HİRA LABORATORY
TESTING EQUIPMENT

QUALITY UNDER CONTROL!

This catalogue is also available in Turkish. If you wish to get one of those editions please visit our web site **www.hira.com.tr** or ask to our offices.

About Us

HİRA has been the designer and manufacturer of its own Drying-Grading, Aggregates, Rock, Bitumen-Asphalt, Concrete, Building, Cement-Mortar, Soil, Mineral Processing and General Testing Machines, accessories, hardware and software in building and civil engineering industries.

HİRA, thanks to experience which was obtained throughout years accomplished becoming one of the best - leading and reliable companies manufacturing and supplying of test devices within TURKEY.

HİRA became of good reputation and reliable company worldwide. HİRA is exporting its products to more than 50 countries. Some of these countries;
Iraq, Dubai, Burundi, Ethiopia, Chile, Germany, Cote d'ivoire, Macedonia, Republic of Guinea, Republic of South Africa, Egypt, Saudi Arabia, Jordan, Bahrain, Pakistan, Philippines, Romain, Georgia, Ukrain, England, Kenya, Latvia, Israel, Uzbekistan, Yemen, Bangladesh, Azerbaijan, Sri Lanka, Endonesia, Russia, Singapore, Australia, Northern Cyprus, Afghanistan, Qatar, Mauritius, Bulgaria, Vietnam, Spain, Malta, Sudan, Holland, Taiwan, Greece, Malaysia, USA, Kyrgyzstan, Libya, Kuwait, Union of Burma, India, Oman, Ireland.
HİRA is located in a 2800 m² closed area in Ostim Organized Industrial Zone in Ankara, Turkey.
Our range is designed and manufactured with the latest technologies in accordance with the international Standards in force (EN, ASTM, AASHTO, BS, DIN, UNE, UNI, ISO).
HİRA offers its services by giving particular importance to customer delight in the design, manufacturing and supply of testing devices in conformity with the international quality standards.
All HİRA products are tested to guarantee quality, reliability and performance, backed by the international standards and warranties. As part of its clients' product investment HİRA provides a substantial after-sales services.

Within its high technology Quality Control and Calibration Laboratory all products are tested in each step throughout the production, and calibrated before leaving the factory. Our products are used in production facilities of construction companies that carry out worldwide projects, ready mixed concrete manufacturers, cement plants, brick and tile plants, paving stone plants, private laboratories, research & development laboratories of governmental organizations, State Hydraulic Works, Directorate of Mineral Research and Exploration and in research and quality control studies of Civil, Geology, Mining, Mechanical Engineering Faculties of Universities.
A quality assurance system, conforming to ISO 9001:2015 , has been installed to ensure the high standards of production.
HİRA is aiming to become World leading manufacturer of material testing equipment.

Yours Sincerely,
HİRA Management Team
Dilek ASRAV KAYA - Managing Director
Fuat KAYA - President

CORPORATE FACT

more than
8000
Completed Project

97%
Satisfied Clients

more than
50
Number of Countries Exported

MISSION

To become one of the best and leading manufacturer of the test devices which are used by structures, constructions and other related companies with in the World.

VALUES

- Innovation
- Pioneering and Leadership
- Quality
- Being customer oriented
- Manufacturing high quality products
- Responsibility
- Reliability

VISION

- To preserve and maintain customer satisfaction.
- To increase product variety according to customer needs and demands.
- To provide fast and quality service and the necessary support to our customers with based on national and international standards.
- To expand our customer portfolio.

Certificates

WELCOME !!

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will come from passion and hard work.

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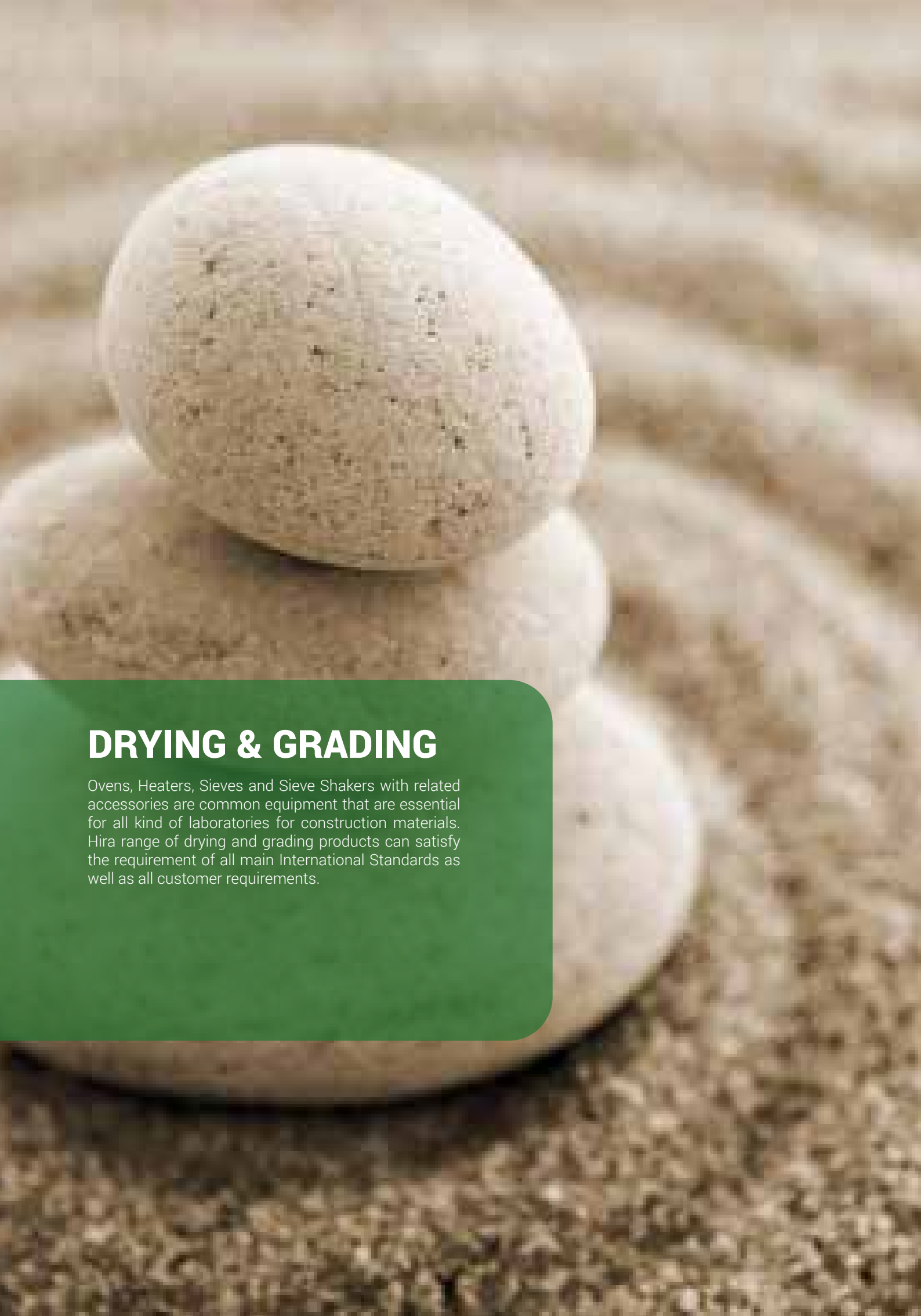

DRYING & GRADING

Ovens, Heaters, Sieves and Sieve Shakers with related accessories are common equipment that are essential for all kind of laboratories for construction materials. Hira range of drying and grading products can satisfy the requirement of all main International Standards as well as all customer requirements.

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LABORATORY DRYING OVENS (FORCED CONVECTION)

STANDARDS: EN 932-5, EN 1097-5, ASTM C 127, C136, D558, D559, D560, D698, D1557, D1559, BS 1924:1, BS 1377:1, UNE 103300

Forced Convection Laboratory Drying Ovens are especially suitable where high temperature uniformity and precision inside the chamber are required.

Forced Convection Laboratory Drying Ovens are fan circulated.

The accuracy of the temperature and its uniformity are granted within the tolerances requested by the Standards.

The interior is made from stainless steel and the exterior is robustly constructed from sheet steel finished in powder coated paint.

Temperature range is from ambient to 200°C and 300°C (in H models) with precision of 2 ºC. Control System is Digital PID Controller.

The Ovens are equipped of a dual safety thermostat with higher thermic threshold to prevent accidental over-temperatures and to ensure safe working conditions.

The Ovens are supplied complete with 2 shelves easily removable and that can be positioned at various heights.

HR-A053X Series Ovens have door with transparent thermal glass window for watching the samples under drying.

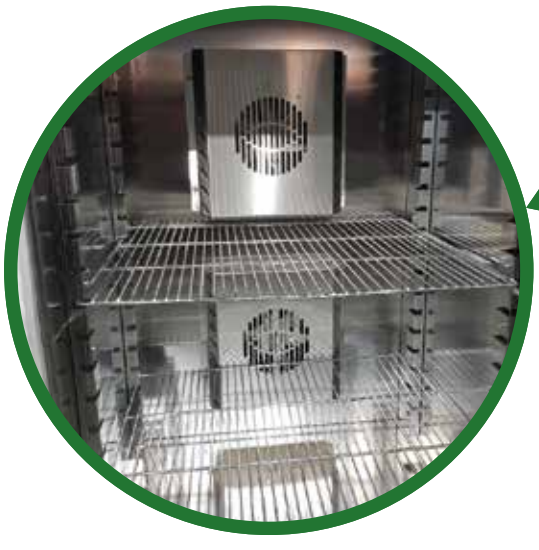
HR-A0510

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Max. Working Temp. (°C)	Power Supply
HR-A0500	Laboratory Oven	30	32x32x32	47x47x60	17	200	220 V, 50-60 Hz, 1 ph
HR-A0505	Laboratory Oven	55	38x38x38	55x61x71	20	200	220 V, 50-60 Hz, 1 ph
HR-A0510	Laboratory Oven	120	57x44x49	80x72x67	70	200	220 V, 50-60 Hz, 1 ph
HR-A0510/H	Laboratory Oven	120	57x44x49	80x72x67	70	300	220 V, 50-60 Hz, 1 ph
HR-A0515	Laboratory Oven	250	57x56x80	80x85x104	100	200	220 V, 50-60 Hz, 1 ph
HR-A0515/H	Laboratory Oven	250	57x56x80	80x85x104	100	300	220 V, 50-60 Hz, 1 ph
HR-A0520	Laboratory Oven	500	57x80x110	80x108x133	140	200	380 V, 50-60 Hz, 3 ph
HR-A0520/H	Laboratory Oven	500	57x80x110	80x108x133	140	300	380 V, 50-60 Hz, 3 ph
HR-A0525	Laboratory Oven	750	57x89x148	80x127x182	170	200	380 V, 50-60 Hz, 3 ph
HR-A0525/H	Laboratory Oven	750	57x89x148	80x127x182	170	300	380 V, 50-60 Hz, 3 ph
HR-A0530	Laboratory Oven, w/Glass Window	30	32x32x32	47x47x60	17	200	220 V, 50-60 Hz, 1 ph
HR-A0531	Laboratory Oven, w/Glass Window	55	38x38x38	55x61x71	20	200	220 V, 50-60 Hz, 1 ph
HR-A0532	Laboratory Oven, w/Glass Window	120	57x44x49	80x72x67	70	200	220 V, 50-60 Hz, 1 ph
HR-A0532/H	Laboratory Oven, w/Glass Window	120	57x44x49	80x72x67	70	300	220 V, 50-60 Hz, 1 ph
HR-A0533	Laboratory Oven, w/Glass Window	250	57x56x80	80x85x104	100	200	220 V, 50-60 Hz, 1 ph
HR-A0533/H	Laboratory Oven, w/Glass Window	250	57x56x80	80x85x104	100	300	220 V, 50-60 Hz, 1 ph
HR-A0534	Laboratory Oven, w/Glass Window	500	57x80x110	80x108x133	140	200	380 V, 50-60 Hz, 3 ph
HR-A0534/H	Laboratory Oven, w/Glass Window	500	57x80x110	80x108x133	140	300	380 V, 50-60 Hz, 3 ph
HR-A0535	Laboratory Oven, w/Glass Window	750	57x89x148	80x127x182	170	200	380 V, 50-60 Hz, 3 ph
HR-A0535/H	Laboratory Oven, w/Glass Window	750	57x89x148	80x127x182	170	300	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-A0550	Laboratory Oven Fan
HR-A0555	Laboratory oven Resistance
HR-A1500/1	Shelve for 30 lt capacity Ovens
HR-A1505/1	Shelve for 55 lt capacity Ovens
HR-A1510/1	Shelve for 120 lt capacity Ovens
HR-A1515/1	Shelve for 250 lt capacity Ovens
HR-A1520/1	Shelve for 500 lt capacity Ovens
HR-A1525/1	Shelve for 750 lt capacity Ovens



HR-A0550 & HR-A1515/1

HR-A0533

HR-A0515

LABORATORY DRYING OVENS (NATURAL CONVECTION)

STANDARDS: EN 932-5, EN 1097-5, EN 12697-1 Clause C, EN 13108, EN 196-2, EN 196-21, EN 459-2, ASTM C 127, C136, D558, D559, D560, D698, D1557, D1559, BS 1924:1, BS 1377:1, UNE 103300

Natural Convection (Air Circulation) Laboratory Drying Ovens are designed for drying, baking, conditioning and moisture determination.

The interior is made from stainless steel and the exterior is robustly constructed from sheet steel finished in powder coated paint.

Temperature range is from ambient to 200°C with precision of 3-4 ºC. Control System is Digital PID Controller.

The Ovens are equipped of a dual safety thermostat with higher thermic threshold to prevent accidental over-temperatures and to ensure safe working conditions.

The Ovens are supplied complete with 2 shelves easily removable and that can be positioned at various heights.

HR-A153X Series Ovens have door with transparent thermal glass window for watching the samples under drying.

HR-A1510

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Max. Working Temp. (°C)	Power Supply
HR-A1500	Laboratory Oven (NC)	30	32x32x32	47x47x60	17	200	220 V, 50-60 Hz, 1 ph
HR-A1505	Laboratory Oven (NC)	55	38x38x38	55x61x71	20	200	220 V, 50-60 Hz, 1 ph
HR-A1510	Laboratory Oven (NC)	120	57x44x49	80x72x67	70	200	220 V, 50-60 Hz, 1 ph
HR-A1515	Laboratory Oven (NC)	250	57x56x80	80x85x104	100	200	220 V, 50-60 Hz, 1 ph
HR-A1520	Laboratory Oven (NC)	500	57x80x110	80x108x133	140	200	380 V, 50-60 Hz, 3 ph
HR-A1525	Laboratory Oven (NC)	750	57x89x148	80x127x182	170	200	380 V, 50-60 Hz, 3 ph
HR-A1530	Laboratory Oven (NC) , w/Glass Window	30	32x32x32	47x47x60	17	200	220 V, 50-60 Hz, 1 ph
HR-A1531	Laboratory Oven (NC) , w/Glass Window	55	38x38x38	55x61x71	20	200	220 V, 50-60 Hz, 1 ph
HR-A1532	Laboratory Oven (NC) , w/Glass Window	120	57x44x49	80x72x67	70	200	220 V, 50-60 Hz, 1 ph
HR-A1533	Laboratory Oven (NC) , w/Glass Window	250	57x56x80	80x85x104	100	200	220 V, 50-60 Hz, 1 ph
HR-A1534	Laboratory Oven (NC) , w/Glass Window	500	57x80x110	80x108x133	140	200	380 V, 50-60 Hz, 3 ph
HR-A1535	Laboratory Oven (NC) , w/Glass Window	750	57x89x148	80x127x182	170	200	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-A1500/1	Shelve for 30 lt capacity Ovens
HR-A1505/1	Shelve for 55 lt capacity Ovens
HR-A1510/1	Shelve for 120 lt capacity Ovens
HR-A1515/1	Shelve for 250 lt capacity Ovens
HR-A1520/1	Shelve for 500 lt capacity Ovens
HR-A1525/1	Shelve for 750 lt capacity Ovens

HR-A1533

DRYING OVEN WITH PLATFORM CART

STANDARDS: EN 932-5, EN 1097-5, ASTM C 127, C136, D558, D559, D560, D698, D1557, D1559, BS 1924:1, BS 1377:1, UNE 103300

Drying Oven with Platform Carts are especially suitable where high temperature uniformity and precision inside the chamber are required.

Drying Ovens are fan circulated.

The accuracy of the temperature and its uniformity are granted within the tolerances requested by the Standards.

The interior is made from stainless steel and the exterior is robustly constructed from sheet steel finished in powder coated paint.

Temperature range is from ambient +10°C to 250°C. Control System is Digital PID Controller.

The Ovens are equipped of a dual safety thermostat with higher thermic threshold to prevent accidental over-temperatures and to ensure safe working conditions.

The Ovens are supplied complete with 8 shelves easily removable and that can be positioned at various heights. Shelves are placed on a wheeled Platform cart. The platform cart has handles for ease of pulling.

Please contact our company for different capacities.

HR-A1550

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Power Supply
HR-A1550	Laboratory Oven with Platform Cart	4000	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-A1550/1	Shelve for HR-A1550

MUFFLE FURNACES

HR-A0602

STANDARDS: EN 12697-1 Clause C, EN 13108

Designed for high temperature heating.

The furnaces cover a range from 1100°C to 1500°C.

The thermic insulation is in ceramic fiber plate and firebrick to avoid the smallest heating leakage and so it takes a great energetic saving.

External Surface Material Electrostatic powder painted.

Muffle Furnaces has Programmable PID Microprocessor Control System, Digital Display, Easy to use Control Panel and a wide flue to eliminate the chemical smoke.

A1 quality wire resistance is used in 1100 °C and 1200 °C Muffle Furnaces, APM quality wire resistance is used in 1300 °C Muffle Furnaces, Silicon carbide resistance is used in Muffle Furnaces between 1400 °C and 1500 °C.

N type thermocouple is used in 1100 °C and 1200 °C Muffle Furnaces, S and B type thermocouples are used in Muffle Furnaces between 1300 °C and 1500 °C.

Temperature Sensitivity is 2 ºC in all Muffle Furnaces.

Technical Specifications:

Product Code	Product Name	Max. Temp. (°C)	Cont. Op. Temp. (°C)	Volume (L)	Int. Dimensions (cm)	Ext. Dimensions (cm)	Power Supply
HR-A0600	Muffle Furnace	1100	1050	3	13x13x18	35x38x37	220 V, 50-60 Hz, 1 ph
HR-A0601	Muffle Furnace	1100	1050	7	19x15x25	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0602	Muffle Furnace	1100	1050	8	17x14x20	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0603	Muffle Furnace	1100	1050	9	21x17x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0604	Muffle Furnace	1100	1050	10	21x19x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0605	Muffle Furnace	1100	1050	15	25x20x30	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0606	Muffle Furnace	1100	1050	30	30x25x40	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0607	Muffle Furnace	1100	1050	40	32x25x49	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0610	Muffle Furnace	1200	1150	3	13x13x18	35x38x37	220 V, 50-60 Hz, 1 ph
HR-A0611	Muffle Furnace	1200	1150	7	19x15x25	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0612	Muffle Furnace	1200	1150	8	17x14x20	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0613	Muffle Furnace	1200	1150	9	21x17x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0614	Muffle Furnace	1200	1150	10	21x19x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0615	Muffle Furnace	1200	1150	15	25x20x30	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0616	Muffle Furnace	1200	1150	30	30x25x40	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0617	Muffle Furnace	1200	1150	40	32x25x49	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0620	Muffle Furnace	1300	1250	3	13x13x18	35x38x37	220 V, 50-60 Hz, 1 ph
HR-A0621	Muffle Furnace	1300	1250	7	19x15x25	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0622	Muffle Furnace	1300	1250	8	17x14x20	43x51x47	220 V, 50-60 Hz, 1 ph
HR-A0623	Muffle Furnace	1300	1250	9	21x17x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0624	Muffle Furnace	1300	1250	10	21x19x25	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0625	Muffle Furnace	1300	1250	15	25x20x30	49x56x53	220 V, 50-60 Hz, 1 ph
HR-A0626	Muffle Furnace	1300	1250	30	30x25x40	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0627	Muffle Furnace	1300	1250	40	32x25x49	56x64x65	380 V, 50-60 Hz, 3 ph
HR-A0630	Muffle Furnace	1400	1350	5	14x15x25	50x53x52	380 V, 50-60 Hz, 3 ph
HR-A0631	Muffle Furnace	1400	1350	9	18x20x25	50x53x52	380 V, 50-60 Hz, 3 ph
HR-A0632	Muffle Furnace	1400	1350	15	25x20x30	49x56x53	380 V, 50-60 Hz, 3 ph
HR-A0640	Muffle Furnace	1500	1450	5	14x15x25	50x53x52	380 V, 50-60 Hz, 3 ph
HR-A0641	Muffle Furnace	1500	1450	9	18x20x25	50x53x52	380 V, 50-60 Hz, 3 ph
HR-A0642	Muffle Furnace	1500	1450	15	25x20x30	49x56x53	380 V, 50-60 Hz, 3 ph

Platinum Crucibles and Molds are also available as optional for use in Muffle Furnaces.

Platinum Crucibles and Molds are 95/5 Platinum/Gold alloy.

Can be produced in special sizes upon request.

HR-A0650

HR-A0660

Platin Crucibles*

Product Code	Product Name	Lower inner dia. (mm)	Upper inner dia. (mm)	Outer edge (mm)	Height (mm)	Base Thickness (mm)	Weight (gr)
HR-A0650	Platin Crucible (95pt/5Au)	20	34	---	38	0,4	35
HR-A0651	Platin Crucible (95pt/5Au)	22	39	---	43	0,4	45
HR-A0652	Platin Crucible (95pt/5Au)	26	44	---	38	0,4	55
HR-A0660	Platin Mold (95pt/5Au)	29	31	41	3	0,8	28
HR-A0661	Platin Mold (95pt/5Au)	32	34	41	3	0,8	30
HR-A0662	Platin Mold (95pt/5Au)	34	36	51	3	0,8	47
HR-A0663	Platin Mold (95pt/5Au)	38	40	51	4	0,8	48
HR-A0664	Platin Mold (95pt/5Au)	39	41	51	3	0,8	48

*Can be produced in special sizes upon request.

HOT PLATES

Hot plates are produced in different dimensions on request. The controller can be digital or manual.

Setting temperature can be adjusted and monitor digitally.

Heater Table made from Cast / Sand Blasting Sheet Iron.

Temperature Range is ambient to 350°C.

HR-G1010

HR-G1015

HR-G1000

Technical Specifications:

Product Code	Product Name	Plate Dimensions (cm)	Control System	Sensitivity (°C)	Dimensions (cm)	Weight (kg)	Power Supply
HR-G1000	Digital Hot Plate	30x30	PID Digital Thermostat	± 2	30x30x25	3,5	220 V, 50 Hz, 1 ph
HR-G1005	Digital Hot Plate	40x40	PID Digital Thermostat	± 2	40x40x25	5,5	220 V, 50 Hz, 1 ph
HR-G1010	Analog Hot Plate	Ø 20 (Single)	Analog Thermostat	± 5	30x30x20	2,5	220 V, 50 Hz, 1 ph
HR-G1015	Analog Hot Plate	Ø 15, Ø 20 (Double)	Analog Thermostat	± 5	60x30x20	6	220 V, 50 Hz, 1 ph

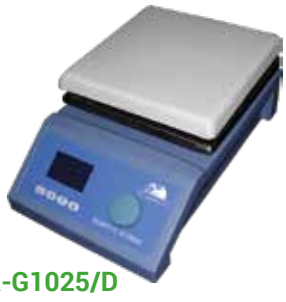
MAGNETIC STIRRER HEATER

Magnetic Stirrer Heater for titration and stirring of liquid and semi-solid materials.

Technical Specifications:

Product Code	HR-G1025/A	HR-G1025/D
Product Name	Analog Magnetic Stirrer Heater	Digital Magnetic Stirrer Heater
Stirring Capacity (lt)	5/10	5/10
Max. Heat Temperature (°C)	380	350
Speed Range (r.p.m.)	100-1600	100-2000
Speed and Temperature Control	Analog	Digital
Table	Aluminium	Ceramic
Cover	Epoxy-coated Aluminium Alloy	Epoxy-coated Aluminium Alloy
Plate Dimension (cm)	12x12	19x19
Dimension (cm)	13x21x9	19x31x13
Weight (kg)	2,2	4
Power Supply	220 V, 50-60 Hz, 1 ph, 500 W	220 V, 50-60 Hz, 1 ph, 600 W

HR-G1025/A



HR-G1025/D

WARM-AIR DRIER

For general laboratory purposes, to dry soil and aggregate samples.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G1035	Warm-Air Drier	55x50x20	1,5	220 V, 50-60 Hz, 1 ph

HR-G1035

HOT AIR GUN

For general laboratory purposes, used for drying small amount of aggregates. The air flow can be adjusted (250-500 lt/min).

The air temperature can be adjusted between 350-550 °C.

HR-G1040

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G1040	Hot Air Gun	50x40x20	0,7	220 V, 50-60 Hz, 1 ph

MICROWAVE OVEN

Microwave oven is used for drying, conditioning moisture determination and pre-heating applications when quick drying is required.

Rotating tray system, 100 min program timer.

HR-G1045

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Max. Temp. (°C)	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Power Supply
HR-G1045	Microwave Oven	17	250	21x28x28	45x30x30	11	220 V, 50-60 Hz, 1 ph

GRID SIEVES

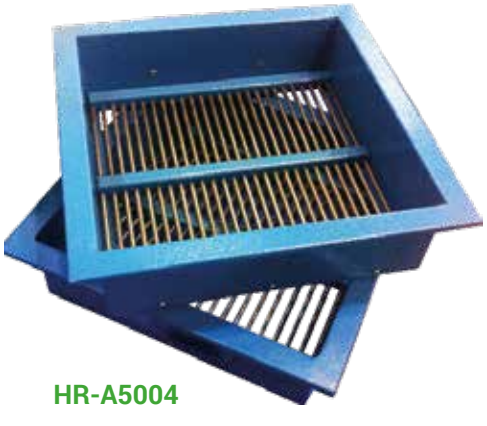
STANDARDS: EN 933-3

Used to determine the flakiness index of the aggregates.

Consists of electrostatic painted frame and 5 mm diameter stainless steel bars.

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

HR-A5001



HR-A5004

Technical Specifications:

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

FLAKINESS SIEVES

STANDARDS: BS 812

Used to determine if aggregate is flaky; i.e. if thickness is less than 0,6 of nominal size.
Each sieve made from heavy gauge steel sheets in dimensions specified in the standards and coated with electrostatic paint.

Technical Specifications:

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

WET WASHING SIEVES

STANDARDS: ASTM E11

Used for wet testing of various materials enabling to wash the fines through the sieve without losing any of the sample.
Frame and woven wire cloth are stainless steel made.

Technical Specifications:

Product Name	Frame Ø200 x 100 mm	Frame Ø300 x 100 mm	Aperture Size (mm)
Wet Washing Sieve	HR-G2210	HR-G3210	6.3 mm (¼")
Wet Washing Sieve	HR-G2211	HR-G3211	4.75 mm (No.4)
Wet Washing Sieve	HR-G2212	HR-G3212	2 mm (No.10)
Wet Washing Sieve	HR-G2213	HR-G3213	425 µm (No. 40)
Wet Washing Sieve	HR-G2214	HR-G3214	75 µm (No. 200)
Wet Washing Sieve	HR-G2215	HR-G3215	63 µm (No. 230)

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

HR-G2214

HR-G3215

TEST SIEVES

STANDARDS: EN 933-1, EN 933-2, ISO 3310-1, ISO 3310-2, ISO 565, ASTM E11

HİRA Laboratory Testing Equipment proposes a complete range of testing sieves which are used in all types of sieve testing applications, from sampling and classification of soils, aggregates and other powdered and granular materials.

Each sieve is individually serial numbered on metal label, ensuring full traceability.

The HİRA sieves are made with only the highest quality materials and are available in diameter sizes of 100, 150, 200, 300, 400 and 450 mm.

Woven wire mesh Sieves are available in 100, 150, 200, 300, 400 and 450 mm frame diameters materials of stainless steel.

Perforated Plate Sieves are available in 200, 300 mm frame diameters materials of stainless steel.

Table for the Woven Wire Mesh Sieves (ISO 3310-1)

Aperture Size	Frame Ø100 x 50 mm	Frame Ø150 x 50 mm	Frame Ø200 x 50 mm	Frame Ø300 x 75 mm	Frame Ø400 x 50 mm	Frame Ø450 x 50 mm
125 mm	HR-G12125	HR-G1125	HR-G2125	HR-G3125	HR-G4125	HR-G5125
100 mm (4″)	HR-G12126	HR-G1126	HR-G2126	HR-G3126	HR-G4126	HR-G5126
90 mm (3 ½″)	HR-G12127	HR-G1127	HR-G2127	HR-G3127	HR-G4127	HR-G5127
80 mm	HR-G12128	HR-G1128	HR-G2128	HR-G3128	HR-G4128	HR-G5128
75 mm (3″)	HR-G12129	HR-G1129	HR-G2129	HR-G3129	HR-G4129	HR-G5129
63 mm (2 ½″)	HR-G12130	HR-G1130	HR-G2130	HR-G3130	HR-G4130	HR-G5130
56 mm	HR-G12131	HR-G1131	HR-G2131	HR-G3131	HR-G4131	HR-G5131
53 mm (2.12″)	HR-G12132	HR-G1132	HR-G2132	HR-G3132	HR-G4132	HR-G5132
50 mm (2″)	HR-G12133	HR-G1133	HR-G2133	HR-G3133	HR-G4133	HR-G5133
45 mm (1 ¾″)	HR-G12134	HR-G1134	HR-G2134	HR-G3134	HR-G4134	HR-G5134
40 mm	HR-G12135	HR-G1135	HR-G2135	HR-G3135	HR-G4135	HR-G5135
37.5 mm (1-½″)	HR-G12136	HR-G1136	HR-G2136	HR-G3136	HR-G4136	HR-G5136
31.5 mm (1 ¼″)	HR-G12137	HR-G1137	HR-G2137	HR-G3137	HR-G4137	HR-G5137
26.5 mm (1.06″)	HR-G12138	HR-G1138	HR-G2138	HR-G3138	HR-G4138	HR-G5138
25 mm (1″)	HR-G12139	HR-G1139	HR-G2139	HR-G3139	HR-G4139	HR-G5139
22.4 mm (7/8″)	HR-G12140	HR-G1140	HR-G2140	HR-G3140	HR-G4140	HR-G5140
20 mm	HR-G12141	HR-G1141	HR-G2141	HR-G3141	HR-G4141	HR-G5141
19 mm (¾″)	HR-G12142	HR-G1142	HR-G2142	HR-G3142	HR-G4142	HR-G5142
16 mm (5/8″)	HR-G12143	HR-G1143	HR-G2143	HR-G3143	HR-G4143	HR-G5143
14 mm	HR-G12144	HR-G1144	HR-G2144	HR-G3144	HR-G4144	HR-G5144
13.2 mm (.530″)	HR-G12145	HR-G1145	HR-G2145	HR-G3145	HR-G4145	HR-G5145
12.5 mm (½″)	HR-G12146	HR-G1146	HR-G2146	HR-G3146	HR-G4146	HR-G5146
11.2 mm (7/16″)	HR-G12147	HR-G1147	HR-G2147	HR-G3147	HR-G4147	HR-G5147
10 mm	HR-G12148	HR-G1148	HR-G2148	HR-G3148	HR-G4148	HR-G5148
9.5 mm (3/8″)	HR-G12149	HR-G1149	HR-G2149	HR-G3149	HR-G4149	HR-G5149
8 mm (5/16″)	HR-G12150	HR-G1150	HR-G2150	HR-G3150	HR-G4150	HR-G5150
6.7 mm (.265″)	HR-G12151	HR-G1151	HR-G2151	HR-G3151	HR-G4151	HR-G5151
6.3 mm (¼″)	HR-G12152	HR-G1152	HR-G2152	HR-G3152	HR-G4152	HR-G5152
5.6 mm (No. 3 ½)	HR-G12153	HR-G1153	HR-G2153	HR-G3153	HR-G4153	HR-G5153
5 mm	HR-G12154	HR-G1154	HR-G2154	HR-G3154	HR-G4154	HR-G5154
4.75 mm (No.4)	HR-G12155	HR-G1155	HR-G2155	HR-G3155	HR-G4155	HR-G5155
4 mm (No.5)	HR-G12156	HR-G1156	HR-G2156	HR-G3156	HR-G4156	HR-G5156
3.35 mm (No. 6)	HR-G12157	HR-G1157	HR-G2157	HR-G3157	HR-G4157	HR-G5157
3.15 mm	HR-G12158	HR-G1158	HR-G2158	HR-G3158	HR-G4158	HR-G5158
2.8 mm (No. 7)	HR-G12159	HR-G1159	HR-G2159	HR-G3159	HR-G4159	HR-G5159
2.5 mm	HR-G12160	HR-G1160	HR-G2160	HR-G3160	HR-G4160	HR-G5160
2.36 mm (No.8)	HR-G12161	HR-G1161	HR-G2161	HR-G3161	HR-G4161	HR-G5161
2 mm (No.10)	HR-G12162	HR-G1162	HR-G2162	HR-G3162	HR-G4162	HR-G5162
1.7 mm (No. 12)	HR-G12163	HR-G1163	HR-G2163	HR-G3163	HR-G4163	HR-G5163
1.6 mm	HR-G12164	HR-G1164	HR-G2164	HR-G3164	HR-G4164	HR-G5164
1.4 mm (No. 14)	HR-G12165	HR-G1165	HR-G2165	HR-G3165	HR-G4165	HR-G5165
1.25 mm	HR-G12166	HR-G1166	HR-G2166	HR-G3166	HR-G4166	HR-G5166
1.18 mm (No.16)	HR-G12167	HR-G1167	HR-G2167	HR-G3167	HR-G4167	HR-G5167
1 mm (No. 18)	HR-G12168	HR-G1168	HR-G2168	HR-G3168	HR-G4168	HR-G5168
850 µm (No. 20)	HR-G12169	HR-G1169	HR-G2169	HR-G3169	HR-G4169	HR-G5169
800 µm	HR-G12170	HR-G1170	HR-G2170	HR-G3170	HR-G4170	HR-G5170
710 µm (No. 25)	HR-G12171	HR-G1171	HR-G2171	HR-G3171	HR-G4171	HR-G5171
630 µm	HR-G12172	HR-G1172	HR-G2172	HR-G3172	HR-G4172	HR-G5172

HİRA TESTING EQUIPMENT

Aperture Size	Frame Ø100 x 50 mm	Frame Ø150 x 50 mm	Frame Ø200 x 50 mm	Frame Ø300 x 75 mm	Frame Ø400 x 50 mm	Frame Ø450 x 50 mm
600 µm (No. 30)	HR-G12173	HR-G1173	HR-G2173	HR-G3173	HR-G4173	HR-G5173
500 µm (No. 35)	HR-G12174	HR-G1174	HR-G2174	HR-G3174	HR-G4174	HR-G5174
425 µm (No. 40)	HR-G12175	HR-G1175	HR-G2175	HR-G3175	HR-G4175	HR-G5175
400 µm	HR-G12176	HR-G1176	HR-G2176	HR-G3176	HR-G4176	HR-G5176
355 µm (No. 45)	HR-G12177	HR-G1177	HR-G2177	HR-G3177	HR-G4177	HR-G5177
315 µm	HR-G12178	HR-G1178	HR-G2178	HR-G3178	HR-G4178	HR-G5178
300 µm (No. 50)	HR-G12179	HR-G1179	HR-G2179	HR-G3179	HR-G4179	HR-G5179
250 µm (No. 60)	HR-G12180	HR-G1180	HR-G2180	HR-G3180	HR-G4180	HR-G5180
212 µm (No. 70)	HR-G12181	HR-G1181	HR-G2181	HR-G3181	HR-G4181	HR-G5181
200 µm	HR-G12182	HR-G1182	HR-G2182	HR-G3182	HR-G4182	HR-G5182
180 µm (No. 80)	HR-G12183	HR-G1183	HR-G2183	HR-G3183	HR-G4183	HR-G5183
160 µm	HR-G12184	HR-G1184	HR-G2184	HR-G3184	HR-G4184	HR-G5184
150 µm (No. 100)	HR-G12185	HR-G1185	HR-G2185	HR-G3185	HR-G4185	HR-G5185
125 µm (No. 120)	HR-G12186	HR-G1186	HR-G2186	HR-G3186	HR-G4186	HR-G5186
106 µm (No. 140)	HR-G12187	HR-G1187	HR-G2187	HR-G3187	HR-G4187	HR-G5187
100 µm	HR-G12188	HR-G1188	HR-G2188	HR-G3188	HR-G4188	HR-G5188
90 µm (No. 170)	HR-G12189	HR-G1189	HR-G2189	HR-G3189	HR-G4189	HR-G5189
80 µm	HR-G12190	HR-G1190	HR-G2190	HR-G3190	HR-G4190	HR-G5190
75 µm (No. 200)	HR-G12191	HR-G1191	HR-G2191	HR-G3191	HR-G4191	HR-G5191
63 µm (No. 230)	HR-G12192	HR-G1192	HR-G2192	HR-G3192	HR-G4192	HR-G5192
53 µm (No. 270)	HR-G12193	HR-G1193	HR-G2193	HR-G3193	HR-G4193	HR-G5193
50 µm	HR-G12194	HR-G1194	HR-G2194	HR-G3194	HR-G4194	HR-G5194
45 µm (No. 325)	HR-G12195	HR-G1195	HR-G2195	HR-G3195	HR-G4195	HR-G5195
40 µm	HR-G12196	HR-G1196	HR-G2196	HR-G3196	HR-G4196	HR-G5196
38 µm (No. 400)	HR-G12197	HR-G1197	HR-G2197	HR-G3197	HR-G4197	HR-G5197
25 µm	HR-G12198	HR-G1198	HR-G2198	HR-G3198	HR-G4198	HR-G5198
LID	HR-G12199	HR-G1199	HR-G2199	HR-G3199	HR-G4199	HR-G5199
RECEIVER	HR-G12200	HR-G1200	HR-G2200	HR-G3200	HR-G4200	HR-G5200
LID & RECEIVER	HR-G12201	HR-G1201	HR-G2201	HR-G3201	HR-G4201	HR-G5201

Ø200 x 50 mm Woven Wire Mesh Sieves

Table for the Woven Wire Mesh Sieves (Coarse) (ASTM E11)

Aperture Size	Frame Ø 8″ x 50 mm	Frame Ø 12″ x 50 mm
100 mm (4″)	HR-G9126	HR-G10126
90 mm (3 ½″)	HR-G9127	HR-G10127
75 mm (3″)	HR-G9129	HR-G10129
63 mm (2 ½″)	HR-G9130	HR-G10130
53 mm (2.12″)	HR-G9132	HR-G10132
50 mm (2″)	HR-G9133	HR-G10133
45 mm (1 ¾″)	HR-G9134	HR-G10134
37.5 mm (1-½″)	HR-G9136	HR-G10136
31.5 mm (1 ¼″)	HR-G9137	HR-G10137
26.5 mm (1.06″)	HR-G9138	HR-G10138
25 mm (1″)	HR-G9139	HR-G10139
22.4 mm (7/8″)	HR-G9140	HR-G10140
19 mm (¾″)	HR-G9142	HR-G10142
16 mm (5/8″)	HR-G9143	HR-G10143
13.2 mm (.530″)	HR-G9145	HR-G10145
12.5 mm (½″)	HR-G9146	HR-G10146
11.2 mm (7/16″)	HR-G9147	HR-G10147
9.5 mm (3/8″)	HR-G9149	HR-G10149
8 mm (5/16″)	HR-G9150	HR-G10150
6.7 mm (.265″)	HR-G9151	HR-G10151
6.3 mm (¼″)	HR-G9152	HR-G10152
5.6 mm (No. 3 ½)	HR-G9153	HR-G10153
4.75 mm (No.4)	HR-G9155	HR-G10155
4 mm (No.5)	HR-G9156	HR-G10156
LID	HR-G9199	HR-G10199
RECEIVER	HR-G9200	HR-G10200
LID & RECEIVER	HR-G9201	HR-G10201

Table for the Woven Wire Mesh Sieves (Fine) (ASTM E11)

Aperture Size	Frame Ø 8″ x 50 mm	Frame Ø 12″ x 50 mm
3.35 mm (No. 6)	HR-G9157	HR-G10157
2.8 mm (No. 7)	HR-G9159	HR-G10159
2.36 mm (No.8)	HR-G9161	HR-G10161
2 mm (No.10)	HR-G9162	HR-G10162
1.7 mm (No. 12)	HR-G9163	HR-G10163
1.4 mm (No. 14)	HR-G9165	HR-G10165
1.18 mm (No.16)	HR-G9167	HR-G10167
1 mm (No. 18)	HR-G9168	HR-G10168
850 µm (No. 20)	HR-G9169	HR-G10169
710 µm (No. 25)	HR-G9171	HR-G10171
600 µm (No. 30)	HR-G9173	HR-G10173
500 µm (No. 35)	HR-G9174	HR-G10174
425 µm (No. 40)	HR-G9175	HR-G10175
355 µm (No. 45)	HR-G9177	HR-G10177
300 µm (No. 50)	HR-G9179	HR-G10179
250 µm (No. 60)	HR-G9180	HR-G10180
212 µm (No. 70)	HR-G9181	HR-G10181
180 µm (No. 80)	HR-G9183	HR-G10183
150 µm (No. 100)	HR-G9185	HR-G10185
125 µm (No. 120)	HR-G9186	HR-G10186
106 µm (No. 140)	HR-G9187	HR-G10187
90 µm (No. 170)	HR-G9189	HR-G10189
75 µm (No. 200)	HR-G9191	HR-G10191
63 µm (No. 230)	HR-G9192	HR-G10192
53 µm (No. 270)	HR-G9193	HR-G10193
45 µm (No. 325)	HR-G9195	HR-G10195
40 µm	HR-G9196	HR-G10196
38 µm (No. 400)	HR-G9197	HR-G10197
LID	HR-G9199	HR-G10199
RECEIVER	HR-G9200	HR-G10200
LID & RECEIVER	HR-G9201	HR-G10201

Ø300 x 50 mm Woven Wire Mesh Sieves

HR-G2201

HR-G3201

Table for the Perforated Plate Sieves (ISO 3310-2)

Aperture Size	Frame Ø200x 50mm	Frame Ø300 x 75mm
125 mm	HR-G16125	HR-G17125
100 mm (4″)	HR-G16126	HR-G17126
90 mm (3 ½″)	HR-G16127	HR-G17127
80 mm	HR-G16128	HR-G17128
75 mm (3″)	HR-G16129	HR-G17129
63 mm (2 ½″)	HR-G16130	HR-G17130
56 mm	HR-G16131	HR-G17131
53 mm (2.12″)	HR-G16132	HR-G17132
50 mm (2″)	HR-G16133	HR-G17133
45 mm (1 ¾″)	HR-G16134	HR-G17134
40 mm	HR-G16135	HR-G17135
37.5 mm (1-½″)	HR-G16136	HR-G17136
31.5 mm (1 ¼″)	HR-G16137	HR-G17137
26.5 mm (1.06″)	HR-G16138	HR-G17138
25 mm (1″)	HR-G16139	HR-G17139
22.4 mm (7/8″)	HR-G16140	HR-G17140
20 mm	HR-G16141	HR-G17141
19 mm (¾″)	HR-G16142	HR-G17142

Aperture Size	Frame Ø200 x 50mm	Frame Ø300 x 75mm
16 mm (5/8″)	HR-G16143	HR-G17143
14 mm	HR-G16144	HR-G17144
13.2 mm (.530″)	HR-G16145	HR-G17145
12.5 mm (½″)	HR-G16146	HR-G17146
11.2 mm (7/16″)	HR-G16147	HR-G17147
10 mm	HR-G16148	HR-G17148
9.5 mm (3/8″)	HR-G16149	HR-G17149
8 mm (5/16″)	HR-G16150	HR-G17150
6.7 mm (.265″)	HR-G16151	HR-G17151
6.3 mm (¼″)	HR-G16152	HR-G17152
5.6 mm (No. 3 ½)	HR-G16153	HR-G17153
5 mm	HR-G16154	HR-G17154
4.75 mm (No.4)	HR-G16155	HR-G17155
4 mm (No.5)	HR-G16156	HR-G17156
LID	HR-G16199	HR-G17199
RECEIVER	HR-G16200	HR-G17200
LID & RECEIVER	HR-G16201	HR-G17201

SIEVE SHAKERS

STANDARDS: EN 932-5, ISO 565, ISO 3310-1, ISO 3310-2, ASTM E11, E323, BS 410-1, BS 410-2, EN 1339, EN 1367-1; TS 2824

The sieve shaker imparts a circular motion to the material being sieved so that it makes a slow progression over the surface of the sieve. They are ideal for heavy duty applications when heavy or large bulk samples have to be analyzed.

They are equipped with a dynamic power source which ensures the right vibration is imparted to the sieves and sample for fast, accurate and reproducible tests. The vertical movement is fixed to ensure the sample spends maximum time on the sieve surface. The unique vibratory action also helps keep the apertures clear and free from binding.

The shaker is fitted with a very efficient clamping device that ensures sieves are held firmly without over-tightening and allows them to be quickly removed and replaced.

The shaker is fitted with digital timer which can be pre-set for any duration up to 99 minutes.

Different models are available according to the sieve diameters.

Wet sieving kits in the appropriate sizes may be used with this shaker.

The HR-G0515, HR-G0520, HR-G0525 series have the additional frequency adjustment/control property.

Noise reduction cabinet should be ordered separately.

Sieve Capacities

Sieve Diameter	200 mm	8”	250 mm	300 mm	12”	315 mm	400 mm	450 mm
Sieve Capacity	15 pieces		10 pieces				7 pieces	
	plus lid and receiver							

HR-G0500

HR-G0515

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Product Name	Sieve Dia. Capacity (mm)	Dimensions (cm)	Weight (kg)	Power Supply
HR-G0500	Sieve Shaker, Time Controlled	Ø200/Ø300	52x73x40	30	220 V, 50 Hz, 1 ph
HR-G0500/60Hz	Sieve Shaker, Time Controlled	Ø200/Ø300	52x73x40	30	220 V, 60 Hz, 1 ph
HR-G0505	Sieve Shaker, Time Controlled	Ø200/8"/250/300/12"/315	52x73x40	30	220 V, 50 Hz, 1 ph
HR-G0505/60Hz	Sieve Shaker, Time Controlled	Ø200/8"/250/300/12"/315	52x73x40	30	220 V, 60 Hz, 1 ph
HR-G0510	Sieve Shaker, Time Controlled	Ø200/8"/250/300/12"/315/400/450	72x93x40	50	220 V, 50 Hz, 1 ph
HR-G0510/60Hz	Sieve Shaker, Time Controlled	Ø200/8"/250/300/12"/315/400/450	72x93x40	50	220 V, 60 Hz, 1 ph
HR-G0515	Sieve Shaker with Frequency Controlled	Ø200/300	52x73x40	30	220 V, 50-60 Hz, 1 ph
HR-G0520	Sieve Shaker with Frequency Controlled	Ø200/8"/250/300/12"/315	52x73x40	50	220 V, 50-60 Hz, 1 ph
HR-G0525	Sieve Shaker with Frequency Controlled	Ø200/8"/250/300/12"/315/400/450	72x93x40	50	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-G0500/1	Noise reduction cabinet for HR-G0500 & HR-G0515 Series
HR-G0505/1	Noise reduction cabinet for HR-G0505 & HR-G0520 Series
HR-G0510/1	Noise reduction cabinet for HR-G0510 & HR-G0525 Series

HR-G0500 & HR-G0500/1

HR-G0500 & HR-G0500/1

ROTATAP TYPE SIEVE SHAKER

STANDARDS: ASTM C136

Rotatap Type Motorized Sieve Shaker is designed for effective sieving in 200 mm / 8" diameter sieves.

It provides bidirectional motion as horizontal and vertical.

The shaker is fitted with digital timer which can be pre-set for any duration up to 99 minutes.

Provides 278 oscillations with a horizontal circular motion and 150 taps per minute with vertical tapping motion.

Noise reduction cabinet should be ordered separately.

