HR-G1394	ASTM 13C Thermometer (155 – 170 °C)	30x30x300	ASTM 13C

### WATER IN BITUMINOUS MATERIALS TEST SET (DEAN-STARK METHOD)

STANDARDS: ASTM D95, D244; AASHTO T55, T59; IP 74/77; CNR No.101; NLT 123

Used to determine the water content in petroleum products or bituminous materials, by distilling them with a water immiscible, volatile solvent.

Water in Bituminous Materials Test Set Complete with Electric Heater with Thermo Regulator, Glass Condenser, Glass Receiver and 10 ml Glass Still.

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2345	Water in Bituminous Materials Test Set	20x20x45	5	220 V, 50 -60 Hz, 1 ph

#### Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2345/1	Electric Heater with Thermo Regulator	60x40x35	25	220 V, 50 -60 Hz, 1 ph
HR-AS2345/2	Glass Condenser, Glass Receiver, Glass Still	---	---	---



HR-AS2345

## ABA - ASPHALT BINDER ANALYZER

STANDARTLAR: TS EN 12697-39, AASHTO TP53, AASHTO T308, ASTM D6307

The HIRATEST ABA Asphalt Binder Analyzer is used to determine the binder content of hot mix asphalt/bituminous mixtures by the method of loss on ignition. The system combines a sophisticated furnace and weighing system to continuously measure the weight loss of a bituminous mixture during combustion and automatically calculates its binder content at the end of the test.

Supplied complete with 2 specimen baskets with a safety cover with a carrying tray mounted, a fork to catch the tray, and 3 meter metal exhaust pipe.

If the tests are to be performed consecutively without waiting for cooling, Spare Basket and Tray Set and Cooling cage and should be ordered separately.

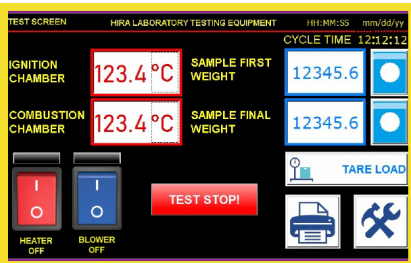
Spare Basket and Tray Set consists of 2 pcs. basket (one has a safety cover) and a carrying tray mounted.

### OVEN AND AFTERBURNER

- High efficiency heating system with afterburner chamber for a total combustion of exhaust fumes to minimize emissions to conform with EU Directives
- Sample size up to 4500 g for more representative test results
- Maximum power rating is 7,5 kW

### HARDWARE

- 16 bit microprocessor with one CPU card controlling test data display, temperature, database and internal functions
- Usb support to store test results
- On board thermal printer
- Weighing system 15000 g capacity, 0.1 g resolution and detecting mass variations of  $\pm 0,1$  g
- PID closed loop thermoregulation for both oven and afterburner chamber
- 950 °C Afterburner 540 °C oven set temperature according to standard
- TFT touchscreen with 800x480 resolution and 65000 colors



### FIRMWARE

- Bidirectional real time communication with the weighing system
- Test setting menu with physical and descriptive sample parameters (initial weight, weight loss percentage, correction factor)
- Calibration menu to check and set the temperature and weight calibration for possible manual control of the test performance
- Test performance menu with simultaneous display of all the test data
- Internal memory for up to 100 tests

### SAFETY FEATURES

- Automatic door locking after 150 °C
- Automatic monitoring of closed door before test start

### Technical Specifications:

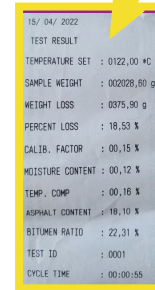
Product Code	Product Name	Dimensions (mm)	Weight (kg)	Power (kW)	Power Supply
HR-AS0960	Asphalt Binder Analyzer (ABA) by the Ignation Method	700x1000x1280	135	7,5	380 V, 50 Hz, 3 ph

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS0960/1	Spare Basket and Tray Set
HR-AS0960/2	Cooling Cage
HR-AS0960/3	Fork
HR-AS0960/4	Metal Exhaust Pipe, 3 meter



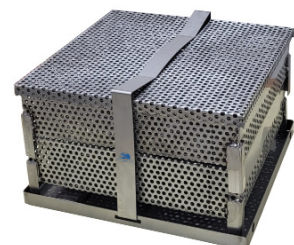
HR-AS0960



HR-AS0960/3



HR-AS0960/2



HR-AS0960/1

## DUCTILITY TESTING MACHINE

STANDARDS for HR-AS2200 & HR-AS2205 : EN 13398, ASTM D113, ASTM D6084, AASHTO T51

STANDARDS for HR-AS2210 & HR-AS2215 : EN 13589, EN 13398, EN 13703, ASTM D113, ASTM D6084, AASHTO T51, AASHTO T300

Used to determine the bituminous ductility, that is to say, the distance to which a briquette of molten bitumen can be extended under controlled conditions, before its breaking.

The Ductilometer basically consists of a moving carriage travelling along guide ways. The carriage is driven by an electrical motor, inside a large tank which is fitted with digital thermostat, immersion electric heater and pump unit.

This model works in an automatic way at a speed of 50 mm/min. Models with a maximum Stroke of 1000 mm and 1500 mm are available. The tank is all made from stainless steel with fiberglass insulation and the external frame is electrostatic painted. Water bath temperature is maintained constant at  $25^{\circ}\text{C} \pm 0,5^{\circ}\text{C}$  by a digital thermoregulator.

Ductilometer with Cooling System is also available and it is equipped with incorporated refrigerating unit for tests with water temperature from  $+5^{\circ}$  to  $+25^{\circ}\text{C}$ .

Force Ductility Testing Machine has 3 loadcells. Speed can be set. Speed control with servo motor between 1 to 100 mm/min. Force Ductility Testing Machine with Cooling System is also available.

All of devices are suitable for testing 3 samples simultaneously. Supplied complete with 3 moulds and base plates.



### Technical Specifications:

Product Code	Product Name	Stroke (mm)	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2200	Ductility Testing Machine	1500	50x230x60	85	220 V, 50 Hz, 1 ph
HR-AS2200/60Hz	Ductility Testing Machine	1500	50x230x60	85	220 V, 60 Hz, 1 ph
HR-AS2220	Ductility Testing Machine	1000	45x200x50	80	220 V, 50 Hz, 1 ph
HR-AS2220/60Hz	Ductility Testing Machine	1000	45x200x50	80	220 V, 60 Hz, 1 ph
HR-AS2205	Ductility Testing Machine with Cooling System	1500	50x230x110	110	220 V, 50 Hz, 1 ph
HR-AS2205/60Hz	Ductility Testing Machine with Cooling System	1500	50x230x110	110	220 V, 60 Hz, 1 ph
HR-AS2225	Ductility Testing Machine with Cooling System	1000	45x200x100	105	220 V, 50 Hz, 1 ph
HR-AS2225/60Hz	Ductility Testing Machine with Cooling System	1000	45x200x100	105	220 V, 60 Hz, 1 ph
HR-AS2210	Force Ductility Testing Machine	1500	50x230x60	85	220 V, 50 Hz, 1 ph
HR-AS2210/60Hz	Force Ductility Testing Machine	1500	50x230x60	85	220 V, 60 Hz, 1 ph
HR-AS2230	Force Ductility Testing Machine	1000	45x200x50	80	220 V, 50 Hz, 1 ph
HR-AS2230/60Hz	Force Ductility Testing Machine	1000	45x200x50	80	220 V, 60 Hz, 1 ph
HR-AS2215	Force Ductility Testing Machine with Cooling System	1500	50x230x110	110	220 V, 50 Hz, 1 ph
HR-AS2215/60Hz	Force Ductility Testing Machine with Cooling System	1500	50x230x110	110	220 V, 60 Hz, 1 ph
HR-AS2235	Force Ductility Testing Machine with Cooling System	1000	45x200x100	105	220 V, 50 Hz, 1 ph
HR-AS2235/60Hz	Force Ductility Testing Machine with Cooling System	1000	45x200x100	105	220 V, 60 Hz, 1 ph

### Spare Parts & Accessories:

Product Code	Product Name	Standards
HR-AS2200/1	Briquette Mould	ASTM D133 & AASHTO T51
HR-AS2200/2	Briquette Mould	EN 13398
HR-AS2200/3	Briquette Mould Base Plate	ASTM D133 & AASHTO T51 & EN 13398



## AUTOMATIC RING AND BALL SOFTENING POINT APPARATUS

STANDARDS: EN 1427, ASTM D36, AASHTO T 53

Automatic Ring and Ball Apparatus is used for determining softening point of bituminous materials by ring and ball method.

The device is Microprocessor controlled and has Colored, Large Touch screen display. Two bitumen samples casted in shouldered brass rings while being held in horizontal position, temperature is increased under controlled rate according to the standards.

The softening point is the average of the temperature values read from the thermometer when each ball embedded in the disc shaped bitumen samples drops below  $25.0 \pm 0.4$  mm. The softening point is detected by the photoelectric sensors and the temperature is measured with the PT100 sensor.

With the help of a magnetic stirrer with an adjustable speed control system, a homogeneous temperature distribution is achieved in the vessel and temperature control in accordance with the relevant standards during the experiment is provided by the 0-10 V, VDC Analog SSR.

Due to its custom software; selection of test method and test parameters, automatic start of the test, data acquisition, data recording and printing and calibration of the device can be performed. The device can save a total of 9 tests. Thanks to the USB port available on the device, the data can be transferred to the computer and opened in excel.

Single test option is available as 30 °C to 80 °C for water.

The cooling system is integrated to the device. The cooling system ensures that the temperature of the test liquid is reduced rapidly and the stable temperature rise rates specified in the standard are achieved and reduces the time between two tests.

Automatic Ring and Ball Apparatus consist of 2 steel balls, Frame (thermometer and ring holder, ball centering guide and bottom plate), 2 brass rings and 800 ml glass beaker.

Thermometer should be ordered separately.

### Main Features

- Heating system,
- Cooling system,
- Electrical beaker lifting system,
- Speed controlled magnetic stirrer,
- Digital Barrier type photoelectric sensor (for the determination of the actual value of the bitumen softening point),
- Microprocessor controlled (automatically programmable for water),
- Colored, Large Touch Screen,
- PT100 temperature probe,
- 0-10 V, VDC Analog SSR,
- USB port for computer or printer connection,
- PID controlled heating system,
- Custom Software.