HR-G0522

Technical Specifications:

Product Code	Product Name	Sieve Dia. Capacity (mm)	Dimensions (cm)	Weight (kg)	Power Supply
HR-G0522	Rotatap Type Sieve Shaker, Time Controlled	Ø200 / 8"	51x70x64	75	220 V, 50 Hz, 1 ph
HR-G0522/60Hz	Rotatap Type Sieve Shaker, Time Controlled	Ø200 / 8"	51x70x64	75	220 V, 60 Hz, 1 ph

Sieve Capacities

Sieve Diameter	200 mm	8"
Sieve Capacity	7 pieces with full height & 14 pieces with half height	
	plus lid and receiver	

Spare Parts & Accessories:

Product Code	Product Name
HR-G0522/1	Noise reduction cabinet for HR-G0522

HIGH CAPACITY SIEVE SHAKER

STANDARDS: TS EN 1339, 1367-1, EN 932-5, ISO 3310-1, TS 2824

HR-G4030

HR-G4011

Ideal for sizing large quantities of crushed stones, sand, gravel, slag, coal, coke, ores, pellets and similar materials.

The screen shaker has a capacity of about 30 lt (60 ÷ 70 Kg) of sample. For use with 40x60 cm dimension screens.

Various sizes of screens are available on request.

HR-G0530

Capacity is 6 sieves and lid. The shaker is fitted with timer which can be pre-set for any duration up to 99 minutes.

The HR-G0535, HR-G0520, HR-G0525 series have the additional frequency adjustment/ control property.

Supplied with dust cup. Sieves should be ordered separately.

Safety Doors, upper and frontal, complete with micro-switch, complying to CE Safety Directive. If the door is opened while the shaker is working, it automatically stops. The doors also protect from dust. Safety Doors (should be factory installed) should be ordered separately.

Security Cabinet, steel made with micro-switch, complying to CE Safety Directive, lined with sound-proofing material for noise reduction. If the door is opened while the shaker is working, it automatically stops. The cabinet also protects from dust.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G0530	High Capacity Sieve Shaker, Time Controlled	59x79x85	180	220 V, 50 Hz, 1 ph
HR-G0530/60Hz	High Capacity Sieve Shaker, Time Controlled	59x79x85	180	220 V, 60 Hz, 1 ph
HR-G0535	High Capacity Sieve Shaker with Frequency Controlled	59x79x85	180	220 V, 50 Hz, 1 ph
HR-G0535/60Hz	High Capacity Sieve Shaker with Frequency Controlled	59x79x85	180	220 V, 60 Hz, 1 ph
HR-G0540	High Capacity Sieve Shaker, Time Controlled with Soundproof Safety Cabinet	90x90x135	300	220 V, 50 Hz, 1 ph
HR-G0540/60Hz	High Capacity Sieve Shaker, Time Controlled with Soundproof Safety Cabinet	90x90x135	300	220 V, 60 Hz, 1 ph
HR-G0545	High Capacity Sieve Shaker with Frequency Controlled with Soundproof Safety Cabinet	90x90x135	300	220 V, 50 Hz, 1 ph
HR-G0545/60Hz	High Capacity Sieve Shaker with Frequency Controlled with Soundproof Safety Cabinet	90x90x135	300	220 V, 60 Hz, 1 ph
HR-G0546	Safety Doors	---	---	---

Table for the sieves

Product Code	Frame Dimensions (cm)	Aperture Size (mm)
HR-G4000	40x60x7,5	125 mm
HR-G4001	40x60x7,5	100 mm (4″)
HR-G4002	40x60x7,5	90 mm (3 ½″)
HR-G4003	40x60x7,5	80 mm
HR-G4004	40x60x7,5	75 mm (3″)
HR-G4005	40x60x7,5	63 mm (2 ½″)
HR-G4006	40x60x7,5	56 mm
HR-G4007	40x60x7,5	53 mm (2.12″)
HR-G4008	40x60x7,5	50 mm (2″)
HR-G4009	40x60x7,5	45 mm (1 ¾″)
HR-G4010	40x60x7,5	40 mm

Product Code	Frame Dimensions (cm)	Aperture Size (mm)
HR-G4011	40x60x7,5	37.5 mm (1-½″)
HR-G4012	40x60x7,5	31.5 mm (1 ¼″)
HR-G4013	40x60x7,5	26.5 mm (1.06″)
HR-G4014	40x60x7,5	25 mm (1″)
HR-G4015	40x60x7,5	22.4 mm (7/8″)
HR-G4016	40x60x7,5	20 mm
HR-G4017	40x60x7,5	19 mm (¾″)
HR-G4018	40x60x7,5	16 mm (5/8″)
HR-G4019	40x60x7,5	13.2 mm (.530″)
HR-G4020	40x60x7,5	12.5 mm (½″)
HR-G4021	40x60x7,5	11.2 mm (7/16″)

Product Code	Frame Dimensions (cm)	Aperture Size (mm)
HR-G4022	40x60x7,5	10 mm
HR-G4023	40x60x7,5	9.5 mm (3/8″)
HR-G4024	40x60x7,5	8 mm (5/16″)
HR-G4025	40x60x7,5	6.7 mm (.265″)
HR-G4026	40x60x7,5	6.3 mm (¼″)
HR-G4027	40x60x7,5	5.6 mm (No. 3 ½)
HR-G4028	40x60x7,5	5 mm
HR-G4029	40x60x7,5	4.75 mm (No.4)
HR-G4030	40x60x7,5	4 mm (No.5)

VACUUM SIEVING DEVICE - ALPINE AIR JET SIEVE SHAKERS

Vacuum Sieving Device / Alpine Air Jet Sieve Shaker especially for the separation of all fine, dry particle size products and provides the elimination analysis in determining the precise particle size distribution is a measuring device.

Sieving analysis is performed with the orientation of the panel in the device. Operator error short sieving times, high sieving ability, reproducible sieve analysis data are obtained.

Vacuum Sieving Device / Alpine Air Jet Sieve Shaker is available in two different versions, BASIC and PROFESSIONAL, suitable for standard Ø 200 mm - 203 mm laboratory sieves with wide analysis ranges for up to 80% faster and more efficient results compared to other sieving methods.

For product quality control and sieve analysis inspection data can be saved to our device, the data can be transferred to a computer or printer all the sieve elimination analysis data print numerically and graphically.

High Performance Cyclone
- Vacuum absorbed particles pass through the cyclone Recycle 98%.
- Recovers product
- Prevents filter contamination and extends filter life
- Previous product and other product do not mix
- Can stock 0,5 lt material

Laboratory Scale

- Quality plastic made.
- 600 g capacity
- High sensitivity
- 0,01 g readability
- 160x160 cm pan
- Built-in battery
- LCD display with backlight
- Standard RS232 output

Industrial Type Vacuum Cleaner

- High performance industrial type
- 17 lt Container capacity
- 200 Watt Air
- 1000 W Energy use
- Stainless steel Material of the chamber
- 35 mm ID accessory
- 1000 W Maximum engine power
- 220/240 V, 50/60 Hz Power supply

Technical Specifications:

Features	Basic Model	Professional Model
Rapid analysis and evaluation	√	√
Manual sieving under adjustable pressure	√	√
7" touch handy operator panel	√	√
Simple and convenient menu structure	√	√
Direct connection via interface with a compatible	√	√
RS-232C, Ethernet data units	√	√
Adjustable vacuum pressure	---	√
Engine speed adjustable	---	√
Communication with Laboratory Scale	---	√
Printable from specified printer	---	√
Panel and USB storage	---	√

HR-G4515

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Produt Name	Dimensions (mm)	Weight (kg)
HR-G4515	Vacuum Sieving Device Basic Model	350x460x 400	18
HR-G4525	Vacuum Sieving Device Professional Model	350x460x 400	18

Spare Parts & Accessories:

Product Code	Produt Name	Dimensions (mm)	Weight (kg)
HR-G4530	High Performance Cyclone	250x150x750	5,5
HR-G4531	Laboratory Scale	280x180x90	18
HR-G4532	Industrial Type Vacuum Cleaner	388x340x525	5,8
HR-G4532/1	Dust Bag for Industrial Type Vacuum Cleaner. Pack of 24.	---	---

Technical Specifications:

Features	
Sieve diameter	Ø200 / Ø203 mm
Analysis range	20 µm – 4 mm
Navigation	High definition
Touch screen	7”
Power cord	1 m
Low pressure	12000 Pa
Air flow rate	25-125 m³/h
Speed	30 rpm
Protection class	IP 54

HR-G4587 & HR-G4594

HR-G4546

Alpine Sieves

STANDARDS: ISO 565, DIN ISO 3310, ASTM E 11, BS 410

All of sieves are made of stainless steel.

Aperture Size	Frame Ø200 x 25 mm
4 mm (No.5)	HR-G4535
3.55 mm	HR-G4536
3.35 mm (No.6)	HR-G4537
3.15 mm	HR-G4538
2.8 mm (No.7)	HR-G4539
2.5 mm	HR-G4540
2.36 mm (No.8)	HR-G4541
2.24 mm	HR-G4542
2 mm (No.10)	HR-G4543
1.8 mm	HR-G4544
1.7 mm (No. 12)	HR-G4545
1.6 mm	HR-G4546
1.4 mm (No. 14)	HR-G4547
1.25 mm	HR-G4548
1.18 mm (No.16)	HR-G4549
1.12 mm	HR-G4550
1 mm (No. 18)	HR-G4551
900 µm	HR-G4552
850 µm (No. 20)	HR-G4553
800 µm	HR-G4554

Aperture Size	Frame Ø200 x 25 mm
710 µm (No. 25)	HR-G4555
630 µm	HR-G4556
600 µm (No. 30)	HR-G4557
560 µm	HR-G4558
500 µm (No. 35)	HR-G4559
450 µm	HR-G4560
425 µm (No. 40)	HR-G4561
400 µm	HR-G4562
355 µm (No. 45)	HR-G4563
315 µm	HR-G4564
300 µm (No. 50)	HR-G4565
280 µm	HR-G4566
250 µm (No. 60)	HR-G4567
224 µm	HR-G4568
212 µm (No. 70)	HR-G4569
200 µm	HR-G4570
180 µm (No. 80)	HR-G4571
160 µm	HR-G4572
150 µm (No. 100)	HR-G4573
140 µm	HR-G4574

Aperture Size	Frame Ø200 x 25 mm
125 µm (No. 120)	HR-G4575
112 µm	HR-G4576
106 µm (No. 140)	HR-G4577
100 µm	HR-G4578
90 µm (No. 170)	HR-G4579
80 µm	HR-G4580
75 µm (No. 200)	HR-G4581
71 µm	HR-G4582
63 µm (No. 230)	HR-G4583
56 µm	HR-G4584
53 µm (No. 270)	HR-G4585
50 µm	HR-G4586
45 µm (No. 325)	HR-G4587
40 µm	HR-G4588
38 µm (No. 400)	HR-G4589
36 µm	HR-G4590
32 µm (No. 450)	HR-G4591
25 µm (No. 500)	HR-G4592
20 µm (No. 635)	HR-G4593
Lid	HR-G4594

SAMPLE SPLITTERS (RIFFLE BOXES)

STANDARDS: EN 932-1, EN 932-2, ASTM C702, BS 812:1, 1377:1, 1924:1

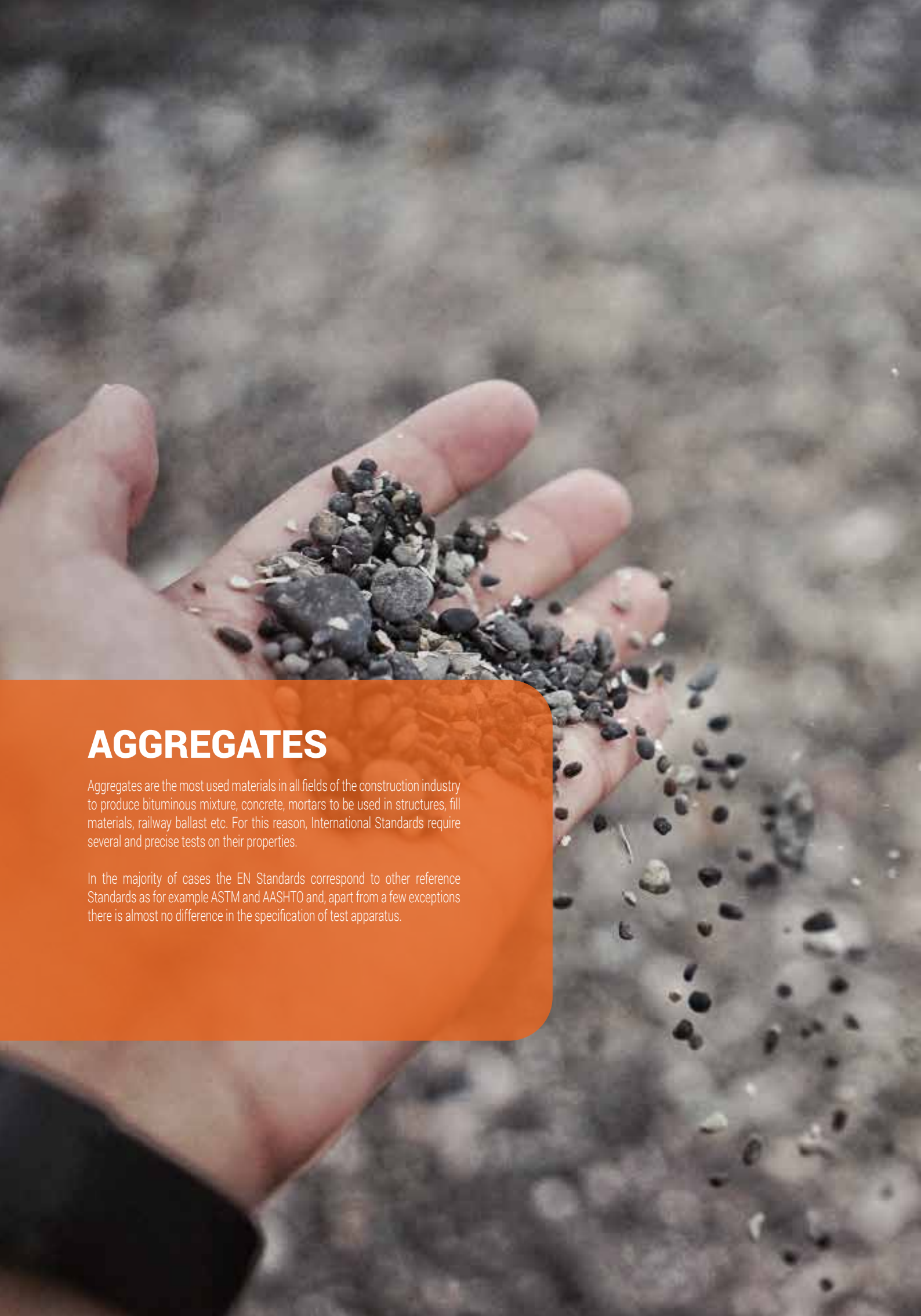
Used for the precise division into two representative portions of materials such as: aggregates, sand, gravel and similar.

Electrostatically painted and they are supplied with 3 collecting pans.

Another model Mini Riffle Box is available as stainless steel.

Technical Specifications:

Product Code	Product Name	Aperture (mm)	Number of Slots	Dimensions (cm)	Weight (kg)
HR-A0700	Riffle Box	7	12	13x18x18	2
HR-A0701	Riffle Box	10	12	15x20x25	4,5
HR-A0702	Riffle Box	13	12	20x25x35	6
HR-A0703	Riffle Box	15	12	20x29x35	6,5
HR-A0704	Riffle Box	19	10	22x31x40	11
HR-A0705	Riffle Box	20	10	23x32x42	11
HR-A0706	Riffle Box	25	10	25x35x42	12
HR-A0707	Riffle Box	30	10	23x42x45	15
HR-A0708	Riffle Box	38	8	32x43x57	16
HR-A0709	Riffle Box	45	8	32x45x59	20
HR-A0710	Riffle Box	50	8	32x50x60	27
HR-A0711	Riffle Box	64	8	36x60x60	32
HR-A0712	Riffle Box	75	8	37x70x60	35
HR-A0713	Mini Riffle Box	5	16	---	1,4



AGGREGATES

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

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

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SPEEDY MOISTURE TESTER

STANDARDS: ASTM D4944, AASHTO T217

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

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

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

Complete with Precision Scale, measuring spoon and cup, 1 box of calcium carbide reagent, cleaning brush, 2 pieces balls, 2 pieces 10 gr weight and carrying case.

HR-A0350

Technical Specifications:

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

Spare Parts & Accessories:

Product Code	Product Name
HR-A0350/1	Calcium carbide reagent (500 gr)
HR-A0350/2	Precision Scale
HR-A0350/3	Measuring spoon
HR-G0276	Plastic Beaker. 50 ml
HR-A0350/4	Cleaning brush
HR-A0350/5	Balls, 2 pieces
HR-A0350/6	Weights, 10 gr, 2 pieces
HR-A0350/7	Carrying case

MOISTURE METER MICROLANCE

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

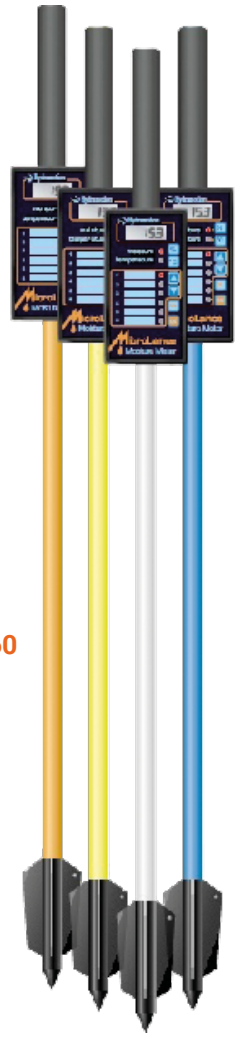
For quick, convenient, on-site moisture measurement from small batches to hundreds of tons.

Instant spot read out or average of whole load.

No sample preparation, chemicals, balances or ovens etc.

Technical Specifications:

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



HR-A0360

DESICCATORS

Complete with perforated porcelain plate.

HR-G0221

HR-G0223

Technical Specifications:

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

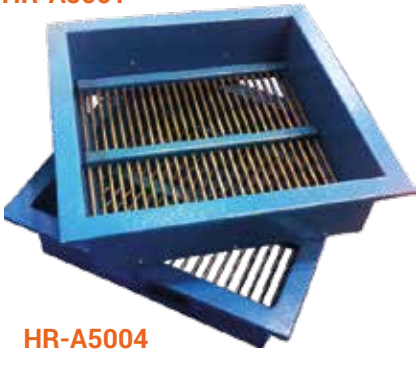
GRID SIEVES

STANDARDS: EN 933-3

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

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

HR-A5001



HR-A5004

Technical Specifications:

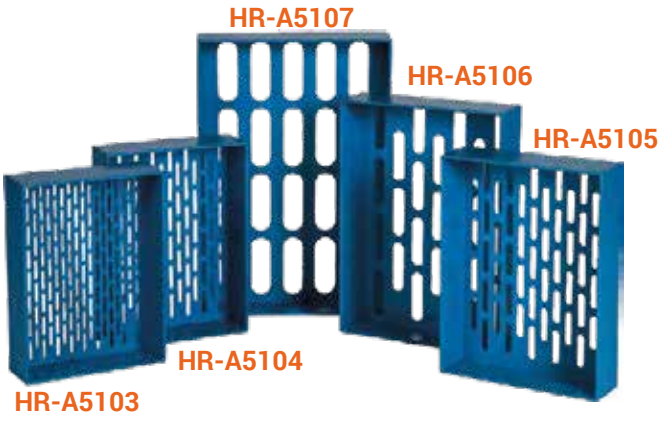
Product Code	Product Name	Aperture (mm)	Dimensions (cm)	Weight (kg)
HR-A5001	Grid Sieve	2,5	34x32x8	4
HR-A5002	Grid Sieve	3,15	34x32x8	4
HR-A5003	Grid Sieve	4	34x32x8	4
HR-A5004	Grid Sieve	5	34x32x8	4
HR-A5005	Grid Sieve	6,3	34x32x8	4
HR-A5006	Grid Sieve	8	34x32x8	4
HR-A5007	Grid Sieve	10	34x32x8	4
HR-A5008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

FLAKINESS SIEVES

STANDARDS: BS 812

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

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



Technical Specifications:

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

SAMPLE SPLITTERS (RIFFLE BOXES)

STANDARDS: EN 932-1, EN 932-2, ASTM C702, BS 812:1, 1377:1, 1924:1

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

Electrostatically painted and they are supplied with 3 collecting pans.

Another model Mini Riffle Box is available as stainless steel.

Technical Specifications:

Product Code	Product Name	Aperture (mm)	Number of Slots	Dimensions (cm)	Weight (kg)
HR-A0700	Riffle Box	7	12	13x18x18	2
HR-A0701	Riffle Box	10	12	15x20x25	4,5
HR-A0702	Riffle Box	13	12	20x25x35	6
HR-A0703	Riffle Box	15	12	20x29x35	6,5
HR-A0704	Riffle Box	19	10	22x31x40	11
HR-A0705	Riffle Box	20	10	23x32x42	11
HR-A0706	Riffle Box	25	10	25x35x42	12
HR-A0707	Riffle Box	30	10	23x42x45	15
HR-A0708	Riffle Box	38	8	32x43x57	16
HR-A0709	Riffle Box	45	8	32x45x59	20
HR-A0710	Riffle Box	50	8	32x50x60	27
HR-A0711	Riffle Box	64	8	36x60x60	32
HR-A0712	Riffle Box	75	8	37x70x60	35
HR-A0713	Mini Riffle Box	5	16	---	1,4

BULK DENSITY MEASURES

STANDARDS: EN 1097–3, ASTM C29-97

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

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

Technical Specifications:

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

LARGE CAPACITY SAMPLE SPLITTER

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

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

Large Capacity Sample Splitter consist of three parts;
- Carrier,
- Splitter,
- Collecting pan

All parts are manufactured from steel and electrostatic painted.

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

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

Wheels are available as an option and should be ordered separately.

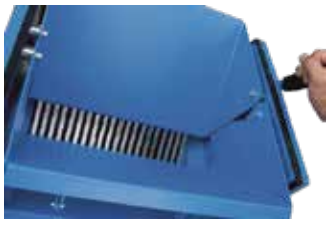
HR-M4000 &
HR-M4000/1

Technical Specifications:

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

Technical Specifications:

Product Code	Product Name
HR-M4000/1	Wheels (4 pieces)



FLAKINESS (THICKNESS) GAUGE

STANDARD: BS 812

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

Technical Specifications:

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

HR-A0730

LENGTH GAUGE

STANDARDS: BS 812

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

Technical Specifications:

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

HR-A0732

SHAPE INDEX CALIPER

STANDARDS: EN 933–4, 933–5, 933–7

For measuring the length/thickness ratio of individual particles.

Technical Specifications:

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

HR-A0734

LOS ANGELES ABRASION MACHINE

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

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

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

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

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

Abrasive charges should be ordered separately according to the standards.

HR-A0750

Technical Specifications:

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

HR-A0755

HR-A0755

HR-A0760 & HR-A0761

HR-A0750 with HR-A0765

HR-A0765

Spare Parts & Accessories:

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

MICRO-DEVAL TESTING MACHINE

STANDARDS: EN 1097-1

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

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

Soundproof Safety Cabinet should be ordered separately during the order stage.

HR-A0770

Technical Specifications:

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

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0770/1	Stainless Steel Drum	Ø 200x154	---
HR-A0770/3	Stainless Steel Drum	Ø 200x400	---
HR-A0770/2	Micro-Deval Abrasion Charges	Ø 10	25
HR-A0770/4	Soundproof Safety Cabinet	---	---

AGGREGATE IMPACT VALUE APPARATUS

STANDARDS: BS 812

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

HR-A0780

Technical Specifications:

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

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-A0780/1	Cylindrical Mould (NF Standard)	Ø 102x52

NORDIC ABRASION TESTING MACHINE

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

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

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

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

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

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

HR-A0850

Spare Parts & Accessories:

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

Technical Specifications:

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

SAND ABSORPTION (ABRAHAM CONE) SET

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

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

Apparatus is manufactured from plated steel for protection against corrosion.

Technical Specifications:

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

HR-A0725

AGGREGATE CRUSHING VALUE APPARATUS

STANDARDS: BS 812:110

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

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

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

All parts are powder coated or galvanized.

HR-A0785

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-A0790

SAND EQUIVALENT TEST SET

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

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

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

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

HR-A0805

HR-A0810

Spare Parts & Accessories:

Product Code	Product Name	Standard
HR-A0805/1	Measuring cylinder	EN
HR-A0810/1	Measuring cylinder	ASTM
HR-A0805/2	Siphon Assembly	EN, ASTM
HR-A0805/3	Weighted foot Assembly	EN
HR-A08103	Weighted foot Assembly	ASTM
HR-G0476	Steel Ruler, 300 mm	EN, ASTM
HR-G0314	Funnel	EN, ASTM
HR-G0610	Measuring Can, Ø 55 x 35 mm	EN, ASTM
HR-S5710	5 lt Capacity Sand Jar	EN, ASTM
HR-A0805/4	Carrying Case	---

Technical Specifications:

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

SAND EQUIVALENT SHAKERS

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

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

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

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

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

HR-A0815

HR-A0820

HR-A0805/1

HR-A0810/1

HİRA TESTING EQUIPMENT

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

HR-A0820

Technical Specifications:

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

COLOUR STANDARD CHART (ORGANIC IMPURITIES TEST SET)

STANDARDS: ASTM C 40, AASHTO T 21

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

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

Glass Bottle and Sodium Hydroxide should be ordered separately.

HR-A0915

Technical Specifications:

Product Code	Product Name
HR-A0915	Colour Standard Chart

Spare Parts & Accessories:

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

HR-A0915/1 & HR-G0916

METHYLENE BLUE TEST SET

STANDARDS: EN 933–9

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

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

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

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-A0400

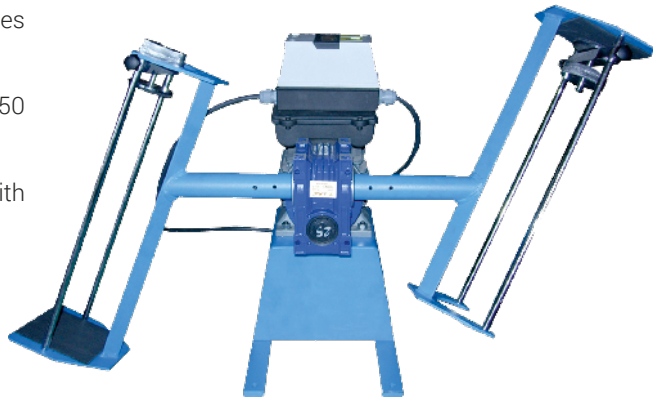
END OVER END SHAKER

STANDARDS: BS 1377:2, EN 1997-2

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

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

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



HR-A0800

Spare Parts & Accessories:

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

Technical Specifications:

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

FILLER COMPACTION APPARATUS

STANDARDS: EN 1097-4, BS 812

Filler Compaction Apparatus is used for the determination of the voids content of dry compacted filler.

The apparatus consists of three parts:

• cylinder having inside diameter 25.4 mm;
• plunger freely sliding into the cylinder with max. lateral play of 0.20 ± 0.05 mm;
• four columns and metallic base holding the whole, size 100x150 mm.

To perform the test a measuring device (vernier caliper with 0.01 mm accuracy) and 25 mm dia. Filter Paper are required and should be ordered separately.

It can be fit with a Blow Counter Kit, should be ordered separately.

HR-A0900

Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-A0900	Filler Compaction Apparatus	7

Spare Parts & Accessories:

Product Code	Product Name
HR-A0900/1	Filter Paper, 25 mm dia. Pack of 100.
HR-A0900/2	Blow Counter Kit
HR-G0410	Digital Caliper, 150 mm

FINE AGGREGATE ANGULARITY APPARATUS

STANDARDS: ASTM C1252, AASHTO T304

Fine Aggregate Angularity Apparatus is used to determine the uncompacted void content of a fine aggregate to determine angularity and sphericity properties that affect the workability of mixed designs.

Supplied complete with Funnel with specified hopper, Funnel Stand, 100ml Copper Cylindrical Measure and a Glass Plate for calibration.

Flexible Spatula, Round Brush and Stainless Steel Pan should be ordered separately.

HR-A0920

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0920	Fine aggregate angularity apparatus	205x205x690	2

Spare Parts & Accessories:

Product Code	Product Name
HR-A0920/1	Funnel with specified hopper
HR-A0920/2	Funnel Stand
HR-A0920/3	Copper Cylindrical Measure, 100 ml
HR-A0920/4	Glass Plate, 60x60x4 mm
HR-G0700	Flexible Spatula, 100 mm
HR-G0444	Round Bristle Brush
HR-G0681	Stainless Steel Pan, Ø30 cm

COARSE AGGREGATE ANGULARITY APPARATUS

STANDARDS: AASHTO T326

Coarse Aggregate Angularity Apparatus measures the uncompacted void content of coarse aggregate. The testing apparatus is recommended to evaluate aggregates for Hot-Mix Asphalt (HMA) pavement. Gradation and void content data provide an indication of angularity, sphericity, and surface texture that can be related to permanent deformation and fatigue cracking of asphalt.

Aggregate is allowed to free fall from the hopper into a cylindrical measure. Excess heaped aggregate is struck off using the included bar, the mass is measured, and void content is computed. The hopper, stand, and measure is stainless steel and a locator pin and circle on the bottom plate of the stand make it easy to center the measure below the hopper.

Coarse Aggregate Angularity Apparatus consist of Stainless Steel Measure, Strike-off Bar and Glass Plate for calibration.

Steel Material Handling Pan should be ordered separately.

HR-A0923

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0923	Coarse aggregate angularity apparatus	254x254x690	13

Spare Parts & Accessories:

Product Code	Product Name
HR-A0923/1	Stainless Steel Measure
HR-A0923/2	Strike-off Bar
HR-A0923/3	Glass Plate for calibration
HR-A0923/4	Steel Material Handling Pan

PROPORTIONAL CALIPER

STANDARDS: ASTM D4791, BS 812:105-1

Use for the rapid and easy determination of percentage of flat particles, elongated particles, or both in coarse aggregate fractions of 9.5mm (3/8 in) or larger.

Budget Caliper consists of 6" x 16" (152.4 x 406.4mm) base plate with four rubber feet for stability, two fixed posts and a 13in (330mm) pivoting arm. The positioning of the pivoting arm allows to obtain desired ratio among 1:2, 1:3, 1:4, or 1:5.

Four-Station Caliper is similar, but provides openings for all four ratios simultaneously, without the need to reposition the pivot screw. Manual testing can be performed more efficiently. Moveable posts are also replaceable.

HR-A0736

HR-A0735

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-A0735	Proportional caliper	406x203x76	4
HR-A0736	Four-Station Proportional caliper	406x152x76	4,5

SPECIFIC GRAVITY FRAME (BOUYANCY BALANCE SYSTEM)

STANDARDS: EN 1097-6, 12390-7

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

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

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

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

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

HR-C0500

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-C0500/2

DENSITY BASKET

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

Used for specific gravity tests, stainless steel made.

HR-G4039
HR-G4044
HR-G4043
HR-G4041
HR-G4049
HR-G4051

Technical Specifications:

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

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

PYKNOMETER METHOD (SPECIFIC GRAVITY BOTTLE, GAY LUSSAC TYPE)

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

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

Technical Specifications:

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

PYKNOMETER (BOTTLE TYPE)

STANDARDS: EN 1097-6

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

Double Edged and Capillary Tubed Funnel should be ordered separately.

Technical Specifications:

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

PYKNOMETER (GLASS JAR TYPE)

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

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

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

Technical Specifications:

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

ABRASION BOHME TESTER

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

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

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

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

Abrasive Sand is must be ordered separately.

HR-A2510

Technical Specifications:

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

Spare Parts & Accessories:

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

ABRASION TESTER FOR NATURAL STONES AND CONCRETE

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

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

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

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

HR-A2520

Spare Parts & Accessories:

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

Technical Specifications:

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

ABRASION TESTER FOR BRICKS AND GLAZED TILES

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

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

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

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-A2525

MAGNESIUM / SODIUM SULPHATE TEST

STANDARDS: EN 1367-2, 13450; ASTM C88

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

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

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

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

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

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

Magnesium Sulphate Test Set complete with, 2 pieces Plastic Lever Lid Container Ø255 x 235 mm, Ø120 x 160 mm, 3,35 (No.6) mm density basket, Ø95 x 120 mm, 0,600 (No.30) mm density basket, Hydrometer 1200-1300 g/ml and 1 kg Magnesium Sulphate.

Sodium Test Set complete with 2 pieces Plastic Lever Lid Container Ø255 x 235 mm, Ø120 x 160 mm, 1,7 (No.12) mm density basket, Ø120 x 160 mm, 0,600 (No.30) mm density basket, Hydrometer 1100-1200 g/ml, 1 kg Sodium Sulphate.

Other options and accessories should be ordered separately.

HİRA TESTING EQUIPMENT

Spare Parts & Accessories:

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

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

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

HR-A3005

HR-A3010

HR-A3000

Technical Specifications:

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

DETERMINATION OF DRYING SHRINKAGE

STANDARDS: EN 1367-4, BS 812:102

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

Length Comparators (Length Measuring Frames) are used to determine possible the length changes in prisms of different size due to Drying shrinkage, Alkali Silica Reaction (ASR) etc.

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

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

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

Analog Dial Indicator; 10 x 0,01 mm division. Digital Dial Indicator has two alternatives as 12.7 x 0,01 mm or 12.7 x 0,001 mm resolution.

HR-A0905 with HR-G0875

HR-A0905 with HR-G0877

Technical Specifications:

Product Code	Product Name
HR-A0905/AS	Analog Drying Shrinkage Set with HR-G0875
HR-A0910/DS	Digital Drying Shrinkage Set with HR-G0877
HR-A0905/DS	Digital Drying Shrinkage Set with HR-G0879
HR-A0913/DS	Digital Drying Shrinkage Set with HR-G0890

HR-A0905 with HR-G0890

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

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A1000	Prism Mould, 50x50x200 mm	33x7x22	15
HR-A1000/1	Steel Insert for HR-A1000 (Pack of 10)	---	---
HR-A1000/2	Reference Rod	20,5	---
HR-A0905	Length Comparator	18x18x45	6
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm	---	---
HR-G0877	Digital Dial Indicator, 12.7 x 0,01 mm	---	---
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm	---	---
HR-G0890	Heidenhain Digital Readout Unit with Length Measuring Sensor	---	---

ALKALI-SILICA REACTION BATH

STANDARDS: CANADA CSA-A23.2-25A

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

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

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

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

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

Alkali Specimens Can is manufactured from stainless steel. It has a stainless steel hanger which can hold 3 pieces 25x25x285 mm specimens.

HR-A0925

Alkali Reactivity Reaction Container is used for the chemical determination of the potential reactivity of aggregates with alkalis in Portland cement concrete in accordance with ASTM C289, UNI 8520:22, NF P94-048 standards. It is made of stainless steel and has an airtight cover. It has a capacity of about 60 ml.

Alkali Reactivity Reaction Container, Alkali Specimens Can, Length Comparator, Analog or Digital Dial Gauge or Heidenhain Digital Readout Unit with 30x0,0001 mm Length Measuring Sensor, Two Gang Prism Shrinkage Mould, Steel Inserts and Reference Rod should be ordered separately.

HR-A0905 with HR-G0875

HR-CE9010

HR-CE9010/2

HR-CE9010/1

HR-A0925/1

HR-A0925/2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-A0925/1	Alkali Specimens Can	---	---
HR-A0925/2	Alkali Reactivity Reaction Container	---	2
HR-A0905	Length Comparator	18x18x45	6
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm	---	---
HR-G0877	Digital Dial Indicator, 12.7 x 0,01 mm	---	---
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm	---	---
HR-G0890	Heidenhain Digital Readout Unit with Length Measuring Sensor	---	---
HR-CE9010	Two Gang Prism Shrinkage Mould, 25x25x285 mm	33x19x7	4
HR-CE9010/1	Steel Insert for HR-CE9010 (Pack of 10)	---	---
HR-CE9010/2	Reference Rod	30,5	---

HR-A0905 with HR-G0877

Technical Specifications:

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

FREEZING AND THAWING CHAMBERS

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

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

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

2 models are available. Freezing and Thawing Chamber on Air and Freezing on Air and Thawing on Water Chamber.

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

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

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

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

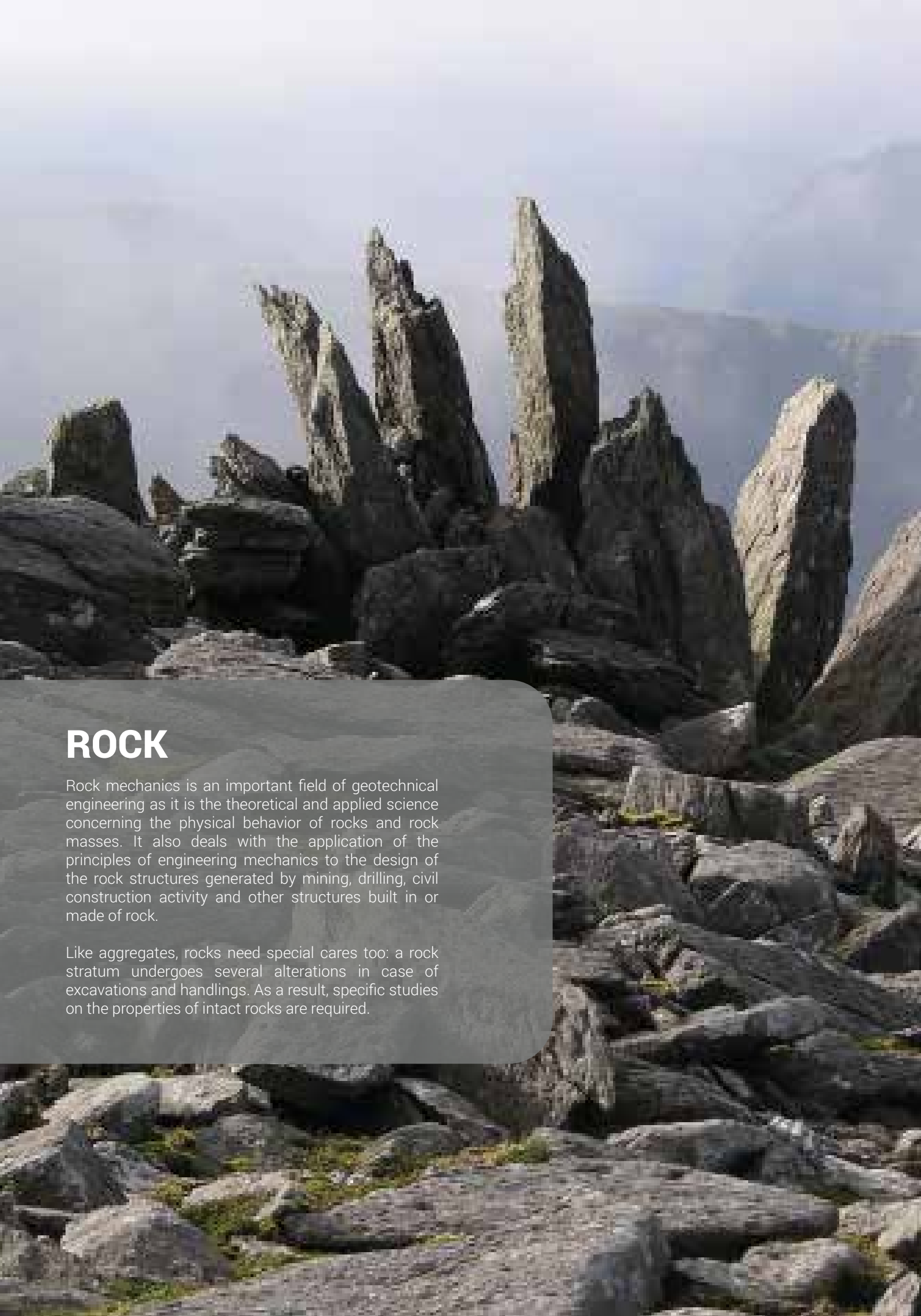
Software for data transfer to a computer is supplied complete with the cabinet, and data can be monitored during the tests.

HR-G6005

Technical Specifications:

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

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



ROCK

Rock mechanics is an important field of geotechnical engineering as it is the theoretical and applied science concerning the physical behavior of rocks and rock masses. It also deals with the application of the principles of engineering mechanics to the design of the rock structures generated by mining, drilling, civil construction activity and other structures built in or made of rock.

Like aggregates, rocks need special cares too: a rock stratum undergoes several alterations in case of excavations and handlings. As a result, specific studies on the properties of intact rocks are required.

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DIGITAL POINT LOAD TESTER (ROCK STRENGTH INDEX)

STANDARD: ASTM D5731

Used to determine the strength values of a rock specimen both in the field and in the laboratory.

It consist of a load frame for applying loads up to 50 kN or 100 kN, on which a manual hydraulic jack is mounted.

The instrument accepts core specimens up to 4" (101.6 mm) diameter which are loaded by two cone shaped points. A graduated scale indicates the distance between the conical points.

Complete with Manuel Hydraulic Jack, Digital Indicator, Safety Mask and Wooden Carrying Case.

Spare Parts & Accessories:

Product Code	Product Name
HR-R0125/1	Manuel Hydraulic Jack for HR-R0125
HR-R0130/1	Manuel Hydraulic Jack for HR-R0130
HR-R0125/2	Digital Indicator
HR-R0125/3	Safety Mask
HR-R0125/4	Wooden Carrying Case

HR-R0125

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-R0125	Digital Point Load Tester (Rock Strength Index), 50 kN	40x53x72	25
HR-R0130	Digital Point Load Tester (Rock Strength Index), 100 kN	40x53x72	40

ROCK CLASSIFICATION HAMMER (LOW IMPACT ENERGY MODEL)

STANDARDS: ASTM D5873

This lightweight and portable impact hammer is used for rock classification tests.

Includes rubbing stone for surface preparation.

The hammer is similar to a device used for many years for strength classification tests of mass concrete.

Cylindrical cores, usually NW size, are held in a horizontal position and the hammer mechanism impacted against the core to obtain rebound readings. A series of readings is taken along the length of the core to get the average rebound number.

The core rock specimen normally NX Ø54,7 mm is held on a special cradle in horizontal position and the hammer tests the same in all its length to obtain average of the readings.

The Rock Cradle is used to hold cores (EX Ø21,46 mm and NX Ø54,74 mm) in place during rock classification test procedures. The cradle incorporates a guide for positioning the hammer to allow for a series of readings along the length of the core.

HR-R0120 with HR-R0110

Rock cradle and Calibration Anvil should be ordered separately.

Technical Specifications:

Product Code	Product Name	Impact energy (Nm)	Dimensions (cm)	Weight (kg)
HR-R0120	Rock Classification Hammer (Low Impact Energy Model)	0.74	10X10X36	2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-R0110	Rock Cradle	15x11x31	20
HR-R0115	Calibration Anvil	Ø 15x23	16

CALIBRATION ANVIL

STANDARDS: EN 12504-2, ASTM D5873, C805

Used for the verification of the calibration of the hammers.

The EN 12504:2 Specification requires obligatory the use of the anvil for the hammer tests.

The Standard specifies; before a sequence of tests on a concrete surface, take and record readings using the steel reference anvil and check to ensure that they are within the range recommended by the manufacturer. If they are not, clean and/or adjust the hammer.

After tests, take readings using the steel anvil, record them and compare them with those taken prior to the test. If the results differ, clean and/or adjust the hammer and repeat the test.

Made of hardened steel according to the standards.

HR-R0115

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-R0115	Calibration Anvil	Ø 15x23	25

SLAKE DURABILITY APPARATUS

STANDARDS: ASTM D4644

This equipment has been developed to assess the durability of rock to weakening and disintegration when subjected to the simulated effects of climatic slaking.

The rock samples are dried and then submitted to wear stress inside a drum which is rotated into water.

The test is performed different times and the wear is given by the loss in weight of the sample.

The system incorporates a motor drive unit mounted on a baseplate which revolves two stainless steel drums manufactured from 2 mm mesh, 140 mm dia. x 100 mm long.

The tanks are filled with water to a level 20 mm below the drum axis.

A digital timer automatically stops the motor after the preset time. The machine can turn to two or four drums with 20 rpm.

The equipment is supplied complete with two Drums with tanks, base and accessories.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R0135	Slake Durability Apparatus	35x74x30	30	220 V, 50 Hz, 1 ph
HR-R0135/60Hz	Slake Durability Apparatus	35x74x30	30	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-R0135/1	Drum (2 pieces)	Ø 140 x 100

HR-R0135

AUTOMATIC CORE-ROCK COMPRESSION TESTING MACHINE

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic 600 kN Capacity Compression Testing Machine has been designed for reliable and consistent testing of core and rock samples. Machine confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

A compression test determines behavior of materials under crushing loads. The specimen is compressed and deformation at various loads is recorded.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Core-Rock Compression Testing Machine allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

HR-R6000

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-R6000/TS with HR-G0979

The Automatic Core-Rock Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Distance Pieces, Ø165x30 mm, Ø165x50 mm and Ø165x80 mm,
- Upper Platen (with ball seating assembly) Ø165 mm,
- Lower Platen Ø165 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.
- Software and Ethernet Cable.

Core-Rock Compression Load Frame

Load Frame is 600 kN Capacity.

The dimensions of the 600 kN Load Frame allow the testing of concrete and rock samples up to its capacity.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

Upper Platens/Lower Platens

Upper Platen (with ball seating assembly) Ø 165 mm and Lower Platen Ø 165 mm.

The platens enable the testing of a wide variety of cylinder or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cylinder samples.

HR-C8166 & HR-C8167 & HR-C8168

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø165x30 mm, Ø165x50 mm and Ø165x80 mm distance pieces.

Loading Cylinder Assembly & Limit Switch

The Load Frame has a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

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

At the end of the test process to start a new test the piston returns to default position.

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

HİRA TESTING EQUIPMENT

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

HR-C8003

HR-C8003

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Load Cell

600 kN Load Cell can be used for load measurements instead of High Precision Pressure Transducer.

These property allows high accuracy at very low sample failures. (Class 1 at 6 kN to 600 kN)

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

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

HR-C8002

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

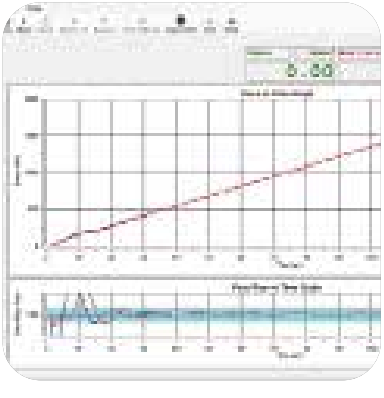
Digital graphic display is able to draw real-time “Load vs. Time”.

Software

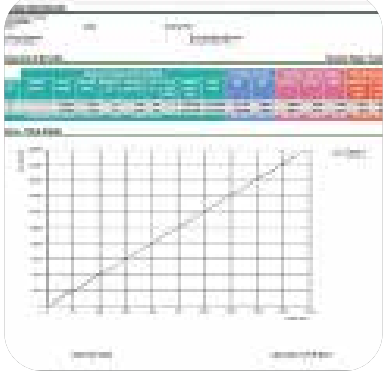
Sample, company, laboratory and test values can be entered in the programme.

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.



The Automatic Core-Rock Compression machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.



Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

HİRA TESTING EQUIPMENT

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	HR-R6000
Capacity (kN)	600
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	165
Ø Upper Platen (mm)	165
Max. Vertical clearance (mm)	330
Piston diameter (mm)	150
Piston Stroke (mm)	50
Horizontal clearance (mm)	230
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000	600 kN Automatic Core-Rock Compression Testing Machine	71x38x91	450	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000/1	600 kN Load Frame	35x30x91	350	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC CORE-ROCK COMPRESSION TESTING MACHINE WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic 600 kN Capacity Compression Testing Machine has been designed for reliable and consistent testing of core and rock samples. Machine confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Core-Rock Compression Testing Machine allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-R6000/TS

HR-R6000/TS with HR-G0979

The Automatic Core-Rock Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Distance Pieces, Ø165x30 mm, Ø165x50 mm and Ø165x80 mm,
- Upper Platen (with ball seating assembly) Ø165 mm,
- Lower Platen Ø165 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety,
- H-GUI Software and Ethernet Cable..