### Software

- Date/Time,
- Test parameter suitable for test type: 80°C
- Preheat temperature selection and thermocouple calibration (for heater temperature measurement)
- Magnetic stirrer speed adjustment (between 10 and 150 rpm)

### Safety Features

- The heater turns off automatically at the end of the test cycle.
- The experiment is stopped automatically when the sensor fails or fails to position.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2260	Automatic Ring and Ball Test Set	52x43x73	27	220 V, 50 -60 Hz, 1 ph



HR-AS2260



# HİRA TESTING EQUIPMENT

## Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS2260/5	Cooling System	---	---
HR-AS2250/1	Steel ball, 2 pieces	---	---
HR-AS2260/2	Frame	---	---
HR-AS2250/3	Brass ring, 2 pieces	---	---
HR-G0008	Glass Beaker, 800 ml	10x10x13,5	0,5
HR-G0391	Glass Thermometer; max 110 °C	3x3x30	0,1
HR-G0392	Glass Thermometer; max 360 °C	3x3x30	0,1
HR-G1395	ASTM 15C Thermometer. -2 - (+80) °C.	3x3x30	0,1
HR-G1397	ASTM 16C Thermometer. 30-200 °C.	3x3x30	0,1

## RING AND BALL SOFTENING POINT APPARATUS

STANDARDS: EN 1427, ASTM D36, AASHTO T 53

Used for determining softening point of bituminous materials by ring and ball method.

The softness of bitumen depends, amongst other factors, on the temperature of the substance, where, as the temperature is raised, the softness of the bitumen increases.

Analog Ring and Ball Test Set is supplied complete with an Analog hotplate with magnetic stirrer, 2 steel balls, Frame (thermometer and ring holder, ball centering guide and bottom plate), 2 brass rings (ASTM or EN (It must be specified at the time of order.)), 600 ml glass beaker and max. 110 °C thermometer.

Dijital Ring and Ball Test Set is supplied complete with a Digital hotplate with digital magnetic stirrer (with Immersion type temperature sensor with it's holder and a stirring bar), 2 steel balls, Frame (thermometer and ring holder, ball centering guide and bottom plate), 2 brass rings (ASTM or EN (It must be specified at the time of order.)), 600 ml glass beaker and max. 110 °C thermometer.

Glass or ASTM Thermometers and Pouring Plate should be ordered separately.

## Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2250	Analog Ring and Ball Test Set	21x31x40	4,5	220 V, 50 -60 Hz, 1 ph
HR-AS2250/D	Digital Ring and Ball Test Set	21x31x40	4,5	220 V, 50 -60 Hz, 1 ph

## Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G1025/A	Analog Magnetic Stirrer Heater	21x31x10	2,8	230 V, 50-60 Hz, 1 ph
HR-G1025/D	Digital Magnetic Stirrer Heater	19x31x13	4	230 V, 50-60 Hz, 1 ph
HR-AS2250/1	Steel ball, 2 pieces	---	---	---
HR-AS2250/2	Frame	---	---	---
HR-AS2250/3	Brass ring, 2 pieces, EN	---	---	---
HR-AS2250/3A	Brass ring, 2 pieces, ASTM	---	---	---
HR-AS2250/4	Pouring Plate, EN, Metal	---	---	---
HR-AS2250/4A	Pouring Plate, ASTM, Brass	---	---	---
HR-G0007	Glass Beaker, 600 ml	9x9x12,5	0,25	---
HR-G0391	Glass Thermometer; max 110 °C	3x3x30	0,1	---
HR-G0392	Glass Thermometer; max 360 °C	3x3x30	0,1	---
HR-G1395	ASTM 15C Thermometer. -2 - (+80) °C.	3x3x30	0,1	---
HR-G1397	ASTM 16C Thermometer. 30-200 °C.	3x3x30	0,1	---

HR-AS2250/2



HR-AS2250/1 with HR-AS2250/3

HR-AS2250

## RATE OF SPREAD SPRING BALANCE

STANDARDS: EN 12272-1, EN 12274-4, BS 598:108

This simple equipment use to determine the rate of spread of binder on the surface of the road.

The equipment consists of a metal 300 mm square tray, which can be lifted by means of four chains. The chains are attached to a balance and the rate of spread can be assessed by a balance.

Strength Capacity is up to 16 kg/m<sup>2</sup> and Readability is 0.5 kg/m<sup>2</sup>. It is calibrated to give direct reading in kg/ m<sup>2</sup>.

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-AS2355	Spread Spring Balance	33x180x60	0,2
HR-AS2356	Metal Tray with Chain	300x300x25	0,4



HR-AS2355 with  
HR-AS2356

## APPARATUS FOR DISTILLATION OF CUT-BACK ASPHALT

STANDARDS: EN 1431, ASTM D244, AASHTO T 59

Used to measure the amount of the most volatile constituents in cut-back asphaltic products.

The apparatus consists of Aluminium still container, bunsen burner, stand, graduated cylinder, glass connectors including condenser, two thermometers ASTM 7C, range -2 to +300°C, bunsen burner with gas stop valve controlled by a flame sensor to CE safety Directive.