Core-Rock Compression Load Frame

Load Frame is 600 kN Capacity.

The dimensions of the 600 kN Load Frame allow the testing of concrete and rock samples up to its capacity.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation. The machine's hydraulic power pack, control and read out units are positioned on the right hand side of the load frame for easier accessibility, increased productivity and for safer operations.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

Upper Platens/Lower Platens

Upper Platen (with ball seating assembly) Ø 165 mm and Lower Platen Ø 165 mm.

The platens enable the testing of a wide variety of cylinder or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cylinder samples.

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø165x30 mm, Ø165x50 mm and Ø165x80 mm distance pieces.

HR-C8166 & HR-C8167 & HR-C8168

Loading Cylinder Assembly & Limit Switch

The Load Frame has a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

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

At the end of the test process to start a new test the piston returns to default position.

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

HR-C8003

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Load Cell

600 kN Load Cell can be used for load measurements instead of High Precision Pressure Transducer.

These property allows high accuracy at very low sample failures. (Class 1 at 6 kN to 600 kN)

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

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

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

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

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

Software

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

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

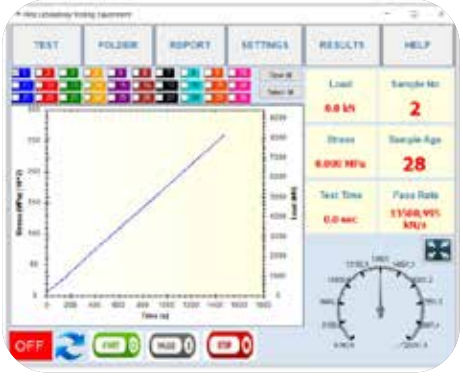
The advanced functions for database management provide an easy navigation of all saved data.

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

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

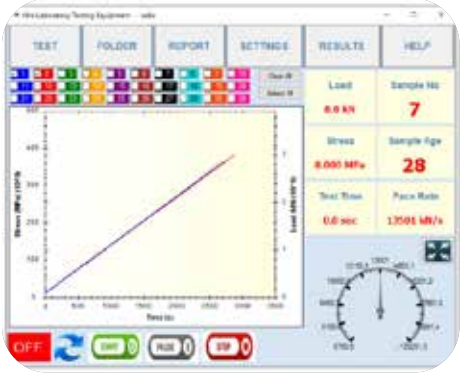
Following tests can be done with the HİRATEST H-GUI Software;

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



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

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



Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Accuracy Class 1 acc. to EN 12390-4 starting from with the 5% of the machine capacity (Special calibration option Class 1 starting from 1% of the full range with HR-C8003)
- Supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a pressure transducer
- Hydraulic pump with dual stage for rapid approach
- Welded steel walled frame with a single acting piston
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	HR-R6000/TS
Capacity (kN)	600
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	165
Ø Upper Platen (mm)	165
Max. Vertical clearance (mm)	330
Piston diameter (mm)	150
Piston Stroke (mm)	50
Horizontal clearance (mm)	230
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000/TS	600 kN Automatic Core-Rock Compression Testing Machine	71x38x91	450	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000/1	600 kN Load Frame	35x30x91	350	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

COMPRESSION JIG ASSEMBLY FOR ROCK CORE SPECIMENS

STANDARDS: ASTM D2938

The jig assembly is used for uniaxial compressive strength tests of rock core specimens with Ø 50 to 55 mm and 100 to 110 mm height and consists of a two-column frame fit with an upper platen with spherical seat that moves vertically sustained by a spring. The lower platen is fit to the base. The assembly is also used for compressive strength test of natural stone core specimens. Minimum Hardness of Platens is 58 HRC.

Compression Jig Assembly is used for uniaxial compressive strength for rock core specimens.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-R0105	Compression Jig Assembly for Rock Core Specimens	12x12x25	10

HR-R0105

TRIAXIAL TESTS ON ROCK SPECIMENS

STANDARDS: EN 1926, 14580; ASTM D2664, D2938, D3148, D5407

The manual pressure system is used for maintaining the constant lateral pressure in the Hoek triaxial cells and consists of a hydraulic hand pump with oil reservoir, a precision digital readout unit, a pressure transducer and a 3 m long flexible hose with quick release coupling.

The manual pressure system is used with any Hoek triaxial cell and 2000 kN Automatic Compression Testing Machine for the triaxial tests. Other type of HİRA compression testing machine can be used instead of HR-C2000.

BX type (Ø 42,04 mm), NX type (Ø 54,74 mm) and HQ, Ø 63,5 mm Hoek Cells have been designed for triaxial testing of rock specimens.

Hoek Cells comprise a steel body complete with two quick release self-sealing couplings, two steel end caps which are screwed to the cell body, 2 pieces of upper and 2 pieces of lower loading caps with spherical coupling and a rubber sealing sleeve to separate the specimen from the cell fluid.

Triaxial Test Set complete with Hand operated pressure system for lateral pressure in Hoek Cell with 700 bar capacity.

Hoek Cells and Spare Sealing Sleeves for Hoek Cells should be ordered separately according the test.

HR-R0150 with HR-C2000

Technical Specifications:

Product Code	Product Name	Max. Working Pressure	Dimensions (cm)	Weight (kg)
HR-R0150	Triaxial Test Set on Rock Specimens	700 bar	---	---
HR-C2000/TS	2000 kN Automatic Compression Testing Machine	400 bar	81x50x100	900

Spare Parts & Accessories:

Product Code	Product Name	Max. Working Pressure	Dimensions (cm)	Weight (kg)
HR-R0151	Hand Operated Pressure System for Lateral Pressure in Hoek Cell	700 bar	105x50x30	20
HR-G9000	Hydraulic Hand Pump	700 bar	---	---
HR-R0153	Pressure Transducer and Digital Readout Unit	---	---	---
HR-R0154	Hoek Cell, BX, Ø 42,04 mm	---	35x15x20	15
HR-R0154/1	Spare Sealing Sleeves for HR-R0154	---	---	---
HR-R0155	Hoek Cell, NX, Ø 54,74 mm	---	35x15x20	15
HR-R0155/1	Spare Sealing Sleeves for HR-R0155	---	---	---
HR-R0156	Hoek Cell, HQ, Ø 63,5 mm	---	35x15x20	15
HR-R0156/1	Spare Sealing Sleeves for HR-R0156	---	---	---

SPECIMEN EXTRUDER FOR HOEK TRIAXIAL CELLS

Specimen Extruder for Hoek Triaxial Cells is used to eject the rock sample from the rubber jacket, avoiding to empty the confining fluid out of the Hoek Cell.

The Specimen Extruder consists of a steel frame with a rack and pinion mechanism.

Supplied without Adaptors and should be ordered separately according the sample.

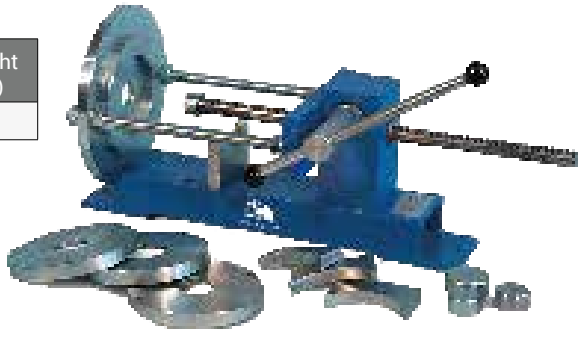
Adaptor Alternatives are BX Type (Ø 42,04 mm), NX Type (Ø 54,74 mm), HQ Type (Ø 63,5 mm) Adaptors.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-R0100	Specimen Extruder for Hoek Triaxial Cells	50x25x20	15

Spare Parts & Accessories:

Product Code	Product Name
HR-R0100/1	BX (Ø 42,04 mm) Type Adaptor
HR-R0100/2	NX (Ø 54,74 mm) Type Adaptor
HR-R0100/3	HQ (Ø 63,5 mm) Type Adaptor



HR-R0100

BRAZILIAN TEST APPARATUS

Brazilian Test Apparatus is designed to test specimens from 50 mm dia to 100 mm dia having thickness equal to half of the diameter for determination of Indirect Tensile Strength of rocks.

The specimen is held in circular jaws, this is primarily similar to a compression Machine and consists of a small load frame having sturdy base with two vertical threaded rods and an adjustable cross head. The hydraulic jack is fitted at the centre of the base of the load frame. The jack of the load frame is self-retracting and two plain platens are supplied.

A pressure gauge capacity is 0-100 x 1 kN is fixed at the base of jack.

A maximum pointer is also provided on the gauge, a pair of semicircular platens for Ø 50mm samples also provided.

The other Pair of jaws should be ordered separately.

Technical Specifications:

Product Code	Product Name
HR-R0250	Brazilian Test Apparatus

Spare Parts & Accessories:

Product Code	Product Name
HR-R0250/1	Pair of jaws for Ø 50 mm samples
HR-R0250/2	Pair of jaws for Ø 60 mm samples
HR-R0250/3	Pair of jaws for Ø 70 mm samples
HR-R0250/4	Pair of jaws for Ø 80 mm samples
HR-R0250/5	Pair of jaws for Ø 90 mm samples
HR-R0250/6	Pair of jaws for Ø 100 mm samples

HR-R0250

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.

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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.

HR-AS1535

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	---

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 Pycnometer, 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-AS1560

HR-AS1550/2

HR-AS1550

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

HR-AS1603

HR-AS1602

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

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-AS1607

HR-AS1606

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.

HR-AS2335 with HR-AS2335/3

HR-AS2335/3

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

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	---	---

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

HR-AS1625/1

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 ± 9 gr and dropped by the user from a height of 457 ± 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.

HR-AS1700

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

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 45x45x20 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 g ± 20 gr compaction hammer, plated against corrosion, to the height of 460mm ± 3 mm allows free fall.

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

HR-AS1750

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 ± 15	
Free fall height (mm)	457± 5	
Overall dimensions (cm)	55x192x55	
Weight (kg)	265	
Power Supply	220 V, 50 Hz, 1 ph	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

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

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 ± 9 gr compaction hammer, plated against corrosion, to the height of 457mm ± 3 mm allows free fall.

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

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

HR-AS1755

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

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

HR-AS1795

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-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.

HR-AS1800

Technical Specifications:

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

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.

HR-AS5000

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

HR-AS5000/7

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

HİRATEST 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.

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		

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

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-S5000/1 & HR-G0876

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.

HR-AS0500 & HR-AS5000/1

HR-S5000/1

Technical Specifications:

Product Code	HR-AS0500	HR-AS0501
Product Name	CBR & Marshall & Unaxial 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	

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

Spare Parts & Accessories:

Product Code	Product Name
HR-AS0500/1	CBR & Marshall & Unaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Unaxial 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.

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

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

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 & MARSHALL & UNAXIAL 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.

HR-AS0500/TS & HR-AS5000/1

HR-S5100

HR-S5000/1

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

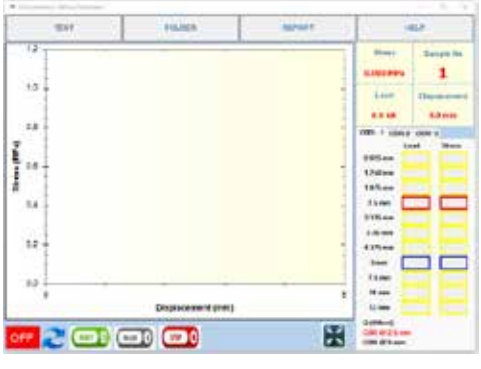
• Permanent storage capacity up to 10 0000 test results
• 1/256000 dot resolution for each channel
• 10 data acquisition per second (at sample rate) on each channel
• 2 fully customizable analog channels with 24-bit ADC and PGA-FPGA circuit
• Ethernet port for computer connection
• 800x480 pixel and 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 (qu) value and the undrained shear strength (cu) 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 & Unaxial 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 & Unaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Unaxial 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

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.

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-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.

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

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

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 ºC ± 0.1 °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 to 70 ºC ± 0.1 °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 (ºC)
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	± 0.1 ºC
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.

HR-AS1925

HR-AS1925/7

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.

HR-AS1950

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.

HR-G1525

HR-AS1950/1

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-AS2000/1

HR-G0825

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

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-AS2100/1

HR-G0601/S

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.

HR-AS2345

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-AS0960/4

ABA - ASPHALT BINDER ANALYZER

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

The HİRATEST 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 shoud be ordered seperately.

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

HR-AS0960

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 ± 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

HR-AS0960/3

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-AS0960/2

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°C ± 0,5°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° to + 25°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.

HR-AS2200/3

HR-AS2200/1

HR-AS2200/1 with HR-AS2200/3

HR-AS2200

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 ± 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.

Two test options are available;
1. 30 to 80 °C for water
2. 80 to 150 °C for glycerol

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.

HR-AS2260

Thermometer should be ordered separately.

The cooling system is available as an option and must be ordered separately. 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.

Main Features

- Heating system,
- Optional 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 or glycerin),
- 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 parameters suitable for test types: 80°C and 80- 150°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

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.)), 800 ml glass griffin beaker and max. 110 °C thermometer.

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

HR-AS2250/2

HR-AS2250/1 with HR-AS2250/3

HR-AS2250

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-G0008/G	Glass Griffin 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	---

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/m² and Readability is 0.5 kg/m². It is calibrated to give direct reading in kg/ m².

HR-AS2355 with HR-AS2356

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

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.

HR-AS2325

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

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.

HR-AS2275

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

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.

HR-AS2280

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

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.

HR-AS2290

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

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.

HR-AS2300

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. Graduation0.2 °C.
HR-G1405	ASTM 24C Thermometer. 39-54 °C. Graduation0.2 °C.
HR-G1406	ASTM 25C Thermometer. 95-105 °C. Graduation0.2 °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

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.

HR-AS2310

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 shoud be ordered seperately.

HR-AS2350

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-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

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.

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

Supplied complete with wooden carrying case.

HR-AS0900

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.

HR-AS0955

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, 1ph

Spare Parts & Accessories:

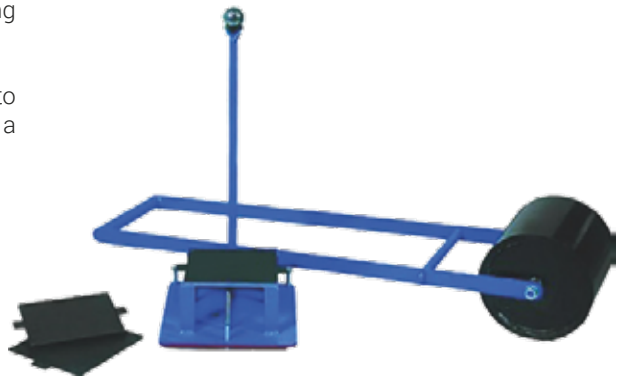
Product Code	Product Name	Capacity	Dimensions (cm)	Weight (kg)	Power Supply
HR-AS0925/1	Vacuum Pyknometer	5 lt	85x57x46	40	---
HR-G0500	Vibro-Deaerator	---	---	---	220 V, 50 Hz, 1 ph
HR-G0500/60Hz	Vibro-Deaerator	---	---	---	220 V, 60 Hz, 1 ph
HR-G0800	Vacuum Pump	51 lt/min. - 2 Pa	29x13x23	6,6	220 V, 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	---

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.



HR-AS1900

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

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

HR-AS2455
HR-AS2456
HR-AS2457

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-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.

HR-AS2475

Technical Specifications:

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

HR-G2192

HR-AS2475/1

HR-AS2480

HR-AS2485

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

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

HR-AS2550

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

NON-NUCLEAR ASPHALT DENSITY GAUGE

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

HR-AS0980

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

Units: Interchangeable settings for Density (kg/m3, lb/ft3), Temp (°C, °F), Depth (in, mm) and Stone Size (in, mm)

Calculator: Built in four function calculator

Enhanced Customer Support: Diagnostic screen to aid in factory Support

User Programmable Target Density: Used for calculating % compaction

GENERAL FEATURES:

• New status bar feature, displays GPS status, data save status, available battery voltage, low battery status and date and time

• Measures density in common units (kg/m3), and can measure the asphalt temperature

• New data management feature, you can store 4000 readings on the internal data logger, quickly access, download or delete your project data

• Ability to download files from the EDG-A via USB drive

• Fast, reliable, accurate 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. Stores thousands of records.

Continuous: Instantaneous density readings.

FUNCTIONS

Density: % Compaction

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

Recaharge 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-AS0980	Non-Nuclear Asphalt Density Gauge	49x22x39	9

NON-NUCLEAR ASPHALT DENSITY GAUGE, TOUCH SCREEEN

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/m3, lb/ft3), Temp (°C, °F), Depth (in, mm) and Stone Size (in, mm)

Calculator: Built in four function calculator

Enhanced Customer Support: Diagnostic screen to aid in factory Support

User Programmable Target Density: Used for calculating % compaction

User Changeable Battery: Easily change batteries in the field

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 acces, download or delete your project data
•Ability to download files from the EDG-2A via USB drive
•Fast, reliable, accurate material density and compaction test, and repetable 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

Recaharge 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

CONCRETE

Concrete is a composite construction material made primarily from aggregate, cement, and water. There are many formulations of concrete that provide various properties.

Concrete is the most widely used man-made product in the world as the main building material within architectural structures, foundations, brick/block walls, pavements, bridges, roads, runways, parking structures, dams, pipes, highways and superhighways. Therefore, concrete quality must accurately be tested for any building realization.

The quality of concrete is important in planning earthquake resistant structures that minimize damage, preventing injury and human loss.

Due to this reason, concrete must be closely controlled according to the relevant standards in every stage of production by experienced people using quality test equipment.

Since then the quality and the production technology of concrete strongly evolved hence considerable care supported by knowledge is required to produce quality concrete.

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AUTOMATIC CONCRETE COMPRESSION TESTING MACHINES, WELDED WALL

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic range of 1500 kN, 2000 kN and 3000 kN Capacity Compression Testing Machines have been designed for reliable and consistent testing of a wide range of specimens. Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit.
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-C2000

HR-C3000 & HR-G0979

The Automatic Concrete Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Distance Pieces, 30 mm, 50 mm and 80 mm,
- Upper Platen (with ball seating assembly),
- Lower Platen,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.
- Software and Ethernet Cable.

Concrete Compression Load Frame

Capacities of 1500 kN, 2000 kN and 3000 kN Load Frames are most popular and available models for welded type frames.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

HR-C1270

Upper Platens / Lower Platens

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm and Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cube, 100 mm and 150 mm cylinder samples.

Block Platens with Sliding Rail Assembly

STANDARDS: EN 772-1, 12390-4

Product Code: HR-C1250

Block Platens with Sliding Rail Assembly are installed on the compression testing machines for testing concrete blocks and other structural materials. The Sliding Rail Assembly allows the platens to be easily installed without removing the existing Ø 300 mm compression platens. This assembly should be factory installed.

It should be noted that after installing, the vertical clearance between the platens decreases by 50 mm.

Block Platens Lifting Assembly is used for easy removal of the lower platen of Block Platens and easy replacement of the distance pieces between the piston and the lower platen.

HR-C1250

Technical Specifications:

Product Code	HR-C1255	HR-C1260	HR-C1265	HR-C1270	HR-C1275
Product Name	Upper Loading Platen (with ball seating assembly) and Lower Loading Platen				
Standard	ASTM C39	ASTM C39	EN 12390-4 & ASTM C39	EN 12390-4	EN 772-1
Dimensions (mm)	Ø 105	Ø 165	Ø 216	Ø 300	310x510x50
Samples	Ø 2", 3", 4" cylinders	Ø 4", 6" cylinders, 100 mm cubes	Ø 6" cylinders 100, 150 mm cubes	Ø 100, 150, 160 mm cylinders 100, 150, 200 mm cubes	Blocks up to 310x510 mm
Hardness (not less than)	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen.

HR-C8201
HR-C8202
HR-C8203

Technical Specifications:

Product Name	Distance Piece					
Product Code	HR-C1500	HR-C1550	HR-C2000	HR-C2100	HR-C3000	HR-C3100
Distance Piece Dia. (mm)	Ø 200	Ø 165	Ø 200	Ø 165	Ø 200	Ø 165

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

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

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

HR-C8002

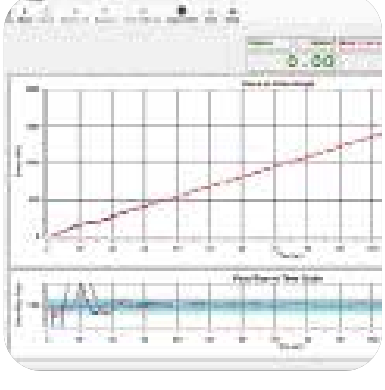
Software

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

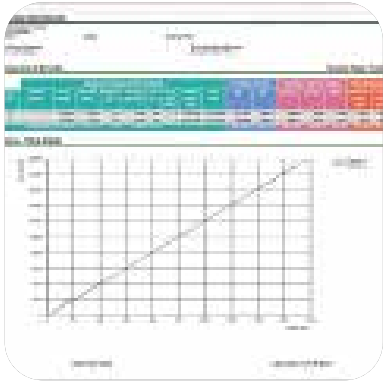
Load-time graphic, test reports and sample reports can be taken.

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Compression Machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.



HİRA TESTING EQUIPMENT



Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Compression Testing Machines, Welded Wall					
Product Code	HR-C1500	HR-C1550	HR-C2000	HR-C2100	HR-C3000	HR-C3100
Standard	EN	ASTM	EN	ASTM	EN	ASTM
Capacity (kN)	1500	1500	2000	2000	3000	3000
Roughness (µm)	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2
Ø Lower Platen (mm)	300	165	300	165	300	165
Ø Upper Platen (mm)	300	165	300	165	300	165
Max. Vertical clearance (mm)	340	365	340	365	340	365
Piston diameter (mm)	230	230	250	250	320	320
Piston Stroke(mm)	50	50	50	50	50	50
Horizontal clearance (mm)	320	320	350	350	440	440
Thickness of platens (mm)	50	50	50	50	50	50
Hardness of Platens (HRC)	55-60	55-60	55-60	55-60	55-60	55-60
Oil Capacity (lt)	25	25	25	25	25	25
Max. Working Pressure (bar)	400	400	400	400	400	400
Power (W)	750	750	750	750	750	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1500	1500 kN Automatic Compression Testing Machine, Welded Wall, EN	79x38x93	650	220 V, 50-60 Hz, 1 ph
HR-C1550	1500 kN Automatic Compression Testing Machine, Welded Wall, ASTM	79x38x93	600	220 V, 50-60 Hz, 1 ph
HR-C2000	2000 kN Automatic Compression Testing Machine, Welded Wall, EN	81x38x101	850	220 V, 50-60 Hz, 1 ph
HR-C2100	2000 kN Automatic Compression Testing Machine, Welded Wall, ASTM	81x38x101	800	220 V, 50-60 Hz, 1 ph
HR-C3000	3000 kN Automatic Compression Testing Machine, Welded Wall, EN	95x48x105	1150	220 V, 50-60 Hz, 1 ph
HR-C3100	3000 kN Automatic Compression Testing Machine, Welded Wall, ASTM	95x48x105	1100	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1500/1	1500 kN Load Frame, Welded Wall, EN	43x35x93	550	---
HR-C1550/1	1500 kN Load Frame, Welded Wall, ASTM	43x35x93	500	---
HR-C2000/1	2000 kN Load Frame, Welded Wall, EN	45x35x101	750	---
HR-C2100/1	2000 kN Load Frame, Welded Wall, ASTM	45x35x101	700	---
HR-C3000/1	3000 kN Load Frame, Welded Wall, EN	59x48x105	1050	---
HR-C3100/1	3000 kN Load Frame, Welded Wall, ASTM	59x48x105	1000	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-C8200	Distance Pieces	Ø 20 x 2,5	---	---
HR-C8201	Distance Pieces	Ø 20 x 3	---	---
HR-C8202	Distance Pieces	Ø 20 x 5	---	---
HR-C8203	Distance Pieces	Ø 20 x 8	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-C1250	Block Platens with Sliding Rail Assembly	51x31x50	175	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC CONCRETE COMPRESSION TESTING MACHINES, WELDED WALL, WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic range of 1500 kN, 2000 kN and 3000 kN Capacity Compression Testing Machines have been designed for reliable and consistent testing of a wide range of specimens. Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

HR-C2000/TS

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit.
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-C3000/TS & HR-G0979

The Automatic Concrete Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Distance Pieces, 30 mm, 50 mm and 80 mm,
- Upper Platen (with ball seating assembly),
- Lower Platen,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.
- H-GUI Software and Ethernet Cable.

Concrete Compression Load Frame

Capacities of 1500 kN, 2000 kN and 3000 kN Load Frames are most popular and available models for welded type frames.

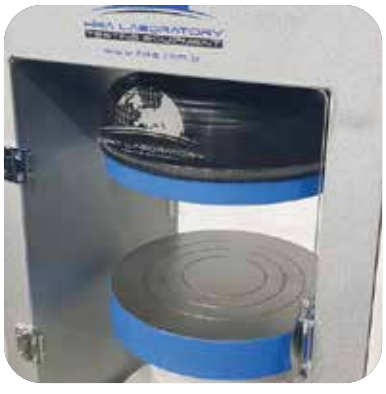
The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

Upper Platens / Lower Platens

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm and Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cube, 100 mm and 150 mm cylinder samples.



HR-C1270

Block Platens with Sliding Rail Assembly

STANDARDS: EN 772-1, 12390-4

Product Code: HR-C1250

Block Platens with Sliding Rail Assembly are installed on the compression testing machines for testing concrete blocks and other structural materials. The Sliding Rail Assembly allows the platens to be easily installed without removing the existing Ø 300 mm compression platens. This assembly should be factory installed.

It should be noted that after installing, the vertical clearance between the platens decreases by 50 mm.

Block Platens Lifting Assembly is used for easy removal of the lower platen of Block Platens and easy replacement of the distance pieces between the piston and the lower platen.

HR-C1250

Technical Specifications:

Product Code	HR-C1255	HR-C1260	HR-C1265	HR-C1270	HR-C1275
Product Name	Upper Loading Platen (with ball seating assembly) and Lower Loading Platen				
Standard	ASTM C39	ASTM C39	EN 12390-4 & ASTM C39	EN 12390-4	EN 772-1
Dimensions (mm)	Ø 105	Ø 165	Ø 216	Ø 300	310x510x50
Samples	Ø 2", 3", 4" cylinders	Ø 4", 6" cylinders, 100 mm cubes	Ø 6" cylinders 100, 150 mm cubes	Ø 100, 150, 160 mm cylinders 100, 150, 200 mm cubes	Blocks up to 310x510 mm
Hardness (not less than)	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen.

HR-C8201
HR-C8202
HR-C8203

Technical Specifications:

Product Name	Distance Piece					
Product Code	HR-C1500/TS	HR-C1550/TS	HR-C2000/TS	HR-C2100/TS	HR-C3000/TS	HR-C3100/TS
Distance Piece Dia. (mm)	Ø 200	Ø 165	Ø 200	Ø 165	Ø 200	Ø 165

HİRA TESTING EQUIPMENT

Loading Cylinder Assembly & Limit Switch

All frames have a single acting up stroking ram. The diameter of the piston is designed to work with the load capacity.

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

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

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

HR-C8002/TS

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

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

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

HİRA TESTING EQUIPMENT

Main Features of H-Touch Pro Max Control Unit

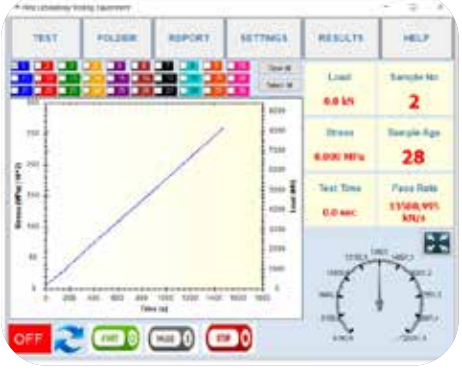
- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

Software

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



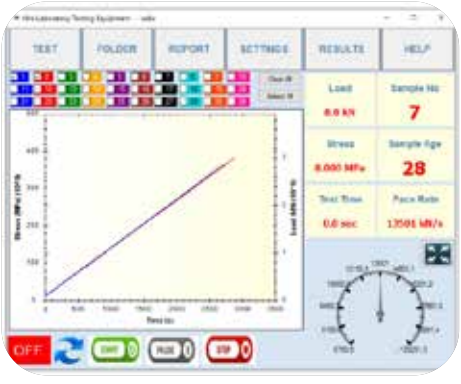
The Automatic Compression Machine can be controlled (Start, Stop commands) by a computer with the HİRATEST H-GUI Software free of charge.

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

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

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

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



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

Main Features of H-GUI Software

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

Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Accuracy Class 1 acc. to EN 12390-4 starting from with the 5% of the machine capacity (Special calibration option Class 1 starting from 1% of the full range with HR-C8003)
- Supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a pressure transducer
- Hydraulic pump with dual stage for rapid approach
- Welded steel walled frame with a single acting piston
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Compression Testing Machines, Welded Wall					
Product Code	HR-C1500/TS	HR-C1550/TS	HR-C2000/TS	HR-C2100/TS	HR-C3000/TS	HR-C3100/TS
Standard	EN	ASTM	EN	ASTM	EN	ASTM
Capacity (kN)	1500	1500	2000	2000	3000	3000
Roughness (µm)	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2
Ø Lower Platen (mm)	300	165	300	165	300	165
Ø Upper Platen (mm)	300	165	300	165	300	165
Max. Vertical clearance (mm)	340	365	340	365	340	365
Piston diameter (mm)	230	230	250	250	320	320
Piston Stroke(mm)	50	50	50	50	50	50
Horizontal clearance (mm)	320	320	350	350	440	440
Thickness of platens (mm)	50	50	50	50	50	50
Hardness of Platens (HRC)	55-60	55-60	55-60	55-60	55-60	55-60
Oil Capacity (lt)	25	25	25	25	25	25
Max. Working Pressure (bar)	400	400	400	400	400	400
Power (W)	750	750	750	750	750	750

HİRA TESTING EQUIPMENT

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1500/TS	1500 kN Automatic Compression Testing Machine, Welded Wall, EN	79x38x93	650	220 V, 50-60 Hz, 1 ph
HR-C1550/TS	1500 kN Automatic Compression Testing Machine, Welded Wall, ASTM	79x38x93	600	220 V, 50-60 Hz, 1 ph
HR-C2000/TS	2000 kN Automatic Compression Testing Machine, Welded Wall, EN	81x38x101	850	220 V, 50-60 Hz, 1 ph
HR-C2100/TS	2000 kN Automatic Compression Testing Machine, Welded Wall, ASTM	81x38x101	800	220 V, 50-60 Hz, 1 ph
HR-C3000/TS	3000 kN Automatic Compression Testing Machine, Welded Wall, EN	95x48x105	1150	220 V, 50-60 Hz, 1 ph
HR-C3100/TS	3000 kN Automatic Compression Testing Machine, Welded Wall, ASTM	95x48x105	1100	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1500/1	1500 kN Load Frame, Welded Wall, EN	43x35x93	550	---
HR-C1550/1	1500 kN Load Frame, Welded Wall, ASTM	43x35x93	500	---
HR-C2000/1	2000 kN Load Frame, Welded Wall, EN	45x35x101	750	---
HR-C2100/1	2000 kN Load Frame, Welded Wall, ASTM	45x35x101	700	---
HR-C3000/1	3000 kN Load Frame, Welded Wall, EN	59x48x105	1050	---
HR-C3100/1	3000 kN Load Frame, Welded Wall, ASTM	59x48x105	1000	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-C8200	Distance Pieces	Ø 20 x 2,5	---	---
HR-C8201	Distance Pieces	Ø 20 x 3	---	---
HR-C8202	Distance Pieces	Ø 20 x 5	---	---
HR-C8203	Distance Pieces	Ø 20 x 8	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-C1250	Block Platens with Sliding Rail Assembly	51x31x50	175	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC CONCRETE COMPRESSION TESTING MACHINES, FOUR COLUMN

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic range of 2000 kN, 3000 kN and 4000 kN, 5000 kN capacity four column compression testing machines have been designed for reliable and consistent testing of a wide range of specimens. Machines confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-C2200

The Four Column Automatic Concrete Compression Testing Machines consist of;

- Heavy duty Four Column Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Distance Pieces, Ø 200x30 mm, Ø 200x50 mm and Ø 200x80 mm,
- Upper Platen (with ball seating assembly) Ø300 mm,
- Lower Platen Ø300 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.

HR-C2200/1

Heavy duty Four Column Concrete Compression Load Frame

Capacities of 2000 kN, 3000 kN, 4000 kN and 5000 kN Four Column Load Frames are available models for column type frames.

The Four Column load frame provides the stability needed for accurate and repeatable test results over the years of operation.

HİRA TESTING EQUIPMENT

Upper Platens / Lower Platens

Upper Platen (with ball seating assembly) Ø 300 mm, Lower Platen Ø 300 mm.

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of samples

HR-C1270

Technical Specifications:

Product Code	HR-C1270
Product Name	Upper Loading Platen (with ball seating assembly) and Lower Loading Platen
Standard	EN 12390-4
Dimensions (mm)	Ø 300
Samples	Ø 100, 150, 160 mm cylinders & 100, 150, 200 mm cubes
Hardness (not less than)	≥ 55 HRC

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø200 mm distance pieces.

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

High Precision Pressure Transducer

All models are supplied in Class 1 starting from 50 kN as standard EN 12390-3, 12390-4, BS 1881 and ASTM C39. The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.

HİRA TESTING EQUIPMENT

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

HR-C8002

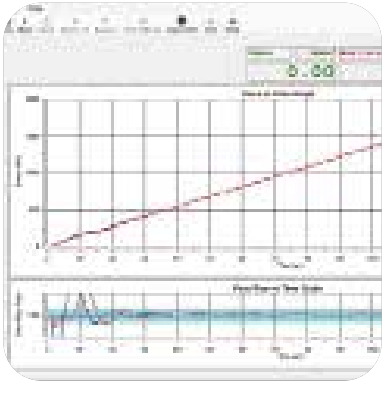
Software

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

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Compression machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.



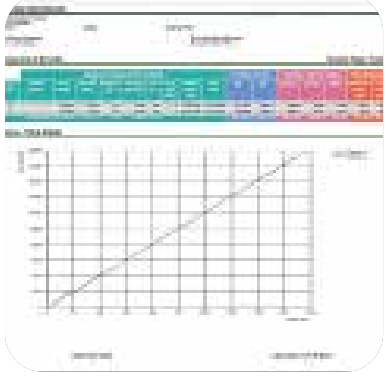
Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.



Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Compression Testing Machines, Four Column			
Product Code	HR-C2200	HR-C3200	HR-C4200	HR-C5200
Capacity (kN)	2000	3000	4000	5000
Roughness (µm)	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2
Ø Lower Platen (cm)	300	300	300	300
Ø Upper Platen (cm)	300	300	300	300
Max. Vertical clearance (cm)	33	33	52	52
Piston diameter (cm)	25	32	37	41
Piston Stroke(cm)	5	5	5	5
Horizontal clearance (cm)	35	44	49	53
Thickness of platens (cm)	5	5	5	5
Hardness of Platens (HRC)	55-60	55-60	55-60	55-60
Oil Capacity (lt)	25	25	25	25
Max. Working Pressure (bar)	400	400	400	400
Power (W)	750	750	750	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C2200	2000 kN Automatic Compression Testing Machine, Four Column	91x56x107	1130	220 V, 50-60 Hz, 1 ph
HR-C3200	3000 kN Automatic Compression Testing Machine, Four Column	102x57x112	1900	220 V, 50-60 Hz, 1 ph
HR-C4200	4000 kN Automatic Compression Testing Machine, Four Column	109x61x135	2450	220 V, 50-60 Hz, 1 ph
HR-C5200	5000 kN Automatic Compression Testing Machine, Four Column	115x64x154	3250	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C2200/1	2000 kN Load Frame, Four Column	53x56x107	1030	---
HR-C3200/1	3000 kN Load Frame, Four Column	64x57x112	1800	---
HR-C4200/1	4000 kN Load Frame, Four Column	71x61x135	2350	---
HR-C5200/1	5000 kN Load Frame, Four Column	77x64x154	3150	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-C8200	Distance Pieces	Ø 20 x 2,5	---	---
HR-C8201	Distance Pieces	Ø 20 x 3	---	---
HR-C8202	Distance Pieces	Ø 20 x 5	---	---
HR-C8203	Distance Pieces	Ø 20 x 8	---	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC CONCRETE COMPRESSION TESTING MACHINES, FOUR COLUMN WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic range of 2000 kN, 3000 kN and 4000 kN, 5000 kN capacity four column compression testing machines have been designed for reliable and consistent testing of a wide range of specimens. Machines confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Testing machines are supplied with EN compression platens as standard.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-C2200/TS

The Four Column Automatic Concrete Compression Testing Machines consist of;

- Heavy duty Four Column Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Distance Pieces, Ø 200x30 mm, Ø 200x50 mm and Ø 200x80 mm,
- Upper Platen (with ball seating assembly) Ø300 mm,
- Lower Platen Ø300 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.
- H-GUI Software and Ethernet Cable.

HR-C2200/1

Heavy duty Four Column Concrete Compression Load Frame

Capacities of 2000 kN, 3000 kN, 4000 kN and 5000 kN Four Column Load Frames are available models for column type frames.

The Four Column load frame provides the stability needed for accurate and repeatable test results over the years of operation.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

HR-C1270

Upper Platens / Lower Platens

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cube, 100 mm and 150 mm cylinder samples.
- Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen has a specimen centering apparatus on lower platen as standard 150 mm cube and 150 mm cylinder.

Technical Specifications:

Product Code	HR-C1270
Product Name	Upper Loading Platen (with ball seating assembly) and Lower Loading Platen
Standard	EN 12390-4
Dimensions (mm)	Ø 300
Samples	Ø 100, 150, 160 mm cylinders & 100, 150, 200 mm cubes
Hardness (not less than)	≥ 55 HRC

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø200 mm distance pieces.

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

HİRA TESTING EQUIPMENT

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

High Precision Pressure Transducer

All models are supplied in Class 1 starting from 50 kN as standard EN 12390-3, 12390-4, BS 1881 and ASTM C39. The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

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

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

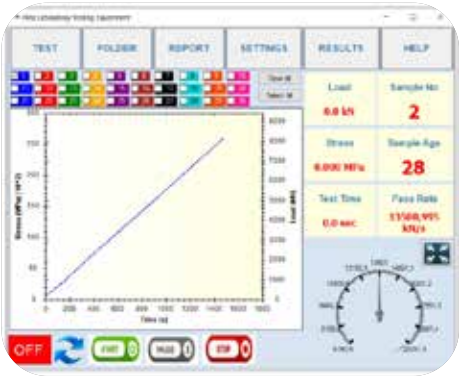
Hardware

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

HİRA TESTING EQUIPMENT

Software

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



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

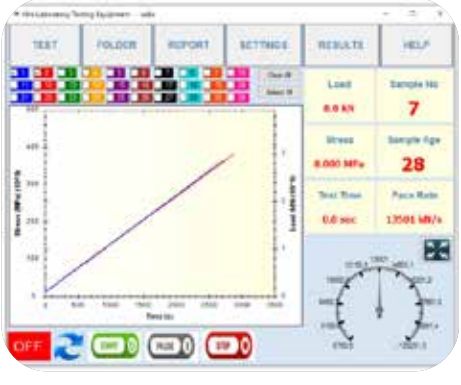
The advanced functions for database management provide an easy navigation of all saved data.

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

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

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

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



Main Features of H-GUI Software

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

Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Accuracy Class 1 acc. to EN 12390-4 starting from with the 5% of the machine capacity (Special calibration option Class 1 starting from 1% of the full range with HR-C8003)
- Supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a pressure transducer
- Hydraulic pump with dual stage for rapid approach
- Welded steel walled frame with a single acting piston
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Compression Testing Machines, Four Column			
Product Code	HR-C2200/TS	HR-C3200/TS	HR-C4200/TS	HR-C5200/TS
Capacity (kN)	2000	3000	4000	5000
Roughness (µm)	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2
Ø Lower Platen (cm)	300	300	300	300
Ø Upper Platen (cm)	300	300	300	300
Max. Vertical clearance (cm)	33	33	52	52
Piston diameter (cm)	25	32	37	41
Piston Stroke(cm)	5	5	5	5
Horizontal clearance (cm)	35	44	49	53
Thickness of platens (cm)	5	5	5	5
Hardness of Platens (HRC)	55-60	55-60	55-60	55-60
Oil Capacity (lt)	25	25	25	25
Max. Working Pressure (bar)	400	400	400	400
Power (W)	750	750	750	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C2200/TS	2000 kN Automatic Compression Testing Machine, Four Column	91x56x107	1130	220 V, 50-60 Hz, 1 ph
HR-C3200/TS	3000 kN Automatic Compression Testing Machine, Four Column	102x57x112	1900	220 V, 50-60 Hz, 1 ph
HR-C4200/TS	4000 kN Automatic Compression Testing Machine, Four Column	109x61x135	2450	220 V, 50-60 Hz, 1 ph
HR-C5200/TS	5000 kN Automatic Compression Testing Machine, Four Column	115x64x154	3250	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C2200/1	2000 kN Load Frame, Four Column	53x56x107	1030	---
HR-C3200/1	3000 kN Load Frame, Four Column	64x57x112	1800	---
HR-C4200/1	4000 kN Load Frame, Four Column	71x61x135	2350	---
HR-C5200/1	5000 kN Load Frame, Four Column	77x64x154	3150	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-C8200	Distance Pieces	Ø 20 x 2,5	---	---
HR-C8201	Distance Pieces	Ø 20 x 3	---	---
HR-C8202	Distance Pieces	Ø 20 x 5	---	---
HR-C8203	Distance Pieces	Ø 20 x 8	---	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

SEMI-AUTOMATIC CONCRETE COMPRESSION TESTING MACHINES

STANDARDS: ASTM C39, ISO EN 7500, 12390-4

The HİRA Semi-Automatic (Motorized) range of 600 kN, 1500 kN, 2000 kN and 3000 kN capacity compression testing machines have been designed for reliable and consistent testing of a wide range of specimens. Machines confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

The Semi-Automatic Concrete Compression Testing Machines consist of;

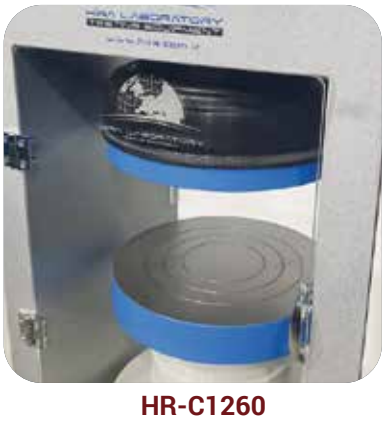
- Load Frame,
- Semi-Automatic Hydraulic Power Pack,
- Digital Readout Unit or LPI Digital Readout Unit,
- Distance Pieces, 30 mm, 50 mm and 80 mm,
- Upper Platen (with ball seating assembly),
- Lower Platen,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.

HR-C2450

Concrete Compression Load Frame

Capacities of 600 kN, 1500 kN, 2000 kN and 3000 kN Load Frames are most popular and available models for welded type frames.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation. The machine's hydraulic power pack, control and read out units are positioned on the right hand side of the load frame for easier accessibility, increased productivity and for safer operations.



HR-C1260

Upper Platens/Lower Platens

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm and Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cube, 100 mm and 150 mm cylinder samples.
- Ø 300 mm Upper Platen (with ball seating assembly) and Lower Platen has an specimen centering apparatus on lower platen as standard 150 mm cube and 150 mm cylinder.

Block Platens with Sliding Rail Assembly

STANDARDS: EN 772-1, 12390-4

Product Code: HR-C1250

Block Platens with Sliding Rail Assembly are installed on the compression testing machines for testing concrete blocks and other structural materials. The Sliding Rail Assembly allows the platens to be easily installed without removing the existing Ø 300 mm compression platens. This assembly should be factory installed.

It should be noted that after installing, the vertical clearance between the platens decreases by 50 mm.

Block Platens Lifting Assembly is used for easy removal of the lower platen of Block Platens and easy replacement of the distance pieces between the piston and the lower platen.

HR-C1250

Technical Specifications:

Product Code	HR-C1255	HR-C1260	HR-C1265	HR-C1270	HR-C1275
Product Name	Upper Loading Platen (with ball seating assembly) and Lower Loading Platen				
Standard	ASTM C39	ASTM C39	EN 12390-4 & ASTM C39	EN 12390-4	EN 772-1
Dimensions (mm)	Ø 105	Ø 165	Ø 216	Ø 300	310x510x50
Samples	Ø 2", 3", 4" cylinders	Ø 4", 6" cylinders, 100 mm cubes	Ø 6" cylinders 100, 150 mm cubes	Ø 100, 150, 160 mm cylinders 100, 150, 200 mm cubes	Blocks up to 310x510 mm
Hardness (not less than)	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC	≥ 55 HRC

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen.

HR-C8166 & HR-C8167
HR-C8168

Technical Specifications:

Product Name	Distance Pieces						
Product Code	HR-C2350	HR-C2400	HR-C2450	HR-C2500	HR-C2600	HR-C3500	HR-C3600
Distance Piece Dia. (mm)	Ø 165	Ø 200	Ø 165	Ø 200	Ø 165	Ø 200	Ø 165

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

SEMI-AUTOMATIC (MOTORIZED) HYDRAULIC POWER PACK AND DIGITAL READOUT UNIT

Semi-Automatic (Motorized) Hydraulic Power Pack

The Semi-Automatic (Motorized) Power Pack, controlled by a pressure rate control valve is designed to supply the required oil to the load frames for loading.

The power pack can load different frames with required pace rates. A pump is supplied as standard.

The power pack is equipped with a safety valve (maximum pressure valve) to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C9000

HİRA TESTING EQUIPMENT

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

The motor which drives the pump in an AC motor.

Distribution Block

A distribution block is used to control the oil flow direction supplied by the pump.

Loading and unloading process and pace rate adjustment is done from the arms on the distribution block.

The following parts are fitted to the distribution block; Safety valve (max. pressure valve) and Transducer.

High Precision Pressure Transducer

The HİRA range of Semi-Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 15 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Readout Unit

The Digital Readout Unit has been designed to use with load cells or pressure transducers on different material test applications.

The peak value and the load change during the test are displayed on the screen.

- Peak value hold property
- Easy preload zeroing
- 5 Digits
- Multi-point Calibration

HR-C9002

LPI Digital Readout Unit

LPI Digital Readout Unit is used for reading of the applied load on load cells or pressure transducers in different material test applications.

- Can operate with 2 x AA batteries or 5V AC adapter
- Real time numeric display of load and load pressure
- 1 channel with two different calibration table (by changing the sensor belong to other frame, the unit can be control for second test frame)
- Peak hold property
- Multi-point calibration
- Easy preload zeroing
- 8 keys keyboard
- RS232 Serial port for PC or thermal or dot matrix printer

HR-C9002/LPI

Technical Specifications:

Product Name	Semi-Automatic Compression Testing Machines						
Product Code	HR-C2350	HR-C2400	HR-C2450	HR-C2500	HR-C2600	HR-C3500	HR-C3600
Standard	ASTM	EN	ASTM	EN	ASTM	EN	ASTM
Capacity (kN)	600	1500	1500	2000	2000	3000	3000
Roughness (µm)	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2	≤ 3.2
Ø Lower Platen (mm)	165	300	165	300	165	300	165
Ø Upper Platen (mm)	165	300	165	300	165	300	165
Max. Vertical clearance (cm)	365	340	365	340	365	340	365
Piston diameter (cm)	150	230	230	250	250	320	320
Piston Stroke(cm)	50	50	50	50	50	50	50
Horizontal clearance (cm)	230	320	320	350	350	440	440
Thickness of platens (cm)	50	50	50	50	50	50	50
Hardness of Platens (HRC)	55-60	55-60	55-60	55-60	55-60	55-60	55-60
Oil Capacity (lt)	25	25	25	25	25	25	25
Max. Working Pressure (bar)	400	400	400	400	400	400	400
Power (W)	750	750	750	750	750	750	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C2350	600 kN Semi-Automatic Compression Testing Machine, ASTM	71x38x91	370	220 V, 50-60 Hz, 1 ph
HR-C2400	1500 kN Semi-Automatic Compression Testing Machine, EN	79x38x93	620	220 V, 50-60 Hz, 1 ph
HR-C2450	1500 kN Semi-Automatic Compression Testing Machine, ASTM	79x38x93	570	220 V, 50-60 Hz, 1 ph
HR-C2500	2000 kN Semi-Automatic Compression Testing Machine, EN	81x38x101	820	220 V, 50-60 Hz, 1 ph
HR-C2600	2000 kN Semi-Automatic Compression Testing Machine, ASTM	81x38x101	770	220 V, 50-60 Hz, 1 ph
HR-C3500	3000 kN Semi-Automatic Compression Testing Machine, EN	95x48x105	1120	220 V, 50-60 Hz, 1 ph
HR-C3600	3000 kN Semi-Automatic Compression Testing Machine, ASTM	95x48x105	1070	220 V, 50-60 Hz, 1 ph
HR-C2350/LPI	600 kN Semi-Automatic Compression Testing Machine, ASTM with LPI unit	71x38x91	370	220 V, 50-60 Hz, 1 ph
HR-C2400/LPI	1500 kN Semi-Automatic Compression Testing Machine, EN with LPI unit	79x38x93	620	220 V, 50-60 Hz, 1 ph
HR-C2450/LPI	1500 kN Semi-Automatic Compression Testing Machine, ASTM with LPI	79x38x93	570	220 V, 50-60 Hz, 1 ph
HR-C2500/LPI	2000 kN Semi-Automatic Compression Testing Machine, EN with LPI unit	81x38x101	820	220 V, 50-60 Hz, 1 ph
HR-C2600/LPI	2000 kN Semi-Automatic Compression Testing Machine, ASTM with LPI	81x38x101	770	220 V, 50-60 Hz, 1 ph
HR-C3500/LPI	3000 kN Semi-Automatic Compression Testing Machine, EN with LPI unit	95x48x105	1120	220 V, 50-60 Hz, 1 ph
HR-C3600/LPI	3000 kN Semi-Automatic Compression Testing Machine, ASTM with LPI	95x48x105	1070	220 V, 50-60 Hz, 1 ph

HİRA TESTING EQUIPMENT

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0650/1	600 kN Load Frame, Welded Wall, ASTM	35x30x91	300	---
HR-C1500/1	1500 kN Load Frame, Welded Wall, EN	43x35x93	550	---
HR-C1550/1	1500 kN Load Frame, Welded Wall, ASTM	43x35x93	500	---
HR-C2000/1	2000 kN Load Frame, Welded Wall, EN	45x35x101	750	---
HR-C2100/1	2000 kN Load Frame, Welded Wall, ASTM	45x35x101	700	---
HR-C3000/1	3000 kN Load Frame, Welded Wall, EN	59x48x105	1050	---
HR-C3100/1	3000 kN Load Frame, Welded Wall, ASTM	59x48x105	1000	---
HR-C9000	Semi-Automatic Hydraulic Power Pack and Digital Readout Unit	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9000/LPI	Semi-Automatic Hydraulic Power Pack and LPI Digital Readout Unit	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9001	Semi-Automatic Hydraulic Power Pack	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9002	Digital Readout Unit	10x9x5	0,300	220 V, 50-60 Hz, 1 ph
HR-C9002/LPI	LPI Digital Readout Unit	15x20x20	1	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8200	Distance Pieces	Ø 20 x 2,5	---	---
HR-C8201	Distance Pieces	Ø 20 x 3	---	---
HR-C8202	Distance Pieces	Ø 20 x 5	---	---
HR-C8203	Distance Pieces	Ø 20 x 8	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-C1250	Block Platens with Sliding Rail Assembly	51x31x50	175	---
HR-C1280	Ball Seating Assembly	---	---	---

HR-C2500/LPI

UNBONDED CAPPING PADS AND RETAINERS

STANDARDS: ASTM C1231

Used for compression tests on concrete cylinder samples, as an alternative method to the sulphur capping and grinding machine.

Two Steel Capping Retainers are applied on the two flat surfaces of the cylinder.

Two Neoprene Pads are put between them, for a better load distribution.

60 Shore hardness pads for expected strength from 10 to 48 MPa.

The system is not applicable for expected strength lower than 10 MPa.

Technical Specifications:

Product Code	Product Name	Hardness	Sample Dimensions (mm)
HR-C8800	Capping Retainers (Pack of 2)	---	100x200
HR-C8801	Capping Retainers (Pack of 2)	---	150x300
HR-C8802	Capping Retainers (Pack of 2)	---	160x320
HR-C8805	Neoprene Pads (Pack of 2)	60 Shore	100x200
HR-C8806	Neoprene Pads (Pack of 2)	60 Shore	150x300
HR-C8807	Neoprene Pads (Pack of 2)	60 Shore	160x320
HR-C8810	Neoprene Pads (Pack of 2)	70 Shore	100x200
HR-C8811	Neoprene Pads (Pack of 2)	70 Shore	150x300
HR-C8812	Neoprene Pads (Pack of 2)	70 Shore	160x320

COMPRESSOMETER

STANDARDS: ASTM C469

Compressometers are used to determine the strain and deformation characteristics of concrete specimens.

Supplied without dial gauge or LVDT and should be ordered separately.

If any Compressometer will use with LVDT, it is used with HİRATEST Semi-Automatic or Automatic Power Units. Digital Data Unit is also required and should be ordered separately. Digital Data Unit can transfer the raw data to computer transiently.

Technical Specifications:

Product Code	Product Name
HR-C8500	Compressometer for 150 mm Cubes
HR-C8501	Compressometer for 200 mm Cubes
HR-C8502	Compressometer for 100x200 mm Cylinders
HR-C8503	Compressometer for 150x300 mm Cylinders

***Please choose dial gauge or LVDT from Accessories.

Spare Parts & Accessories:

Product Code	Product Name
HR-G0879	Digital Dial Gauge, 12.7 x 0,001 mm
HR-G0895	Linear Potantiometric Displacement Transducer, 10 mm
HR-C8550	Digital Data Unit

AUTOMATIC FLEXURAL TESTING MACHINES

STANDARDS: EN 1338, 1339, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The HİRA Automatic range of 100 kN, 200 kN, 300 kN and 400 kN capacity Flexural Testing Machines have been designed for reliable and consistent testing of flexural test on standard concrete beams, concrete or natural stone kerbs, concrete paving flags, and natural stone slabs and tensile splitting test of concrete paving blocks with suitable apparatus.

Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Flexural Testing Machines allow inexperienced operators to perform the tests. Once the machine is switched on and the specimen is placed. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

The HİRA ranges of Flexural Machines have the accuracy of Class 1 starting from 2% of the full capacity.

HR-C5005

The Automatic Flexural Testing Machines consist of;

- Heavy Duty Welded Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Software and Ethernet Cable.

Flexural test assemblies should be ordered separately.

Flexural Load Frame

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

Flexural Frames are designed to accept all accessories required for flexural or compression tests.

Flexural Frames are 100 kN, 200 kN, 300 kN capacity U Type and 300 kN, 400 kN capacity C Type open structure designed to allow easy and practical front loading of the specimen.

The very rigid C type design is ideal either for conventional flexural test or for more sophisticated tests such as deformability and ductility index.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:

- High stability welded assembly
- High accuracy load measurement with load cells
- Can accept wide range of accessories for mentioned standards
- Can be connected to HİRA Compression Machine or Hydraulic Power Pack

HR-C2000

HR-C5005/1

FLEXURAL TESTING ACCESSORIES

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C5050

HR-C5051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C5052

HİRA TESTING EQUIPMENT

HR-C5054

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

HR-C5053

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Concrete Cubes

Can be used for 100 mm cube concrete specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cubes.

HR-C5055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Cylinders

Can be used for Ø100x200 mm Cylindrical Specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cylinders.

HR-C5057

Technical Specifications:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C5050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C5051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C5052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C5053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C5053/1	Distance Piece for HR-C5053 for 100x100 mm Cube Specimens	EN 12390-6	---	---
HR-C5054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C5055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-C5055/1	Distance Piece for HR-C5055 for Ø100x200 mm Cylindrical Specimens	EN 12390-6	---	---
HR-C5056	Apparatus, used for Flexure Test on Rain Gutter	---	---	---
HR-C5057	Wood Fibre Boards, Pack of 50	---	0,4x1,5x34,5	---

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Single Stage Pump

The single stage pump is formed by;

High pressure radial piston pump

On the single stage pump, high pressure radial piston pump is used for test execution.

Motor

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

Distribution Block

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

High Precision Pressure Transducer (Optional)

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

HİRA TESTING EQUIPMENT

Load Cell

Load Cell is used according to the device capacity for load measurements.

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

HR-C8002

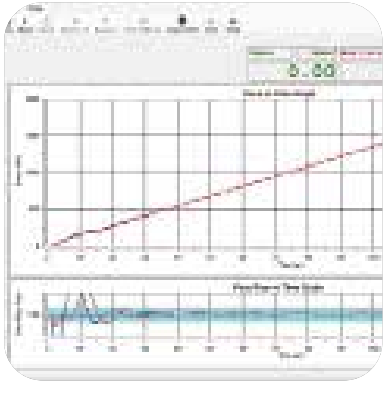
All the operations of the unit is controlled from the front panel consisting of a LCD display and function keys.

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

Software

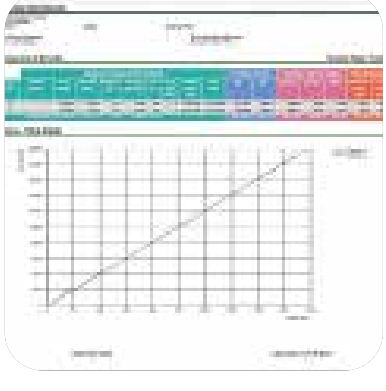


Sample, company, laboratory and test values can be entered in the programme.

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Flexural Testing Machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, flexure and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.



Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Flexural Testing Machines				
Product Code	HR-C5000	HR-C5005	HR-C5010	HR-C5015	HR-C5020
Type	U Type	U Type	U Type	C Type	C Type
Capacity (kN)	100	200	300	300	400
Ram Travel (mm)	70			120	
Max. Vertical clearance (mm)	405 (without accessories)				
Max. Horizontal clearance (mm)	1000				
Max. Clerance Between Lower Rollers (mm)	890				
Class 1 range	1-100 kN	3-200 kN	3-300 kN	3-300 kN	6-400 kN

Safety Features

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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5000	100 kN Automatic Flexural Testing Machine, U Type	119x100x100	300	220 V, 50-60 Hz, 1 ph
HR-C5005	200 kN Automatic Flexural Testing Machine, U Type	119x100x100	325	220 V, 50-60 Hz, 1 ph
HR-C5010	300 kN Automatic Flexural Testing Machine, U Type	119x100x100	400	220 V, 50-60 Hz, 1 ph
HR-C5015	300 kN Automatic Flexural Testing Machine, C Type	128x110x125	655	220 V, 50-60 Hz, 1 ph
HR-C5020	400 kN Automatic Flexural Testing Machine, C Type	128x110x125	700	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5000/1	100 kN Flexural Testing Frame, U Type	81x100x100	200	---
HR-C5005/1	200 kN Flexural Testing Frame, U Type	81x100x100	225	---
HR-C5010/1	300 kN Flexural Testing Frame, U Type	81x100x100	300	---
HR-C5015/1	300 kN Flexural Testing Frame, C Type	90x110x125	555	---
HR-C5020/1	400 kN Flexural Testing Frame, C Type	90x110x125	600	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-G0982	Load Cell, 100 kN capacity	---	---	---
HR-G0983	Load Cell, 200 kN capacity	---	---	---
HR-G0984	Load Cell, 300 kN capacity	---	---	---
HR-G0985	Load Cell, 400 kN capacity	---	---	---
HR-C8003	High Precision Pressure Transducer (optional)	---	---	---
HR-C8004	Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC FLEXURAL TESTING MACHINES WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 1338, 1339, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The HİRA Automatic range of 100 kN, 200 kN, 300 kN and 400 kN capacity Flexural Testing Machines have been designed for reliable and consistent testing of flexural test on standard concrete beams, concrete or natural stone kerbs, concrete paving flags, and natural stone slabs and tensile splitting test of concrete paving blocks with suitable apparatus.

Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Flexural Testing Machines allow inexperienced operators to perform the tests. Once the machine is switched on and the specimen is placed. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

HR-C5005/TS

The HİRA ranges of Flexural Machines have the accuracy of Class 1 starting from 2% of the full capacity.

The Automatic Flexural Testing Machines consist of;

- Heavy Duty Welded Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- H-GUI Software and Ethernet Cable.

Flexural test assemblies should be ordered separately.

Flexural Load Frame

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

Flexural Frames are designed to accept all accessories required for flexural or compression tests.

Flexural Frames are 100 kN, 200 kN, 300 kN capacity U Type and 300 kN, 400 kN capacity C Type open structure designed to allow easy and practical front loading of the specimen.

The very rigid C type design is ideal either for conventional flexural test or for more sophisticated tests such as deformability and ductility index.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:
• High stability welded assembly
• High accuracy load measurement with load cells
• Can accept wide range of accessories for mentioned standards
• Can be connected to HİRA Compression Machine or Hydraulic Power Pack

HR-C2000/TS

HR-C5005/1

FLEXURAL TESTING ACCESSORIES

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C5050

HR-C5051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C5052

HİRA TESTING EQUIPMENT

HR-C5054

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

HR-C5053

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Concrete Cubes

Can be used for 100 mm cube concrete specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cubes.

HR-C5055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Cylinders

Can be used for Ø100x200 mm Cylindrical Specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cylinders.

HR-C5057

Technical Specifications:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C5050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C5051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C5052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C5053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C5053/1	Distance Piece for HR-C5053 for 100x100 mm Cube Specimens	EN 12390-6	---	---
HR-C5054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C5055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-C5055/1	Distance Piece for HR-C5055 for Ø100x200 mm Cylindrical Specimens	EN 12390-6	---	---
HR-C5056	Apparatus, used for Flexure Test on Rain Gutter	---	---	---
HR-C5057	Wood Fibre Boards, Pack of 50	---	0,4x1,5x34,5	---

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

Single Stage Pump

The single stage pump is formed by;

High pressure radial piston pump

On the single stage pump, high pressure radial piston pump is used for test execution.

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

High Precision Pressure Transducer (Optional)

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Load Cell

Load Cell is used according to the device capacity for load measurements.

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity.

Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

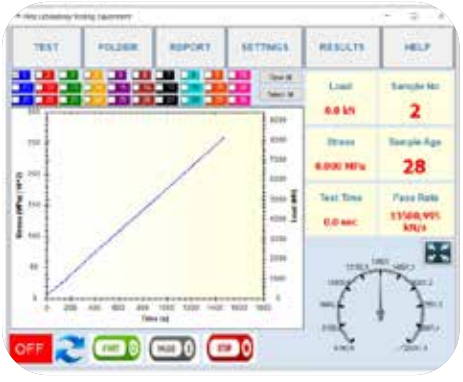
H-Touch PRO Max Control Unit enable simultaneously display machine status, test values, warnings during operation and test graphs such as load-time or load-displacement curves in real time.

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware



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

Software

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

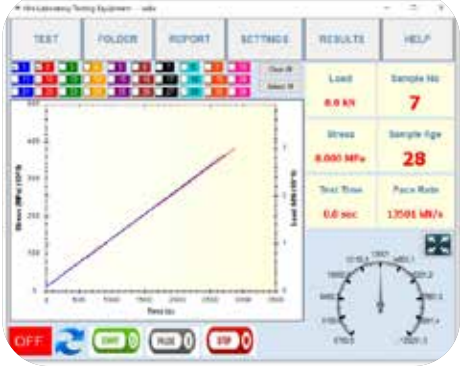
The Automatic Flexural Testing Machine can be controlled (Start, Stop commands) by a computer with the HİRATEST H-GUI Software free of charge.

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

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

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

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



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

Main Features of H-GUI Software

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

Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a load cell
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Name	Automatic Flexural Testing Machines				
Product Code	HR-C5000/TS	HR-C5005/TS	HR-C5010/TS	HR-C5015/TS	HR-C5020/TS
Type	U Type	U Type	U Type	C Type	C Type
Capacity (kN)	100	200	300	300	400
Ram Travel (mm)	70			120	
Max. Vertical clearance (mm)	405 (without accessories)				
Max. Horizontal clearance (mm)	1000				
Max. Clerance Between Lower Rollers (mm)	890				

Safety Features

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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5000/TS	100 kN Automatic Flexural Testing Machine, U Type	119x100x100	300	220 V, 50-60 Hz, 1 ph
HR-C5005/TS	200 kN Automatic Flexural Testing Machine, U Type	119x100x100	325	220 V, 50-60 Hz, 1 ph
HR-C5010/TS	300 kN Automatic Flexural Testing Machine, U Type	119x100x100	400	220 V, 50-60 Hz, 1 ph
HR-C5015/TS	300 kN Automatic Flexural Testing Machine, C Type	128x110x125	655	220 V, 50-60 Hz, 1 ph
HR-C5020/TS	400 kN Automatic Flexural Testing Machine, C Type	128x110x125	700	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5000/1	100 kN Flexural Testing Frame, U Type	81x100x100	200	---
HR-C5005/1	200 kN Flexural Testing Frame, U Type	81x100x100	225	---
HR-C5010/1	300 kN Flexural Testing Frame, U Type	81x100x100	300	---
HR-C5015/1	300 kN Flexural Testing Frame, C Type	90x110x125	555	---
HR-C5020/1	400 kN Flexural Testing Frame, C Type	90x110x125	600	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-G0982	Load Cell, 100 kN capacity	---	---	---
HR-G0983	Load Cell, 200 kN capacity	---	---	---
HR-G0984	Load Cell, 300 kN capacity	---	---	---
HR-G0985	Load Cell, 400 kN capacity	---	---	---
HR-C8003	High Precision Pressure Transducer (optional)	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

FLEXURAL DEVICE ON CONCRETE BEAMS

STANDARDS: EN 12390–5, ASTM C78, C293, AASHTO T 97, BS 1881:118

Flexural device for two points and centre point tests on concrete beams is complete with two lower rollers, one of them articulated, and two upper rollers for third point tests.

• Two fix distances between lower rollers: 300 and 450 mm
• Two fix distances between upper rollers: 100 and 150 mm
It is possible to place in the centre only one upper roller for centre point tests.

HR-C5060

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C5060	Flexural Device on Concrete Beams	26x63x29	28

WIDE CLEARANCE AUTOMATIC FLEXURAL TESTING MACHINES

STANDARDS: EN 1338, 1339, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The HİRA Automatic range of U Type 200 kN and 500 kN capacity, C Type 300 kN capacity Wide Clearance Flexural Testing Machines have been designed for reliable and consist-ent testing of flexural test on standard concrete beams, concrete or natural stone kerbs, concrete paving flags, and natural stone slabs and tensile splitting test of concrete paving blocks with suitable apparatus.
Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety

HR-C5150

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Flexural Testing Machines allow inexperienced operators to perform the tests. Once the machine is switched on and the specimen is placed. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

The HİRA ranges of Flexural Machines have the accuracy of Class 1 starting from 2% of the full capacity.

The Wide Clearance Automatic Flexural Testing Machines consist of;

- Heavy Duty Welded Wide Clearance Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Software and Ethernet Cable.

Flexural test assemblies should be ordered separately.

Wide Clearance Flexural Load Frame

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

The distance between the columns can be adjusted up to 1 meter.

Wide clearance Flexural Frames are designed to accept all accessories required for flexural or compression tests.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:
• High stability welded assembly
• High accuracy load measurement with load cells
• Can accept wide range of accessories for mentioned standards
• Can be connected to HİRA Compression Machine or Hydraulic Power Pack

FLEXURAL TESTING ACCESSORIES

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C6050

HR-C6051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C6052

HR-C6054

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

HR-C6053

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Concrete Cubes

Can be used for 100 mm cube concrete specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cubes.

HR-C6055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Cylinders

Can be used for Ø100x200 mm Cylindrical Specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cylinders.

HR-C6057

Technical Specifications:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C6050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C6051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C6052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C6053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C6053/1	Distance Piece for HR-C5053 for 100x100 mm Cube Specimens	EN 12390-6	---	---
HR-C6054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C6055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-C6055/1	Distance Piece for HR-C5055 for Ø100x200 mm Cylindrical Specimens	EN 12390-6	---	---
HR-C6056	Apparatus, used for Flexure Test on Rain Gutter	---	---	---
HR-C6057	Wood Fibre Boards, Pack of 50	---	0,4x1,5x34,5	---

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Single Stage Pump

The single stage pump is formed by;

High pressure radial piston pump

On the single stage pump, high pressure radial piston pump is used for test execution.

HİRA TESTING EQUIPMENT

Motor

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

Distribution Block

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

High Precision Pressure Transducer (Optional)

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Load Cell

Load Cell is used according to the device capacity for load measurements.

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

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

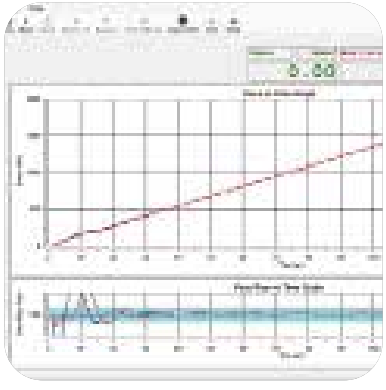
The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

HR-C8002

Software



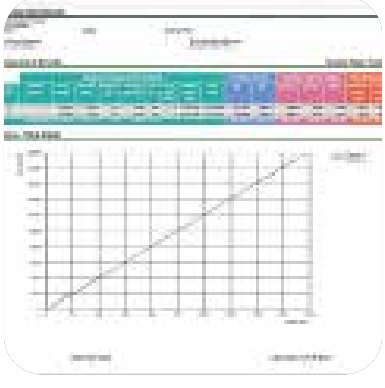
Sample, company, laboratory and test values can be entered in the programme.

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Flexural Testing Machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, flexure and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Software can be performed in Turkish and English.



Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Name	Wide Clearance Automatic Flexural Testing Machines		
Product Code	HR-C5100	HR-C5150	HR-C5125
Type	U Type	U Type	C Type
Capacity (kN)	200	500	300
Ram Travel (mm)	80	80	60
Max. Vertical clearance (mm)	425 (without accessories)		
Max. Horizontal clearance (mm)	1000		620
Max. Clerance Between Lower Rollers (mm)	900		875

Safety Features

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

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5100	200 kN Wide Clearance Automatic Flexural Testing Machine, U Type	180x60x115	600	220 V, 50-60 Hz, 1 ph
HR-C5150	500 kN Wide Clearance Automatic Flexural Testing Machine, U Type	190x750x115	700	220 V, 50-60 Hz, 1 ph
HR-C5125	300 kN Wide Clearance Automatic Flexural Testing Machine, C Type	120x110x125	655	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5100/1	200 kN Wide Clearance Flexural Testing Frame, U Type	140x60x115	500	---
HR-C5150/1	500 kN Wide Clearance Flexural Testing Frame, U Type	150x75x115	600	---
HR-C5125/1	300 kN Wide Clearance Flexural Testing Frame, C Type	100x102x119	555	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-G0983	Load Cell, 200 kN capacity	---	---	---
HR-G0986	Load Cell, 500 kN capacity	---	---	---
HR-G0984	Load Cell, 300 kN capacity	---	---	---
HR-C8003	High Precision Pressure Transducer (optional)	---	---	---
HR-C8004	Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

HR-C5125/1

WIDE CLEARANCE AUTOMATIC FLEXURAL TESTING MACHINES WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 1338, 1339, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The HİRA Automatic range of U Type 200 kN and 500 kN capacity, C Type 300 kN capacity Wide Clearance Flexural Testing Machines have been designed for reliable and consist-ent testing of flexural test on standard concrete beams, concrete or natural stone kerbs, concrete paving flags, and natural stone slabs and tensile splitting test of concrete paving blocks with suitable apparatus.
Machines confirm all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the

HR-C5150/TS

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Flexural Testing Machines allow inexperienced operators to perform the tests. Once the machine is switched on and the specimen is placed. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

The HİRA ranges of Flexural Machines have the accuracy of Class 1 starting from 2% of the full capacity.

The Wide Clearance Automatic Flexural Testing Machines consist of;

- Heavy Duty Welded Wide Clearance Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- H-GUI Software and Ethernet Cable.

Flexural test assemblies should be ordered separately.

Wide Clearance Flexural Load Frame

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

The distance between the columns can be adjusted up to 1 meter.

Wide clearance Flexural Frames are designed to accept all accessories required for flexural or compression tests.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:
• High stability welded assembly
• High accuracy load measurement with load cells
• Can accept wide range of accessories for mentioned standards
• Can be connected to HİRA Compression Machine or Hydraulic Power Pack

FLEXURAL TESTING ACCESSORIES

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C6050

HR-C6051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C6052

HR-C6054

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

HR-C6053

Distance Piece for Splitting Tensile Test Device for Concrete Cubes

Can be used for 100 mm cube concrete specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cubes.

HR-C6055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Cylinders

Can be used for Ø100x200 mm Cylindrical Specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cylinders.

HR-C6057

Technical Specifications:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C6050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C6051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C6052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C6053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C6053/1	Distance Piece for HR-C5053 for 100x100 mm Cube Specimens	EN 12390-6	---	---
HR-C6054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C6055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-C6055/1	Distance Piece for HR-C5055 for Ø100x200 mm Cylindrical Specimens	EN 12390-6	---	---
HR-C6056	Apparatus, used for Flexure Test on Rain Gutter	---	---	---
HR-C6057	Wood Fibre Boards, Pack of 50	---	0,4x1,5x34,5	---

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

Single Stage Pump

The single stage pump is formed by;

High pressure radial piston pump

On the single stage pump, high pressure radial piston pump is used for test execution.

HİRA TESTING EQUIPMENT

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

HR-C8003

High Precision Pressure Transducer (Optional)

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Load Cell

Load Cell is used according to the device capacity for load measurements.

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test.

The level and oil temperature can be seen on the indicator fitted to the tank. It has 25 L capacity.

Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

HR-C8002/TS

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

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

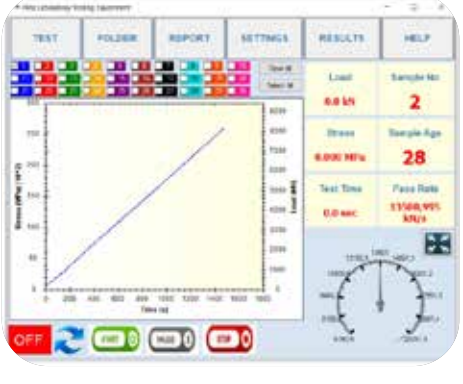
Digital graphic display of the unit is able to draw real-time “Load vs. Time” or “Stress vs. Time” graphics.

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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



Software

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

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

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

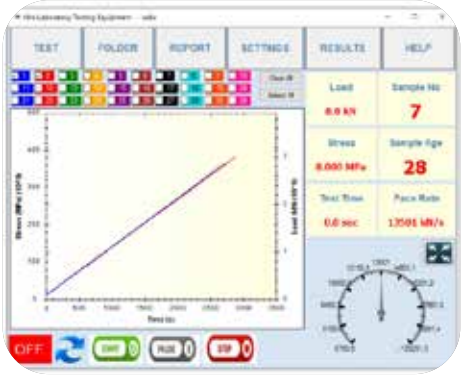
Test parameters can be set and details about the test carried out such as Test Type, Sample Type, Report details, Customer details, Sample details and other information required can be entered in the software.

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

HİRA TESTING EQUIPMENT

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

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



Main Features of H-GUI Software

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

Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a load cell
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

Technical Specifications:

Product Name	Wide Clearance Automatic Flexural Testing Machines		
Product Code	HR-C5100/TS	HR-C5150/TS	HR-C5125/TS
Type	U Type	U Type	C Type
Capacity (kN)	200	500	300
Ram Travel (mm)	80	80	60
Max. Vertical clearance (mm)	425 (without accessories)		
Max. Horizontal clearance (mm)	1000		620
Max. Clerance Between Lower Rollers (mm)	900		875

Safety Features

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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5100/TS	200 kN Wide Clearance Automatic Flexural Testing Machine, U Type	180x60x115	600	220 V, 50-60 Hz, 1 ph
HR-C5150/TS	500 kN Wide Clearance Automatic Flexural Testing Machine, U Type	190x750x115	700	220 V, 50-60 Hz, 1 ph
HR-C5125/TS	300 kN Wide Clearance Automatic Flexural Testing Machine, C Type	120x110x125	655	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5100/1	200 kN Wide Clearance Flexural Testing Frame, U Type	140x60x115	500	---
HR-C5150/1	500 kN Wide Clearance Flexural Testing Frame, U Type	150x75x115	600	---
HR-C5125/1	300 kN Wide Clearance Flexural Testing Frame, C Type	100x102x119	555	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-G0983	Load Cell, 200 kN capacity	---	---	---
HR-G0986	Load Cell, 500 kN capacity	---	---	---
HR-G0984	Load Cell, 300 kN capacity	---	---	---
HR-C8003	High Precision Pressure Transducer (optional)	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

HR-C5125/TS

FLEXURAL TESTING FRAMES

STANDARDS: EN 1338, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

Flexural Frames are designed to accept all accessories required for flexural or compression tests.

Flexural Frames are 100 kN, 200 kN, 300 kN capacity U Type, 200 kN and 500 kN capacity Wide clearance U Type and 300 kN, 400 kN capacity C Type open structure designed to allow easy and practical front loading of the specimen.

The very rigid C type design is ideal either for conventional flexural test or for more sophisticated tests such as deformability and ductility index.
The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

HR-C5015/1

Flexural test assemblies should be ordered separately.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:
- High stability welded assembly
- High accuracy load measurement with load cells
- Can accept wide range of accessories for mentioned standards
- Can be connected to HİRA Compression Machine or Hydraulic Power Pack

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C5000/1	100 kN Flexural Testing Frame, U Type	81x100x100	200
HR-C5005/1	200 kN Flexural Testing Frame, U Type	81x100x100	225
HR-C5010/1	300 kN Flexural Testing Frame, U Type	81x100x100	300
HR-C5015/1	300 kN Flexural Testing Frame, C Type	90x110x125	555
HR-C5020/1	400 kN Flexural Testing Frame, C Type	90x110x125	600
HR-C5100/1	200 kN Wide Clearance Flexural Frame, U Type	140x60x115	500
HR-C5150/1	500 kN Wide Clearance Flexural Frame, U Type	150x75x115	600

HR-C5010/1

HR-C5150/1

Spare Parts & Accessories:

Product Code	Product Name
HR-G0982	Load Cell, 100 kN capacity
HR-G0983	Load Cell, 200 kN capacity
HR-G0984	Load Cell, 300 kN capacity
HR-G0985	Load Cell, 400 kN capacity
HR-G0986	Load Cell, 500 kN capacity

AUTOMATIC PUMICE CONCRETE-BRICK-CONCRETE BLOCK COMPRESSION TESTING MACHINE

STANDARDS: EN 772-1

The HİRA Automatic range of 1200 kN capacity compression testing machine has been designed for reliable and consistent testing of a Pumice Concrete, Brick and Concrete Blocks of specimens.

The dimensions of the upper and lower plates allow the testing of sample on 510x310x50 mm compression plates, concrete blocks and building materials.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-C1200

The Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Distance Pieces, 30 mm and 50 mm,
- Upper Platen (with ball seating assembly) 510x310x50 mm,
- Lower Platen 510x310x50 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Software and Ethernet Cable.

Pumice Concrete-Brick-Concrete Block Compression Load Frame

The Load Frame is made of welded steel walls the piston is placed in the center of frame.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

Upper Platens/Lower Platens

Upper Platen (with ball seating assembly) 510x310x50 mm and Lower Platen 510x310x50 mm.

• Manufactured from high quality steel, which is then hardened, smoothed and finished.
• The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.

HİRA TESTING EQUIPMENT

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with 30 mm and 50 mm distance pieces.

HR-C8201
HR-C8202

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

HR-C8000

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack is equipped with 4 wheels for easy carriage and flexible installation.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

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

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

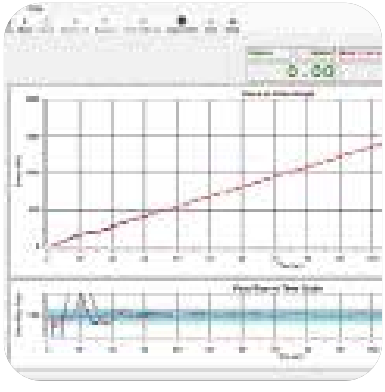
Digital graphic display unit loading rate of the time of Testing and load values can be monitored.

Digital graphic display is able to draw real-time “Load vs. Time”.

HR-C8002

HİRA TESTING EQUIPMENT

Software



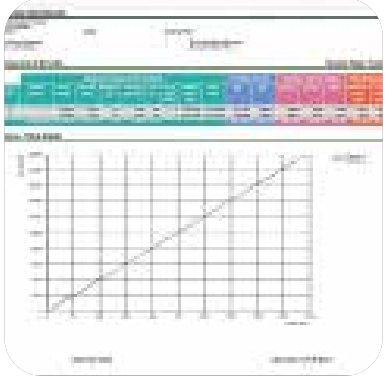
Sample, company, laboratory and test values can be entered in the programme.

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Compression machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Software can be performed in Turkish and English.



Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine
Product Code	HR-C1200
Capacity (kN)	1200
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	510x300x50
Ø Upper Platen (mm)	510x300x50
Max. Vertical clearance (cm)	25
Piston diameter (cm)	20
Piston Stroke(cm)	5
Horizontal clearance (cm)	31
Thickness of platens (cm)	5
Hardness of Platens (HRC)	55-60
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Safety Features

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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1200	Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine	75x60x100	600	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1200/1	1200 kN Pumice Concrete-Brick-Concrete Block Compression Testing Frame	37x60x100	500	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-C8200	Distance Pieces	2,5	---	---
HR-C8201	Distance Pieces	3	---	---
HR-C8202	Distance Pieces	5	---	---
HR-C8203	Distance Pieces	8	---	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC PUMICE CONCRETE-BRICK-CONCRETE BLOCK COMPRESSION TESTING MACHINE WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 772-1

The HİRA Automatic range of 1200 kN capacity compression testing machine has been designed for reliable and consistent testing of a Pumice Concrete, Brick and Concrete Blocks of specimens.

The dimensions of the upper and lower plates allow the testing of sample on 510x310x50 mm compression plates, concrete blocks and building materials.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machines allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

HR-C1200/TS

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

The Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Distance Pieces, 30 mm and 50 mm,
- Upper Platen (with ball seating assembly) 510x310x50 mm,
- Lower Platen 510x310x50 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- H-GUI Software and Ethernet Cable.

Pumice Concrete-Brick-Concrete Block Compression Load Frame

The Load Frame is made of welded steel walls the piston is placed in the center of frame.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

Upper Platens/Lower Platens

Upper Platen (with ball seating assembly) 510x310x50 mm and Lower Platen 510x310x50 mm.

• Manufactured from high quality steel, which is then hardened, smoothed and finished.

• The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with 30 mm and 50 mm distance pieces.

HR-C8201
HR-C8202

Loading Cylinder Assembly & Limit Switch

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

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

At the end of the test process to start a new test the piston returns to default position.

The pressure transducer is used for load measurements.

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

HR-C8000/TS

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

HİRA TESTING EQUIPMENT

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

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

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

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

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

Software

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

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

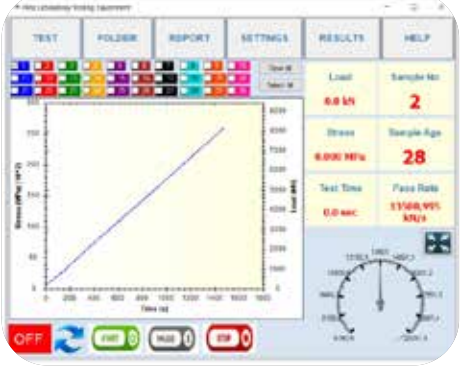
The advanced functions for database management provide an easy navigation of all saved data.

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

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

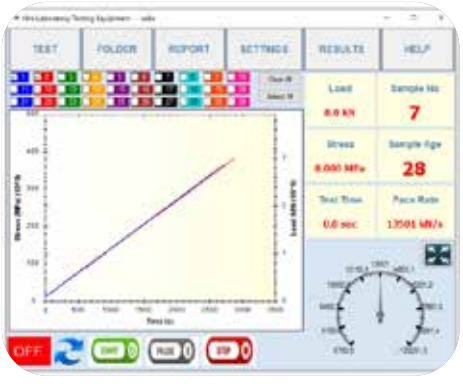
Following tests can be done with the HİRATEST H-GUI Software;

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



HİRA TESTING EQUIPMENT

Main Features of H-GUI Software



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

Main Features of H-GUI Software

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a pressure transducer
- Hydraulic pump with dual stage for rapid approach
- Welded steel walled frame with a single acting piston
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

Technical Specifications:

Product Name	Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine
Product Code	HR-C1200/TS
Capacity (kN)	1200
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	510x300x50
Ø Upper Platen (mm)	510x300x50
Max. Vertical clearance (cm)	25
Piston diameter (cm)	20
Piston Stroke(cm)	5
Horizontal clearance (cm)	31
Thickness of platens (cm)	5
Hardness of Platens (HRC)	55-60
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Safety Features

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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1200/TS	Automatic Pumice Concrete-Brick-Concrete Block Compression Testing Machine	75x60x100	600	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C1200/1	1200 kN Pumice Concrete-Brick-Concrete Block Compression Testing Frame	37x60x100	500	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-C8200	Distance Pieces	2,5	---	---
HR-C8201	Distance Pieces	3	---	---
HR-C8202	Distance Pieces	5	---	---
HR-C8203	Distance Pieces	8	---	---
HR-C1280	Ball Seating Assembly	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

SEMI-AUTOMATIC FLEXURAL TESTING MACHINES

STANDARDS: EN 1338, 1339, 1340, 12390-5, 12390-6, BS 1881, ASTM C78, C293, C496

The HİRA Semi-Automatic (Motorized) range of 100 kN, 200 kN, 300 kN and 400 kN capacity Flexural Testing Machines have been designed for reliable and consistent testing of flexural test on standard concrete beams, concrete or natural stone kerbs, concrete paving flags, and natural stone slabs and tensile splitting test of concrete paving blocks with suitable apparatus.

The Semi-Automatic Flexural Testing Machines consist of;

- Heavy Duty Welded Load Frame,
- Semi-Automatic Hydraulic Power Pack,
- Digital Readout Unit

Flexural test assemblies should be ordered separately.

HR-C5600

Flexural Load Frame

The multipurpose HİRA Flexural Testing Frames are designed for minimum deflection at maximum load resulting in very high accuracy. The load frame is a welded steel fabrication carrying the ram fitted to the steel base. All Frames have a single acting up stroking ram with over travel switch protection to stop the machine when maximum ram travel is reached. A load cell is used for load measurements on all frames.

Flexural Frames are designed to accept all accessories required for flexural or compression tests.

Flexural Frames are 100 kN, 200 kN, 300 kN capacity U Type and 300 kN, 400 kN capacity C Type open structure designed to allow easy and practical front loading of the specimen.

The very rigid C type design is ideal either for conventional flexural test or for more sophisticated tests such as deformability and ductility index.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

All frames can be connected to HİRA compression machine as a second frame or can be used with any HİRA power pack as an independent Flexural Machine.

The main characteristics are:

- High stability welded assembly
- High accuracy load measurement with load cells
- Can accept wide range of accessories for mentioned standards
- Can be connected to HİRA Compression Machine or Hydraulic Power Pack

HR-C5010/1

FLEXURAL TESTING ACCESSORIES

HR-C5050

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C5051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C5052

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

HR-C5054

HR-C5053

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Concrete Cubes

Can be used for 100 mm cube concrete specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cubes.

HİRA TESTING EQUIPMENT

HR-C5055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

Distance Piece for Splitting Tensile Test Device for Cylinders

Can be used for Ø100x200 mm Cylindrical Specimens by using this Distance pieces with Splitting Tensile Test Device for Concrete Cylinders.

HR-C5057

Technical Specifications:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C5050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C5051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C5052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C5053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C5053/1	Distance Piece for HR-C5053 for 100x100 mm Cube Specimens	EN 12390-6	---	---
HR-C5054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C5055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-C5055/1	Distance Piece for HR-C5055 for Ø100x200 mm Cylindrical Specimens	EN 12390-6	---	---
HR-C5056	Apparatus, used for Flexure Test on Rain Gutter	---	---	---
HR-C5057	Wood Fibre Boards, Pack of 50	---	0,4x1,5x34,5	---

SEMI-AUTOMATIC (MOTORIZED) HYDRAULIC POWER PACK AND DIGITAL READOUT UNIT

Semi-Automatic (Motorized) Hydraulic Power Pack

The Semi-Automatic (Motorized) Power Pack, controlled by a pressure rate control valve is designed to supply the required oil to the load frames for loading. The power pack can load different frames with required pace rates. A pump is supplied as standard. The power pack is equipped with a safety valve (maximum pressure valve) to avoid machine overloading. Maximum working pressure of the system is 400 bar.

HR-C9000

Single Stage Pump

The single stage pump is formed by;

High pressure pump

On the single stage pump, high pressure pump is used for test execution.

Motor

The motor which drives the pump in an AC motor.

Distribution Block

A distribution block is used to control the oil flow direction supplied by single stage pump. Loading and unloading process and pace rate adjustment is done from the arms on the distribution block. The following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Load Cell and High pressure radial piston pump.

High Precision Pressure Transducer

The HİRA range of Semi-Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 15 L capacity. Hydraulic motor oil, number 46, must be used.

HİRA TESTING EQUIPMENT

Digital Readout Unit

The Digital Readout Unit has been designed to use with load cells or pressure transducers on different material test applications.

The peak value and the load change during the test are displayed on the screen.

- Peak value hold property
- Easy preload zeroing
- 5 Digits
- Multi-point Calibration

HR-C9002

Technical Specifications:

Product Code	Semi-Automatic Flexural Testing Machines				
Product Code	HR-C5500	HR-C5600	HR-C5700	HR-C5800	HR-C5900
Type	U Type	U Type	U Type	C Type	C Type
Capacity (kN)	100	200	300	300	400
Ram Travel (mm)	70			120	
Max. Vertical clearance (mm)	405 (without accessories)				
Max. Horizontal clearance (mm)	1000				
Max. Clerance Between Lower Rollers (mm)	890				

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5500	100 kN Semi-Automatic Flexural Testing Machine, U Type	119x100x100	300	220 V, 50-60 Hz, 1 ph
HR-C5600	200 kN Semi-Automatic Flexural Testing Machine, U Type	119x100x100	325	220 V, 50-60 Hz, 1 ph
HR-C5700	300 kN Semi-Automatic Flexural Testing Machine, U Type	119x100x100	400	220 V, 50-60 Hz, 1 ph
HR-C5800	300 kN Semi-Automatic Flexural Testing Machine, C Type	128x110x125	655	220 V, 50-60 Hz, 1 ph
HR-C5900	400 kN Semi-Automatic Flexural Testing Machine, C Type	128x110x125	700	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C5000/1	100 kN Flexural Testing Frame, U Type	81x100x100	200	---
HR-C5005/1	200 kN Flexural Testing Frame, U Type	81x100x100	225	---
HR-C5010/1	300 kN Flexural Testing Frame, U Type	81x100x100	300	---
HR-C5015/1	300 kN Flexural Testing Frame, C Type	90x110x125	555	---
HR-C5020/1	400 kN Flexural Testing Frame, C Type	90x110x125	600	---
HR-C9000	Semi-Automatic Hydraulic Power Pack and Digital Readout Unit	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9001	Semi-Automatic Hydraulic Power Pack	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9002	Digital Readout Unit	10x9x5	0,300	220 V, 50-60 Hz, 1 ph
HR-G0982	Load Cell, 100 kN capacity	---	---	220 V, 50-60 Hz, 1 ph
HR-G0983	Load Cell, 200 kN capacity	---	---	---
HR-G0984	Load Cell, 300 kN capacity	---	---	---
HR-G0985	Load Cell, 400 kN capacity	---	---	---
HR-C8003	High Precision Pressure Transducer (optional)	---	---	---

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

HİRA TESTING EQUIPMENT

High Precision Pressure Transducer

HR-C8003

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Oil Tank

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

Digital Data Acquisition & Control System

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

HR-C8002

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

The unit has easy to use menu options.

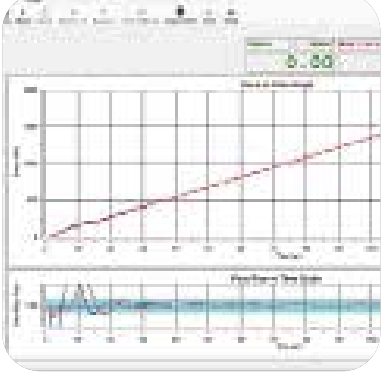
Digital graphic display unit loading rate of the time of Testing and load values can be monitored.

Digital graphic display is able to draw real-time “Load vs. Time”.

Software

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

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



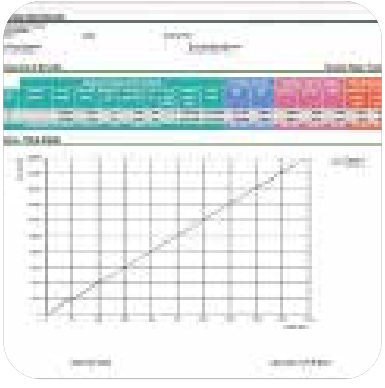
Software provides test data, results, and the load-time graphs can be seen at LCD screen.

The Automatic Compression machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.



Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

The motor which drives the dual pumps in an AC motor and it is controlled by motor inverter.

The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Oil Tank

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

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

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

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

HİRA TESTING EQUIPMENT

Hardware

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

Software

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

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

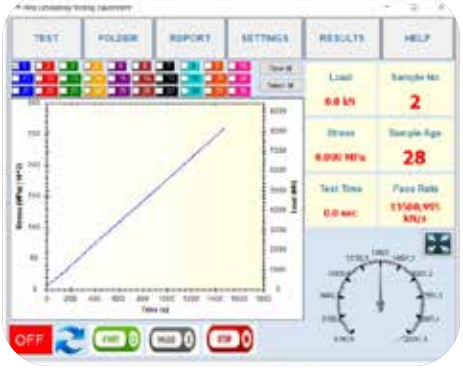
The advanced functions for database management provide an easy navigation of all saved data.

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

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

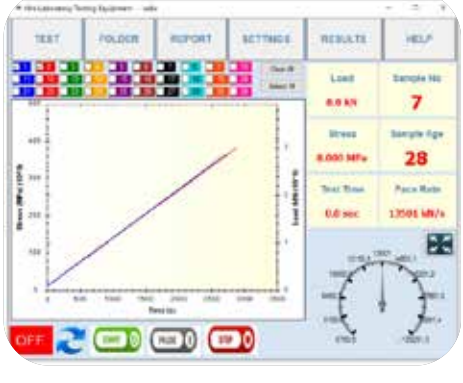
Following tests can be done with the HİRATEST H-GUI Software;

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



Main Features of H-GUI Software

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



Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C8000/TS	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

SEMI-AUTOMATIC (MOTORIZED) HYDRAULIC POWER PACK AND DIGITAL READOUT UNIT

Semi-Automatic (Motorized) Hydraulic Power Pack

The Semi-Automatic (Motorized) Power Pack, controlled by a pressure rate control valve is designed to supply the required oil to the load frames for loading. The power pack can load different frames with required pace rates. A pump is supplied as standard. The power pack is equipped with a safety valve (maximum pressure valve) to avoid machine overloading. Maximum working pressure of the system is 400 bar.

HR-C9000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

The motor which drives the pump in an AC motor.

Distribution Block

A distribution block is used to control the oil flow direction supplied by the pump.

Loading and unloading process and pace rate adjustment is done from the arms on the distribution block.

The following parts are fitted to the distribution block; Safety valve (max. pressure valve) and Transducer.

HİRA TESTING EQUIPMENT

High Precision Pressure Transducer

HR-C8003

The HİRA range of Semi-Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 15 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Readout Unit

The Digital Readout Unit has been designed to use with load cells or pressure transducers on different material test applications.

The peak value and the load change during the test are displayed on the screen.

- Peak hold property
- Easy preload zeroing
- 5 Digits
- Multi-point Calibration

HR-C9002

LPI Digital Readout Unit

LPI Digital Readout Unit is used for reading of the applied load on load cells or pressure transducers in different material test applications.