### Spare Parts & Accessories:

Product Code	Product Name
HR-G1389	High Distillation Thermometer, Range -2 +300°C, ASTM 7C

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS2325	Apparatus for Distillation of Cut-Back Asphalt	30x30x60	6



HR-AS2325

## HİRA TESTING EQUIPMENT

### CLEVELAND FLASH AND FIRE POINT TESTER

STANDARDS: EN 22592, ASTM D92, AASHTO T48, ISO 2592, IP 36

Cleveland Flash Tester is used to measure the flash and fire points of lubricated oils and petroleum products.

It consists of a brass cup mounted on an electric heater with a temperature controller and a glass thermometer. Conforming to the CE European Directive, the unit is supplied complete with a double line-fuse.

-6 + 400°C Thermometer is optional and should be ordered separately.

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2275/1	Brass Cup
HR-G0392	Glass Thermometer, Max. 360 °C
HR-G1393	-6 + 400°C Thermometer, IP 28C, ASTM 11C



HR-AS2275

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2275	Cleveland Flash and Fire Point Tester	25x30x25	7	220 V, 50-60 Hz, 1 ph

### TAG CLOSED-CUP FLASH POINT TESTER

STANDARDS: ASTM D56

Suitable for testing volatile flammable flashing between 0 and 175°F (except fuel

Supplied complete with cup, water bath, lid, slide, electric heater, ASTM 9C rang +110°C and ASTM 57 C range -20 to +50°C thermometer.

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2280/1	Brass Cup
HR-G1391	-5 - (+110) °C Thermometer, IP 15C, ASTM 9C
HR-G1411	-20 - (+50) °C Thermometer, ASTM 57C



HR-AS2280

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2280	Tag Closed-Cup Flash Point Tester	20x30x40	6	220 V, 50 Hz, 1 ph

## SAYBOLT VISCOMETER

STANDARDS: ASTM D88, AASHTO T72

Used to determine the viscosity of petroleum products at specified temperatures between 21 to 99 °C.

Stainless steel made, the Saybolt viscometer is supplied complete with 2 x interchangeable orifices "Furol" and "Universal", oil bath, electric heater with digital thermoregulator, key, thermometer support, stirrer, cooling coil, digital thermometer, heat transfer oil and 2 pieces 60 ml glass saybolt viscosity flasks. Viscometer is 2 sample testing capacity with digital display.

Thermometer Set for Saybolt Viscometer; 19 to 27°C, 34 to 42°C, 49 to 57°C, 57 to 65°C, 79 to 87°C and 95 to 103°C where each thermometer has 0.1°C subdivisions.

Filter Funnel with Wire Mesh and Clip, Withdrawal Tube and Thermometers are optional and should be ordered separately.

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2290/1	Furol Orifices
HR-AS2290/2	Universal Orifices
HR-AS2290/3	Saybolt Viscosity Flask, Glass, 60 ml
HR-AS2290/4	Heat Transfer Oil, 5 lt
HR-AS2290/5	Filter Funnel with Wire Mesh and Clip
HR-AS2290/6	Withdrawal Tube
HR-G0385	Digital Thermometer, max. 300 °C
HR-AS2290/8	Thermometer Set for Saybolt Viscometer



HR-AS2290/5

HR-AS2290/6



HR-AS2290

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS2290	Saybolt Two-Tube Digital Viscometer	45x30x55	12	220 V, 50-60 Hz, 1 ph

## ENGLER VISCOMETER

STANDARDS: ASTM D1665, ASTM D490; AASHTO T54

Digital Engler Viscometer is used to compare the specific viscosity of tars and their fluid products to the viscosity of water.

It consists of a water bath complete with digital precision thermoregulator, electric stirrer.

Thermometers, Kohlrausch calibration flask, Engler Viscosity Test flask and Strainer should be ordered separately.

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2300/1	Kohlrausch Calibration Flask, 200 ml
HR-AS2300/2	Engler Viscosity Flask, Glass, 50 ml
HR-AS2300/3	Strainer, No. 50, ASTM
HR-G1404	ASTM 23C Thermometer. 18-28 °C. Graduation 0.2 °C.
HR-G1405	ASTM 24C Thermometer. 39-54 °C. Graduation 0.2 °C.
HR-G1406	ASTM 25C Thermometer. 95-105 °C. Graduation 0.2 °C.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply	Power (W)
HR-AS2300	Digital Engler Viscometer	45x30x55	12	220 V, 50-60 Hz, 1 ph	300
HR-AS2305	Digital Engler Viscometer, Two-Tube	45x30x55	12	220 V, 50-60 Hz, 1 ph	300



HR-AS2300



## AUTOGRAPHIC RECORDING TRAVELLING BEAM DEVICE

The 3 meter long Autographic Recording Travelling Beam Device is used to check for any irregularities in both concrete and bituminous road surfaces. A sensing unit comprising a wheel connected to an indicator provides a magnification of 4:1.

Deviation of the surface from a straight-line is shown on a scale calibrated in increments of 2 mm in the 0-10 mm range and 5 mm increments in the 10-25 mm range. A dye-marker is fitted which may be used to identify suspect areas. Outrigger wheels provide mobility on site. The device is supplied as three sub-assemblies which are quickly assembled on site.

The Travelling Beam is supplied fitted with an autographic recorder providing a permanent record of the surface profile. The recorded data can be transferred to the computer via sd card.

Wooden box should be ordered separately.



### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS2310	Autographic Recording Travelling Beam Device	33x180x60	55

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2310/2	Wooden Box

### SOLUBILITY TEST SET

STANDARDS: EN 12592, ASTM D2042, AASHTO T44

Solubility Test Set for Bitumen and Bituminous Binders consist of 500 ml filter flask, 30 ml glass Gooch Crucible, glass funnel, 100 g powdered glass, a rubber ring and a rubber stopper.

Solvent and water trompe should be ordered separately.

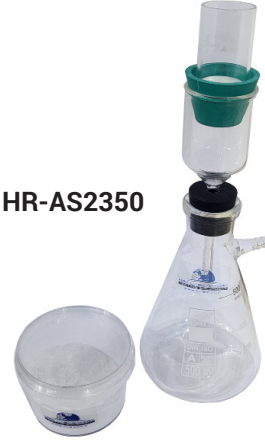
#### Technical Specifications:

Product Code	Product Name
HR-AS2350	Solubility Test Set

#### Spare Parts & Accessories:

Product Code	Product Name	Capacity
HR-AS2350/1	Filter Flask for HR-AS2350	500 ml
HR-AS2350/2	Glass Gooch Crucible	30 ml
HR-AS2350/3	Glass Funnel for HR-AS2350	---
HR-AS2350/4	Powdered glass	100 g
HR-AS2350/5	Rubber ring	---
HR-AS2350/6	Rubber stopper	---
HR-AS2351	Metal water trompe	---

HR-AS2350



HR-AS2351

### MOT STRAIGHT EDGE

STANDARDS: EN 13036-7

The MOT Straightedge is used for irregularity measurement of pavement surface.

Manufactured from anodized aluminium alloy, it is utilized to measure irregularities of road pavement, floors, concrete pavement. Length is 3 m.

Supplied with two steel wedges.

Wooden carrying case should be ordered separately.



HR-AS0915

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS0915	MOT Straightedge	315x16x13	9

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS0915/1	Steel Wedges (2 pieces)
HR-AS0915/2	Wooden Carrying Case

## HİRA TESTING EQUIPMENT

### BENKELMAN BEAM DEVICE

STANDARDS: AASTHO T256-77, CNR N141

Benkelman Beam Device, aluminum alloy made, complete with dial indicator and accessories, it is utilized to measure the deflection of the road surface when loaded by the wheels of vehicles.

The beam is put in contact with the pavement under test between the tires of the vehicle. The measurement of the deflection is performed when the vehicle passes over the test area.

Length of the Benkelman beam is 250 cm. Beam fulcrum ratio 4:1.

Supplied complete with wooden carrying case.



#### Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-AS0900	Benkelman Beam Apparatus	16

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS0900/1	Wooden Carrying Case
HR-G0876	Analog Dial Gauge, 30 x 0,01 mm
HR-G0878	Digital Dial Gauge, 25 x 0,01 mm
HR-G0880	Digital Dial Gauge, 25 x 0,001 mm

### PLATE BEARING EQUIPMENT

STANDARDS: NF P94-117-1

To determine the static deformation of flexible road pavement in the centre of the loading plate, the bearing capacity and deflection of subgrade and subbase of roads.

Used with the Benkelman Beam Apparatus.

HR-AS0950 Plate Bearing Equipment consists of Bearing plate 600 mm diameter cast aluminium, Piston assembly 200 kN capacity, Hydraulic hand pump, High Pressure Hose and Connection Apparatus and Analog manometer.

HR-AS0955 Digital Plate Bearing Equipment consists of Bearing plate 600 mm diameter cast aluminium, Piston assembly 200 kN capacity, Hydraulic hand pump, High Pressure Hose and Connection Apparatus, Analog Manometer, Pressure Transducer and Battery Operated Digital Readout Unit.



## Spare Parts & Accessories:

Product Code	Product Name	Capacity
HR-AS0950/1	Bearing Plate	Ø 600 mm
HR-AS0950/2	Piston Assembly	200 kN
HR-G9000	Hydraulic Hand Pump	700 bar
HR-G9000/1	High Pressure Hose and Connection Apparatus	---
HR-G9010	Analog Manometer	---
HR-S5654	Pressure Transducer	---
HR-S5655	Battery Operated Digital Readout Unit	---
HR-AS0950/2	Wooden box for HR-AS0950 & HR-AS0955	---

## Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-AS0950	Plate Bearing Equipment	100
HR-AS0955	Digital Plate Bearing Equipment	102



HR-AS0950

## ASPHALT MIXTURE MAXIMUM THEORY DENSITY METER

Maximum theory density meter for Asphalt Mixture used to determine the theoretical maximum specific gravity of un-compacted bituminous paving mixtures by vacuum process. It is used to design the ratio of bituminous mixtures, survey the road condition or calculate the void ratio and compactness of road construction.