- Can operate with 2 x AA batteries or 5V AC adapter
- Real time numeric display of load and load pressure
- 1 channel with two different calibration table (by changing the sensor belong to other frame, the unit can be control for second test frame)
- Peak hold property
- Multi-point calibration
- Easy preload zeroing
- 8 keys keyboard
- RS232 Serial port for PC or thermal or dot matrix printer

HR-C9002/LPI

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C9000	Semi-Automatic Hydraulic Power Pack and Digital Readout Unit	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9000/LPI	Semi-Automatic Hydraulic Power Pack and LPI Digital Readout Unit	36x38x91	70	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C9001	Semi-Automatic Hydraulic Power Pack	36x38x91	70	220 V, 50-60 Hz, 1 ph
HR-C9002	Digital Readout Unit	10x9x5	0,300	220 V, 50-60 Hz, 1 ph
HR-C9002	LPI Digital Readout Unit	15x20x20	1	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---

CONCRETE PIPE TESTING MACHINE (PEAK LOAD)

STANDARDS: TS EN 1916

1000 kN capacity Concrete Pipe Testing Machines are designed for the Peak Load Tests on Sewer and Drain Pipes, Concrete Pipes, Fittings, Cones on from 200 mm up to 3700 mm (outer diameters) pipes. Can be used for concrete pipes with a length up to 3000 mm.

600 kN capacity Concrete Pipe Testing Machines are designed for the Peak Load Tests on Sewer and Drain Pipes, Concrete Pipes, Fittings, Cones on from 200 mm up to 2000 mm (outer diameters) pipes. Can be used for concrete pipes with a length up to 2000 mm.

Please contact with us for different dimensions and capacity of Concrete Pipe Testing Machines.

Concrete Pipe Testing Machines consist of;

- Load Frame
- Automatic Hydraulic Power Pack and
- Digital data acquisition & control system

Concrete Pipe Testing Load Frame

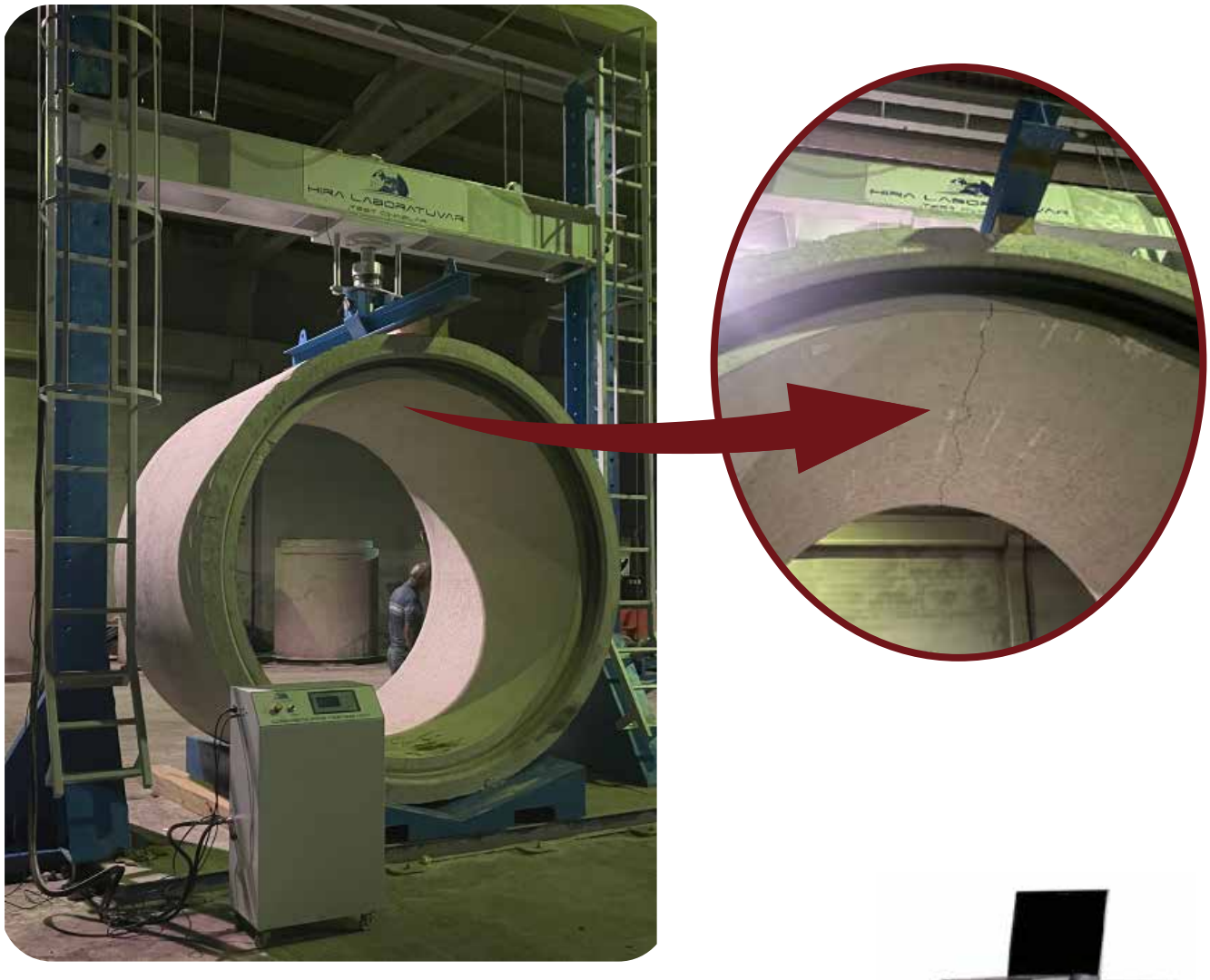
The frames are rigid 2 column constructions with superior axial and lateral stiffness and are precision aligned. The load-controlled double acting piston is integrated to upper beam. The actuator has anti-rotation system to prevent the natural tendency of the actuator to rotate. The stroke of the double acting actuator is 300 mm. Load cell is used for precise load measurement and closed loop control.

The rectangular shaped top bearer is detachable from the actuator and the bottom bearer is V-shaped with an angle of 150°. During pipe loading the system doesn't permit top bearer to move at horizontal plane and allows it to move at vertical plane of a minimum value of ±8°. Upper crosshead height adjustment is done with electric motor drive for easy and precise test set up and manual through locking pins are used to fix the upper crosshead.

There are 2 options depending on frame fixing system, with or without chassis.

First option is not including carrying chassis for the machine. These types of frames have to be anchored to concrete base. Steel fasteners and anchorage plan are sent to the customer before installation. Steel fasteners have to be anchored to concrete base by customer according to plan. Following this anchorage process, the frame is assembled.

Second option is including metal carrying chassis for the machine.



HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%.

A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 410 bar.

HR-C8000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

HR-C8002

Digital graphic display is able to draw real-time “Load vs. Time”.

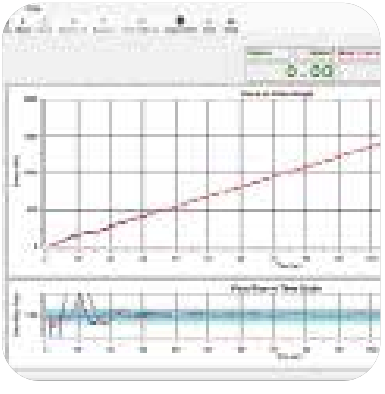
Software

The Concrete Pipe Testing Software is supplied free of charge with the Concrete Pipe Testing Machine.

Sample, company, laboratory and test values can be entered in the programme.
Load-time graphic, test reports and sample reports can be taken.

Software provides test data, results, and the load-time graphs can be seen at LCD screen. The Concrete Pipe Testing Machine can be controlled (Start, Stop commands) by a computer with the software free of charge.

This software provides data acquisition and management for compression tests throughout the test execution.

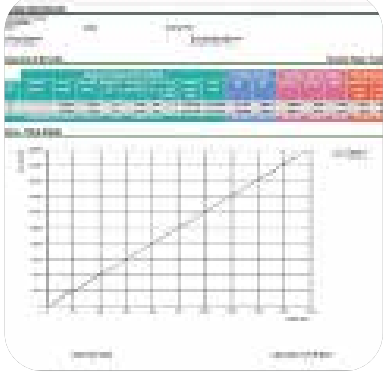


The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information.
Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Software can be performed in Turkish and English.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.



Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Safety Features

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

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Product Name	Capacity (kN)	Max. External Sample Dia. (mm)	Power Supply
HR-C6000	Concrete Pipe Testing Machine without Carrying Chassis	600	2000	220 V, 50-60 Hz, 1 ph
HR-C6005	Concrete Pipe Testing Machine with Carrying Chassis	600	2000	220 V, 50-60 Hz, 1 ph
HR-C1000	Concrete Pipe Testing Machine without Carrying Chassis	1000	3000	220 V, 50-60 Hz, 1 ph
HR-C1005	Concrete Pipe Testing Machine with Carrying Chassis	1000	3000	220 V, 50-60 Hz, 1 ph
HR-C1050	Concrete Pipe Testing Machine without Carrying Chassis	1000	3700	220 V, 50-60 Hz, 1 ph
HR-C1055	Concrete Pipe Testing Machine with Carrying Chassis	1000	3700	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Capacity (kN)	Max. External Sample Dia. (mm)	Power Supply
HR-C6000/1	Concrete Pipe Testing Frame without Carrying Chassis	600	2000	---
HR-C6005/1	Concrete Pipe Testing Frame with Carrying Chassis	600	2000	---
HR-C1000/1	Concrete Pipe Testing Frame without Carrying Chassis	1000	3000	---
HR-C1005/1	Concrete Pipe Testing Frame with Carrying Chassis	1000	3000	---
HR-C1050/1	Concrete Pipe Testing Frame without Carrying Chassis	1000	3700	---
HR-C1055/1	Concrete Pipe Testing Frame with Carrying Chassis	1000	3700	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	---	---	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8004	Software	---	---	---
HR-G0975	Computer & Printer	---	---	---
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

ELECTROMECHANICAL FLEXURAL & COMPRESSION TESTING MACHINE

Electromechanical Flexural-Compression Testing Machine can perform Flexural-Compression Tests of various types of materials.
It is produced with a capacity of 50 kN or 100 kN.

The device works with an Electromechanical Motor.

Piston movement is limited by 2 switches located at the top and bottom of the piston.

The Electromechanical Flexural-Compression Testing Machine machine consists of;

- Load Frame
- 50 kN or 100 kN Load Cell according to device capacity,
- Movable Upper Plate for compression tests,
- Digital graphic readout unit
- Software

Accessories should be ordered separately according to the type of test to be performed for flexure tests.

HR-E0100

Load Frame

The Load Frame consist of 2 rigid columns, a cast iron base with gear box inside and a steel bridge to hold the Load cell and accessories.
The vertical distance can be adjusted by the help of the upper platen.
The distance between the columns can be adjusted up to 1 meter.

Digital Graphic Readout Unit

The device can be controlled from the computer automatically or run from the control unit automatically or manually.
Load/stress values can be read from the computer or LCD screen Graphic Readout Unit.
The Load vs Time graph can be seen from the LCD screen during the test.
Test data can be stored by the computer after failure.
The pace rate can be adjusted between 0,05 and 24 kN/sn.

Software

The device can be connected to any computer with Ethernet cable.
Thanks to software, different types of user and sample data can be stored and printed out the test report.
HİRA Compression-Flexural Software is provided free of charge with the device.

FLEXURAL TESTING ACCESSORIES

HR-C5050

Flexural Testing Assembly for Concrete Beams

The test assembly is used for 3 or 4 point flexural tests on 100 or 150 mm Concrete Beams.

The set consist of 2 upper and 2 lower rollers of Ø38 x 160 mm.

The distance of lower bearers can be adjusted between 100 mm and 800 mm. The distance between upper bearers can be set to 100 mm or 150 mm.

For 3 point testing one of the bearers can be removed and the other placed in the center.

HR-C5051

Flexural Testing Assembly for Concrete Kerbs

The test assembly is used for flexural tests on Concrete Kerbs.

The set consists of 2 lower rollers of Ø 20 x 620 mm and Ø 40 mm upper loading piston with ball seating assembly.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C5052

Flexural Test Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs

The test assembly is used for flexural tests on Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs.

The set consists of 2 lower rollers and upper roller of Ø 20x 620 mm.

The distance of lower rollers can be adjusted between 100 mm to 800 mm.

HR-C5054

Splitting Tensile Test Device for Block Pavers

Splitting Tensile Test Device for Block Pavers is accessory for compression machines for measuring the splitting tensile strengths of 60-100 mm height x 220 mm length concrete block pavers according to the requirements of the related standards.

HR-C5053

Splitting Tensile Test Device for Concrete Cubes

Splitting Tensile Test Device for Concrete Cubes is accessory for compression machines for measuring the splitting tensile strengths of 150 mm cube concrete specimens according to the requirements of the related standards.

HR-C5055

Splitting Tensile Test Device for Cylinders

Splitting Tensile Test Device for Cylinders is accessory for compression machines for measuring the splitting tensile strengths of Ø150x300 mm and Ø160x320 mm cylindrical specimens according to the requirements of the related standards.

CEMENT COMPRESSION & FLEXURAL TEST ACCESSORIES

HR-CE1525

Cement Flexural Jig Assembly (40x40x160 mm)

It is used for flexural strength test of 40x40x160 mm cement samples.

HR-CE1527

Cement Compression Jig Assembly (40x40x40 mm)

It is used for compressive strength test of 40x40x160 mm cement samples.

Cement Compression Jig Assembly (50x50x50 mm)

It is used for compressive strength test of 50x50x50 mm cement samples.

Cement Compression Jig Assembly (70,7 mm)

It is used for compressive strength test of 70,7 mm cement samples.

HR-CE1528

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-E0050	Electromechanical Flexural-Compression Testing Machine, 50 kN	105x130x115	220	220 V, 50-60 Hz, 1 ph
HR-E0100	Electromechanical Flexural-Compression Testing Machine, 100 kN	105x130x115	220	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-E0050/1	Electromechanical Flexural-Compression Testing Frame, 50 kN	---
HR-E0100/1	Electromechanical Flexural-Compression Testing Frame, 100 kN	---
HR-G0975	Computer & Printer	220 V, 50-60 Hz, 1 ph
HR-G0981	Load Cell, 50 kN capacity	---
HR-G0982	Load Cell, 100 kN capacity	---
HR-E8500	Digital Readout Unit	220 V, 50-60 Hz, 1 ph
HR-E8500/1	Software	---

Test Accessories:

Product Code	Product Name	Standards	Dimensions (cm)	Weight (kg)
HR-C5050	Flexural Testing Assembly for Concrete Beams	ASTM C 293, ASTM C 78, EN 12390-5, BS 1881:118	20x20x20	16
HR-C5051	Flexural Testing Assembly for Concrete Kerbs	EN 1340	62x25x10	17
HR-C5052	Flexural Testing Assembly for Concrete Paving Flags and Concrete Terrazzo Tiles, Natural Stone Kerbs and Slabs	EN 1339, EN 1343, EN 12372	62x26x15	25
HR-C5053	Splitting Tensile Test Device for 150x150 mm Cube Specimens	EN 12390-6	18x15x32	15
HR-C5054	Splitting Tensile Test Device for 60-100 mm height Block Pavers	EN 12390-6, EN 1338, ASTM C 496	24x16x32	17,5
HR-C5055	Splitting Tensile Test Device for Ø150x300 mm & Ø160x320 mm Cylindrical Specimens	EN 12390-6, ASTM C 496	34x15x33	25
HR-CE1525	Flexure Jig Assembly to test 40x40x160 mm mortar prisms	---	15x15x18	11
HR-CE1526	Compression Jig Assembly to test 50 mm (2") mortar cubes	---	15x15x18	12
HR-CE1527	Compression Jig Assembly to test 40x40x40 mm mortar prisms	---	15x15x18	12
HR-CE1528	Compression Jig Assembly BS, to test 70,7 mm mortar cubes	---	15x13x19	9

HYDRAULIC FLEXURAL-COMPRESSION-TENSILE TESTING MACHINE

Hydraulic Flexural-Compression-Tensile Testing Machine is used in 3-point and 4-point Flexural Tests, Compression and Tensile tests of different construction materials.

It is produced with a capacity of 100 kN.

With the help of the jaws on the upper part of the device, it allows Tensile tests of cylinder and flat materials with diameters between 0-8 mm.

3-point and 4-point Flexural Tests can be performed by using the Flexural Testing Assembly for Concrete Beams at the bottom of the device.

Compression tests also can be performed by using the Upper Platen (with ball seating assembly) and Lower platen.

The speed range can be adjusted manually or automatically.

Supplied with Automatic Hydraulic Power Pack and Digital Data Acquisition & Control System.

A displacement sensor is used to measure the elongation in tensile tests.

Load Cell is used for load measurements in flexural and compression tests.

HİRA Flexural-Compression-Tensile Software is provided free of charge with the device.

Flexural Testing Assembly for Concrete Beams should be ordered separately.

Upper Platen (with ball seating assembly) and Lower platen should be ordered separately.

HR-H0200

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-H0200	Hydraulic Flexural-Compression-Tensile Testing Machine	105x100x230	370	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-H0200/1	Hydraulic Flexural-Compression-Tensile Testing Frame	---
HR-G0982	Load Cell, 100 kN capacity	---
HR-H7000	Hydraulic Power Pack and Digital Data Acquisition & Control System	220 V, 50-60 Hz, 1 ph
HR-H7000/1	Software	---
HR-G0975	Computer & Printer	220 V, 50-60 Hz, 1 ph
HR-H0200/2	Jaws for tensile tests	---
HR-C5050	Flexural Testing Assembly for Concrete Beams	---
HR-H0200/3	Upper Platen (with ball seating assembly)	---
HR-H0200/4	Lower platen	---

HYDRAULIC COMPRESSION-TENSILE TESTING MACHINE

Hydraulic Compression-Tensile Testing Machine is used in Compression and Tensile tests of different construction materials.

It is produced with a capacity of 100 kN.

With the help of the jaws on the upper part of the device, it allows tensile tests of cylindrical and flat materials with diameters between 0-8 mm, while compression tests also performed by using the Upper Platen (with ball seating assembly) and Lower platen in the area at the bottom of the device.

Supplied with Semi-Automatic (Motorized) Hydraulic Power Pack and Digital Readout Unit.

Load can be seen from the digital display on the device and the loading speed can be adjusted manually from the potentiometer on the device.

HR-H0100

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-H0100	Hydraulic Compression-Tensile Testing Machine	100x55x145	270	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-H0100/1	Hydraulic Compression-Tensile Testing Frame	---
HR-G0982	Load Cell, 100 kN capacity	---
HR-H8000	Semi-Automatic (Motorized) Hydraulic Power Pack and Digital Readout Unit	220 V, 50-60 Hz, 1 ph
HR-H0100/2	Jaws for tensile tests	---
HR-H0100/3	Upper Platen (with ball seating assembly)	---
HR-H0100/4	Lower platen	---

PAN TYPE CONCRETE MIXERS

HR-C0800

The efficient mixing of concrete is essential if quality specimens are to be manufactured. Pan type mixers are suitable for the mixing in small quantities of concrete in the laboratory.

The mixers are designed to give efficient mixing of both dry and wet materials. The mixing pan is removable and tilts for easy access to the pan and emptying on completion of the mixing operation.

The total volume of the pan is 100 liters but the effective capacity of the mixer is 56 liters.

The mixer head lifts clear to provide maximum access to the pan and holds the mixing blades at a constant depth during the mixing operation. The blades can be adjusted to suit the different types and volume of materials to be mixed.

Double Engine Models enable more homogeneous mixtures to be prepared in a shorter time than Single-Engine Models. It has a second motor that rotates the mixing paddles in the opposite direction to the pan-type hopper rotation direction.

The speed of the Pan can be adjusted with the Double Engine, Frequency Controlled (Pan speed controlled) Models.

The speed of the Pan and Mixing Blade can be adjusted with the Double Engine, Frequency Controlled (Pan and Mixing Blade speed controlled) Models.

The pan type mixers are also equipped with rubber wheels which provide high portability. All parts of the IP55 protected mixer are noncorrosive painted and galvanized.

Trolley for Concrete Mixer Pan is available as optional and should be ordered separately. Extra pan is not included to the Trolley and should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0800	Pan Type Concrete Mixer	93x97x122	245	380 V, 50-60 Hz, 3 ph
HR-C0805/50 Hz	Pan Type Concrete Mixer	93x97x122	245	220 V, 50 Hz, 1 ph
HR-C0805/60 Hz	Pan Type Concrete Mixer	93x97x122	245	220 V, 60 Hz, 1 ph
HR-C0810	Pan Type Concrete Mixer, Double Engine	100x100x135	260	380 V, 50-60 Hz, 3 ph
HR-C0810/50Hz	Pan Type Concrete Mixer, Double Engine	100x100x135	260	220 V, 50 Hz, 1 ph
HR-C0810/60Hz	Pan Type Concrete Mixer, Double Engine	100x100x135	260	220 V, 60 Hz, 1 ph
HR-C0815	Pan Type Concrete Mixer, Double Engine, Pan speed controlled	100x100x135	260	220 V, 50-60 Hz, 1 ph
HR-C0820	Pan Type Concrete Mixer, Double Engine, Pan and Blade speed controlled	100x100x135	260	220 V, 50-60 Hz, 1 ph

HR-C0810

HR-C0810

HR-C0800

HR-C0800/1

HR-C0800/2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0800/1	Spare Mixer Pan	64x64x39	60
HR-C0800/2	Trolley for Mixer Pan	80x138x138	40

DRUM TYPE CONCRETE MIXERS

The efficient mixing of concrete, plaster and mosaic.

The drum type mixers are equipped with rubber wheels which provide high portability.

HR-C0825

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Mixing Cap. (lt)	Capacity (per hour)	Power	Dimensions (cm)	Weight (kg)
HR-C0825	Drum Type Concrete Mixer	125	100	1.0-2.0	220 V / 0,7 kW	102x67x115	39
HR-C0826	Drum Type Concrete Mixer	140	120	1.3-2.6	220 V / 0,7 kW	117x66x124	56
HR-C0827	Drum Type Concrete Mixer	160	140	1.4-2.8	220 V / 0,7 kW	123x73x129	65
HR-C0828	Drum Type Concrete Mixer	180	160	1.4-2.8	220 V / 0,7 kW	123x73x129	67

V-FUNNEL

STANDARDS: EN 12350-9

The apparatus is used to evaluate the segregation resistance of freshly mixed self-compacting concrete by the observation the flowing speed due to the difference of samples remaining period in the funnel.

The test is not suitable when the maximum size of the aggregate exceeds 22.4 mm.

The test set consists of a stainless steel funnel placed vertically on a supporting stand.

The discharge orifice is equipped with a lid, which can be momentarily opened.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0835	V-Funnel	55x30x104	18

HR-C0835

U-BOX

STANDARDS: UNI 11044

The U Shape Box is used to determine the confined flow ability and the capacity of SCC concrete to flow within confined spaces.

The U box is made of stainless steel consisting of three Ø12 mm rebars.

The U box is mounted on a frame with a fixing mechanism.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0837	U-Box	65x65x110	20

HR-C0837

L-BOX

STANDARDS: EN 12350-10

The L Shape Box is used for evaluation of self-compact ability (confined flow ability) of freshly mixed self-compacting concrete.

The box gives the opportunity to evaluate different properties, such as filling ability, passing ability and resistance to segregation.

L Shape Box is designed for ease of cleaning the vertical and horizontal hoppers.

The distance between 12 mm diameter bars can be set between 41 ±1 mm or 59 ±1 mm.

The L Shape Box Apparatus is supplied complete with Filling Hopper and Base.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0836	L-Box	30x100x135	35

HR-C0836

J-RING

STANDARDS: EN 12350-12

The J-Ring Test is used for determining the passing ability, the flow spread and the t flow time of self-compacting concrete 500J as the concrete flows through the J-Ring Apparatus.

J-Ring Narrow Gap with Ø 18 mm x 16 smooth bars is manufactured from stainless steel.

J-Ring Wide Gap with Ø 18 mm x 12 smooth bars is manufactured from stainless steel.

Base Plate is 900x900x3 mm square, made of stainless steel with engraved circles of Ø200 mm and Ø500 mm conforming to EN 12350-8.

Slump Cone is made from sheet steel protected against corrosion, with; top Ø100 mm, base Ø200 mm and with a height of 300 mm.

Steel weighted collar is used to stabilize the slump cone on J-Ring or slump flow tests.

J-Ring Narrow Gap Test Set is supplied with J-Ring with J-Ring Narrow Gap, Slump Cone and Base Plate.

J-Ring Wide Gap Test Set is supplied with J-Ring with J-Ring wide Gap, Slump Cone and Base Plate.

Steel weighted collar should be ordered separately.

HR-C0838

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0838	J-Ring Narrow Gap Test Set	90x90x30	32
HR-C0839	J-Ring Wide Gap Test Set	90x90x30	32
HR-C0838/1	J-Ring Narrow Gap	35x35x14	10
HR-C0839/1	J-Ring Wide Gap	35x35x14	10
HR-C0838/2	Base Plate	90x90x0,3	20
HR-C0838/3	Steel Weighted Collar	25x25x5	9
HR-C0850/1	Slump Cone	10x20x30	2

FILL BOX APPARATUS (KAJIMA TEST)

Fill Box Apparatus is used to measure the filling ability of self-compacting concrete with a maximum aggregate size of 20 mm.

The apparatus consists of a container (transparent) with a flat and smooth surface.

In the box, there are 35 pieces of obstacles made of PVC material with a diameter of 20 mm and a distance of 50 mm from the center to the center. At the top of the box, there is a filling pipe with a diameter of 100mm and a height of 500mm for filling material. There is a funnel with a height of 100 mm on the pipe.

HR-C0842

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0842	Fill Box Apparatus	50x30x90	5

SLUMP TEST SET

STANDARDS: EN 12350–2

The Slump test method is used for the determination of the consistency, the medium and high workability of fresh concrete.

Slump Test Set is supplied either galvanized or paint coated to prevent corrosion.

Stainless Steel Slump Test Set is also available.

The set consists of Slump Cone, Slump Cone Funnel, Slump Base Plate, Tamping Rod which is hemispherical at both ends, Rubber Mallet and Steel Ruler.

Round Scoop should be ordered separately.

Portable Slump Test Set is also available.

HR-C0850

The Test consist of Slump Cone, Slump Cone Funnel, Slump Base Plate, Tamping Rod which is hemispherical at both ends, Rubber Mallet and Steel Ruler.

Base, manufactured from heavy duty galvanized steel, complete with clamps and measuring bridge which is also used as carrying handle.

HR-G0621

The components of the set are fitted together for easy carrying. Very practical, robust, ideal for site use.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0850	Slump Test Set	55x60x25	7,5
HR-C0860	Slump Test Set, Stainless Steel	55x60x25	8,5
HR-C0865	Portable Slump Test Set	55x60x25	10

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0850/1	Slump Cone	10x20x30	2
HR-C0850/2	Slump Cone Funnel	---	---
HR-C0850/3	Slump Base Plate	50x50x6	3
HR-G0763	Tamping Rod	Ø 1,6 x 60	0,950
HR-G0748	Rubber Mallet	---	---
HR-G0476	Steel Ruler	30	---
HR-G0621	Round Scoop, Medium	---	0,5

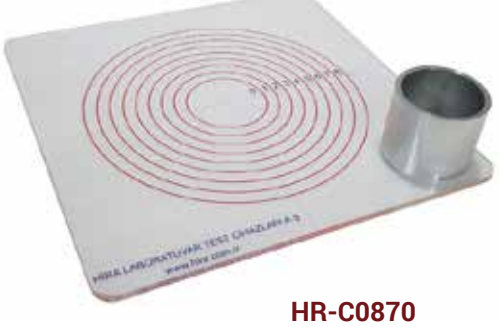
HR-C0865

GLASS REINFORCED CONCRETE SLUMP TESTER

Glass Reinforced Concrete Slump Tester is used for the determination of the slump value of cement slurry.

The dry tube is placed on the target plate coincident with the innermost ring and is then completely filled with slurry under test.

The tube is then lifted vertically off the plate by hand thereby allowing the slurry to flow over the target area of concentric circles. The slump value is given by the extent of flow of the slurry and is expressed on the scale 0-8.



HR-C0870

Technical Specifications:

Product Code	Product Name
HR-C0870	Glass Reinforced Concrete Slump Tester

SLUMP FLOW OF SELF-CONSOLIDATING CONCRETE

STANDARDS:ASTM C 1611

This test starts like a standard slump test, although many testing technicians will turn the cone upside down to make it easier to fill. When the cone is lifted, the SCC spreads out like pancake batter. The slump flow is measured as the diameter of the pancake.

Typical SCC mixes have slump flows ranging from 18 to 30 inches.

The Test Set is supplied with Steel Slump Cone, Strike-off bar, Tamping Rod and Base plate, 36" dia.

Steel Weighted Collar is optional and should be ordered separately.

HR-C0840

HR-C0840/3

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0850/1	Slump Cone	10x20x30	2
HR-C0840/1	Strike-off Bar	30	---
HR-C0840/2	Base Plate	90,5x90,5	5
HR-G0763	Tamping Rod	Ø 1,6 x 60	0,950
HR-C0840/3	Steel Weighted Collar	---	9

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0840	Slump Flow of Self-Consolidating Concrete	92x92x30	7,5

COMPACTING FACTOR APPARATUS

STANDARDS: BS 5075, 1881:103

The Compacting Factor Apparatus is used to determine the compaction factor of concrete with low, medium and high workability.

The apparatus consists of two conical hoppers mounted on a cylinder. Each hopper has a hinged flange with quick release mechanism and everything is mounted on a rigid steel stand.

The compacting factor is the ratio between the weight of the partially compacted concrete and the weight of the fully compacted concrete.

HR-C0896

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0896	Compacting Factor Apparatus	30x40x130	40

Spare Parts & Accessories:

Product Code	Product Name
HR-C0896/1	2 pcs Funnel, for HR-C0896
HR-C0896/2	Cylindrical Receiver for HR-C0896

VEBE CONSISTOMETER

STANDARDS: EN 12350–3, ASTM C1170, ASTM C1176

The method is a mechanized variation of the slump test and includes determination of workability of fresh concrete by performing vibration to concrete after removal of the slump cone.

The assembly is mounted upon a small vibrating table operating at a fixed amplitude and frequency.

The time to complete the required vibration gives an indication of the concrete workability.

HR-C0875 is complying with EN 12350-3 for Determining the Consistency of Fresh Concrete by means of the Vebe time. The set consists of Vibrating Consistometer, Cylindrical Bucket, Slump Cone, Graduated Rod with Transparent Plate with filling funnel and Tamping Rod.

HR-C0880 is complying with ASTM C 1170 for Determining Consistency and Density of Roller-Compacted Concrete. The set consists of Vibrating Consistometer, Cylindrical Bucket, Swivel Arm with Guide Sleeve with 50 lb Surcharge Weight and Tamping Rod.

HR-C0882 is complying with ASTM C 1176 for Making Roller-Compacted Concrete in Cylinder Moulds. The set consists of Vibrating Consistometer, Cylindrical Bucket, Swivel Arm with Guide Sleeve with 20 lb Surcharge Weight and Tamping Rod. Mould is not included.

HR-C0875

Technical Specifications:

Product Code	Product Name	Standard	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0875	Vebe Consistometer Test Set	EN 12350–3	26x38x71	53	220 V, 50 Hz, 1 ph
HR-C0875/60Hz	Vebe Consistometer Test Set	EN 12350–3	26x38x71	53	220 V, 60 Hz, 1 ph
HR-C0880	Vebe Consistometer Test Set	ASTM C1170	26x38x71	53	220 V, 50 Hz, 1 ph
HR-C0880/60Hz	Vebe Consistometer Test Set	ASTM C1170	26x38x71	53	220 V, 60 Hz, 1 ph
HR-C0885	Vebe Consistometer Test Set	ASTM C1176	26x38x71	53	220 V, 50 Hz, 1 ph
HR-C0885/60Hz	Vebe Consistometer Test Set	ASTM C1176	26x38x71	53	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Standard	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0850/1	Slump Cone	EN 12350–3	10x20x30	2	---
HR-C0875/1	Graduated Rod with Transparent Plate	EN 12350–3	Ø23 x 1	2,75	---
HR-C0880/1	50 lb Surcharge Weight	ASTM C1170	---	22,7±0,5	---
HR-C0885/1	20 lb Surcharge Weight	ASTM C1176	---	9,1±0,25	---
HR-C0876	Vibrating Consistometer	EN 12350-3, ASTM C1170, C1176	26x38x71	45	220 V, 50 Hz, 1 ph
HR-C0876/60Hz	Vibrating Consistometer	EN 12350-3, ASTM C1170, C1176	26x38x71	45	220 V, 60 Hz, 1 ph
HR-C0877	Cylindrical Bucket	EN 12350-3, ASTM C1170, C1176	Ø24 x 20	7,5	---
HR-G0763	Tamping Rod	EN 12350-3, ASTM C1170, C1176	Ø 1,6 x 60	0,950	---

FLOW TABLE

STANDARDS: EN 12350-5

The test set is used for concrete mixes of high workability. The test determines flow index as an arithmetic mean of the diameter of the specimen after working on a flow table.

The apparatus consists of a double steel table, the upper table measuring 700x700 mm and hinged at one side to the lower table. The top table is inscribed and all parts are protected against corrosion. The stainless steel cone has a top Ø130 mm, base Ø200 mm, 200 mm high and 1.5 mm thickness. Dimension of wooden tamper is 40x40x200 mm and its holder is 120 mm.

Supplied complete with Flow Cone and Wooden Tamper.

HR-C0890

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0890	Flow Table Test Set	70x85x30	37

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0890/1	Flow Table	70x70	32,5
HR-C0890/2	Flow Cone	Ø13×Ø 20×20	4
HR-C0890/3	Wooden Tamper	4x4x32	0,5

K-SLUMP TESTER

STANDARDS: ASTM C1362

K-Slump Tester is used to determine the degree of compaction and the workability of fresh concrete.

The apparatus can be used for in-place measurements of concrete in test moulds and forms and may be correlated to the standard slump test.

It is simple, economical to use and reduces testing time.

No special calibration is required.

HR-C0940

Technical Specifications:

Product Code	Product Name	Weight (g)
HR-C0940	K-Slump Tester	500

KELLY BALL APPARATUS

STANDARDS: ASTM C360

Kelly Ball Apparatus is used to determine the workability of fresh concrete.

HR-C0945

The Kelly Ball Test is an alternative to the slump test. The simple and inexpensive test can be quickly performed on in-place concrete and the results can be correlated to slump.

Kelly Ball Apparatus consists of a Ø 6" (152 mm) ball which slides through a frame that rests on the fresh concrete. The ball is lowered into the concrete and the penetration measured.

It can be used on site or in laboratory.

Cadmium plated for rust protection.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0945	Kelly Ball Apparatus	36x16x36	15

WALTZ CONSISTOMETER

STANDARDS: EN 12350-4

To measure the consistency of fresh concrete.

Degree of Compactability (Waltz) Container, made of metal, 1.5mm thickness, 200x200 mm base, 400 mm height, square prism container with two carrying handles.

Painted for rust protection.

HR-C0895

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0895	Waltz Container	30x20x40	6

CONCRETE PENETROMETER

STANDARDS: ASTM C403, AASHTO T197

Used to determine the setting time of the mortar fraction in concrete mixes with slump greater than zero, by testing mortar sieved from mix.

The apparatus consists of a spring penetrometer (capacity 100 kgf, precision 1 kgf) and six interchangeable stainless steel needle pointers of 16-32-65-160-325-650 mm² area.

Penetrometer with the handle, barrel and spring-reaction plunger, graduated 10 N to 981 N (1 to 100 kgf).

A sliding ring indicates the reached load on the handle of the penetrometer.

Supplied complete with carrying case.

HR-C0900

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0900	Concrete Proctor Penetrometer	55x25x7	4

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0900/1	Penetrometer Needle Set	---	---
HR-C0900/2	Carrying Case	55x25x7	1

CONCRETE POCKET PENETROMETER

STANDARDS: ASTM C403, AASHTO T197

Used for the evaluation of the initial set of the concrete mortar for field and laboratory use.

The penetration plunger has a tip area of 32 sq/mm. The plunger graduated 0,5 MPa.

HR-C0905

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0905	Concrete Pocket Penetrometer	2,5x1,5x21	0,400

AIR ENTRAINMENT METER

STANDARDS: EN 12350–7, ASTM C231 TYPE B, AASTHO T152

The apparatus is used to determine air content of fresh concrete.

It consists of an aluminum cylindrical vessel with airtight cover assembly incorporating an air pump, a precision pressure gauge 90 mm dia. and valves.

Capacity is 7 lt and Air content range is 0 - 100%.

Lightweight, compact and durable, this meter allows quick clamping system and testing with few pump strokes.

It is not affected by change in atmospheric pressures.

The meter measures up to 22% entrained air.

Direct pressure gauge reading to the nearest 0.1% up to 6%, 0.2% from 6 to 8% and 0.5% from 8 to 10%.

The container can be used also for unit weight measures of fresh concrete and aggregates.

The instrument can be calibrated and it is supplied complete with Tamping Rod and Straight Edge.

Carrying Case should be ordered separately.

HR-C0915

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0915	Air Entrainment Meter, B Type	25x26x52	10

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0915/1	Manometer	11x14x5	0,700
HR-C0915/2	Tamping Rod	Ø 1,6x60	0,95
HR-C0915/3	Straight Edge	30x3x0,3	0,200
HR-C0915/4	Carrying Case	30x31x62	6

UNIT WEIGHT MEASURES

STANDARDS: EN 12350-6, ASTM C29, C138

Unit Weight Measures are used to determine the weight per cubic meter of freshly mixed and compacted concrete.

Manufactured from heavy gauge steel complying with the related standard.

Available in 3, 7, 10, 15 and 30 liter capacity models according to the requirements of different standards.

Coated against corrosion.

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Dimensions (cm)	Weight (kg)
HR-C0930	Unit Weight Measure	3	15x20x20	3
HR-C0931	Unit Weight Measure	7	25x18x25	5
HR-C0932	Unit Weight Measure	10	25x20x30	9
HR-C0933	Unit Weight Measure	15	25x30x32	13
HR-C0934	Unit Weight Measure	30	30x36x42	16

SPECIFIC GRAVITY FRAME (BOUYANCY BALANCE SYSTEM)

STANDARDS: EN 1097-6, 12390-7

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

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

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

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

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

HR-C0500

HR-C0500/2

Spare Parts & Accessories:

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

Technical Specifications:

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

THERMOMETER, K-TYPE THERMOCOUPLE

Thermometers are used for monitoring of temperature development of mass concrete. The number of measurement points for connectors and the cable length needed for each measurement point should be indicated.

HR-C0950, HR-C0951, HR-C0952, HR-C0953 Models are supplied with 9V battery and User Manual, HR-C0954 Model is supplied with Lithium-Ion battery, Transport case and User Manual and HR-C0955 Model Temperature Datalogger is supplied with Software, Batteries, Transport case and User Manual. Usb cable for PC Connection and SD card should be ordered separately.

HR-C0955 Model Temperature Datalogger can measure the temperature of four different measurement points simultaneously. It also has a super-size memory for up to 2 Million readings; This gives you the freedom to read out the logger data at longer intervals, even when measuring cycles are shorter. An exceptionally wide measurement range and is compatible with a number of different thermocouple elements making it ideal for professional use in a variety of different fields. Battery life is 8 years at 15 min. measuring rate. Measuring rate is 1 s to 24 h (freely selectable, for online measurement 2 s to 24 h).

K Type Temperature Probe is Ø5 mm x 40 cm. Should be used with a K Type Digital Thermometer. It has 1 meter spiral cable. Working Temperature is -30°C +600°C. Total length is 53 cm.

K Type Temperature Probe, K-Type Thermocouple Cable and Connector should be ordered separately.

HR-C0951

Spare Parts & Accessories:

Product Code	Product Name
HR-C0950/1	K Type Temperature Probe
HR-C0960	K-Type Thermocouple Cable, 1 meter.
HR-C0961	Connector
HR-C0955/1	Usb cable for HR-C0955
HR-C0955/2	SD Card for HR-C0955

Technical Specifications:

Product Code	Product Name	Channel Capacity	Measuring Range (°C)	Accuracy (°C)	Resolution (°C)	Dimensions (cm)	Weight (kg)
HR-C0950	Digital Thermometer	1	-50 + 1300	±1	1	15x7x3,5	0,400
HR-C0951	Digital Thermometer	1	-200 + 1300	±1.1 or ±0.4 % of reading value	0.1	15x7x3,5	0,190
HR-C0952	Digital Thermometer	2	-50 + 400	±0,1	±0,1	14,9x7,1x4,1	0,300
HR-C0953	Digital Thermometer	2	-200 + 1300	±1.1 or ±0.4% of reading value	0.1	15x7x3,5	0,190
HR-C0954	Digital Thermometer	4	-200 + 1300	From -200 to 0; ±0.4 ±0.3 % of reading From 0 to 1300; ±0.4	0.1	21x11x6	0,485
HR-C0955	Temperature Datalogger	4	-195 + 1000	±1 % of mv (-195 to -100.1 °C) ±0.3 °C (-100 to +70 °C) ±0.5 % of mv (+70.1 to +1000 °C)	0.1	10,3x6,3x3,3	0,230

HR-C0953

HR-C0954

HR-C0952

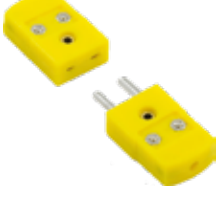
HR-C0950

HR-C0955

HR-C0955/1

HR-C0955/2

HR-C0950/1



HR-C0961

HR-C0960 with HR-C0961

CUBE MOULDS

STANDARDS: EN 12390-1, ASTM C39, C192

Hard plastic or steel cube moulds are manufactured in accordance with dimensions and tolerances stated in the related standards.

Plastic Moulds; one-piece moulds, made from hard Plastic, strong, light, under formable; resistant to vibration shocks and wear, don't require mounting and dismounting operations, thus saving time and labour.

Stopper for Plastic moulds are available and should be ordered separately.

The specimen is expelled from the mould by compressed air or water. They just require a simple clean and demould oiling before being ready for use again for many times.

Steel Moulds are extremely sturdy and the inside surfaces are accurately machined.

HR-C0706

HR-C0700

HR-C0704

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)
HR-C0700	Plastic Cube Mould, Two gang	10x10x10	26x12x12	2
HR-C0702	Steel Cube Mould	10x10x10	27x27x12	7
HR-C0704	Plastic Cube Mould	15x15x15	22x22x18	2,2
HR-C0706	Poliethylene Cube Mould	15x15x15	22x22x18	2,2
HR-C0710	Steel Cube Mould	15x15x15	30x21x16	16,2
HR-C0712	Steel Cube Mould	20x20x20	33x27x22	20,2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0763	Tamping Rod	Ø 16x600	0,950
HR-C0765	Tamping Bar	25x25x380	2
HR-C0715	Tong for Cube Mould	140x900x50	2,5
HR-C0720	Demoulding Oil	---	---
HR-C0721	Stopper	---	---

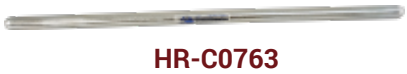
HR-C0715

HR-C0702

HR-C0710

HR-C0712

HR-C0765



HR-C0763

CYLINDER MOULDS

STANDARDS: EN 12390-1, ASTM C39, C192

Hard plastic, Polyethylene or Steel cylinder moulds are manufactured in accordance to dimensions and tolerances stated in the related standards.

Two part and clamp attached base plate plastic and steel moulds are designed to be durable, resistant and easy to clean.

HR-C0734 HR-C0728

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0763	Tamping Rod	Ø 16x600	0,950
HR-C0765	Tamping Bar	25x25x380	2
HR-C0720	Demoulding Oil	---	---

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)
HR-C0725	Plastic Cylinder Mould	10x20	16x16x21	2,6
HR-C0727	Steel Cylinder Mould	10x20	16x16x21	6
HR-C0728	Polyethylene Cylinder Mould	10x20	16x16x21	1,2
HR-C0729	Plastic Body with Steel Plate Cylinder Mould	10x20	16x16x21	0,6
HR-C0731	Plastic Cylinder Mould	15x30	25x25x31	3,7
HR-C0733	Steel Cylinder Mould	15x30	25x25x31	9
HR-C0734	Polyethylene Cylinder Mould	15x30	25x25x31	1,4
HR-C0735	Plastic Body with Steel Plate Cylinder Mould	15x30	20x20x31	1,5
HR-C0738	Steel Cylinder Mould	16x32	26x26x33	11
HR-C0739	Polyethylene Cylinder Mould	16x32	26x26x33	2,4
HR-C0737	Steel Cylinder Mould	25x50	35x35x51	12,5

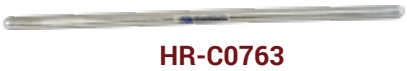
HR-C0735

HR-C0729

HR-C0727

HR-C0733

HR-C0731 HR-C0725



HR-C0763

HR-C0765

BEAM MOULDS

STANDARDS: EN 12390-1, ASTM C39, C192

Hard plastic or Steel beam moulds are manufactured in accordance to dimensions and tolerances stated in the related standards.

Two part and screwed base plate steel moulds are designed to be durable, resistant and easy to clean.

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0763	Tamping Rod	Ø 16x600	0,950
HR-C0765	Tamping Bar	25x25x380	2
HR-C0720	Demoulding Oil	---	---

HR-C0751

HR-C0749

HR-C0747

HR-C0745

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)
HR-C0745	Steel Beam Mould	10x10x40	17x15x50	18,5
HR-C0747	Steel Beam Mould	10x10x50	17x15x60	20,5
HR-C0749	Steel Beam Mould	15x15x60	22x22x70	38,5
HR-C0751	Steel Beam Mould	15x15x75	22x22x85	40
HR-C0753	Plastic Beam Mould	10x10x40	13x12x47	4
HR-C0754	Plastic Beam Mould	15x15x60	21x19x69	15

HR-C0765

HR-C0763

HR-C0754

HR-C0753

VIBRATING TABLE, PORTABLE

STANDARDS: EN 12390–2

Vibrating table suitable for site and laboratory use, it accepts 1 or 2 pieces cube or cylinder moulds can be clamped on the table depending on outer size of the mould to be used.

Lightweight and small sized, it can be handled by one person and easily stored in the car trunk.

Supplied complete with elastic bands to fix the mould to the table.

HR-C0415 is suitable for site use, where no electric supply is available. Complete with connector for the vehicle cigar lighter.

HR-C0416 is Motorised.

HR-C0415

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0415	Vibrating Table, Portable	40x30x20	16	DC 12 V
HR-C0416	Motorised Vibrating Table, Portable	40x30x20	16	220 V

VIBRATING TABLE

STANDARDS: EN 12390–2

Used for the compaction of concrete specimens in laboratory, they are manufactured from rugged steel sheet.

Equipped with motor-vibrator having 3000 vibrations-minute, it is possible to vary the vibration intensity by acting on the excentric masses.

All the vibrating tables accept a vibrating motor, command unit and the clamping device.

The clamping device is used to fix the moulds to the table during the vibrating action.

HR-C0420 and HR-C0425 model tables can also be used for beam moulds.

HR-C0420

HR-C0425

HR-C0430

HR-C0435

Technical Specifications:

Product Code	Product Name	Mould Capacity	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0420	Vibrating Table	4	61x38x78	60	220 V, 50 Hz, 1 ph
HR-C0420/60Hz	Vibrating Table	4	61x38x78	60	220 V, 60 Hz, 1 ph
HR-C0425	Vibrating Table	8	62x126x106	130	220 V, 50 Hz, 1 ph
HR-C0425/60Hz	Vibrating Table	8	62x126x106	130	220 V, 60 Hz, 1 ph
HR-C0430	Vibrating Table	10	62x126x106	130	220 V, 50 Hz, 1 ph
HR-C0430/60Hz	Vibrating Table	10	62x126x106	130	220 V, 60 Hz, 1 ph
HR-C0435	Vibrating Table	6	46x68x37	60	220 V, 50 Hz, 1 ph
HR-C0435/60Hz	Vibrating Table	6	46x68x37	60	220 V, 60 Hz, 1 ph

POKER VIBRATOR

STANDARDS: EN 12390-2, ASTM C31, C192

Poker Vibrator is ideal for the international compaction of concrete specimens and a good alternative to traditional tamping bar especially when there are large numbers of specimens to be compacted.

Vibrating Head diameter and Hose height can be also selected upon user's request.

HR-C0401

Technical Specifications:

Product Code	Product Name	Vibrating Head dia. (mm)	Hose Height (m)	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0401	Poker Vibrator	Ø 38	3	16x85x36	15	220 V, 50-60 Hz, 1 ph
HR-C0402	Poker Vibrator	Ø 45	3	16x85x36	15	220 V, 50-60 Hz, 1 ph

CURING TANKS

STANDARDS: EN 12390–2, ASTM C31, C192, C511

Curing Tanks are designed for curing concrete cubes and cylinders.

The temperature can be adjusted and can be kept constant by an electric resistance incorporating a digital thermo regulator which maintains the set temperature between ambient to 40 ºC with ± 2 ºC accuracy.

Supplied complete with Thermostat Controlled Heater, Base Metal Rack and Submersible Circulator Pump.

Cooling Unit is available as optional. Cooling Unit (should be factory installed) should be ordered separately.

Set of Removable Upper Racks, Cover for Curing Tank and Tong for Cube Mould should be ordered separately.

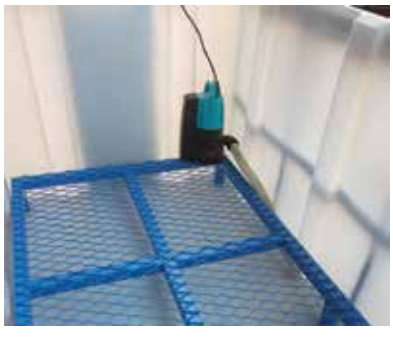
K-Type 4 Channels Datalogger is available as optional. RS 232 Interface and 16000 memory capacity. Resolution is 0,1°C in -200,0°C...+200°C.

HR-C0450

K-Type Thermocouple Cable and Connector should be ordered separately.

Standard Control Device is available as optional. Standard Control Device has 2 pieces 4 Digit Display, Auto-Tuning (automatic setting of PID parameters), Sensor Fault Detection. Usb to RS 485 Cable is needed an should be ordered seperately.

Advanced Control Device with Datalogger is available as optional. Advanced Control Device has 2 pieces 4 Digit Display, PID Heating/Cooling, Auto-Tuning (automatic setting of PID parameters), Automatic/Manual Operating Modes, Sensor Fault Detection. Datalogger for Advanced Control Device has 5 pieces Isolated Analog Input Channel, USB 1.1 and 2.0 Compatible PC Connection, Unlimited Recording Capacity, Excel, Access, Text, HTML and PDF reporting format.



HR-C0450/1 with HR-C0450/3

HR-C0477

HR-C0450/1

HR-C0475

HR-S5415 with HR-C0450/4

HR-C0450/4 with HR-C0450/5

Technical Specifications:

Product Code	Product Name	Mould Capacity (pieces)		Int. Dimensions (cm)	Weight (kg)	Power Supply
		Cube 15x15 cm	Cylinder Ø 15x30 cm			
HR-C0450	Large Curing Tank, Polyethylene	390	195	100x200x80	130	220 V, 50-60 Hz, 1 ph
HR-C0455	Small Curing Tank, Polyethylene	220	110	80x185x70	90	220 V, 50-60 Hz, 1 ph
HR-C0460	Small Curing Tank, Metal	108	54	77x160x70	95	220 V, 50-60 Hz, 1 ph
HR-C0465	Small Curing Tank, Stainless Steel	108	54	77x160x70	115	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)	Power Supply
HR-C0470	Cooling Unit	1000x500x800	90	220 V, 50-60 Hz, 1 ph
HR-C0475	Portable Curing Tank Heater	---	---	220 V, 50-60 Hz, 1 ph
HR-C0477	Portable Heater	---	---	220 V, 50-60 Hz, 1 ph
HR-C0450/1	Set of Removable Upper Racks (6 pcs) for HR-C0450	---	---	---
HR-C0450/2	Curing Tank Heater	---	---	220 V, 50-60 Hz, 1 ph
HR-C0450/3	Circulating Pump	---	---	220 V, 50-60 Hz, 1 ph
HR-C0450/4	Curing Tank Digital Indicator	---	---	220 V, 50-60 Hz, 1 ph
HR-C0450/5	Curing Tank Resistance	---	---	---
HR-C0450/6	Cover for HR-C0450	---	---	---
HR-C0455/1	Cover for HR-C0455	---	---	---
HR-C0460/1	Cover for HR-C0460	---	---	---
HR-C0465/1	Cover for HR-C0465	---	---	---
HR-C0455/2	Set of Removable Upper Racks (6 pcs) for HR-C0455 & HR-C0460 & HR-C0465	---	---	---
HR-C0715	Tong for Cube Mould	140x900x50	2,5	---
HR-C0480	K-Type 4 Channels Datalogger	184x64x30	0,210	1 x 9V AC Adapter
HR-C0960	K-Type Thermocouple Cable, 1 m for HR-C0480	---	---	---
HR-C0961	Connector,1 pcs. for HR-C0480	---	---	---
HR-C0485/1	Advanced Control Device	48x48x108	---	24 V DC
HR-C0485/2	Datalogger for HR-C0485/1	72x112x26	---	---
HR-C0490/1	Standard Control Device	48x48x108	---	24 V DC
HR-C0490/2	Usb to RS 485 Cable for HR-C0490/1	---	---	---

HR-C0460

HR-C0715

ACCELERATED CONCRETE CURING TANK

STANDARDS: ASTM C684, BS 1881:12

Accelerated Concrete Curing Tank has been designed for accelerated concrete strength curing.

HR-C0495

It comprises a fully insulated double wall tank with cover, inside all from stainless steel, outside from steel painted sheet with an intermediate layer of insulating mineral wool and an stainless steel perforated platform for circulation of water and to support the concrete specimes. The tank also has a circulation pump to provide the same water temperature at any point within the tank.

Accelerated Concrete Curing Tank can hold up to 16 pieces 150 mm cube moulds or 16 pieces 150 mm cylinder moulds or 8 pieces 200 mm cube mould. Temperature range; from ambient to 100 °C.

The Digital Control Panel is provided with a Thermoregulator with Timer.

Technical Specifications:

Product Code	Product Name	Mould Capacity (pieces)			Ext. Dimensions (cm)	Weight (kg)	Power Supply
		Cube 15x15 cm	Cylinder Ø 15x30 cm	Cube 20x20 cm			
HR-C0495	Accelerated Concrete Curing Tank	16	16	8	100x75x90	130	220 V, 50-60 Hz, 1 ph

CURING TANK, HEAVY PLASTIC

STANDARDS: EN 12390–2, ASTM C31, C192, C511

Curing Tanks are designed for curing concrete cubes and cylinders.

The temperature can be adjusted and can be kept constant by an electric resistance incorporating an Analog or a Digital thermo regulator which maintains the set temperature between ambient to 40 °C with ± 2 °C accuracy.

Supplied complete with Analog or Digital Thermostat Controlled Heater, Base Metal Rack, Submersible Circulator Pump and cover.

Tong for Cube Mould should be ordered separately.

HR-C0440

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Power Supply
HR-C0440	Curing Tank with Analog Heater, Poliethylene	92x111x61	104x124x80	30	220 V, 50-60 Hz, 1 ph
HR-C0445	Curing Tank with Analog Heater, Poliethylene	74x112x65	84x124x84	25	220 V, 50-60 Hz, 1 ph
HR-C0441	Curing Tank with Digital Heater, Poliethylene	92x111x61	104x124x80	30	220 V, 50-60 Hz, 1 ph
HR-C0442	Curing Tank with Digital Heater, Poliethylene	74x112x65	84x124x84	25	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-C0477	Analog Thermostat Controlled Heater	220 V, 50-60 Hz, 1 ph
HR-C0450/4	Curing Tank Digital Indicator	220 V, 50-60 Hz, 1 ph
HR-C0450/5	Curing Tank Resistance	---
HR-C0440/1	Set of Removable Upper Racks (6 pcs) for HR-C0440 & HR-C0441	---
HR-C0445/1	Set of Removable Upper Racks (6 pcs) for HR-C0445 & HR-C0442	---
HR-C0450/3	Circulation Pump	---
HR-C0715	Tong for Cube Mould	---
HR-C0440/1	Plastic Cover, for HR-C0440 & HR-C0441	---
HR-C0445/1	Plastic Cover, for HR-C0445 & HR-C0442	---

CLIMATIC CHAMBERS

STANDARDS: EN 1367-1, EN 12390-2, EN 12390-9, EN 196-1

Designed for all research and control laboratories to perform: cold and/or hot temperature measurement at controlled humidity conditions, any kind of freezing/thawing tests, accelerated curing tests.

Climatic Chamber is designed to simulate real climate conditions by controlling and changing temperature, humidity, night and day light cycles. Devices Temperature and humidity control range allows making different kind of tests. Also stability, artificial aging, storage and shelf-life tests can be done with great controlled conditions.

Used to cure concrete (EN 12390-2) and cement specimens (EN 196-1) and analyze the behaviour to freezing and thawing of aggregates (EN 1367-1) and concrete (EN 12390-9).

The inner side of the device is made of stainless steel and outer side is made of electrostatically painted steel for long term of usage.

Shelves can be taken off and adjustable in height; adjustable feet.

The powerful lamps protected by anti-humidity glass cover supplies day light to the samples.

Inner tempered glass door allows user to see the samples without disrupting the settled temperature and humidity values.

High density polyurethane injected between the inner chamber and outer wall for Insulation of the device.

Humidity is supplied with a humidity generator and read from a humidity sensor inside the inner chamber. This allows accurate reading and control on the values.

Temperature is controlled with a PID system. Humidity and cooling systems are controlled proportionally.

Temperature safety is supplied with a safety thermostat.

The device is controlled and run from a touch screen 128x64 pixel LCD screen.

Powerful air circulation provides stabile temperature distribution even in low temperature and humidity settings. This also provides fast recovery time after door is opened and closed again.

It equipped with advanced microprocessor control system.

10 programs can be saved to the system.

The device can be connected to a computer with a RS-232 cable which is supplied optionally.

The gas used for the cooler does not include CFC's.

*Lamp for Lightening is optional and should be ordered separately.

HR-C0220

Technical Specifications:

Product Code	HR-C0215	HR-C0220	HR-C0225
Product Name	Climatic Chamber		
Capacity (lt)	120	250	500
Working Temperature Range without Light	-10 °C / +60 °C		
Working Temperature Range with Light*	0 °C / +60 °C		
Working Temperature Range with Humidity	10 °C / +60 °C		
Working Humidity Range	20% - 95% Rh		
Setting Accuracy Temperature/Humidity	± 0.1 °C / 1 % Rh		
Intensity of Light	12.000 lux		
Lighting Timer	0 - 999 h 59 min + Indefinitely		
Working Humidity Sensitivity	5 % Rh		
Lighting	0-24 hours 2 period lighting on, 2 period lighting off		
Power Supply	220 V, 50-60 Hz, 1 ph		

MANUEL GRINDING MACHINE

STANDARDS FOR CONCRETE SAMPLES: EN 12390-1, 12390-3, ASTM C31, C39, C192, C617
STANDARDS FOR CORE SAMPLES: EN 12390-1, 12390-3, 12504-1, ASTM C39, C42

Manuel Grinding Machine is quickly becoming the chosen alternative to the traditional rubber or Sulphur capping method used by Quality Construction Labs.

Can be used to grind concrete cylinder specimens, rocks, natural stones, tiles, block pavers, ceramic materials etc.

This machine is ideal for commercial testing labs and large producers who need to prepare a lot of cylinders for testing or wait times associated with capping compounds.

Not only is it a safer and healthier option, it also provides a better result in surface finish as well as flatness.

The maximum tolerance on the flatness of the potential load bearing surface (the ends of compression test specimens) is 0.050 mm for concrete samples.

The deviation of perpendicularity of the side, with reference to the end faces is 0,5° for core samples.

The safe and ergonomic design prevents the user to exposure to water and dust and provides easy access to the water inlet and outlet. For a safer usage On-Off switch is cover with waterproof box.

All parts of the device is electrostatically painted steel to prevent corrosion of water and concrete.

The device has locking wheels for easy transport.

Used a high-quality genuine diamond cutting wheel, which is supplied, to produce an accurate, smooth finish. The wheel and device unique design helps to make more grinding with one wheel compare to other grinding machines.

Manuel Grinding Machine can be used for Ø150x300 mm cylinder samples as standard.

Supplied with Diamond Cutting Wheel.

Adaptor for Ø 35 mm to Ø 100 mm core samples should be ordered separately. Adapter can be easily mounted and removed.

HR-C0200

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0200	Manuel Grinding Machine	80x80x130	90	380 V, 50-60 Hz, 3 ph
HR-C0200/220	Manuel Grinding Machine	80x80x130	90	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-C0205/1	Diamond Cutting Wheel
HR-C0205/5	Adaptors for Ø 35 mm to Ø 100 mm core samples

AUTOMATIC GRINDING MACHINE

STANDARDS FOR CONCRETE SAMPLES: EN 12390-1, 12390-3, ASTM C31, C39, C192, C617
STANDARDS FOR CORE SAMPLES: EN 12390-1, 12390-3, 12504-1, ASTM C39, C42

Automatic Grinding Machine is quickly becoming the chosen alternative to the traditional rubber or sulphur capping method used by Quality Construction Labs.

Can be used to grind concrete specimens, rocks, natural stones, tiles, block pavers, ceramic materials etc.

This machine is ideal for commercial testing labs and large producers who need to prepare a lot of cylinders for testing or wait times associated with capping compounds.

Not only is it a safer and healthier option, it also provides a better result in surface finish as well as flatness.

The maximum tolerance on the flatness of the potential load bearing surface (the ends of compression test specimens) is 0.050 mm for concrete samples. The deviation of perpendicularity of the side, with reference to the end faces is 0,5° for core samples.

Thanks to the design of the machine the optimum grinding time is only 120-150 seconds and set default time at the factory.

The safe and ergonomic design prevents the user to exposure to water and dust and provides easy access to the water inlet and outlet. Specimen adapters and water restraint panels can easily be installed without the need for any assembly.

All parts of the device is steel to prevent corrosion of water and concrete.

The device has locking wheels for easy transport.

Used a high-quality genuine diamond cutting wheel, wh device unique design helps to make more grinding with one wheel compare to other grinding machines.

In built water spray to clean the device.

Confirms all CE safety standards, including emergency stop, locking mechanism to prevent user accents.

In built drain filter to protect water drainage. Easily removable for cleaning and maintenance.

Adapters of cylinders, cubes and core samples can be easily mounted and removed.

Large base table for grinding contemporaneously up to;

3 pieces 150x300 mm cylinder samples,
3 pieces 100x200 mm cylinder samples,
1 piece 150x150x150 mm cube samples,
3 pieces min. Ø 35 mm, max. Ø 150 mm core samples

or contemporaneously up to;

1 piece 150x300 mm cylinder sample,
1 piece 100x200 mm cylinder sample,
1 piece 150x150x150 mm cylinder sample or
1 piece min. Ø 35 mm, max. Ø 150 mm core sample.

Automatic Grinding Machine can be used for 3 pieces Ø150x300 mm cylinder samples or 1 piece 150 mm cube sample as standard.

Supplied with Diamond Cutting Wheel.

Adaptors for Ø 35 mm to Ø 100 mm core samples should be ordered separately. Adaptors can be easily mounted and removed.

HR-C0205

HR-C0205/2

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0205	Automatic Grinding Machine	80x140x140	250	380 V, 50-60 Hz, 3 ph
HR-C0205/220	Automatic Grinding Machine	80x140x140	250	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-C0205/1	Diamond Cutting Wheel
HR-C0205/5	Adaptors for Ø 35 mm to Ø 100 mm core samples

RAPID CHLORIDE PERMEABILITY TESTER

STANDARDS: ASTM C1202, AASHTO T277

Chloride permeability characteristics of concrete can be reliably determined with the Rapid Chloride Permeability Tester.

Rapid Chloride Permeability Tester has 4 channels which independent of each other, 4 channels 16.000 converter for current, 4 channels temperature input and Large Graphic LCD Screen.

The test speed can be adjusted.

Can be monitored the current, voltage, time, temperature and load values over the Large Graphic LCD Screen for each channel as independent.

HR-C4900

60 V constant voltage difference property.

Accuracy is +/-0.1 V, +/-1 ma.

1 channel temperature sensor input for each cell pair.

Independent test start and stop function.

Sound alarm function when starting the experiment and at the end of the experiment.

Test values can be stored to memory and The stored values can be monitored after test.

Rapid Chloride Permeability Tester has 4 pcs. sturdy, transparent cells, temperature sensor for each cell pair, sample connecting Apparatus, Sealing gaskets, voltage supply inputs and different colors inputs for polarities.

Supplied with 4 pcs. Cells, 4 pcs. Supply cable for V(-), 4 pcs. Supply cable for V(+), 4 pcs. Temperature Sensor Connecting cable and device Supply cable.

Ø 150 x 75 mm Cell should be ordered separately.

Technical Specifications:

Product Code	Product Name	Power Supply
HR-C4900	Rapid Chloride Permeability Tester	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-C4900/1	Transparent Cell
HR-C4900/2	Supply cable for V(-)
HR-C4900/3	Supply cable for V(+)
HR-C4900/4	Temperature Sensor Connecting cable
HR-C4900/5	Supply cable
HR-C4900/6	Ø 150 x 75 mm Cell for HR-C4900

HIGH PRESSURE PERMEABILITY TESTER

STANDARDS: EN 12390-8

Automatic operated High Pressure Permeability Tester is used for the determination of the depth of penetration of water to hardened concrete specimens under pressure.

4,6,12 or 18 specimens capacity.

The system can test 75, 100, 150, 200 mm cube specimens, Ø100x200 mm and Ø150x300 mm cylinder specimens.

Maximum Pressure to the sample is up to 40 bar with 0.1 bar precision.

Impermeability gaskets for every cell and the measurement apparatus are supplied with the device as standard.

Two models are available.

On HR-C0320 Basic Model,
The pressure value in each tube can be adjusted to the same value.

On HR-C0325 Advance Model,
The pressure value in each tube can be adjusted to different values.

HR-C0320

Technical Datas

- Measuring range: 1 - 40 bar
- Universal rubber seals 75 mm and 100, 150, 200 mm dia.
- Electronic controller with high resolution touch screen
- Controlled by a pressure regulator with a pressure gauge with 0,1 bar graduations.
- The test sets with the quantitative measurement equipment of water penetration.
- Manufactured of stainless steel
- 4, 6,12 or 18 capacity models
- Equipped with electric water pump
- Closed water circulation
- 15 lt water tank capacity.

Technical Specifications:

Product Code	Product Name	Specimen Capacity	Dimensions (cm)	Weight (kg)
HR-C0320	High Pressure Permeability Tester, Basic model	4 pieces	75x135x160	130
HR-C0321	High Pressure Permeability Tester, Basic model	6 pieces	75x215x160	140
HR-C0322	High Pressure Permeability Tester, Basic model	12 pieces	75x215x240	325
HR-C0323	High Pressure Permeability Tester, Basic model	18 pieces	75x320x240	565
HR-C0325	High Pressure Permeability Tester, Advance model	4 pieces	75x135x160	130
HR-C0326	High Pressure Permeability Tester, Advance model	6 pieces	75x215x160	140
HR-C0327	High Pressure Permeability Tester, Advance model	12 pieces	75x215x240	325
HR-C0328	High Pressure Permeability Tester, Advance model	18 pieces	75x320x240	565

BUILDING

Testing building materials is a wide and very important sector all over the world. HİRA Testing Equipment Co. provides reliable and convenient testing devices for safer and stronger building structures.

With developing of structure technologies buildings are longer and more functional. We are following technologic developments and applying all to our devices.

The Building section consists of detecting the deformations of various materials such as concrete, cement, metal, rock, asphalt, soil, etc. You will find sufficient types of Hydraulic Testing equipment that conform to various standards as well as accessories such as grips, fixtures and load cells.

Our product range for test on steel includes universal hydraulic machines to perform tensile, compression and flexural tests on metallic materials.

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UNIVERSAL TESTING MACHINES

STANDARDS: EN ISO 15630-1, EN ISO 6892-1, EN ISO 7500-1, TS 708, TS EN 10080

Universal Hydraulic Tensile Test Machine (600/1000 kN capacity) is designed to test the ferrous materials for structural values such as yield strength and tensile strength. Apart from tensile tests, Universal Test Machines can also be used for compression tests up to the capacity of the machine and Bending Tests on 8-20 mm diameter rebars. Bending apparatus and mandrels for Bending tests and Ball Seating Assembly for compression tests should be ordered separately.

To Test Core samples up to 100 mm upper platen must be ordered separately.

Maximum security is maintained on 600kN/1000 kN capacity Universal Test Machine by limit switch on the lower grip as well as the safety check valves on the hydraulic system. Hydraulic power unit works silently.

0-40 mm flat and 8-32 mm round samples can be tested on 600 kN capacity frame and 0-40 mm flat and 8-40 mm round samples can be tested on 1000 kN capacity frame with a user-friendly hydraulic jaws that comply with standards.

Load cell is used to measure stress. Strain measurement is done by the electronic displacement transducer built in the machine.

Tests can be done fully automatic by digital control unit or computer. Machine completes the test with the set pace rate and turns to start position automatically.

The distance between the grips can be set by motor driven handset system. The system is controlled by a hand up/down system. With open front hydraulic wedge grips user can load specimen easily.

HR-B6000

HYDRAULIC GRIPS

Hydraulically operated grips, completely stop the possibility of sample sliding from the grips enabling for correct and definite strain measurements. Hydraulic grips are very safe and user friendly. The hydraulic grips has an independent hydraulic power unit with a working pressure of 400 bars.

600 kN capacity Machine is supplied with 8-32 mm round samples grip set and 1000 kN capacity Machine is supplied with 8-40 mm round samples grip set.

Jaw faces for flat samples should be ordered separately.

BENDING APPARATUS

Bending Apparatus is used for Bending Tests on 8-20 mm diameter rebars.

Can be chosen HR-B6100 & HR-B1100 Models Tensile-Bending Testing Machine for Ø 8-40 mm rebars.

The test piece is bent over a mandrel.

The angle of bend and the diameter of the mandrel should be selected in accordance with the relevant product standard.

The bend test is performed with a minimum angle of bend of 180° over a mandrel according to TS 708 and TS EN 10080 Standards.

After the test, it is checked whether there are any visible breaks or cracks on the test pieces.

Bending apparatus and mandrels for bend tests should be ordered separately.

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

Hydraulic Power Unit is designed to control the machine and processing of data from load-cell and displacement transducers which are fitted to the machine.
Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 2mm/min - 18mm/min with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

All the operations of Graphic Display are controlled from the front LCD display and function keys 2 analogue channels are provided for load-cells and displacement transducers.

It has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option in a seemless manner to activate the option or enter a numeric value to set the test parameters. The digital graphic display is able to draw stress vs. strain graph.

Dual Pumps

The dual pumps are formed by two groups;

1. Grip pump with dual stage pump
2. Piston pump to make tensile and compression tests

HİRA Test HR-B6000 & HR-B1000 tensile testing machine consist of two independent pumps working in one oil tank system.

One pump is controlled with digital readout unit with 3 phase controlled with and inverter to make test, other runs with a pedal to supply pressure to the grips. Grip pump has dual stage pump inside.

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, for quick gripping the rebar while a low delivery, high pressure radial piston pump is used for 400 bar grip pressure.

Two Motors

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

The motor which drives the grip pump in an AC motor and it is controlled by a manual pedal. The maximum pressure of the grips can be monitored by a 0-600 bar manometer fitted to the end of the pipe of upper and lower grip connection.

Two Distribution Blocks

Two distribution blocks are used to control the oil flow direction supplied by the pumps, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer and High pressure radial piston pump for main pump to make the test and Solenoid valve, Safety valve (max. pressure valve), low pressure gear pump and High pressure radial piston pump for grip pump.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the piston up during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 60 L capacity. Hydraulic motor oil, number 46, must be used.

HİRA TESTING EQUIPMENT

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

Software

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

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

Software provides test data, results, and the Stress-Strain graphs can be seen at LCD screen.

The Universal Testing machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Universal Test Software is developed for testing tensile strength of Reinforcing Rubbed Steel Bars and Welded fabric for the Reinforcement and Prestressing of Concrete. The software includes control of machine, data acquisition, saving them and preparing reports. The software accepts sample’s weight, length, diameter and gauge length as input, and then the user can give start test command to the machine. The samples calculated diameter gives user a perspective about the density of rebar prior to the test. The software continuously updates load, stress and elongation percentage till the break point. The software is prepared as making at least 3 samples for each diameter. This gives user a total report about all the batch. The report includes all standard limits and one can easily check whether the sample can be acceptable. These limits are minimum yield, minimum tensile, minimum break elongation value, Tensile per yield ratio etc. Software can be performed in Turkish and English.
Test results, graphics and properties of 12 different specimens can be saved in one folder. Old test folders can be reviewed and be edited easily. Advanced Graphic User Interface Software.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

•Can make test with displacement control.

•Real time display of test graph.

•2 analog channels (one for load cell, one for displacement transducer)

•10 data per second sample rate for each channel

•Multi-language support (Turkish and English)

•2 different unit system selection; SI and metric

•Real-time clock and date

•RS-232 serial port connection with the device

•Free of charge PC software for the test control and advanced report generation

Technical Specifications:

Product Name		Universal Testing Machine			
Product Code		HR-B6000	HR-B6000/60Hz	HR-B1000	HR-B1000/60Hz
Capacity		600 kN		1000 kN	
Test Speed		2mm/min - 18mm/min		2mm/min - 18mm/min	
Load Measurement Accuracy		± %1		± %1	
Displacement Measurement Resolution		0,01 mm		0,01 mm	
Columns Diameter	Lower	50 mm		60 mm	
	Upper	70 mm		80 mm	
Vertical Test Distance	Tension	Minimum 70 mm		Minimum 70 mm	
		Maximum 300 mm		Maximum 320 mm	
	Compression	Maximum 110 mm		Maximum 110 mm	
Distance Between Columns		460 mm		480 mm	
Piston Stroke		150 mm		200 mm	
Maximum Pressure	Grips	400 bar		400 bar	
	Load	200 bar		320 bar	
Weight		1850 kg		2050 kg	
Height		2400 mm		2400 mm	
	Max. stroke	2650 mm		2700 mm	
Power Supply		220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph	220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph

Mandrels for Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		
	TS 708			TS EN 10080		
d (ø) (mm)	Mandrel Code	Ø 5d	d (ø) (mm)	Mandrel Code	d ≤ Ø 16 3d	d > Ø 16 6d
8-9	HR-B6015/1	40	**8-9**	HR-B6015/11	24	---
10-11	HR-B6015/2	50	**10-11**	HR-B6015/12	30	---
12-14	HR-B6015/3	60	**12-14**	HR-B6015/13	36	---
16-18	HR-B6015/4	80	**16**	HR-B6015/14	48	---
20	HR-B6015/6	100	**18-20**	HR-B6015/15	---	108

HİRA TESTING EQUIPMENT

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-B6000/1	600 kN capacity Universal Testing Frame	66x70x260	1800	---
HR-B1000/1	1000 kN capacity Universal Testing Frame	76x80x260	2000	---
HR-B8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	70x45x100	150	220 V, 50 Hz, 1 ph
HR-B8000/60Hz	Hydraulic Power Pack and Digital Data Acquisition & Control System	70x45x100	150	220 V, 60 Hz, 1 ph
HR-B8001	Hydraulic Power Pack	70x45x100	148	220 V, 50 Hz, 1 ph
HR-B8001/60Hz	Hydraulic Power Pack	70x45x100	148	220 V, 60 Hz, 1 ph
HR-B8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-B8003	Software	---	---	---
HR-G0975	Computer & Printer	---	---	---
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---
HR-B6005	Jaw faces for flat samples	---	---	---
HR-B6006	Jaw faces for round samples	---	---	---
HR-B6007	Ball Seating Assembly in order to perform the compression tests	---	---	---
HR-B6008	Upper Platen to test core samples up to 100 mm	---	---	---
HR-B6015	Bending Apparatus for 8-20 mm diameter steel rebars	---	---	---
HR-B6015/1	Mandrel for 8-9 mm diameter samples, TS 708	---	---	---
HR-B6015/2	Mandrel for 10-11 mm diameter samples, TS 708	---	---	---
HR-B6015/3	Mandrel for 12-14 mm diameter samples, TS 708	---	---	---
HR-B6015/4	Mandrel for 16-18 mm diameter samples, TS 708	---	---	---
HR-B6015/6	Mandrel for 20 mm diameter samples, TS 708	---	---	---
HR-B6015/11	Mandrel for 8-9 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/12	Mandrel for 10-11 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/13	Mandrel for 12-14 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/14	Mandrel for 16 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/15	Mandrel for 18-20 mm diameter samples, TS EN 10080	---	---	---

UNIVERSAL TESTING MACHINES
WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN ISO 15630-1, EN ISO 6892-1, EN ISO 7500-1, TS 708, TS EN 10080

Universal Hydraulic Tensile Test Machine (600/1000 kN capacity) is designed to test the ferrous materials for structural values such as yield strength and tensile strength. Apart from tensile tests, Universal Test Machines can also be used for compression tests up to the capacity of the machine and Bending Tests on 8-20 mm diameter rebars. Bending apparatus and mandrels for Bending tests and Ball Seating Assembly for compression tests should be ordered separately.

To Test Core samples up to 100 mm upper platen must be ordered separately.

Maximum security is maintained on 600kN/1000 kN capacity Universal Test Machine by limit switch on the lower grip as well as the safety check valves on the hydraulic system. Hydraulic power unit works silently.

HR-B6000/TS

0-40 mm flat and 8-32 mm round samples can be tested on 600 kN capacity frame and 0-40 mm flat and 8-40 mm round samples can be tested on 1000 kN capacity frame with a user-friendly hydraulic jaws that comply with standards.

Load cell is used to measure stress. Strain measurement is done by the electronic displacement transducer built in the machine.

Tests can be done fully automatic by digital control unit or computer. Machine completes the test with the set pace rate and turns to start position automatically.

HYDRAULIC GRIPS

Hydraulically operated grips, completely stop the possibility of sample sliding from the grips enabling for correct and definite strain measurements. Hydraulic grips are very safe and user friendly. The hydraulic grips has an independent hydraulic power unit with a working pressure of 400 bars.

600 kN capacity Machine is supplied with 8-32 mm round samples grip set and 1000 kN capacity Machine is supplied with 8-40 mm round samples grip set.

Jaw faces for flat samples should be ordered separately.

BENDING APPARATUS

Bending Apparatus is used for Bending Tests on 8-20 mm diameter rebars.

Can be chosen HR-B6100 & HR-B1100 Models Tensile-Bending Testing Machine for Ø 8-40 mm rebars.

The test piece is bent over a mandrel.

The angle of bend and the diameter of the mandrel should be selected in accordance with the relevant product standard.

The bend test is performed with a minimum angle of bend of 180° over a mandrel according to TS 708 and TS EN 10080 Standards.

After the test, it is checked whether there are any visible breaks or cracks on the test pieces.

Bending apparatus and mandrels for bend tests should be ordered separately.

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

Hydraulic Power Pack

Automatic Hydraulic Power Pack, controlled by H-Touch Pro Max Universal Control Unit is designed to control the machine and processing of data from load-cells and displacement transducers which are fitted to the machine.

Very silent power pack can load the specimen between 2mm/min - 18mm/min with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

All the operations of Graphic Display are controlled from the front LCD display and function keys 2 analogue channels are provided for load-cells and displacement transducers.

It has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option in a seemless manner to activate the option or enter a numeric value to set the test parameters. Digital graphic display is able to draw real-time "Load vs. Time", or "Stress vs. Strain" graphics.

Automatic Hydraulic Power Pack has Dual Pumps.

Dual Pumps

The dual pumps are formed by two groups;

1. Grip pump with dual stage pump
2. Piston pump to make tensile and compression tests

HİRA Test HR-B6000 & HR-B1000 tensile testing machine consist of two independent pumps working in one oil tank system.

One pump is controlled with digital readout unit with 3 phase controlled with and inverter to make test, other runs with a pedal to supply pressure to the grips. Grip pump has dual stage pump inside.

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, for quick gripping the rebar while a low delivery, high pressure radial piston pump is used for 400 bar grip pressure.

Two Motors

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

The motor which drives the grip pump in an AC motor and it is controlled by a manual pedal. The maximum pressure of the grips can be monitored by a 0-600 bar manometer fitted to the end of the pipe of upper and lower grip connection.

Two Distribution Blocks

Two distribution blocks are used to control the oil flow direction supplied by the pumps, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer and High pressure radial piston pump for main pump to make the test and Solenoid valve, Safety valve (max. pressure valve), low pressure gear pump and High pressure radial piston pump for grip pump.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the piston up during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 60 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

HİRATEST H-Touch Pro Max Universal Control Unit is designed to control the machine and processing of data from the load cells or pressure transducers connected to the device in order to test the structural values of ferrous materials such as yield strength and tensile strength.

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

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.

HR-B8002/TS

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

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

Main Features of H-Touch Pro Max Universal Control Unit

• Displacement and load controlled
• Real-time graphic display,
• 2 analog channels for load cell or pressure sensors or displacement sensors.
• Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
• Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
• Up to 8-point calibration support and adjustable digital gains for every channel
• User-customizable load, position limits and test termination conditions
• Backup and recall option for device settings
• Recalling to factory default settings option.
• Easy recall of embedded test parameters for different types of tests and sample sizes
• Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
• The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
• Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
• Real time and adjustable date/time
• PC interface with Ethernet connection
• Multi-language support (English, French, Spanish, Turkish)
• LAN connection for instantaneous transfer of test data to PC.
• USB port support for transfer of test data to a flash drive.
• Password Protection for machine settings, calibration and channel menus
• Record of test results in txt and MS excel format on pre-defined intervals
• 5 different visual themes
• Customizable IP

Hardware

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

HİRA TESTING EQUIPMENT

Software

HİRATEST H-GUI Universal Software has been designed to test the structural values of ferrous materials such as yield strength and tensile strength with appropriate Hydraulic Universal Testing Machines and also with a computer.

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

This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

HİRATEST H-GUI Universal Software is developed for testing tensile strength of Reinforcing Rubbed Steel Bars and Welded fabric for the Reinforcement and Prestressing of Concrete. The software includes control of machine, data acquisition, saving them and preparing reports. The software accepts sample's weight, length, diameter and gauge length as input, and then the user can give start test command to the machine. The samples calculated diameter gives user a perspective about the density of rebar prior to the test. The software continuously updates load, stress and elongation percentage till the break point. The software is prepared as making at least 3 samples for each diameter. This gives user a total report about all the batch. The report includes all standard limits and one can easily check whether the sample can be acceptable. These limits are minimum yield, minimum tensile, minimum break elongation value, Tensile per yield ratio etc.

Software can be performed in Turkish and English.

Test results, graphics and properties of specimens can be saved in one folder. Old test folders can be reviewed and be edited easily.

User can highlight all 42 different specimen curves in different colors on the graphics.

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

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Each report is a group of 42 samples where 14 different diameters had been entered.

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

Main Features of H-GUI Universal Software

- Multi-language support and customizable user interface
- 42 Tests Results, Graphics and Properties Storage Capacity in One Test File
- Exporting test results to database
- Advanced test graphical interface
- Option to store and recall test information
- Modification of test machine parameters using the software
- Exporting reports and graphs
- Flexible report and graph formats

Technical Specifications:

Product Name		Universal Testing Machine			
Product Code		HR-B6000/TS	HR-B6000/60Hz/TS	HR-B1000/TS	HR-B1000/60Hz/TS
Capacity		600 kN		1000 kN	
Test Speed		2mm/min - 18mm/min		2mm/min - 18mm/min	
Load Measurement Accuracy		± %1		± %1	
Displacement Measurement Resolution		0,01 mm		0,01 mm	
Columns Diameter	Lower	50 mm		60 mm	
	Upper	70 mm		80 mm	
Vertical Test Distance	Tension	Minimum 70 mm		Minimum 70 mm	
		Maximum 300 mm		Maximum 320 mm	
	Compression	Maximum 110 mm		Maximum 110 mm	
Distance Between Columns		460 mm		480 mm	
Piston Stroke		150 mm		200 mm	
Maximum Pressure	Grips	400 bar		400 bar	
	Load	200 bar		320 bar	
Weight		1850 kg		2050 kg	
Height		2400 mm		2400 mm	
	Max. stroke	2650 mm		2700 mm	
Power Supply		220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph	220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph

Mandrels for Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		
	TS 708			TS EN 10080		
d (ø) (mm)	Mandrel Code	Ø 5d	d (ø) (mm)	Mandrel Code	d ≤ Ø 16 3d	d > Ø 16 6d
8-9	HR-B6015/1	40	**8-9**	HR-B6015/11	24	---
10-11	HR-B6015/2	50	**10-11**	HR-B6015/12	30	---
12-14	HR-B6015/3	60	**12-14**	HR-B6015/13	36	---
16-18	HR-B6015/4	80	**16**	HR-B6015/14	48	---
20	HR-B6015/6	100	**18-20**	HR-B6015/15	---	108

HİRA TESTING EQUIPMENT

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-B6000/1	600 kN capacity Universal Testing Frame	66x70x260	1800	---
HR-B1000/1	1000 kN capacity Universal Testing Frame	76x80x260	2000	---
HR-B8000/TS	Hydraulic Power Pack and H-Touch Pro Max Universal Control Unit	70x45x100	150	220 V, 50 Hz, 1 ph
HR-B8000/60Hz/TS	Hydraulic Power Pack and H-Touch Pro Max Universal Control Unit	70x45x100	150	220 V, 60 Hz, 1 ph
HR-B8001	Hydraulic Power Pack	70x45x100	148	220 V, 50 Hz, 1 ph
HR-B8001/60Hz	Hydraulic Power Pack	70x45x100	148	220 V, 60 Hz, 1 ph
HR-B8002/TS	H-Touch Pro Max Universal Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-B8003/TS	H-GUI Universal Software	---	---	---
HR-G0975	Computer & Printer	---	---	---
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---
HR-B6005	Jaw faces for flat samples	---	---	---
HR-B6006	Jaw faces for round samples	---	---	---
HR-B6007	Ball Seating Assembly in order to perform the compression tests	---	---	---
HR-B6008	Upper Platen to test core samples up to 100 mm	---	---	---
HR-B6015	Bending Apparatus for 8-20 mm diameter steel rebars	---	---	---
HR-B6015/1	Mandrel for 8-9 mm diameter samples, TS 708	---	---	---
HR-B6015/2	Mandrel for 10-11 mm diameter samples, TS 708	---	---	---
HR-B6015/3	Mandrel for 12-14 mm diameter samples, TS 708	---	---	---
HR-B6015/4	Mandrel for 16-18 mm diameter samples, TS 708	---	---	---
HR-B6015/6	Mandrel for 20 mm diameter samples, TS 708	---	---	---
HR-B6015/11	Mandrel for 8-9 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/12	Mandrel for 10-11 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/13	Mandrel for 12-14 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/14	Mandrel for 16 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/15	Mandrel for 18-20 mm diameter samples, TS EN 10080	---	---	---

UNIVERSAL TENSILE/BENDING TESTING MACHINES

STANDARDS: EN ISO 15630-1, EN ISO 6892-1, EN ISO 7500-1, TS 708, TS EN 10080

Universal Hydraulic Tensile/Bending Test Machine (600/1000 kN capacity) is designed to test the ferrous materials for structural values such as yield strength and tensile strength. Apart from tensile tests, Universal Test Machines can also be used for compression tests up to the capacity of the machine and Bending Tests on 8-40 mm diameter rebars. Bending apparatus and mandrels for Bending tests and Ball Seating Assembly for compression tests should be ordered separately.

To Test Core samples up to 100 mm upper platen must be ordered separately.

Maximum security is maintained on 600kN/1000 kN capacity Universal Test Machine by limit switch on the lower grip as well as the safety check valves on the hydraulic system. Hydraulic power unit works silently.

0-40 mm flat and 8-32 mm round samples can be tested on 600 kN capacity frame and 0-40 mm flat and 8-40 mm round samples can be tested on 1000 kN capacity frame with a user-friendly hydraulic jaws that comply with standards.

Load cell is used to measure stress. Strain measurement is done by the electronic displacement transducer built in the machine.

Tests can be done fully automatic by digital control unit or computer. Machine completes the test with the set pace rate and turns to start position automatically.

The distance between the grips can be set by motor driven handset system. The system is controlled by a hand up/down system. With open

HR-B6100

HYDRAULIC GRIPS

Hydraulically operated grips, completely stop the possibility of sample sliding from the grips enabling for correct and definite strain measurements. Hydraulic grips are very safe and user friendly. The hydraulic grips has an independent hydraulic power unit with a working pressure of 400 bars.

600 kN capacity Machine is supplied with 8-32 mm round samples grip set and 1000 kN capacity Machine is supplied with 8-40 mm round samples grip set.

Jaw faces for flat samples should be ordered separately.

BENDING APPARATUS

Bending Apparatus is used for Bending Tests on 8-40 mm diameter rebars.

Can be chosen HR-B6000 & HR-B1000 Models Tensile-Bending Testing Machine for Ø 8-20 mm rebars.

The test piece is bent over a mandrel.

The angle of bend and the diameter of the mandrel should be selected in accordance with the relevant product standard.

The bend test is performed with a minimum angle of bend of 180° over a mandrel according to TS 708 and TS EN 10080 Standards.

After the test, it is checked whether there are any visible breaks or cracks on the test pieces.

Bending apparatus and mandrels for bend tests should be ordered separately.

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

Hydraulic Power Unit is designed to control the machine and processing of data from load-cell and displacement transducers which are fitted to the machine.
Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 2mm/min - 18mm/min with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

All the operations of Graphic Display are controlled from the front LCD display and function keys 2 analogue channels are provided for load-cells and displacement transducers.

It has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option in a seemless manner to activate the option or enter a numeric value to set the test parameters. The digital graphic display is able to draw stress vs. strain graph.

Dual Pumps

The dual pumps are formed by two groups;

1. Grip pump with dual stage pump
2. Piston pump to make tensile and compression tests

HİRA Test HR-B6000 & HR-B1000 tensile testing machine consist of two independent pumps working in one oil tank system.

One pump is controlled with digital readout unit with 3 phase controlled with and inverter to make test, other runs with a pedal to supply pressure to the grips. Grip pump has dual stage pump inside.

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, for quick gripping the rebar while a low delivery, high pressure radial piston pump is used for 400 bar grip pressure.

Two Motors

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

The motor which drives the grip pump in an AC motor and it is controlled by a manual pedal. The maximum pressure of the grips can be monitored by a 0-600 bar manometer fitted to the end of the pipe of upper and lower grip connection.

Two Distribution Blocks

Two distribution blocks are used to control the oil flow direction supplied by the pumps, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer and High pressure radial piston pump for main pump to make the test and Solenoid valve, Safety valve (max. pressure valve), low pressure gear pump and High pressure radial piston pump for grip pump.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the piston up during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 60 L capacity. Hydraulic motor oil, number 46, must be used.

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

Software

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

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

Software provides test data, results, and the Stress-Strain graphs can be seen at LCD screen.

The Universal Testing machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Universal Test Software is developed for testing tensile strength of Reinforcing Rubbed Steel Bars and Welded fabric for the Reinforcement and Prestressing of Concrete. The software includes control of machine, data acquisition, saving them and preparing reports. The software accepts sample’s weight, length, diameter and gauge length as input, and then the user can give start test command to the machine. The samples calculated diameter gives user a perspective about the density of rebar prior to the test. The software continuously updates load, stress and elongation percentage till the break point. The software is prepared as making at least 3 samples for each diameter. This gives user a total report about all the batch. The report includes all standard limits and one can easily check whether the sample can be acceptable. These limits are minimum yield, minimum tensile, minimum break elongation value, Tensile per yield ratio etc. Software can be performed in Turkish and English.
Test results, graphics and properties of 12 different specimens can be saved in one folder. Old test folders can be reviewed and be edited easily. Advanced Graphic User Interface Software.

User can highlight all 12 different specimen curves in different colors on the graphics.

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

•Can make test with displacement control.

•Real time display of test graph.

•2 analog channels (one for load cell, one for displacement transducer)

•10 data per second sample rate for each channel

•Multi-language support (Turkish and English)

•2 different unit system selection; SI and metric

•Real-time clock and date

•RS-232 serial port connection with the device

•Free of charge PC software for the test control and advanced report generation

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Name		Universal Tensile/Bending Testing Machine			
Product Code		HR-B6100	HR-B6100/60Hz	HR-B1100	HR-B1100/60Hz
Capacity		600 kN		1000 kN	
Test Speed		2mm/min - 18mm/min		2mm/min - 18mm/min	
Load Measurement Accuracy		± %1		± %1	
Displacement Measurement Resolution		0,01 mm		0,01 mm	
Columns Diameter	Lower	50 mm		60 mm	
	Upper	70 mm		80 mm	
Vertical Test Distance	Tension	Minimum 70 mm		Minimum 70 mm	
		Maximum 300 mm		Maximum 320 mm	
	Compression	Maximum 110 mm		Maximum 110 mm	
Distance Between Columns		460 mm		480 mm	
Piston Stroke		150 mm		200 mm	
Maximum Pressure	Grips	400 bar		400 bar	
	Load	200 bar		320 bar	
Weight		1950 kg		2150 kg	
Height		2500 mm		2500 mm	
	Max. stroke	2750 mm		2800 mm	
Power Supply		220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph	220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph

Mandrels for Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm) TS 708		Specimen Nominal Diameter	Maximum Mandrel Dia. (mm) TS EN 10080		
d (ø) (mm)	Mandrel Code	Ø 5d	d (ø) (mm)	Mandrel Code	d ≤ Ø 16 3d	d > Ø 16 6d
8-9	HR-B6015/1	40	**8-9**	HR-B6015/11	24	---
10-11	HR-B6015/2	50	**10-11**	HR-B6015/12	30	---
12-14	HR-B6015/3	60	**12-14**	HR-B6015/13	36	---
16-18	HR-B6015/4	80	**16**	HR-B6015/14	48	---
20-22	HR-B6015/5	100	**18-20**	HR-B6015/15	---	108
24-25	HR-B6015/7	120	**22-24**	HR-B6015/16	---	132
26-28	HR-B6015/8	130	**25-26**	HR-B6015/17	---	150
30-32	HR-B6015/9	150	**28-30**	HR-B6015/18	---	168
40	HR-B6015/10	200	**32**	HR-B6015/19	---	192
			40	HR-B6015/20	---	240

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-B6100/1	600 kN capacity Universal Tensile/Bending Testing Frame	66x70x250	1800	---
HR-B1100/1	1000 kN capacity Universal Tensile/Bending Testing Frame	76x80x250	2000	---
HR-B8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	70x45x100	150	220 V, 50 Hz, 1 ph
HR-B8000/60Hz	Hydraulic Power Pack and Digital Data Acquisition & Control System	70x45x100	150	220 V, 60 Hz, 1 ph
HR-B8001	Hydraulic Power Pack	70x45x100	148	220 V, 50 Hz, 1 ph
HR-B8001/60Hz	Hydraulic Power Pack	70x45x100	148	220 V, 60 Hz, 1 ph
HR-B8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-B8003	Software	---	---	---
HR-G0975	Computer & Printer	---	---	---
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---
HR-B6005	Jaw faces for flat samples	---	---	---
HR-B6006	Jaw faces for round samples	---	---	---
HR-B6007	Ball Seating Assembly in order to perform the compression tests	---	---	---
HR-B6008	Upper Platen to test core samples up to 100 mm	---	---	---
HR-B6010	Bending Apparatus for 8-40 mm diameter steel rebars	---	---	---
HR-B6015/1	Mandrel for 8-9 mm diameter samples, TS 708	---	---	---
HR-B6015/2	Mandrel for 10-11 mm diameter samples, TS 708	---	---	---
HR-B6015/3	Mandrel for 12-14 mm diameter samples, TS 708	---	---	---
HR-B6015/4	Mandrel for 16-18 mm diameter samples, TS 708	---	---	---
HR-B6015/5	Mandrel for 20-22 mm diameter samples, TS 708	---	---	---
HR-B6015/7	Mandrel for 24-25 mm diameter samples, TS 708	---	---	---
HR-B6015/8	Mandrel for 26-28 mm diameter samples, TS 708	---	---	---
HR-B6015/9	Mandrel for 30-32 mm diameter samples, TS 708	---	---	---
HR-B6015/10	Mandrel for 40 mm diameter samples, TS 708	---	---	---
HR-B6015/11	Mandrel for 8-9 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/12	Mandrel for 10-11 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/13	Mandrel for 12-14 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/14	Mandrel for 16 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/15	Mandrel for 18-20 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/16	Mandrel for 22-24 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/17	Mandrel for 25-26 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/18	Mandrel for 28-30 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/19	Mandrel for 32 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/20	Mandrel for 40 mm diameter samples, TS EN 10080	---	---	---

UNIVERSAL TENSILE/BENDING TESTING MACHINES WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN ISO 15630-1, EN ISO 6892-1, EN ISO 7500-1, TS 708, TS EN 10080

Universal Hydraulic Tensile/Bending Test Machine (600/1000 kN capacity) is designed to test the ferrous materials for structural values such as yield strength and tensile strength. Apart from tensile tests, Universal Test Machines can also be used for compression tests up to the capacity of the machine and Bending Tests on 8-40 mm diameter rebars. Bending apparatus and mandrels for Bending tests and Ball Seating Assembly for compression tests should be ordered separately.