Complete With 2 pieces 5 Lt Stainless Steel Vacuum Pycnometer, Vibro-Deaerator, Vacuum Pump, tubing for vacuum, Vacuum Gauge and Air Drying Unit (Water trap).



HR-AS0925

## Technical Specifications:

Product Code	Product Name	Weight (kg)	Power Supply
HR-AS0925	Maximum Theory Density Meter	50	220 V, 50-60 Hz, 1 ph

## Spare Parts & Accessories:

Product Code	Product Name	Capacity	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS0925/1	Vacuum Pycnometer	5 Lt	85x57x46	40	---
HR-G0500	Vibro-Deaerator	---	---	---	220 V, 50 Hz, 1 ph
HR-G0500/60Hz	Vibro-Deaerator	---	---	---	220 V, 60 Hz, 1 ph
HR-G0800	Vacuum Pump	51 Lt/min. - 2 Pa	29x13x23	6,6	220 V, 50-60 Hz, 1 ph
HR-G0815	Tubing for Vacuum	1,5 m	---	---	---
HR-AS0925/2	Vacuum Gauge Manometer	1000 mbar	Ø 6,3	0,15	---
HR-AS1550/2	Air Drying Unit (Water Trap)	500 g	---	---	---
HR-G0935	Silica Gel, 1 kg	1 kg	---	1	---



## HİRA TESTING EQUIPMENT

### VIALIT PLATE (BINDER ADHESION) TEST

STANDARDS: EN 12272-1, 12272-3

This apparatus is used for determining the rate of spread of coated chippings on the road surface. The method is a check on the adhesion of aggregates to be applied to the surface of wearing course rolled asphalt.

Consist of a metal basement with three vertical pointed rods to hold the test plate; a 512 g steel ball, six metal test plates and a hand operated rubber lined roller.

#### Spare Parts & Accessories:

Product Code	Product Name
HR-AS1900/1	Flat Steel Plates, 6 pcs.
HR-AS1900/2	Steel Ball, 512 g
HR-AS1900/3	Rubber Wheel Roller, hand operated
HR-AS1900/4	Mechanical Aggregate Deployment, 100 chippings



HR-AS1900

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS1900	Vialit Plate (Binder Adhesion) Test Apparatus	40X140X40	45

### DEPOT TRAY TEST SET

STANDARDS: BS 1707

Depot Tray Test Set is used to determine the transverse uniformity of distribution of sprayed binder to BS 1707.

Consisting of a wheeled trolley with a holding device for accepting a set of 50 containers. Containers are included.

The trolley and containers are pushed underneath the spray hood of the distributor, which is backed over a catch pit for the test. Once the containers are almost full, the trolley is withdrawn and the depth of binder in each container is measured, ensuring that the correct depth (not obscured by froth on the surface of the liquid) is obtained.

Results are expressed as a percentage deviation from the mean for all the 50mm units over the effective width.

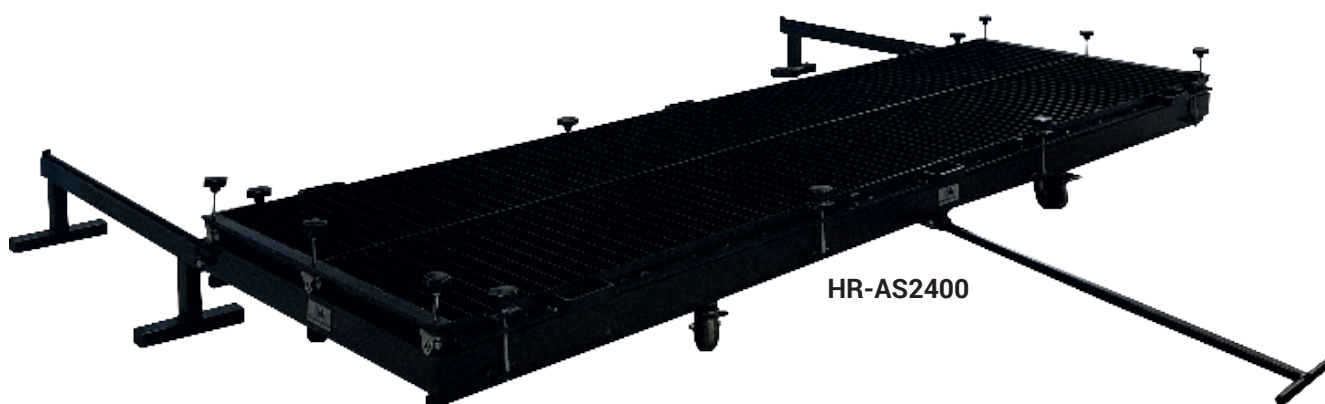
Height is 200mm without trays and 300mm with trays (including wheels).



HR-AS2400

#### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS2400	Depot Tray Test Set	140x365x30	440



HR-AS2400

## BOTTLE ROLLER APPARATUS

STANDARDS: BS 598-102, BS 812, EN 12697-1, EN 13108

A compact bench unit designed to rotate 2 bottles simultaneously about their longitudinal axis.

The Bottle Roller Apparatus is robustly constructed; designed to accept bottle of various sizes and rotates at speeds relevant to most international standards.

Main Shaft Rotation is Adjustable up to 30 rpm.