To Test Core samples up to 100 mm upper platen must be ordered separately.

Maximum security is maintained on 600kN/1000 kN capacity Universal Test Machine by limit switch on the lower grip as well as the safety check valves on the hydraulic system. Hydraulic power unit works silently.

0-40 mm flat and 8-32 mm round samples can be tested on 600 kN capacity frame and 0-40 mm flat and 8-40 mm round samples can be tested on 1000 kN capacity frame with a user-friendly hydraulic jaws that comply with standards.

Load cell is used to measure stress. Strain measurement is done by the electronic displacement transducer built in the machine.

Tests can be done fully automatic by digital control unit or computer. Machine completes the test with the set pace rate and turns to start position automatically.

The distance between the grips can be set by motor driven handset system. The system is controlled by a hand up/down system. With open front hydraulic wedge grips user can load specimen easily.

HR-B6100/TS

HYDRAULIC GRIPS

Hydraulically operated grips, completely stop the possibility of sample sliding from the grips enabling for correct and definite strain measurements. Hydraulic grips are very safe and user friendly. The hydraulic grips has an independent hydraulic power unit with a working pressure of 400 bars.

600 kN capacity Machine is supplied with 8-32 mm round samples grip set and 1000 kN capacity Machine is supplied with 8-40 mm round samples grip set.

Jaw faces for flat samples should be ordered separately.

BENDING APPARATUS

Bending Apparatus is used for Bending Tests on 8-40 mm diameter rebars.

Can be chosen HR-B6000 & HR-B1000 Models Tensile-Bending Testing Machine for Ø 8-20 mm rebars.

The test piece is bent over a mandrel.

The angle of bend and the diameter of the mandrel should be selected in accordance with the relevant product standard.

The bend test is performed with a minimum angle of bend of 180° over a mandrel according to TS 708 and TS EN 10080 Standards.

After the test, it is checked whether there are any visible breaks or cracks on the test pieces.

Bending apparatus and mandrels for bend tests should be ordered separately.

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

Hydraulic Power Pack

Automatic Hydraulic Power Pack, controlled by H-Touch Pro Max Universal Control Unit is designed to control the machine and processing of data from load-cells and displacement transducers which are fitted to the machine.

Very silent power pack can load the specimen between 2mm/min - 18mm/min with an accuracy of ±5%. Safety valve (maximum pressure valve) is used to avoid machine overloading.

All the operations of Graphic Display are controlled from the front LCD display and function keys 2 analogue channels are provided for load-cells and displacement transducers.

It has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option in a seemless manner to activate the option or enter a numeric value to set the test parameters. Digital graphic display is able to draw real-time "Load vs. Time", or "Stress vs. Strain" graphics.

Automatic Hydraulic Power Pack has Dual Pumps.

Dual Pumps

The dual pumps are formed by two groups;

1. Grip pump with dual stage pump
2. Piston pump to make tensile and compression tests

HİRA Test HR-B6000 & HR-B1000 tensile testing machine consist of two independent pumps working in one oil tank system.

One pump is controlled with digital readout unit with 3 phase controlled with and inverter to make test, other runs with a pedal to supply pressure to the grips. Grip pump has dual stage pump inside.

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, for quick gripping the rebar while a low delivery, high pressure radial piston pump is used for 400 bar grip pressure.

Two Motors

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

The motor which drives the grip pump in an AC motor and it is controlled by a manual pedal. The maximum pressure of the grips can be monitored by a 0-600 bar manometer fitted to the end of the pipe of upper and lower grip connection.

Two Distribution Blocks

Two distribution blocks are used to control the oil flow direction supplied by the pumps, the following parts are fitted to the distribution block; Solenoid valve, Safety valve (max. pressure valve), Transducer and High pressure radial piston pump for main pump to make the test and Solenoid valve, Safety valve (max. pressure valve), low pressure gear pump and High pressure radial piston pump for grip pump.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the piston up during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 60 L capacity. Hydraulic motor oil, number 46, must be used.

HİRA TESTING EQUIPMENT

Digital Data Acquisition & Control System

HİRATEST H-Touch Pro Max Universal Control Unit is designed to control the machine and processing of data from the load cells or pressure transducers connected to the device in order to test the structural values of ferrous materials such as yield strength and tensile strength.

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

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.

HR-B8002/TS

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

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

Main Features of H-Touch Pro Max Universal Control Unit

- Displacement and load controlled
- Real-time graphic display,
- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time
- PC interface with Ethernet connection
- Multi-language support (English, French, Spanish, Turkish)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

Software

HİRATEST H-GUI Universal Software has been designed to test the structural values of ferrous materials such as yield strength and tensile strength with appropriate Hydraulic Universal Testing Machines and also with a computer.

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

This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

HİRATEST H-GUI Universal Software is developed for testing tensile strength of Reinforcing Rubbed Steel Bars and Welded fabric for the Reinforcement and Prestressing of Concrete. The software includes control of machine, data acquisition, saving them and preparing reports. The software accepts sample's weight, length, diameter and gauge length as input, and then the user can give start test command to the machine. The samples calculated diameter gives user a perspective about the density of rebar prior to the test. The software continuously updates load, stress and elongation percentage till the break point. The software is prepared as making at least 3 samples for each diameter. This gives user a total report about all the batch. The report includes all standard limits and one can easily check whether the sample can be acceptable. These limits are minimum yield, minimum tensile, minimum break elongation value, Tensile per yield ratio etc.

Software can be performed in Turkish and English.

Test results, graphics and properties of specimens can be saved in one folder. Old test folders can be reviewed and be edited easily.

User can highlight all 42 different specimen curves in different colors on the graphics.

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

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Each report is a group of 42 samples where 14 different diameters had been entered.

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

Main Features of H-GUI Universal Software

- Multi-language support and customizable user interface
- 42 Tests Results, Graphics and Properties Storage Capacity in One Test File
- Exporting test results to database
- Advanced test graphical interface
- Option to store and recall test information
- Modification of test machine parameters using the software
- Exporting reports and graphs
- Flexible report and graph formats

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Name		Universal Tensile/Bending Testing Machine			
Product Code		HR-B6100/TS	HR-B6100/60Hz/TS	HR-B1100/TS	HR-B1100/60Hz/TS
Capacity		600 kN		1000 kN	
Test Speed		2mm/min - 18mm/min		2mm/min - 18mm/min	
Load Measurement Accuracy		± %1		± %1	
Displacement Measurement Resolution		0,01 mm		0,01 mm	
Columns Diameter	Lower	50 mm		60 mm	
	Upper	70 mm		80 mm	
Vertical Test Distance	Tension	Minimum 70 mm		Minimum 70 mm	
		Maximum 300 mm		Maximum 320 mm	
	Compression	Maximum 110 mm		Maximum 110 mm	
Distance Between Columns		460 mm		480 mm	
Piston Stroke		150 mm		200 mm	
Maximum Pressure	Grips	400 bar		400 bar	
	Load	200 bar		320 bar	
Weight		1950 kg		2150 kg	
Height		2500 mm		2500 mm	
	Max. stroke	2750 mm		2800 mm	
Power Supply		220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph	220 V, 50 Hz, 1ph	220 V, 60 Hz, 1ph

Mandrels for Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm) TS 708		Specimen Nominal Diameter	Maximum Mandrel Dia. (mm) TS EN 10080		
d (ø) (mm)	Mandrel Code	Ø 5d	d (ø) (mm)	Mandrel Code	d ≤ Ø 16 3d	d > Ø 16 6d
8-9	HR-B6015/1	40	**8-9**	HR-B6015/11	24	---
10-11	HR-B6015/2	50	**10-11**	HR-B6015/12	30	---
12-14	HR-B6015/3	60	**12-14**	HR-B6015/13	36	---
16-18	HR-B6015/4	80	**16**	HR-B6015/14	48	---
20-22	HR-B6015/5	100	**18-20**	HR-B6015/15	---	108
24-25	HR-B6015/7	120	**22-24**	HR-B6015/16	---	132
26-28	HR-B6015/8	130	**25-26**	HR-B6015/17	---	150
30-32	HR-B6015/9	150	**28-30**	HR-B6015/18	---	168
40	HR-B6015/10	200	**32**	HR-B6015/19	---	192
			40	HR-B6015/20	---	240

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-B6100/1	600 kN capacity Universal Tensile/Bending Testing Frame	66x70x250	1800	---
HR-B1100/1	1000 kN capacity Universal Tensile/Bending Testing Frame	76x80x250	2000	---
HR-B8000/TS	Hydraulic Power Pack and H-Touch Pro Max Universal Control Unit	70x45x100	150	220 V, 50 Hz, 1 ph
HR-B8000/60Hz/TS	Hydraulic Power Pack and H-Touch Pro Max Universal Control Unit	70x45x100	150	220 V, 60 Hz, 1 ph
HR-B8001	Hydraulic Power Pack	70x45x100	148	220 V, 50 Hz, 1 ph
HR-B8001/60Hz	Hydraulic Power Pack	70x45x100	148	220 V, 60 Hz, 1 ph
HR-B8002/TS	H-Touch Pro Max Universal Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-B8003/TS	H-GUI Universal Software	---	---	---
HR-G0975	Computer & Printer	---	---	---
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---
HR-B6005	Jaw faces for flat samples	---	---	---
HR-B6006	Jaw faces for round samples	---	---	---
HR-B6007	Ball Seating Assembly in order to perform the compression tests	---	---	---
HR-B6008	Upper Platen to test core samples up to 100 mm	---	---	---
HR-B6010	Bending Apparatus for 8-40 mm diameter steel rebars	---	---	---
HR-B6015/1	Mandrel for 8-9 mm diameter samples, TS 708	---	---	---
HR-B6015/2	Mandrel for 10-11 mm diameter samples, TS 708	---	---	---
HR-B6015/3	Mandrel for 12-14 mm diameter samples, TS 708	---	---	---
HR-B6015/4	Mandrel for 16-18 mm diameter samples, TS 708	---	---	---
HR-B6015/5	Mandrel for 20-22 mm diameter samples, TS 708	---	---	---
HR-B6015/7	Mandrel for 24-25 mm diameter samples, TS 708	---	---	---
HR-B6015/8	Mandrel for 26-28 mm diameter samples, TS 708	---	---	---
HR-B6015/9	Mandrel for 30-32 mm diameter samples, TS 708	---	---	---
HR-B6015/10	Mandrel for 40 mm diameter samples, TS 708	---	---	---
HR-B6015/11	Mandrel for 8-9 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/12	Mandrel for 10-11 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/13	Mandrel for 12-14 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/14	Mandrel for 16 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/15	Mandrel for 18-20 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/16	Mandrel for 22-24 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/17	Mandrel for 25-26 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/18	Mandrel for 28-30 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/19	Mandrel for 32 mm diameter samples, TS EN 10080	---	---	---
HR-B6015/20	Mandrel for 40 mm diameter samples, TS EN 10080	---	---	---

COLD TEST BENDING MACHINE

STANDARDS: EN ISO 15630-1, 7438, EN 10080

150 kN capacity Cold Test Bending Machine is used for bending and re-bending tests of reinforcing bars, wire rod and wire for concrete in accordance with the requirements of EN ISO 15630-1.

The test piece is bent over a mandrel. The angle of bend and the diameter of the mandrel (D) is selected in accordance with the relevant product standard EN 10080.

The Bending test is performed with a minimum angle of bend of 180° over a mandrel according to EN ISO 15630-1.

For Re-Bending test, first the test piece is bend with a minimum angle of bend of 90° over a mandrel, in a second step, the aging treatment is applied and then the test pieces bent back up to a minimum of 20° according to EN ISO 15630-1.

After the test, test pieces are inspected for cracks and fissures visible to a person with normal or corrected vision.

HR-B0150

Bending & Re-Bending Apparatus is used for Bending & Re Bending Tests on 8-40 mm diameter rebars. Bending & Re-Bending Apparatus and Mandrels should be ordered separately.

Spare Parts & Accessories:

Mandrels for Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)		
	TS 708			TS EN 10080		
d (ø) (mm)	Mandrel Code	Ø 5d	d (ø) (mm)	Mandrel Code	d ≤ Ø 16 3d	d > Ø 16 6d
8-9	HR-B6015/1	40	**8-9**	HR-B6015/11	24	---
10-11	HR-B6015/2	50	**10-11**	HR-B6015/12	30	---
12-14	HR-B6015/3	60	**12-14**	HR-B6015/13	36	---
16-18	HR-B6015/4	80	**16**	HR-B6015/14	48	---
20-22	HR-B6015/5	100	**18-20**	HR-B6015/15	---	108
24-25	HR-B6015/7	120	**22-24**	HR-B6015/16	---	132
26-28	HR-B6015/8	130	**25-26**	HR-B6015/17	---	150
30-32	HR-B6015/9	150	**28-30**	HR-B6015/18	---	168
40	HR-B6015/10	200	**32**	HR-B6015/19	---	192
			40	HR-B6015/20	---	240

Mandrels for Re-Bending Apparatus:

Specimen Nominal Diameter	Maximum Mandrel Dia. (mm)			
	TS 708 and TS EN 10080			
d (ø) (mm)	Mandrel Code	d ≤ Ø 16 5d	Ø16 < d ≤ Ø25 8d	d > Ø25 10d
8-9	HR-B6020/1	40	---	---
10-11	HR-B6020/2	50	---	---
12-14	HR-B6020/3	60	---	---
16	HR-B6020/4	80	---	---
18-20	HR-B6020/5	---	144	---
22-24	HR-B6020/6	---	176	---
25	HR-B6020/7	---	200	---
26-28	HR-B6020/8	---	---	260
30-32	HR-B6020/9	---	---	300
40	HR-B6020/10	---	---	400

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-B0150	150 kN capacity Cold Test Bending Machine	150x85x120	520	220 V, 50 Hz, 1 ph
HR-B0150/60Hz	150 kN capacity Cold Test Bending Machine	150x85x120	520	220 V, 60 Hz, 1 ph
HR-B6010	Bending Apparatus for 8-40 mm diameter steel rebars	---	---	---
HR-B6015/1	Mandrel for 8-9 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/2	Mandrel for 10-11 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/3	Mandrel for 12-14 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/4	Mandrel for 16-18 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/5	Mandrel for 20-22 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/7	Mandrel for 24-25 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/8	Mandrel for 26-28 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/9	Mandrel for 30-32 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/10	Mandrel for 40 mm diameter samples, TS 708 Bending Test	---	---	---
HR-B6015/11	Mandrel for 8-9 mm diameter samples, TS EN 10080 Bending Test	---	---	---
HR-B6015/12	Mandrel for 10-11 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/13	Mandrel for 12-14 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/14	Mandrel for 16 mm diameter samples, TS EN 10080 Bending Test	---	---	---
HR-B6015/15	Mandrel for 18-20 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/16	Mandrel for 22-24 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/17	Mandrel for 25-26 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/18	Mandrel for 28-30 mm diameter samples, TS EN 10080 Bending	---	---	---
HR-B6015/19	Mandrel for 32 mm diameter samples, TS EN 10080 Bending Test	---	---	---
HR-B6015/20	Mandrel for 40 mm diameter samples, TS EN 10080 Bending Test	---	---	---
HR-B6020	Re-Bending Apparatus for 8-40 mm diameter steel rebars	---	---	---
HR-B6020/1	Mandrel for 8-9 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/2	Mandrel for 10-11 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/3	Mandrel for 12-14 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/4	Mandrel for 16 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/5	Mandrel for 18-20 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/6	Mandrel for 22-24 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/7	Mandrel for 25 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/8	Mandrel for 26-28 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/9	Mandrel for 30-32 mm diameter samples, TS 708 and TS EN 10080	---	---	---
HR-B6020/10	Mandrel for 40 mm diameter samples, TS 708 and TS EN 10080	---	---	---

REBAR CUTTING MACHINE

Rebar Cutting Machine is with hydraulic system and with spring system return.

Along the ease of transport in short distances thanks to its wheels, it is suitable for construction sites thanks to their durable structures against heavy conditions such as dust and heavy work.

It consumes low power, can conduct cutting operations in low bar pressures, it is silent, safe and environment friendly.

The control type is comfortable; it requires less maintenance and has a long product life.

When compared to machines with the same capacity but different systems, it is much economic. As the hydraulic oil tank of the machine is threaded and disassembled, its assembly is very easy (during parts change and renewal).

Hydraulic Oil Tank capacity is 20 lt.

Supplied complete with Allen Key and 2 pieces Spare Blade Set.

Technical Specifications:

Product Code	Product Name	Engine Power (kW)	Dimensions (cm)	Weight (kg)	Power Supply
HR-B9000	Rebar Cutting Machine	3	64x133x75	352	380 V, 50 Hz

Strength of Steel	Piece	Sample Dia. (mm)
45 kg/mm2	1	Ø 38
45 kg/mm2	2	Ø 26
65 kg/mm2	1	Ø 36
65 kg/mm2	2	Ø 22
85 kg/mm2	1	Ø 32
85 kg/mm2	2	Ø 20

Spare Parts & Accessories:

Product Code	Product Name
HR-B9000/1	Allen Key
HR-B9000/3	Spare Blade Set. 2 pieces

HR-B9000

AUTOMATIC CORE-ROCK COMPRESSION TESTING MACHINE

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic 600 kN Capacity Compression Testing Machine has been designed for reliable and consistent testing of core and rock samples. Machine confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

A compression test determines behavior of materials under crushing loads. The specimen is compressed and deformation at various loads is recorded.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by either Digital Readout Unit or on a computer with using free Software.

The Automatic Core-Rock Compression Testing Machine allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-R6000

The Automatic Core-Rock Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- Digital data acquisition & control system,
- Distance Pieces, Ø165x30 mm, Ø165x50 mm and Ø165x80 mm,
- Upper Platen (with ball seating assembly) Ø165 mm,
- Lower Platen Ø165 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety.
- Software and Ethernet Cable.

Core-Rock Compression Load Frame

Load Frame is 600 kN Capacity.

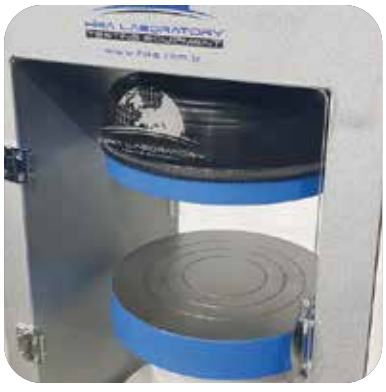
The dimensions of the 600 kN Load Frame allow the testing of concrete and rock samples up to its capacity.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

HİRA TESTING EQUIPMENT

Upper Platens/Lower Platens



Upper Platen (with ball seating assembly) Ø 165 mm and Lower Platen Ø 165 mm.

The platens enable the testing of a wide variety of cylinder or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cylinder samples.

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø165x30 mm, Ø165x50 mm and Ø165x80 mm distance pieces.

HR-C8166 HR-C8167 HR-C8168

Loading Cylinder Assembly & Limit Switch

The Load Frame has a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

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

At the end of the test process to start a new test the piston returns to default position.

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

HR-C8003

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

Load Cell

600 kN Load Cell can be used for load measurements instead of High Precision Pressure Transducer.

These property allows high accuracy at very low sample failures. (Class 1 at 6 kN to 600 kN)

The user can choose Load Cell or Transducer in the order stage.

HİRA TESTING EQUIPMENT

Oil Tank

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

Digital Data Acquisition & Control System

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

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

The unit has easy to use menu options.

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

Digital graphic display is able to draw real-time “Load vs. Time”.

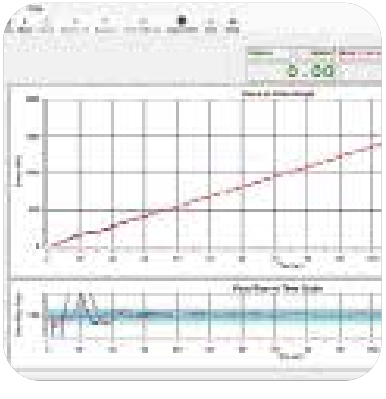
HR-C8002

Software

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

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

Software provides test data, results, and the load-time graphs can be seen at LCD screen.

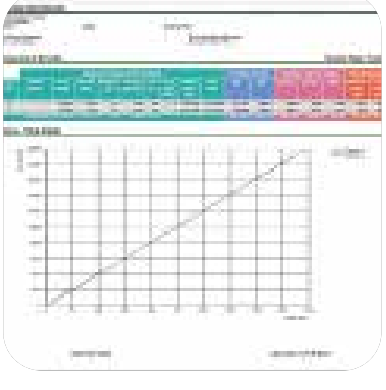


The Automatic Core-Rock Compression machine can be controlled (Start, Stop commands) by a computer with the software free of charge. This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Software can be performed in Turkish and English.

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed.

User can highlight all 12 different specimen curves in different colors on the graphics.



Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

Main Features

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Can control 2 frames (optional)
- Can make test with load control.
- Real time display of test graph.
- Analog channels for different frame load cells
- RS-232 serial port connecting for computer interface
- LCD display
- 2 different unit system selection; kN and kgf
- Multi-language support (English and Turkish)
- 2 different unit system selection; SI and Metric
- Real-time clock and date
- Free of charge PC software for the test control and printout the test report.

Technical Specifications:

Product Code	HR-R6000
Capacity (kN)	600
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	165
Ø Upper Platen (mm)	165
Max. Vertical clearance (mm)	330
Piston diameter (mm)	150
Piston Stroke (mm)	50
Horizontal clearance (mm)	230
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000	600 kN Automatic Core-Rock Compression Testing Machine	71x38x91	450	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000	600 kN Automatic Core-Rock Compression Testing Machine	71x38x91	450	220 V, 50-60 Hz, 1 ph
HR-R6000/1	600 kN Load Frame	35x30x91	350	---
HR-C8000	Hydraulic Power Pack and Digital Data Acquisition & Control System	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002	Digital Data Acquisition & Control System	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004	Software	---	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

AUTOMATIC CORE-ROCK COMPRESSION TESTING MACHINE WITH H-TOUCH PRO MAX CONTROL UNIT (TOUCH SCREEN)

STANDARDS: EN 12390-3, 12390-4; BS 1881, ASTM C39

The HİRA Automatic 600 kN Capacity Compression Testing Machine has been designed for reliable and consistent testing of core and rock samples. Machine confirms all EN, ASTM and BS standards written above. These also meet the requirements of CE norms for the safety and health of the operator.

Testing machines are supplied with EN compression platens as standard. Machines also comply with the ASTM C39 standard when used together with suitable platens.

Tests can be performed by controlling the machine either H-Touch Pro Max Control Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines. There are several advantages of performing tests on computer with using HİRATEST Software, such as reporting and graphical output.

The Automatic Core-Rock Compression Testing Machine allow inexperienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed).
- Pressing the START button on the control unit
- The machine automatically starts the rapid approach, when the specimen touches the upper platen the rapid approach is ended and starts loading at the pace rate that selected by user and stops once the specimen fails.
- Automatically saves the test parameters and test results.

HR-R6000/TS

HR-R6000/TS with HR-G0979

The Automatic Core-Rock Compression Testing Machines consist of;

- Load Frame,
- Automatic Hydraulic Power Pack,
- H-Touch Pro Max Control Unit,
- Distance Pieces, Ø165x30 mm, Ø165x50 mm and Ø165x80 mm,
- Upper Platen (with ball seating assembly) Ø165 mm,
- Lower Platen Ø165 mm,
- Loading Cylinder Assembly & Limit Switch for safety,
- Front and Rear Protective Doors for safety,
- H-GUI Software and Ethernet Cable..

Core-Rock Compression Load Frame

Load Frame is 600 kN Capacity.

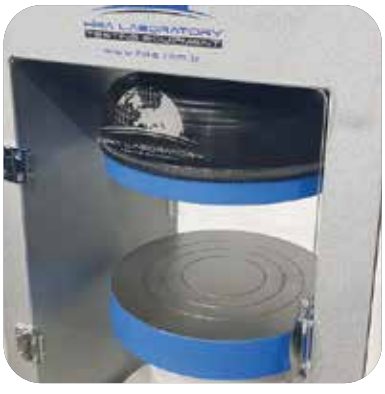
The dimensions of the 600 kN Load Frame allow the testing of concrete and rock samples up to its capacity.

The load frame provides the stability needed for accurate and repeatable test results over the years of operation. The machine's hydraulic power pack, control and read out units are positioned on the right hand side of the load frame for easier accessibility, increased productivity and for safer operations.

The frames are supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4.

Upper Platens/Lower Platens

Upper Platen (with ball seating assembly) Ø 165 mm and Lower Platen Ø 165 mm.



The platens enable the testing of a wide variety of cylinder or similar samples.

- Manufactured from high quality steel, which is then hardened, smoothed and finished.
- The roughness value for the surface texture of the auxiliary platens is ≤ 3.2 µm.
- Ø 165 mm Upper Platen (with ball seating assembly) and Lower Platen have centering rings on the lower platens for proper centering of 100 mm and 150 mm cylinder samples.

Distance Pieces

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. Supplied with Ø 165x30 mm, Ø 165x50 mm and Ø 165x80 mm distance pieces.

HR-C8166 HR-C8167 HR-C8168

Loading Cylinder Assembly & Limit Switch

The Load Frame has a single acting up stroking ram. The diameter of piston changes with regard to the capacity.

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

At the end of the test process to start a new test the piston returns to default position.

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration. The Hydraulic Power Pack, Control and Read out Units are positioned on the right-hand side of the load frame for easier accessibility, increased productivity and for safer operations.

Very silent power pack can load the specimen between 1 kN/sec. to 20 kN/sec, with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Maximum working pressure of the system is 400 bar.

HR-C8000/TS

HİRA TESTING EQUIPMENT

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Distribution Block

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

High Precision Pressure Transducer

The HİRA range of Automatic Machines can be upgraded with option High Precision Pressure Transducer special calibration Class 1 starting from 1% of the full range.

This unique performance enables the machines to be used for a considerable number of applications including:

- Early age (2 or 3 days) compression strength tests
- Flexural and splitting tests by using proper accessories
- Mortar (Cement) compression tests by using proper accessories
- Core Testing

HR-C8003

Load Cell

600 kN Load Cell can be used for load measurements instead of High Precision Pressure Transducer.

These property allows high accuracy at very low sample failures. (Class 1 at 6 kN to 600 kN)

The user can choose Load Cell or Transducer in the order stage.

Oil Tank

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

Digital Data Acquisition & Control System

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

HR-C8002/TS

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

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.

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

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

Main Features of H-Touch Pro Max Control Unit

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

HİRA TESTING EQUIPMENT

Software

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

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

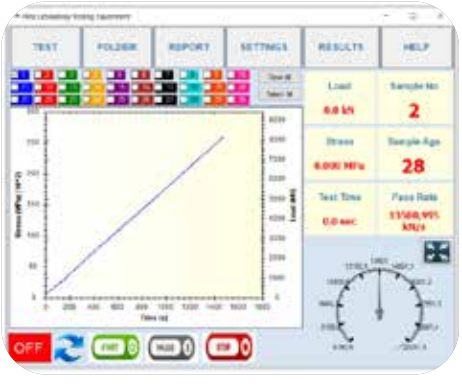
The advanced functions for database management provide an easy navigation of all saved data.

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

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

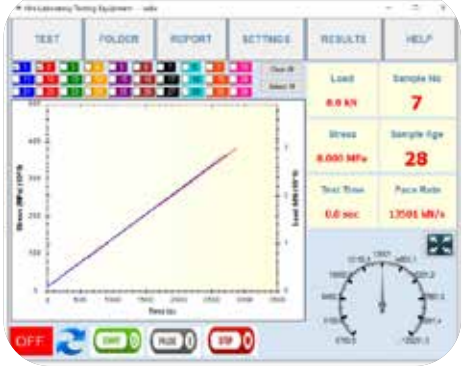
Following tests can be done with the HİRATEST H-GUI Software;

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



Main Features of H-GUI Software

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



Main Features of the device

- Pace rate control from 1 kN/sec to 20 kN/sec depending on piston size.
- Accuracy Class 1 acc. to EN 12390-4 starting from with the 5% of the machine capacity (Special calibration option Class 1 starting from 1% of the full range with HR-C8003)
- Supplied with factory calibration certificate for force transfer stability and the self-alignment of the upper loading platen conforming to EN 12390-4
- Tests automatically with closed loop control
- Tests can be performed by controlling the machine either H-Touch Screen Digital Readout Unit or on a computer with using free HİRATEST Software which is provided free of charge with the machines.
- Load measurement with a pressure transducer
- Hydraulic pump with dual stage for rapid approach
- Welded steel walled frame with a single acting piston
- Piston return at the end of test automatically
- Multi-Point calibration function for the channels
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Ethernet port connecting for computer interface
- H-Touch Screen Digital Readout Unit
- Free of charge HİRATEST Software for the test control and printout the test report.

Technical Specifications:

Product Code	HR-R6000/TS
Capacity (kN)	600
Roughness (µm)	≤ 3.2
Ø Lower Platen (mm)	165
Ø Upper Platen (mm)	165
Max. Vertical clearance (mm)	330
Piston diameter (mm)	150
Piston Stroke (mm)	50
Horizontal clearance (mm)	230
Oil Capacity (lt)	25
Max. Working Pressure (bar)	400
Power (W)	750

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
- Front and rear transparent durable Plexiglas guards

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000/TS	600 kN Automatic Core-Rock Compression Testing Machine	71x38x91	450	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-R6000/1	600 kN Load Frame	35x30x91	350	---
HR-C8000/TS	Hydraulic Power Pack and H-Touch Pro Max Control Unit	36x38x91	100	220 V, 50-60 Hz, 1 ph
HR-C8001	Hydraulic Power Pack	36x38x91	98	220 V, 50-60 Hz, 1 ph
HR-C8002/TS	H-Touch Pro Max Control Unit	---	---	220 V, 50-60 Hz, 1 ph
HR-C8003	High Precision Pressure Transducer	---	---	---
HR-C8004/TS	H-GUI Software	---	---	---
HR-C8165	Distance Pieces	Ø 16,5 x 2,5	---	---
HR-C8166	Distance Pieces	Ø 16,5 x 3	---	---
HR-C8167	Distance Pieces	Ø 16,5 x 5	---	---
HR-C8168	Distance Pieces	Ø 16,5 x 8	---	---
HR-G0975	Computer & Printer	---	---	220 V, 50-60 Hz, 1 ph
HR-G0975/1	Usb to com port Converter	---	---	---
HR-G0979	Thermal Printer	---	---	---
HR-G0979/1	Thermal Printer roll for printer (pack of 10 rolls)	---	---	---

CYLINDER CAPPING EQUIPMENT

STANDARDS: TS EN 12390–3, ASTM C31, C192, C617, AASTHO T23, T126

This heavy-duty vertical Cylinder capper is used in applying capping compound to Ø75, Ø100 and Ø150 mm concrete test cylinders in preparation for compression tests.

The vertical Capper simplifies the capping process by ensuring the plane, end surfaces are at right angles to the axis of the cylinder. The upright is used as a guide for positioning the cylinder. Molten capping compound is poured into the mold (plate); then the cylinder is placed on the capping material. After the compound is set, the capped cylinder is removed for testing. All types of capping compounds can be used with this apparatus.

Supplied complete with base plates for Ø100 and Ø150 mm cylinder specimens.

Base plates for Ø 75 mm cylinder specimens should be ordered separately.

Concrete Cylinder Carrier (Cradle-Type) is plated to resist rust. Used to carry Ø150 mm concrete cylinders in field or laboratory. Concrete Cylinder Carrier should be ordered separately.

HR-C0240

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C0240	Cylinder Capping Equipment	21x19x24	12

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-C0240/1	Cylinder Capping Frame	200x200x320	5
HR-C0240/2	Base Plate	Ø 75x20	1
HR-C0240/3	Base Plate	Ø 100x20	1,5
HR-C0240/4	Base Plate	Ø 150x20	2
HR-C0249	Concrete Cylinder Carrier	Ø 165x450	1

HR-C0249

HR-C0249
with sample

MELTING POT

STANDARDS: EN 12390–3, 12390-1, 12504-1; ASTM C31, C192, C617, C39, C42; AASTHO T23, T126

Used for Melting Capping Compound (Sulphur + Graphite).

HR-C0245

The apparatus consists of a 3,5 lt capacity aluminum cast container, covered by a special made steel resistance, stone wool insulator and thermostatic control heating system to keep the temperature constant in the range of 40 to 350 °C.

Supplied with scoop.

Sulphur and Graphite should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-C0245	Melting Pot	35x40x30	9	220 V, 50-60 Hz, 1 ph

HR-G0912

Spare Parts & Accessories:

Product Code	Product Name
HR-G0914	Sulphur, 1 kg
HR-G0915	Sulphur, 25 kg
HR-G0912	Graphite, 1 kg
HR-G0913	Graphite, 25 kg
HR-G0739	Ladle, Stainless

HR-G0739

HR-G0914

UNBONDED CAPPING PADS AND RETAINERS

STANDARDS: ASTM C1231

Used for compression tests on concrete cylinder samples, as an alternative method to the sulphur capping and grinding machine.

Two Steel Capping Retainers are applied on the two flat surfaces of the cylinder.

Two Neoprene Pads are put between them, for a better load distribution.

The Neoprene Pads are available in two models.

- 60 Shore hardness pads for expected strength from 10 to 48 MPa.
- 70 Shore hardness pads for expected strength over 48 MPa.

The system is not applicable for expected strength lower than 10 MPa.

Technical Specifications:

Product Code	Product Name	Hardness	Sample Dimensions (mm)
HR-C8800	Capping Retainers (Pack of 2)	---	100x200
HR-C8801	Capping Retainers (Pack of 2)	---	150x300
HR-C8802	Capping Retainers (Pack of 2)	---	160x320
HR-C8805	Neoprene Pads (Pack of 2)	60 Shore	100x200
HR-C8806	Neoprene Pads (Pack of 2)	60 Shore	150x300
HR-C8807	Neoprene Pads (Pack of 2)	60 Shore	160x320
HR-C8810	Neoprene Pads (Pack of 2)	70 Shore	100x200
HR-C8811	Neoprene Pads (Pack of 2)	70 Shore	150x300
HR-C8812	Neoprene Pads (Pack of 2)	70 Shore	160x320

CORE DRILLING MACHINE

For shock-free drilling in concrete, natural stone and asphalt with a diameter range from 50 to 255 mm. The machine is equipped with 2 load speeds. Electronics - soft start, current limitation, thermal overload protection. Mechanical safety clutch. 2-speed (460/840 rpm) oil bath gearbox – optimal speed adjustment in the entire drill range. Feed lever change without any tool (right/left side). Feed lever – drilling in tight areas. Quick-change plate – motor/rig.

Water Pump is 15 lt capacity. It is supplied with 3 m hose. Water Pump should be ordered separately.

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G3025	Core Bit	Ø 50x450	2
HR-G3026	Core Bit	Ø 54,74x450	2,25
HR-G3027	Core Bit	Ø 75x450	2,5
HR-G3028	Core Bit	Ø 100x450	3
HR-G3029	Core Bit	Ø 150x450	5
HR-G3030	Core Bit	Ø 200x450	8
HR-G3000/1	Water Pump	---	---

Technical Specifications:

Product Code	Product Name	Power input	Drilling dia. (mm)	Rated speed (rpm)	Weight (kg)	Power Supply
HR-G3000	Core Drilling Machine	2600 W	50-255	460/840	25,2	220 V, 50-60 Hz, 1 ph

MASONRY SAW (SPECIMEN CUTTING MACHINE)

STANDARDS: EN 12390-3, 12504-1, ASTM C42, D4543

The Universal Cutting Machines have been developed to cut and prepare concrete, rock or natural stone cores or other type test specimens.

Special “V” block clamp assembly allows specimens to be held during cutting operation.

The machine is supplied complete with circulation water pump and Cutting Blade.

Special clamp assembly should be ordered separately.

If 220 V Power Supply is required please mention at time of order.

HR-C0250 with HR-C0250/1 & HR-C0280

Technical Specifications:

Product Code	HR-C0250	HR-C0250/220	HR-C0255	HR-C0255/220	HR-C0260	HR-C0270
Product Name	Masonry Saw (Specimen Cutting Machine)					
Blade Diameter (cm)	35		45		60	35
Cutting Depth (cm)	12		17,5		25	10,5
Cutting Length (cm)	60		50		50	180
Engine Power	3 hp - 380 V	3 hp - 220 V	4 hp - 380 V	4 hp - 220 V	5.5 hp - 380 V	4 hp - 380 V
Water Pump Power	0.37 hp - 220 V		0.37 hp - 220 V		0.37 hp - 220 V	0.37 hp - 220 V
Blade Speed (rpm)	2800		1435	1420	1440	2800
Water Tank Capacity (lt)	60		60		65	220
Weight (kg)	110		135		165	190
Dimension (cm)	110x66x125		110x71x135		122x81x150	240x70x140

Spare Parts & Accessories:

Product Code	Product Name	Diameter (mm)
HR-C0250/1	Cutting Blade	350
HR-C0255/1	Cutting Blade	450
HR-C0260/1	Cutting Blade	600
HR-C0280	Clamp for Concrete Cutting Machine	---

HR-C0250/1 with HR-C0280

PULL OUT TEST APPARATUS

The device is used for determining the bond strength between anchored reinforcing steel bar (rebar) and concrete and for checking anchorage performance in-situ.

Manuel Rebar Pull-Out Force Testers have Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.

Two alternatives are offered for Digital Rebar Pull-Out Test Apparatus.

HR-C0295, HR-C0297 and HR-C0299 Models are supplied with Battery Operated Digital Readout Unit, Pressure Transducer, Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.

HR-C0290

HR-C0295/LPI, HR-C0297/LPI and HR-C0299/LPI Models are supplied with LPI Battery Operated Digital Readout Unit, Pressure Transducer, Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.
Rebar Pull-Out Force Testers have a steel hydraulic cylinder.

HR-C0290, HR-C0292, HR-C0295, HR-C0295/LPI, HR-C0297 and HR-C0297/LPI Models are supplied complete with three Jaw Sets for 8/12 - 12/20 - 22/32 mm rebars and Jaw Seat for Ø 8/32 mm rebars which allows user to test anchorage rebar with different diameters. These jaws are made of high strength steel.

HR-C0291/1
HR-C0291/2
HR-C0291/3

HR-C0293, HR-C0299 and HR-C0299/LPI Models are supplied complete with three Jaw Sets for 8/12 - 12/20 - 22/32 mm rebars, Jaw Seat for Ø 8/32 mm rebars and Jaw Seat for Ø 32/40 mm rebars which allows user to test anchorage rebar with different diameters. These jaws are made of high strength steel.

Technical Specifications:

Product Code	Product Name	Rebar dia. (mm)	Stroke (mm)	Dimensions (cm)	Weight (kg)
HR-C0290	Manuel Pull Out Test Apparatus. 30 ton capacity.	Ø 8 to 32	50	80x35x32	50
HR-C0295	Digital Pull Out Test Apparatus. 30 ton capacity.	Ø 8 to 32	50	80x35x32	50
HR-C0295/LPI	LPI Digital Pull Out Test Apparatus. 30 ton capacity.	Ø 8 to 32	50	80x35x32	50
HR-C0292	Manuel Pull Out Test Apparatus. 60 ton capacity.	Ø 8 to 32	50	80x40x32	60
HR-C0297	Digital Pull Out Test Apparatus. 60 ton capacity.	Ø 8 to 32	50	80x40x32	60
HR-C0297/LPI	LPI Digital Pull Out Test Apparatus. 60 ton capacity.	Ø 8 to 32	50	80x40x32	60
HR-C0293	Manuel Pull Out Test Apparatus. 100 ton capacity.	Ø 8 to 40	50	80x43x32	75
HR-C0299	Digital Pull Out Test Apparatus. 100 ton capacity.	Ø 8 to 40	50	80x43x32	75
HR-C0299/LPI	LPI Digital Pull Out Test Apparatus. 100 ton capacity.	Ø 8 to 40	50	80x43x32	75

Spare Parts & Accessories:

Product Code	Product Name
HR-C0290/1	Hydraulic Hand Pump
HR-C0290/2	Hydraulic Jack (Piston). 30 ton capacity.
HR-C0292/2	Hydraulic Jack (Piston). 60 ton capacity.
HR-C0293/2	Hydraulic Jack (Piston). 100 ton capacity.
HR-C0290/3	High Pressure Hose, 1 m
HR-C0295/1	Battery Operated Digital Readout Unit
HR-C9002/LPI	LPI Battery Operated Digital Readout Unit
HR-C0295/2	Pressure Transducer
HR-C0291	Three Jaws Set and Jaw Seat for Ø 8/32 mm rebars
HR-C0294	Three Jaws Set, Jaw Seats for Ø 8/32 mm and for Ø 32/40 mm rebars
HR-C0291/1	Jaw Set for Ø 8-12 mm
HR-C0291/2	Jaw Set for Ø 12-20 mm
HR-C0291/3	Jaw Set for Ø 20-32 mm
HR-C0291/4	Jaw Seat for Ø 8/32 mm rebars
HR-C0291/5	Jaw Seat for Ø 32/40 mm rebars

HR-C0295/1 & HR-C0295/2

HR-C9002/LPI

ROCK BOLT (SOIL NAIL-GROUND ANCHOR) PULL OUT TEST APPARATUS

This device is used to test the firmness of the combination between the anchor and the foundation. It is widely used in railways, highway tunnels, water conservancy projects, coal mine shafts and national defense projects.
Manuel Rebar Pull-Out Force Testers have Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.
Two alternatives are offered for Digital Rebar Pull-Out Test Apparatus.
HR-C0405, HR-C0407 and HR-C0409 Models are supplied with Battery Operated Digital Readout Unit, Pressure Transducer, Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.
HR-C0405/LPI, HR-C0407/LPI and HR-C0409/LPI Models are supplied with LPI Battery Operated Digital Readout Unit, Pressure Transducer, Hydraulic Jack (Piston), 700 bar Hydraulic Hand Pump, High Pressure Hose and Connection apparatus.
Rebar Pull-Out Force Testers have a steel hydraulic cylinder.
HR-C0400, HR-C0402, HR-C0405, HR-C0407, HR-C0405/LPI ve HR-C0407/LPI Models allow the user to test rock bolts up to 32 mm diameter.
HR-C0403, HR-C0409 ve HR-C0409/LPI Models allow the user to test rock bolts up to 38 mm diameter.
Intermediate reduction shaft must be ordered separately depending on the sample type and diameter.

HR-C0295/1 & HR-C0295/2

HR-C9002/LPI

Technical Specifications:

Product Code	Product Name	Rock Bolt dia. (mm)	Dimensions (cm)	Weight (kg)
HR-C0400	Manuel Rock Bolt Pull Out Test Apparatus. 30 ton capacity.	Ø 16 to 32	80x35x32	50
HR-C0405	Digital Rock Bolt Pull Out Test Apparatus. 30 ton capacity.	Ø 16 to 32	80x35x32	50
HR-C0405/LPI	LPI Digital Rock Bolt Pull Out Test Apparatus. 30 ton capacity.	Ø 16 to 32	80x35x32	50
HR-C0402	Manuel Rock Bolt Pull Out Test Apparatus. 60 ton capacity.	Ø 16 to 32	80x40x32	60
HR-C0407	Digital Rock Bolt Pull Out Test Apparatus. 60 ton capacity.	Ø 16 to 32	80x40x32	60
HR-C0407/LPI	LPI Digital Rock Bolt Pull Out Test Apparatus. 60 ton capacity.	Ø 16 to 32	80x40x32	60
HR-C0403	Manuel Rock Bolt Pull Out Test Apparatus. 100 ton capacity.	Ø 16 to 38	80x43x32	75
HR-C0409	Digital Rock Bolt Pull Out Test Apparatus. 100 ton capacity.	Ø 16 to 38	80x43x32	75
HR-C0409/LPI	LPI Digital Rock Bolt Pull Out Test Apparatus. 100 ton capacity.	Ø 16 to 38	80x43x32	75

Spare Parts & Accessories:

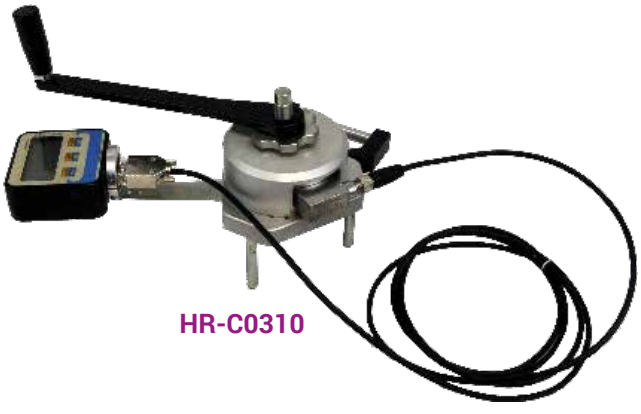
Product Code	Product Name
HR-C0290/1	Hydraulic Hand Pump
HR-C0400/1	Hydraulic Jack (Piston). 30 ton capacity.
HR-C0400/2	Piston placing apparatus for HR-C0400/1.
HR-C0402/1	Hydraulic Jack (Piston). 60 ton capacity.
HR-C0402/2	Piston placing apparatus for HR-C0402/1.
HR-C0403/1	Hydraulic Jack (Piston). 100 ton capacity.
HR-C0403/2	Piston placing apparatus for HR-C0403/1.
HR-C0400/3	High Pressure Hose, 3 m
HR-C0295/1	Battery Operated Digital Readout Unit
HR-C9002/LPI	LPI Battery Operated Digital Readout Unit
HR-C0295/2	Pressure Transducer
HR-C0400/5	SN Bulon Intermediate reduction shaft for 16 mm dia.
HR-C0400/6	SN Bulon Intermediate reduction shaft for 18 mm dia.
HR-C0400/7	SN Bulon Intermediate reduction shaft for 20 mm dia.
HR-C0400/8	SN Bulon Intermediate reduction shaft for 22 mm dia.
HR-C0400/9	SN Bulon Intermediate reduction shaft for 25 mm dia.
HR-C0400/10	SN Bulon Intermediate reduction shaft for 28 mm dia.
HR-C0400/11	SN Bulon Intermediate reduction shaft for 32 mm dia.
HR-C0400/12	İBO Bulon Intermediate reduction shaft for 25 mm dia.
HR-C0400/13	İBO Bulon Intermediate reduction shaft for 32 mm dia.
HR-C0400/14	İBO Bulon Intermediate reduction shaft for 38 mm dia.

HR-C0400

PULL-OFF TESTER DRC

STANDARDS: EN 1015-12, EN 1348, ASTM C1583, ASTM D4541, BS 1881 Part 207, DIN 1048 Part 2

The LDV Pull-Off Tester provides a quick and easy way to determine the adhesion force between two different surfaces/ materials. The Pull-Off tester is generally used to check the adhesion of different kind of materials (i.e. plastic, synthetic, fabric and others), fixed to concrete surfaces.



HR-C0310

The Pull-Off test can be run on site without the need for installing or preparing any equipment during the casting process or while the part is being made.

The test consists in gluing a metal plate to the part being tested: the plate is then pulled off the part, using a top support complete with extraction system coupled to a load cell.

The pull off force is shown on the instrument's digital display. The peak value is logged.

Thanks to its versatile attachment system, the LDV Pull-Off tester can be used for testing the adhesion of mechanical components (anchors) and components which are larger than conventional plates, using support extenders.