Steel Bottles and Flask funnel for Steel Bottles should be ordered separately.



HR-AS2450

### Spare Parts & Accessories:

Product Code	Product Name	Capacity (ml)
HR-AS2455	Steel Bottle with rubber stopper	600
HR-AS2456	Steel Bottle with rubber stopper	2500
HR-AS2457	Steel Bottle with rubber stopper	7000
HR-AS2460	Flask funnel for Steel Bottles	---



HR-AS2455  
HR-AS2456  
HR-AS2457



HR-AS2460

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)	Power Supply
HR-AS2450	Bottle Roller Apparatus	560x910x295	40	220 V, 50-60 Hz, 1ph

## PRESSURE FILTER

STANDARDS: BS 598-102, EN 12697-1

Pressure Filter is used for determining the bitumen content.

The Pressure Filter consists of a plated steel pressure vessel with a filter support and pressure gauge.

Foot Pump, Test Sieve, Filter Paper and Filter Filler Funnel should be ordered separately.

### Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-AS2475	Pressure Filter	Ø 292x382	24



HR-AS2475



HR-G2192

HR-AS2475/1



HR-AS2480

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2485	Foot Pump, (0 -100 psi / 0 - 7 bar) with flexible hose 65 cm long approx.
HR-G2192	Sieve, Ø200x50mm, stainless steel frame and mesh, woven cloth,63µm (#230)
HR-AS2480	Filter Paper, Ø 270 mm with 33 mm hole (Pack of 50)
HR-AS2475/1	Filter Filler Funnel



HR-AS2485

## **BINDER RECOVERY APPARATUS, VACUUM PUMP METHOD** **HOT EXTRACTION METHOD SOLUBLE BINDER CONTENT** **(BITUMEN RECOVERY)**

STANDARDS: BS 598-102, EN 12697-1

Used for the separation of solvent from the binder/solvent solution and to determine the binder content in an aggregate/bitumen mixture.

The apparatus consists of Thermostatically controlled Water Bath to keep boiling water during all the recovery cycle, complete with cover and digital thermostat, Vacuum Pump with Vacuum Gauge Manometer, 6 m Tubing for Vacuum, 1000 ml Filter Flask with rubber bung, Two flat-bottomed glass flasks having 250 ml capacity with rubber bungs and other necessary fittings and connections.

The Thermostatically controlled Water Bath may be used also as general purposes water bath.

For more information on the Water Bath, see Water Baths, Model HR-G1505.

For more information on the Vacuum Pump, see Vacuum Pumps, Model HR-G0801.



**HR-AS2500**

### **Technical Specifications:**

Product Code	Product Name	Weight (kg)	Power Supply
HR-AS2500	Binder Recovery Apparatus	25	220 V, 50-60 Hz, 1ph

### **Spare Parts & Accessories:**

Product Code	Product Name
HR-G1505	Water Bath with Circulation System, 30 lt capacity
HR-G0801	Vacuum Pump, Single Stage, 70 l/min
HR-G0815/1	Tubing for Vacuum. 6 m
HR-G0816	Vacuum Gauge Manometer, 1000 mbar, Ø63 mm
HR-G0082	Filter Flask with rubber bung, 1000 ml
HR-G0085	Glass Flask, Flat-bottomed, 250 ml with rubber bungs



**HR-G0085 with connections**

## HOT EXTRACTOR SET (PAPER FILTER METHOD)

STANDARDS: EN 12697-1

Hot Extractor Set is used to extract the binder from bituminous mixtures and to determine the moisture content.

Consisting of a Steel Pot complete with Gauze Basket and Filter, Dean Stark Collector, Condenser, Ø 400 mm Filter paper (Pack of 50).

Hot Plate should be ordered separately.

For more information on the Hot Plate, see Hot Plates, Model HR-G1010.

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS2550	Hot Extractor Set	48x48x90	22

### Spare Parts & Accessories:

Product Code	Product Name
HR-AS2550/1	Steel Pot with Gauze Basket and Filter
HR-AS2550/2	Dean Stark Collector
HR-AS2555	Filter Paper, Ø 400 mm, (Pack of 50)
HR-G1010	Analog Hot Plate, Ø 20, (Single)



HR-G1010



HR-AS2555



HR-AS2550/1

HR-AS2550



## HİRA TESTING EQUIPMENT



### NON-NUCLEAR ASPHALT DENSITY GAUGE, TOUCH SCREEN

STANDARDS: ASTM D 7113-05, AASHTO T 343-12

#### OPERATIONAL FEATURES:

**Status Bar:** Displays GPS status, Data Save status, battery voltage, low battery and date and time

**Storage:** Built-in 512M memory, stores up to 40000 project measurement points with details, and up to 200 models

**Data Logging:** When enabled, stores all measurements taken in single or average modes (Status Bar Icon)

**Reports:** Easily download data to be imported into Excel

**GPS Control:** When activated will display latitude and longitude positions, number of satellites the gauge is connected to as well as the UTC date and time, also available in UTM format. GPS information will store with each measurement when Data Save and GPS feature is enabled (Status Bar Icon)

**Update Software:** One touch upload of new software using a USB memory stick

**Data Management:** Quickly Access, download or delete your project data

**Set Time & Date:** Quick time and date setup, MM/DD/YY and DD/MM/YY formats

**Units:** Interchangeable settings for Density (kg/m<sup>3</sup>, lb/ft<sup>3</sup>), Temp (°C, °F), Depth (in, mm) and Stone Size (in, mm)

**Enhanced Customer Support:** Diagnostic screen to aid in factory Support

**User Programmable Target Density:** Used for calculating % compaction

#### GENERAL FEATURES:

- 7.0 in full color graphics driven user interface, touch screen operation, easy to use.
- New status bar feature, displays GPS status, data save status, available battery voltage, low battery status and date and time
- New data management feature, quickly access, download or delete your project data
- Ability to download files from the device via USB drive
- Fast, reliable, accurate material density and compaction test, and repeatable readings in real time, user friendly, cost effective
- Non-Nuclear means no badges, licenses or storage and transport concerns

#### TECHNICAL SPECIFICATIONS:

##### MODES

**Single:** Reading time less than five (5) seconds. Stores Data.

**Average:** Averages five (5) readings and stores data including date and time.

**Continuous:** Instantaneous density readings.



HR-AS0980



HR-AS0980



HR-AS0980

## FUNCTIONS

**Density:** % Compaction, % Porosity

**Integrated Temperature Sensing:** Real time temperature display 0 °C to 350 °C

## CALIBRATION MODES

**Normal:** Correlation offset to cores.

## MEASUREMENT SPECIFICATIONS:

**Sensing Area:** 260mm diameter base allows optimum measurement on fine and coarse material types.

**Measurement Depth:** 300 mm

**Measurement Display:** Density, % Compaction, Surface Temperature, Mix Name & Project Name

## ELECTRICAL SPECIFICATIONS:

Microprocessor Controlled

**Battery:** 13200mAh ternary lithium battery

**Recharge Life:** >15h

**Battery charger:** DC5V 2A

**Computer Ports:** 1 USB Port

## Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-AS0980	Non-Nuclear Asphalt Density Gauge	260x260x237	3,25

## NON-NUCLEAR ASPHALT DENSITY GAUGE, TOUCH SCREEN

STANDARDS: ASTM D 7113-05, AASHTO T 343-12

## OPERATIONAL FEATURES:

**Status Bar:** Displays GPS status, Data Save status, battery voltage, low battery and date and time

**Project Details:** Stores up to 10 projects with details

**Mix Details:** Stores up to 20 mixes, details include (MTD, Mix Name, Stone Size, Depth Offset, Operator Name)

**Data Logging:** When enabled, stores all measurements taken in single or average modes (Status Bar Icon)

**Reports:** Easily download data to be imported into Excel

**GPS Control:** When activated will display latitude and longitude positions, number of satellites the gauge is connected to as well as the UTC date and time, also available in UTM format. GPS information will store with each measurement when Data Save and GPS feature is enabled (Status Bar Icon)

**Update Software:** One touch upload of new software using a USB memory stick

**Data Management:** Quickly Access, download or delete your project data

**Set Time & Date:** Quick time and date setup, MM/DD/YY and DD/MM/YY formats



HR-AS0985

# HİRA TESTING EQUIPMENT



**Units:** Interchangeable settings for Density (kg/m<sup>3</sup>, lb/ft<sup>3</sup>), Temp (°C, °F), Depth (in, mm) and Stone Size (in, mm)

**Enhanced Customer Support:** Diagnostic screen to aid in factory Support

**User Programmable Target Density:** Used for calculating % compaction

## GENERAL FEATURES:

- Full color graphics driven user interface, touch screen operation, easy to use.
- New status bar feature, displays GPS status, data save status, available battery voltage, low battery status and date and time
- New data management feature, quickly access, download or delete your project data
- Ability to download files from the device via USB drive
- Fast, reliable, accurate material density and compaction test, and repeatable readings in real time, user friendly, cost effective
- No other method of calibration is required, and on-site testing can be performed directly. You can read the data accurately in three seconds, with higher precision and better stability.
- Non-Nuclear means no badges, licenses or storage and transport concerns

## TECHNICAL SPECIFICATIONS:

### MODES

**Single:** Reading time less than five (5) seconds. Stores Data.

**Average:** Averages five (5) readings and stores data including date and time. Stores thousands of records.

**Continuous:** Instantaneous density readings.

### FUNCTIONS

**Density:** % Compaction

**Porosity:** %

**Integrated Temperature Sensing:** Real time temperature display 0 °C to 350 °C

### CALIBRATION MODES

**Normal:** Correlation offset to cores.

## MEASUREMENT SPECIFICATIONS:

**Sensing Area:** 11 in. (27.9cm) diameter base allows optimum measurement on fine and coarse material types.

**Measurement Depth:** 110 mm

**Measurement Display:** Density, % Compaction, Surface Temperature, Mix Name & Project Name

## ELECTRICAL SPECIFICATIONS:

Microprocessor Controlled

**Battery:** 2.5 Amp-hr NiMH, 12V

**Recharge Time:** 4 hours

**Battery charger:** 12V Universal AC charge

**Computer Ports:** 1 USB Port

### Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-AS0985	Non-Nuclear Asphalt Density Gauge, Touch screen	49x22x39	9