The extended point of support makes it possible to test elements which are larger than normal adhesion plates.

Fields of Application

- Any application in which the adhesion between two different materials is to be measured;
- Checking restoration work on damaged concrete structures;
- Work using carbon fibre.

The instrument can be used with bitumen, cement, mortar, plaster, plastics and fabrics.

Reading system with DaTa 500 connection

The result is displayed either by the removable external force reader, which facilitates display when the test position is difficult to access, or by connecting the pull-off tester to the DaTa 500 reader with the cable included in the kit.

Pull Off LDV is supplied complete with Contrast Support, Loading Cell (25 o 50 kN) and Removable Display System, Adjustable Ball Traction Handles, Support Extensions, Pull-off Plate D50, Calibration Report, User Manual and Rigid Carry Case.

Technical Specifications:

Product Name:	Pull Off Tester
Product Code:	HR-C0310
Load Cell:	TC4 25KN with DFI - A/D16 bit reader
Accuracy:	± 0,020 %
Linearity:	± 0,015 %
Working Temperature:	0 - 50°C
Max. Force:	2,5 tons
Filters:	digital, programmable, peak and zero force function
Display:	digital, 5 divisions
Battery Life:	1 year without recharging
Calibration:	digital
Dimensions:	150x150x145 mm
Dimensions with package:	260x230x145 mm
Weight:	1,2 kg
Weight with package:	4 kg

SEMI-AUTOMATIC PULL-OFF TESTER

STANDARDS: EN 1015-12, EN 1348, EN 1542, EN 13693, EN 14496, ASTM C1583, ASTM D4541, ASTM D7522, ASTM D7234, BS 1881 Part 207, DIN 1048 Part 2

Pull-Off Tester is used to evaluate the bond strength of two layers of concrete or the adhesive strength of surface coatings (e.g. cement plaster, lime, wall plaster etc.) on its support.

Semi-Automatic Pull-Off Tester is DC Controlled with voltage regulator.

Calibration Certificate is optional.

All accessories should be ordered separately.

HR-C0335

Technical Specifications:

Product Name:	Pull Off Tester
Product Code:	HR-C0335
Load Capacity:	10 kN
Load Speed:	15-250 N/sec.
Digital Indicator:	kN or Newton
Battery:	Up to 75 tests
Charge Unit:	230 V, 50 Hz
Power Supply:	220 V adapter or Battery (optional)
Weight:	8,5 kg

Spare Parts & Accessories:

Product Code	Product Name
HR-C0330/1	Drill bit with centering point to obtain, Ø 50 mm test surface
HR-C0330/2	Drill bit with centering point to obtain, Ø 20 mm test surface
HR-C0330/3	Metal ring (dinking die), Ø 50x25 mm high, for fresh plaster, to EN 1015-12
HR-C0330/4	Aluminium Test Disc, Ø 50 mm
HR-C0330/5	Aluminium Test Disc, Ø 20 mm
HR-C0330/6	Square Aluminium Test Plate, 50x50mm, conforming to EN 1348
HR-C0330/7	Stainless Steel Disc Ø 50x20 mm thickness, conforming to EN 1015-12
HR-C0330/8	Adhesion Silicon and Gun

AUTOMATIC PULL-OFF TESTER

STANDARDS: EN 1015-12, EN 1348, EN 1542, EN 13693, EN 14496, ASTM C1583, ASTM D4541, ASTM D7522, ASTM D7234, BS 1881 Part 207, DIN 1048 Part 2

Pull-Off Tester is used to evaluate the bond strength of two layers of concrete or the adhesive strength of surface coatings (e.g. cement plaster, lime, wall plaster etc.) on its support.

Automatic Pull-Off Tester is DC Controlled with touch screen.

Calibration Certificate is optional.

All accessories should be ordered separately.

HR-C0345

Technical Specifications:

Product Name:	Pull Off Tester
Product Code:	HR-C0345
Load Capacity:	10 kN
Load Speed:	15-250 N/sec.
Digital Indicator:	kN or Newton or Mpa
Battery:	Up to 99 tests
Charge Unit:	230 V, 50 Hz
Power Supply:	220 V adapter or Battery (optional)
Weight:	15 kg

Spare Parts & Accessories:

Product Code	Product Name
HR-C0330/1	Drill bit with centering point to obtain, Ø 50 mm test surface
HR-C0330/2	Drill bit with centering point to obtain, Ø 20 mm test surface
HR-C0330/3	Metal ring (dinking die), Ø 50x25 mm high, for fresh plaster, to EN 1015-12
HR-C0330/4	Aluminium Test Disc, Ø 50 mm
HR-C0330/5	Aluminium Test Disc, Ø 20 mm
HR-C0330/6	Square Aluminium Test Plate, 50x50mm, conforming to EN 1348
HR-C0330/7	Stainless Steel Disc Ø 50x20 mm thickness, conforming to EN 1015-12
HR-C0330/8	Adhesion Silicon and Gun

PULL-OFF TESTER

STANDARDS: EN 1015-12, EN 1348, EN 1542, EN 13693, EN 14496, ASTM C1583, ASTM D4541, ASTM D7522, ASTM D7234, BS 1881 Part 207, DIN 1048 Part 2

Pull-Off Tester is used to evaluate the bond strength of two layers of concrete or the adhesive strength of surface coatings (e.g. cement plaster, lime, wall plaster etc.) on its support.

Supplied complete with Carrying Case. All accessories should be ordered separately.

Battery operated Pull-Off Tester has Seat ball assuring Axial/C

To perform the test a common electric drill is required.

HR-C0330

Technical Specifications:

Product Name:	Pull Off Tester
Product Code:	HR-C0330
Load Capacity:	10 kN
Resolution:	10 N
Working Range:	0,10 to 10 kN
Accuracy:	better than ± % 1
Repeatability:	better than ± % 1
Hand Wheel rounds:	60 with mechanical round/counter
Dimensions:	21x26x17 cm
Weight:	3,5 kg

Spare Parts & Accessories:

Product Code	Product Name
HR-C0330/1	Drill bit with centering point to obtain, Ø 50 mm test surface
HR-C0330/2	Drill bit with centering point to obtain, Ø 20 mm test surface
HR-C0330/3	Metal ring (dinking die), Ø 50x25 mm high, for fresh plaster, to EN 1015-12
HR-C0330/4	Aluminium Test Disc, Ø 50 mm
HR-C0330/5	Aluminium Test Disc, Ø 20 mm
HR-C0330/6	Square Aluminium Test Plate, 50x50mm, conforming to EN 1348
HR-C0330/7	Stainless Steel Disc Ø 50x20 mm thickness, conforming to EN 1015-12
HR-C0330/8	Adhesion Silicon and Gun

DISC PULL OUT TEST APPARATUS

STANDARDS: BS EN 12504-3:2005

Pull-Out Test Apparatus is used to evaluate concrete resistance as per the strength applied to extract a disc embedded into concrete.

The kit consists of a 100kN capacity hydraulic extraction unit with pump, 0-100kN precision manometer, bearing ring, & 10 x 25 mm diameter steel discs (EN 12504-3) in carrying cases.

Technical Specifications:

Product Code	Product Name	Weight (kg)
HR-C0298	Disc Pull Out Test Apparatus. 10 ton capacity. EN 12504-3	18

HR-C0298

Spare Parts & Accessories:

Product Code	Product Name
HR-C0298/1	Hydraulic Hand Pump
HR-C0298/2	Hydraulic Jack (Piston). 10 ton capacity.
HR-C0298/3	0-100kN precision manometer
HR-C0298/4	25 mm diameter steel discs (EN 12504-3) (Pack of 10)

CONCRETE (SCHMIDT) TEST HAMMER

STANDARDS: EN 12504-2, 13791; ASTM C 805; BS 1881:202

The quality of concrete is mainly judged by its compressive strength directly affecting the load-bearing capacity and durability of concrete structures.

Spring impact energy 2,207 Nm (Joule). Suitable for finished concrete structures and buildings having strength resistances from 10 to 70 N/mm².

This concrete test hammer, has aluminum frame, and thanks to its very accurate manufacture processing and selected components ensures high precision test results in the time.

Supplied complete with calibration curve chart in N/mm² (Mpa) values, abrasive stone and carrying case.

HR-C7010

Calibration Anvil, Used for the verification of the calibration of the hammers.

For more information on the Calibration Anvil, see Calibration Anvil, Model HR-C7000.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C7010	Concrete (Schmidt) Test Hammer	35x18x10	2 kg
HR-C7000	Calibration Anvil	15x15x23	16 kg

DIGITAL CONCRETE TEST HAMMER

STANDARDS: EN 12504-2, ASTM C 805; BS 1881:202

The Digital Concrete Test Hammer for concrete allows for an analysis of on on-site concrete quality in order to estimate the mechanical characteristics of the material. Investigations with the Rebound Hammer are based on the surface “hardness” measurement of material expressed in terms of the “Rebound Index.”

Investigations with the Digital Rebound Hammer falls under the category of Non Destructive methods, as implementation of the testing, in addition to not causing damage to structures and building function, involves relatively low costs.

The Rebound hammer method field of application is mainly directed toward evaluation of the following properties:

HR-C7035

Concrete uniformity checks in different parts of the structure.

The above-mentioned applications can therefore be summarized by stating that rebound hammer tests are to be used to estimate concrete compressive strength of already built structures.

It can be easily connected to a PC or serial printer via the RS 232 port.

A large permanent memory can store up to 48000 results.

Digital Rebound Hammer is supplied with Abrasion Stone, Plastic Case for Stone, Rechargeable Battery and Carrying Case.

Technical Specifications:

Product Name	Digital Test Hammer
Product Code	HR-C7035
Impact Energy	2.207 Nm
Measuring Range of Compressive Strength	10 to 70 N/mm²
Memory	48000 results
Screen	16-bit true color, 176×220 resolution, 5 grades backlight adjustment
Connection	USB 2.0
Dimensions (mm)	60x90x290
Dimensions with Package (mm)	150x350x440
Weight (kg)	4,5

MECHANICAL TEST HAMMER (MADE IN ITALY)

STANDARDS: EN 12504-2, ASTM C 805; BS 1881:202

The Rebound Hammer for concrete allows for an analysis of on on-site concrete quality in order to estimate the mechanical characteristics of the material. Investigations with the Rebound Hammer are based on the surface “hardness” measurement of material expressed in terms of the “Rebound Index.”

Investigations with the Mechanical Rebound Hammer falls under the category of Non Destructive methods, as implementation of the testing, in addition to not causing damage to structures and building function, involves relatively low costs.

The Mechanical Rebound Hammer is supplied with a rubberised plastic handle which facilitates manoeuvrability at work sites and protects it from possible accidental shock. The Mechanical Test Hammer is entirely made in Italy.

HR-C7020

The Rebound hammer method field of application is mainly directed toward evaluation of the following properties:

Concrete uniformity checks in different parts of the structure.
Estimation of the mechanical characteristics of the concrete through the use of correlation curves.
Evaluation of changes in concrete properties over time.
Verification of concrete characteristics on-site during the testing phase.

The above-mentioned applications can therefore be summarized by stating that rebound hammer tests are to be used to estimate concrete compressive strength of already built structures.

Mechanical Test Hammer is supplied with Abrasion Stone, Plastic Case for Stone, Plastic Grid 30x30 cm, Pencil, Fenolftaleina 100ml, Paper Note, Operating Manual, Calibration Report and Soft Bag.

Technical Specifications:

Product Name:	Mechanical Rebound Hammer
Product Code	HR-C7020
Impact Energy	2.207 Nm
Measuring Range of Compressive Strength	5 to 120 N/mm2
Dimensions (mm)	70x70x300
Dimensions with Package (mm)	300x150x400
Weight (kg)	1,3
Weight with Package (kg)	4

HR-C7020

DIGITAL CONCRETE TEST HAMMER (MADE IN ITALY)

STANDARDS: EN 12504-2, ASTM C 805; BS 1881:202

The Digital Concrete Test Hammer for concrete allows for an analysis of on on-site concrete quality in order to estimate the mechanical characteristics of the material. Investigations with the Rebound Hammer are based on the surface “hardness” measurement of material expressed in terms of the “Rebound Index.”

Investigations with the Digital Rebound Hammer falls under the category of Non Destructive methods, as implementation of the testing, in addition to not causing damage to structures and building function, involves relatively low costs.

The Digital Test Hammer is entirely made in Italy.

The Rebound hammer method field of application is mainly directed toward evaluation of the following properties:

Concrete uniformity checks in different parts of the structure.

Estimation of the mechanical characteristics of the concrete through the use of correlation curves.

Evaluation of changes in concrete properties over time.

Verification of concrete characteristics on-site during the testing phase.

The above-mentioned applications can therefore be summarized by stating that rebound hammer tests are to be used to estimate concrete compressive strength of already built structures.

Digital Rebound Hammer is supplied with Abrasion Stone, Plastic Case for Stone, Plastic Grid 30 x 30 cm, Pencil, Fenolftaleina 100ml, Paper Note, Operating Manual, Calibration Report, SD Card, Rechargeable Feeder and Carrying Case.

HR-C7040

Technical Specifications:

Product Name:	Digital Test Hammer
Product Code	HR-C7040
Impact Energy	2.207 Nm
Measuring Range of Compressive Strength	5 to 120 N/mm²
Memory	2 GB
Screen	LCD 64x128
Connection	USB & SD Kart
Power Supply	5 x LR6 Rechargeable Battery
Working Temperature	-10 + 60 °C
Dimensions (mm)	65x80x320
Dimensions with Package (mm)	420x280x180
Weight (kg)	1,4
Weight with Package (kg)	5

HR-C7040

PROCEQ (SCHMIDT) TEST HAMMERS

STANDARDS: EN 12504-2, 13791; ASTM C 805; BS 1881:202

The Concrete Test Hammers are the most widely used portable NDT measuring instruments for a rapid assessment of the condition of a concrete structure.

ORIGINAL SCHMIDT

The classic Original Schmidt Hammer that became the basis of every major rebound hammer testing standard worldwide.

HR-C7015

Type N/L: The benchmark against which all rebound hammers are compared and the basis of every international rebound hammer standard. Available with different impact energies allowing customers to test a wide variety of materials and types of structure.

Original Schmidt Hammers are supplied with Impact Device, Carrying Case, Grinding Stone and Operating Instructions.

Calibration Certificate should be ordered separately.

Technical Specifications for ORIGINAL SCHMIDT

ORIGINAL SCHMIDT		
Type	Type N	Type L
Product Code	HR-C7015	HR-C7019
Impact Energy Measuring Range of Compressive Strength	2.207 Nm 10 to 70 N/	0.735 Nm 10 to 70 N/

SILVER SCHMIDT

The SilverSchmidt is a unique integrated concrete test hammer featuring true rebound value calculated from the quotient of the impact velocity and rebound velocity to provide maximum accuracy.

HR-C7023

ST: Standard model. Hammerlink software provided for performing firmware upgrades and selecting statistics presets only. Useful memory limited to the last 20 series.

PC: Full Hammerlink software functionality. Extended memory usage. Download to PC. User defined custom curves.

Type N: Standard impact energy. Test object should have minimum thickness of 100 mm (3.9″) and be firmly fixed in the structure.

Type L: Low impact energy. Suitable for brittle objects or structures less than 100 mm (3.9″) thick.

Intuitive User Interface

The language independent user interface is simple to use and provides all of the functionality necessary for a rapid assessment of the structure. Practically every command can be activated either directly or in two consecutive steps.

Data Acquisition and Processing

Pre-programmed statistical methods in accordance with all of the major standards assures an error free, rapid determination of the rebound value.

Reduced dispersion and direct conversion to compressive strength based on validated curves, regional curves or user defined curves bring improved accuracy to compressive strength estimates.

All data is automatically saved and the last 20 series may be reviewed in the data list.

Hammerlink – Data Analysis made simple

The Windows based software Hammerlink unlocks the full capabilities of the SilverSchmidt PC version, making it an even more powerful instrument for structural assessment.

HİRA TESTING EQUIPMENT

Hammerlink features:
- Extended memory usage
- Rapid uniformity testing with the summary view
- User defined conversion curves (polynomial and exponential)
- User defined statistical methods
- Printouts
- Export to third party software

Extending the range to fresh Concrete
The mushroom plunger in combination with the SilverSchmidt PC Type L hammer extends the lower measuring range down to approximately 5 MPa (725 psi).

This coupled with the SilverSchmidt's inherent angle independency makes it the perfect tool for early strength applications such as determining when to remove formwork in tunnel linings.

SilverSchmidt Hammers are supplied with Impact device, carrying case, grinding stone and operating instructions.

Calibration Certificate should be ordered separately.

Technical Specifications for SILVER SCHMIDT

SILVER SCHMIDT				
Type	Type ST/N	Type PC/N	Type ST/L	Type PC/L
Product Code	HR-C7023	HR-C7027	HR-C7025	HR-C7029
Impact Energy Measuring Range of Compressive Strength	2.207 Nm 10 to 100 N/mm2 (1'450 to 14'500 psi)		0.735 Nm 10 to 100 N/mm2 (1'450 to 14'500 psi)	

Features

Product Name:	Silver Schmidt	Original Schmidt
Display	Integrated Digital Display	Mechanical Display
Memory	400 series of 10 measurements (PC N and PC L versions only)	---
Connections	USB interface to PC	---
Standards	EN 12504-2, EN 13791, ASTM C805	EN 12504-2, EN 13791, ASTM C805

The Schmidt Concrete Test Hammers can be applied on all concrete structures such as bridges, buildings, retaining walls, barrages and many more. But they are also the perfect instruments to test in tunnels (e.g. the formwork stripping strength which is the concrete compressive strength fc to be achieved before removal of the formwork).

CALIBRATION ANVIL

STANDARDS: EN 12504-2, ASTM D5873, C805

Used for the verification of the calibration of the hammers.

The EN 12504:2 Specification requires obligatory the use of the anvil for the hammer tests.

The Standard specifies; before a sequence of tests on a concrete surface, take and record readings using the steel reference anvil and check to ensure that they are within the range recommended by the manufacturer. If they are not, clean and/or adjust the hammer.

After tests, take readings using the steel anvil, record them and compare them with those taken prior to the test. If the results differ, clean and/or adjust the hammer and repeat the test.

Made of hardened steel according to the standards.

HR-C7000

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-C7000	Calibration Anvil	Ø 15x23	16

ULTRASONIC PULSE VELOCITY AND PULSE ECHO TESTING OF CONCRETE

STANDARDS: EN 12504-4, ASTM C 597-02, BS 1881 Part 203, ISO 1920-7:2004

Structural defects cause serious damages and collapses. Ultrasonic testing provides information on the strength and uniformity of concrete, rock, composites, ceramics, wood, epoxy, refractory materials and can be used to detect and localize voids, pipes, cracks and defects.

The pulse velocity in a material depends on its density and its elastic properties which in turn are related to the quality and the compressive strength of the concrete. It is therefore possible to obtain information about the properties of components by sonic investigations.

Proceq offers the most versatile instrument for ultrasonic testing of concrete.

Ultrasonic Pulse Velocity - Pundit Lab

Measurement performance; Optimized pulse shaping, automated transmission settings for optimum performance and a range of new, more powerful transducers ensure accurate, stable measurements.

Integrated waveform display; Allows analysis of the received signal and manual triggering directly on the instrument.

On-line data acquisition; Full remote control of all transmission parameters, data logging function and functionality that turns your PC into an oscilloscope.

USB interface and data analysis software; Data analysis and export to third party programs.

Open interface; Control Pundit Lab using third party software such as LabVIEW.
Pundit Lab consisting of: Display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA(LR6) batteries, data carrier with software, documentation and carrying case.

Ultrasonic Pulse Velocity - Pundit Lab Plus
Integrated gain stage; Removes the need for an external amplifier when using exponential transducers and long cables.

HR-C7050

HİRA TESTING EQUIPMENT

Compressive strength measurement; Conversion curves for strength estimation can be created in the software and uploaded to the instrument to give instant strength estimations on site.

Combined estimates with rebound hammer; SONREB curves may also be uploaded onto the instrument for improved compressive strength estimates in combination with rebound hammer measurements.

Time stamp; A real time clock has been integrated to provide a time stamp to every measurement recorded.

Review list; Saved measurements may be reviewed directly on site without the need for a PC connection.

Pundit Lab Plus consisting of: Display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA(LR6) batteries, data carrier with software, documentation and carrying case

HR-C7050

Pundit Link Analysis Software
The Windows based software Pundit Link, developed by Proceq SA, unlocks the full capabilities of the Pundit Lab, providing the user with:

- Waveform visualization and analysis turning your PC into an oscilloscope
- Interactive adjustment of trigger point
- On-line data acquisition
- Full remote control of the instrument instrument including programmable data logging functionality
- Export of data to third party applications
- (Pundit Lab+ only) creation of conversion curves for compressive strength (exponential, polynomial).
- (Pundit Lab+ only) creation of SONREB curves for combined (ultrasonic/rebound value) estimates of compressive strength

Technical Specifications

Product Code	HR-C7055	HR-C7050
Product Name	Ultrasonic Pulse Velocity and Pulse Echo Testing of Concrete	
	Pundit Lab	Pundit Lab Plus
Transit Time Range	0.1 – 9999 µs	
Resolution	0.1 µs	
Energising Pulse	125 V, 250 V, 350 V, 500V, AUTO	
Tx Frequency Range	24 kHz – 500 kHz	
Transit Time	Yes	
Pulse Velocity	Yes	
Path Length	Yes	
Surface Velocity	Yes	
Crack Depth	Yes	
Memory	> 500 readings	
Power Supply	Mains/Battery(>20h)/USB	
IP Classification	IP42	
Integrated Gain Stage	1x, 10x, 100x	1x, 2x, 5x, 10x, 20x, 50x, 100x, 200x, 500x, 1000x
Compressive Strength	---	Yes
SONREB Method (Ultrasonic plus rebound hammer for compressive strength)	---	Yes
Time Stamp for Measurements	---	Yes
Measurement Review List on Instrument	---	Yes

CONCRETE COVERMETERS

The Professional Multi-detectors can be used to locate live cables and wooden sub-constructions as well as ferrous and non-ferrous metals.

The automatic calibration eliminates errors and the LED luminous ring displays results in conjunction with the Centre Finder scale.

Complete with 1 x 9 V 6LR61 (block) battery and Protective Bag.

HR-C7070

HR-C7075

Technical Specifications:

Product Code	Product Name	Maximum Detection Depth			Dimensions (mm)	Weight (kg)
		Steel	Copper	Copper Wiring		
HR-C7070	Concrete Covermeter	100 mm	80 mm	50 mm	101x342x174	0,29
HR-C7075	Concrete Covermeter	120 mm	80 mm	50 mm	85x200x32	0,27

PROFOMETER PM-600 – ADVANCED CONCRETE COVER METER – ENTRY LEVEL MODEL

STANDARDS: BS 1881 Part 204, DIN 1045

The Profometer PM-600 is an Advanced Cover Meter for the precise and non-destructive measurement of concrete cover and rebar diameters and the detection of rebar locations using the eddy current principle with pulse induction as the measuring method.

Based on the new generation Profometer Touchscreen unit, the instrument offers real time control over the measurement procedure directly on site. The high resolution color display allows best possible measuring and analysis of the statistical data for an entire working day (battery lifetime > 8h).

The instrument comes along with a Universal Probe including a spot probe especially suited for areas with congested rebar arrangement such as columns, girders and slabs over columns.

Lightweigth IP 67 universal probe with detachable scan cart and spot functionality for measurements where space is limited.

PM-600

Features

- 1-Layer Neighboring Rebar Correction (NRC)
- Visual assistance for scanning speed and signal strength control
- Settings directly accessible on the measurement screen
- Graphical display of measured values and minimum cover set
- Change settings before and after storage
- 11 Languages and timezone supported
- PC Software; Profometer Link to download saved data to a PC for analysis and export to third party applications
- Connections; USB host / device and Ethernet
- Measurement Modes; Rebar location, diameter estimation and cover measurement and Data acquisition

HİRA TESTING EQUIPMENT

Applications

- Locate rebars before drilling, cutting and coring
- Spot check of rebar cover
- Measurements on rough surfaces with scan cart

Technical Specifications:

Product Code	PM-600
Product Name	Profometer - Advanced Concrete Cover Meter
Cover Measuring Range	Up to 185 mm (7.3")
Cover Measuring Accuracy	± 1 mm to ± 4 mm (0.04" to 0.16")
Measuring Resolution	Depending on diameter and cover
Path Measuring Accuracy on Smooth Surface	± 3 mm (0,12 inch) + 0.5 to 1.0 % of measured length
Display	7" color rugged touchscreen unit (800 x 480 pixels) with dual core processor
Diameter Measuring Range	Cover up to 63 mm (2.50 inch), Diameter up to 40 mm (# 12)
Diameter Measuring Accuracy	± 1 on single rebar
Memory	Internal 8 GB Flash memory
Regional Settings	Metric and imperial units and multi-language supported
Battery	3.6 V, 14.0 Ah
Battery Lifetime	> 8h (in standard operating mode)
Operating temperature	-10°C – 50°C
Humidity	< 95 % RH, non-condensing
IP Classification	Touchscreen IP54, Universal Probe IP67
Directives	CE certification
Dimensions	250 x 162 x 62 mm
Weight (of display device)	1525 g (incl. Battery)
Power Input	12 V +/-%25 / 1,5 A

PROFOMETER PM-630 AL – ADVANCED SCAN CONCRETE COVER METER

STANDARDS: BS 1881 Part 204, DIN 1045

The Profometer PM-630 Al is an Advanced Cover Meter is a sophisticated instrument extending the application range of the Profometer PM-600 with the Line and Area Scan Modes and an extensive choice of statistical views.

Based on the new generation Profometer touchscreen with universal probe and scan cart. Enhanced correction factor for maximum cover accuracy on congested rebar arrangements. Dedicated functionalities for mapping concrete cover and for reporting one layer rebar arrangements.

It is especially suited to measuring large areas, long lines or when comprehensive reporting is required. For example when inspecting tunnels, retaining walls, concrete slab soffits, bridge slabs or dams.

The instrument offers real time control over the measurement procedure directly on site. The high resolution color display allows best possible measuring and analysis of the statistical data for an entire working day (battery lifetime > 8h).

PM-630 AL

Features

- 2-Layer Neighboring Rebar Correction Artificial Intelligence (NRC AI)
- Cover calibration
- Zoom in to scale rebars according to your needs
- Display with cover curve or signal strength curve
- Signal strength spectrum for further evaluation
- Visual assistance for scanning speed and signal strength control
- Settings directly accessible on the measurement screen
- Graphical display of measured values and minimum cover set
- Change settings before and after storage
- 11 Languages and timezone supported
- PC Software; Profometer Link to download saved data to a PC for analysis and export to third party applications
- Connections; USB host / device and Ethernet
- Measurement Modes; Rebar location, diameter estimation and cover measurement and Data acquisition, One layer scans, tomographic view, advanced statistics

Applications

- Locate rebars before drilling, cutting and coring
- Spot check of rebar cover
- Measurements on rough surfaces with scan cart
- Measuring wide areas over long distances
- Conformity check of new buildings
- Fire resistance assessment

Technical Specifications:

Product Code	PM-630 AI
Product Name	Profometer - Advanced Scan Concrete Cover Meter
Cover Measuring Range	Up to 185 mm (7.3“)
Cover Measuring Accuracy	± 1 mm to ± 4 mm (0.04” to 0.16”)
Measuring Resolution	Depending on diameter and cover
Path Measuring Accuracy on Smooth Surface	± 3 mm (0,12 inch) + 0.5 to 1.0 % of measured length
Display	7” color rugged touchscreen unit (800 x 480 pixels) with dual core processor
Diameter Measuring Range	Cover up to 63 mm (2.50 inch), Diameter up to 40 mm (# 12)
Diameter Measuring Accuracy	± 1 on single rebar
Memory	Internal 8 GB Flash memory
Regional Settings	Metric and imperial units and multi-language supported
Battery	3.6 V, 14.0 Ah
Battery Lifetime	> 8h (in standard operating mode)
Operating temperature	-10°C – 50°C
Humidity	< 95 % RH, non-condensing
IP Classification	Touchscreen IP54, Universal Probe IP67
Directives	CE certification
Dimensions	250 x 162 x 62 mm
Weight (of display device)	1525 g (incl. Battery)
Power Input	12 V +/-%25 / 1,5 A

PROFOMETER PM-650 AL – ADVANCED CROSS-SCAN CONCRETE COVER METER

STANDARDS: BS 1881 Part 204, DIN 1045

The Profometer PM-650 Al extends the measuring modes of the Profometer PM-630 Al with the unique Cross-Line Mode and further analysis functions. The Cross-Line Mode allows users to measure the rebar of the first and second layer typically arranged in a rectangular mesh.

Advanced cover meter based on the new generation Profometer touchscreen with universal probe and scan cart. Enhanced correction factor for maximum cover accuracy on congested rebar arrangements. Dedicated functionalities for mapping concrete cover and for reporting any 2D rectangular rebar arrangement.

Features

- 2-Layer Neighboring Rebar Correction Artificial Intelligence (NRC AI)
- Cover calibration
- Zoom in to scale rebars according to your needs
- Display with cover curve or signal strength curve
- Signal strength spectrum for further evaluation
- Visual assistance for scanning speed and signal strength control
- Settings directly accessible on the measurement screen
- Graphical display of measured values and minimum cover set
- Change settings before and after storage
- 11 Languages and timezone supported
- PC Software; Profometer Link to download saved data to a PC for analysis and export to third party applications
- Connections; USB host / device and Ethernet
- Measurement Modes; Rebar location, diameter estimation and cover measurement and Data acquisition, One layer scans, tomographic view, advanced statistics
- Two layers scans, tomographic view, advanced statistics

PM-650 AL

Applications

- Locate rebars before drilling, cutting and coring
- Spot check of rebar cover
- Measurements on rough surfaces with scan cart
- Measuring wide areas over long distances
- Conformity check of new buildings
- Fire resistance assessment
- Investigation of unknown structures
- Complete, 2D and 3D imaging of rebar layout

Technical Specifications:

Product Code	PM-650 Al
Product Name	Profometer - Advanced Cross-Scan Concrete Cover Meter
Cover Measuring Range	Up to 185 mm (7.3")
Cover Measuring Accuracy	± 1 mm to ± 4 mm (0.04" to 0.16")
Measuring Resolution	Depending on diameter and cover
Path Measuring Accuracy on Smooth Surface	± 3 mm (0,12 inch) + 0.5 to 1.0 % of measured length
Display	7" color rugged touchscreen unit (800 x 480 pixels) with dual core processor
Diameter Measuring Range	Cover up to 63 mm (2.50 inch), Diameter up to 40 mm (# 12)
Diameter Measuring Accuracy	± 1 on single rebar
Memory	Internal 8 GB Flash memory
Regional Settings	Metric and imperial units and multi-language supported
Battery	3.6 V, 14.0 Ah
Battery Lifetime	> 8h (in standard operating mode)
Operating temperature	-10°C – 50°C
Humidity	< 95 % RH, non-condensing
IP Classification	Touchscreen IP54, Universal Probe IP67
Directives	CE certification
Dimensions	250 x 162 x 62 mm
Weight (of display device)	1525 g (incl. Battery)
Power Input	12 V +/-%25 / 1,5 A

CRACK DETECTION MICROSCOPE

The Crak Detection Microscope is suitable for measuring cracks in concrete. This microscope is further enhanced by having its own adjustable light source for darkened conditions.

Current codes of practice, state that calculated maximum crack widths should not exceed certain values. BS 8110: Part 2 for concrete permits a crack width of 0.3 mm which is 15 divisions on the scale for most types of environment.

The image is focused by turning a knurled knob on the side of the instrument.

Two models are available as 40X and 100X.

100X Crak Detection Microscope Measuring range is 1,6 mm which are subdivided into 0,02 mm divisions.

Complete with carrying case.

HR-C7125

Technical Specifications:

Product Code	Product Name	Magnification	Dimensions (mm)	Weight (kg)
HR-C7125	Crack Microscope	X40	50x23x138	0,550
HR-C7126	Crack Microscope	X100	50x23x138	0,550

MECHANICAL STRAIN GAUGE

STANDARDS: BS 1881:206

Mechanical Strain Gauges are used for determining the length changes in different parts of a structure. Especially designed to perform measurement on concrete structures. It can also be used for other structures like steel, wood etc.

There are models in different lengths according to the standard length to be measured.

The digital dial gauge has a resolution of 0.001 mm and an output for PC connection.

Mechanical Strain gauge with digital dial gauge, standard bar, calibration bar, datum discs (pack of 50), adhesive compound for datum discs and carrying case supplied with all models.

Serial cable for PC connection should be ordered separately.

HR-C7132

Technical Specifications:

Product Code	Product Name	Measuring Base (mm)	Dimensions (mm)	Weight (kg)
HR-C7130	Mechanical Strain Gauge	100x5	300x400x110	2,5
HR-C7131	Mechanical Strain Gauge	200x5	300x400x110	3
HR-C7132	Mechanical Strain Gauge	300x5	300x600x110	3,5
HR-C7133	Mechanical Strain Gauge	600x5	300x600x110	4

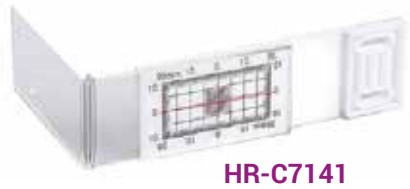
Spare Parts & Accessories:

Product Code	Product Name
HR-C7130/1	Datum Discs. Pack of 50.
HR-C7130/2	Adhesive, 20 gr
HR-C7130/3	Standard Bar
HR-C7130/4	Calibration Bar
HR-C7130/5	Digital Dial Gauge, 0.001 mm
HR-C7130/6	Serial Cable
HR-C7130/7	Carrying Case for HR-C7130 & HR-C7131
HR-C7130/8	Carrying Case for HR-C7132 & HR-C7133

CRACK METER

Crackmeters are used to monitor the progress of surface cracks in structural components and buildings caused by subsidence or mechanical failure.

Two models are available, depending on the type and positioning of the lesion to be detected, the Linear Crackmeter for linear cracks and the Angular Crackmeter for Angular cracks.



HR-C7141

They are composed of two transparent acrylic resin plates, overlapping and able to move relative to each other.

The upper plate is engraved with a reference cross, while the underlying one is marked with a grid in millimetres, both horizontal and vertical, which can be zeroed along its axes.

The plates are mounted to the wall or structure with screws or other mechanical mounting equipment (wall plugs, glue, resin, silicone) in such a way that the cross on the upper plate is centred on the origin (centre) of the grid underlying it.

HR-C7140

The movement of the crack can then be read in millimetres by monitoring the displacement of the top plate (cross) relative to the underlying one (grid).

Crackmeters have the advantages of being much less costly than other solutions, as well as being easy to install and use.

Technical Specifications:

Product Code	Product Name
HR-C7140	Crack meter, Linear
HR-C7141	Crack meter, Angolar

CONCRETE WATER IMPERMEABILITY TESTERS

STANDARDS: EN 12390-8

Concrete Water Impermeability Testers are used to determine the depth of penetration of the water into the hardened concrete specimens (impermeability) under known time and pressure.

The system can test 150x150x150 mm, 200x200x200 mm cube or 100x200 mm, 150x300 mm cylinder specimens.

3 or 6 specimen capacity models and with and without quantitative measurement equipment of water penetratoion models are available.

Pressure to the sample, up to 8 bar with 0,2 bar precision is generated by way of compressed air applied to the integral water tank and controlled by a pressure regulator; with a pressure gauge.

The test sets with the quantitative measurement equipment of water penetration the penetration of water is measured through the burettes. The system comprises impermeability gaskets for every cell.

The apparatus has to be fitted with the suitable air compressor with maximum working pressure of bar.

The Air Compressor should be ordered separately.

HR-C0300

HR-G0825

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G0825	Air Pressure Pump, 8 bar, 25 lt	60x30x60	30	220 V, 50-60 Hz, 1 ph

Technical Specifications:

Product Code	Product Name	Specimen Capacity	Dimensions (cm)	Weight (kg)
HR-C0300	Concrete Water Impermeability Tester with Quantitative Measurement Equipment	3 pieces	50x160x180	125
HR-C0305	Concrete Water Impermeability Tester with Quantitative Measurement Equipment	6 pieces	50x160x180	165
HR-C0307	Concrete Water Impermeability Tester without Quantitative Measurement Equipment	3 pieces	50x160x180	90
HR-C0308	Concrete Water Impermeability Tester without Quantitative Measurement Equipment	6 pieces	50x160x180	130

CEMENT

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

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

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

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BLAINE AIR PERMEABILITY APPARATUS

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

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

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

Calibration Sand and Reference Cement should be ordered separately.

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE8000

DIGITAL SEMI-AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS

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

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

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

The device is controlled using a button.

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

Calibration Sand and Reference Cement should be ordered separately.

HR-CE8005

Technical Specifications:

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

Spare Parts & Accessories:

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

AUTOMATIC BLAINE AIR PERMEABILITY APPARATUS

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

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

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

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

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

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

HR-CE8010

Spare Parts & Accessories:

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

Technical Specifications:

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

BULK & PACKAGED CEMENT SAMPLER

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

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

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

HR-CE2000

HR-CE2005

Technical Specifications:

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

BULK DENSITY OF CEMENT

STANDARDS: ASTM C191, ASTM C110

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

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

The discharge hole of the funnel has 8 mm dia.

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE2100

AIR CONTENT METER

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

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

Made from cast aluminum. The test pot 1 lt capacity and the upper part are air-tight sealedby means of two quick action spring clamps.

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

A built-in operated air pump is also included.

The push-buttons TEST and CORRECTION are arranged to perform the test in a simple and quick system.

Technical Specifications:

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

HR-CE9020

BULK DENSITY OF LIME

STANDARDS: EN 459-2, DIN 1060

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

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

Technical Specifications:

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

HR-CE2125

DROPPING BALL APPARATUS

STANDARDS: BS 4551-1, 6463-4

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

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

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

The base of the stand is machined. Chromed finishing.

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

HR-CE2150

Technical Specifications:

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

Spare Parts & Accessories:

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

FLOW CONE SET

STANDARDS: EN 445

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

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

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

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

HR-CE9030

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

Technical Specifications:

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

Spare Parts & Accessories:

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

MUD BALANCE

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

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

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

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

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

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

HR-CE9050

Technical Specifications:

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

MARSH FUNNEL VISCOMETER SET

STANDARDS: ISO 2431

Utilized for viscosity determination on drilling muds and fluid materials.

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

Plastic break-resistant made.

Supplied complete with 1 lt Plastic Measuring Cup.

HR-CE9040

Technical Specifications:

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

Spare Parts & Accessories:

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

VICAT TEST SET

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

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

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

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

700 g Additional Weight should be ordered separately.

Technical Specifications:

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

HR-CE9100

Spare Parts & Accessories:

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

AUTOMATIC VICAT TEST SET

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

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

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

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

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

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

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

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

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

Other accessories should be ordered separately.

HİRA TESTING EQUIPMENT

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE9120

GILLMORE APPARATUS

STANDARDS: ASTM C91, C141, C266, AASHTO T154

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

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

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE2175

FLOW CHANNEL TEST APPARATUS (FUNNEL GROOVE)

STANDARDS: EN 13395-2, UNI 8997

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

Technical Specifications:

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

HR-CE2200

LE CHATELIER FLASK

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

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

The glass flask has a 250ml capacity.

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

HR-CE9125

Technical Specifications:

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

LE CHATELIER TEST SET

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

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

The mould consists of a spring tensioned split cylinder Ø30 x 30 mm with two indicator stems which measure 150 mm from the points to the center line of the cylinder and O ring.

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

HR-CE9135

Spare Parts & Accessories:

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

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (g)
HR-CE9130	Le Chatelier Mould	Ø 30x30	30
HR-CE9135	Le Chatelier Test Set	340x290x80	2000

PAT TEST (SOUNDNESS OF HYDRATED LIME AND GYPSUM PLASTERS)

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

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

Consisting of a Brass Ring Mould, Ø 100 x 5 mm.

The mould has an inside taper of 5°.

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

HR-CE2225

Technical Specifications:

Product Code	Product Name
HR-CE2225	Pat Test Apparatus

Spare Parts & Accessories:

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

LE CHATELIER WATER BATH

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

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

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

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

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

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

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

Le Chatelier Moulds are should be ordered separately.

HR-CE9150

Technical Specifications:

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

WATER RETENTION APPARATUS

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

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

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

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

Technical Specifications:

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

HR-CE9170

Yedek Parça & Aksesuarlar:

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

FINENESS TEST SPRAY APPARATUS

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

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

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

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

HR-CE8600 with accessories

Technical Specifications:

Product Code	Product Name
HR-CE8600	Fineness Test Spray Apparatus

Spare Parts & Accessories:

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

CEMENT AUTOCLAVE

STANDARDS: ASTM C151, C490; UNE 7207

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

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

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

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

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

HR-CE9600

Technical Specifications:

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

LENGTH CHANGE (SHRINKAGE AND EXPANSION)

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

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

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

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

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

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

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

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

HR-A0905 with HR-G0877

Technical Specifications:

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

HR-A0905 with HR-G0890

Spare Parts & Accessories:

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

HR-A0905 with HR-G0875

HR-CE9010

HR-CE9010/2

HR-CE9010/1

HR-CE9000/T

PLUNGER PENETRATION APPARATUS

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

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

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

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

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE9230

CALCIMETER

Calcimeter is used to determine the Carbonate content CaCO3 in Limestone and Lime Marl.

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

As the volume of the produced gas (Co2) is in relation to the CaCo2 amount contained in the material, it is possible to calculate the percentage of CaCo3.

Technical Specifications:

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

HR-CE2250

CEMENT FLOW TABLES

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

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

Manual and motorized two models are available.

The hand operated model is fitted with a hand wheel.

The motor operated model is driven by a motor speed reducer through a mechanical coupling at the rate of 1 revolution per second. The number of drops is preset on a counter and the machine stops automatically at the end of the cycle.

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

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

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

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

Both models are supplied complete with flow mould and tamper.

HR-CE9200

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE9215

MANUEL MORTAR MIXER

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

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

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

The mixer is supplied complete with bowl and the beater.

HR-CE9250

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE9250/1

HR-CE9250/2

AUTOMATIC MORTAR MIXER

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

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

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

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

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

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

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

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

Spare Parts & Accessories:

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

HR-CE9255

Technical Specifications:

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

HİRA TESTING EQUIPMENT

CEN REFERENCE SAND

STANDARDS: EN 196-1

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

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

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

Reference sand size is 0,08÷2 mm.

HR-CE9285

Technical Specifications:

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

Technical Specifications:

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

CEMENT MOULDS

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

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

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

All dimensions and specifications comply with the related standards.

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

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

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

Steel Inserts and Reference Rods should be ordered separately.

HR-CE9000

HR-CE9300

HR-CE9500

HR-CE9400

HR-CE9010/2

HR-CE9010/1

HR-CE9010

Technical Specifications:

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

Spare Parts & Accessories:

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

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

HR-CE9555

HR-CE9570

JOLTING TABLE APPARATUS

STANDARDS: EN 196-1, EN ISO 679

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

The drop height is 15 mm.

The machine is equipped with a digital counter which provides automatic shut off at end of preset drop numbers. Rapid mould lock and release system allows easy and quick operation.

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

The motor and gearbox assembly is enclosed in a protective housing, which promotes user safety (the moving parts are inaccessible) and long life for the gearbox.

HR-CE9275

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

Technical Specifications:

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

VIBRATING MACHINE

STANDARDS: BS 4550

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

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

The machine is supplied complete with Control Panel with Timer.

70.7 mm Cube Mould should be ordered separately.

HR-CE2275

Technical Specifications:

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

CURING CABINETS

STANDARDS: EN 196-1, ISO 679

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

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

Step Controlled (10 programs) Curing Cabinet with LCD Touch Screen provides 20 ± 1°C temperature and over 95% RH humidity for cement specimens.

Internal chamber and racks are made of stainless steel. The temperature is maintained at 20 ± 1°C by a immersion heater and refrigerator unit which are supplied complete with cabinet. The cabinet is equipped with a digital control unit which controls and monitors the temperature.

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

HR-CE9300

Technical Specifications:

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

TRANSVERSE DEFORMATION JIG

STANDARDS: EN 12004

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

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

HR-CE4500

Technical Specifications:

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

Spare Parts & Accessories:

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

CEMENT COMPRESSION / FLEXURAL TEST MACHINE

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

HR-CE1500

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

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

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

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

The only required operations are;

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

The Automatic Cement Compression and Flexural Testing Machines consist of;

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

Cement Compression & Flexural Load Frames

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

Upper Platens

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

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

Distance Pieces

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

Loading Cylinder Assembly & Limit Switch

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

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

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

HYDRAULIC POWER PACK AND DIGITAL DATA ACQUISITION & CONTROL SYSTEM

HR-CE4000

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

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

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Maximum capacity is 400 bar.

Distribution Block

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

Load Cell

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

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

Oil Tank

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

HİRA TESTING EQUIPMENT

Digital Readout and Control Unit

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

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

The unit has easy to use menu options.

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

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

Software

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

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

Main Features

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

Technical Specifications:

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

Safety Features

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

Technical Specifications:

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

Spare Parts & Accessories:

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

HR-CE1528

HR-CE1527

HR-CE1525

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

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

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

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

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

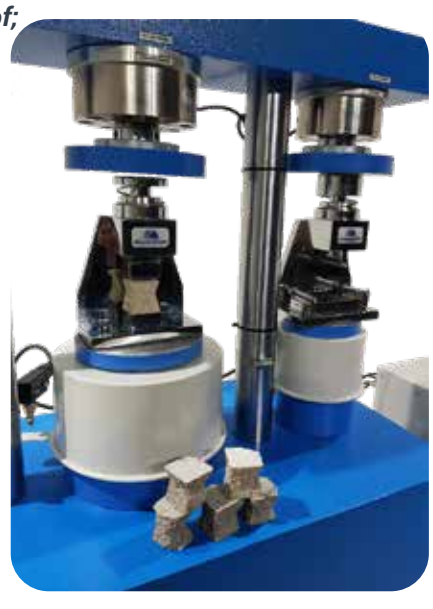
The Automatic Cement Compression and Flexure Testing Machines allow less experienced operators to perform the tests.

The only required operations are;

HR-CE1500/TS

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

The Automatic Cement Compression and Flexural Testing Machines consist of;



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

Cement Compression & Flexural Load Frames

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

Upper Platens

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

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

Distance Pieces

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

Loading Cylinder Assembly & Limit Switch

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

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

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

HYDRAULIC POWER PACK AND H-TOUCH PRO MAX CONTROL UNIT

HR-CE4000/TS

Hydraulic Power Pack

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

Controller unit has a simple and compact configuration.

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

Dual Stage Pump

The dual stage pump is formed by two groups;

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

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

Motor

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

Maximum capacity is 400 bar.

Distribution Block

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

Load Cell

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

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

Oil Tank

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

HİRA TESTING EQUIPMENT

Digital Readout and Control Unit

HR-CE4002/TS

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

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

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

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

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

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

- 2 analog channels for load cell or pressure sensors or displacement sensors.
- Can control 2 frames
- Provides load control of two separate testing frames with Closed-loop PID.
- Optionally supplied-integrated thermal printer (If requested, must be specified in the order)
- Real-time numeric display of load, loading rate and load/ time curves with automatic resolution adjustment on the touchscreen
- Up to 8-point calibration support and adjustable digital gains for every channel
- User-customizable load, position limits and test termination conditions
- Backup and recall option for device settings
- Recalling to factory default settings option.
- Easy recall of embedded test parameters for different types of tests and sample sizes
- Storage capacity up to 10.000 test result or 80 hours real time data recording with 1 sample per second recording interval (recording interval is variable).
- Graph axes on touchscreen can be configured for different tests and configurations
- The axes of the graph drawn on the device can be set to constant maximum values or axes can be automatically scaled according to the data
- Three different unit system selection; kN- Mpa -mm or lbf- psi- in or kgf- kgf/cm²- cm
- Real time and adjustable date/time.
- Multi-language support (English, French, Spanish, Turkish, Russian…)
- LAN connection for instantaneous transfer of test data to PC.
- USB port support for transfer of test data to a flash drive.
- Password Protection for machine settings, calibration and channel menus
- Record of test results in txt and MS excel format on pre-defined intervals
- 5 different visual themes
- Customizable IP

Hardware

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

Software

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

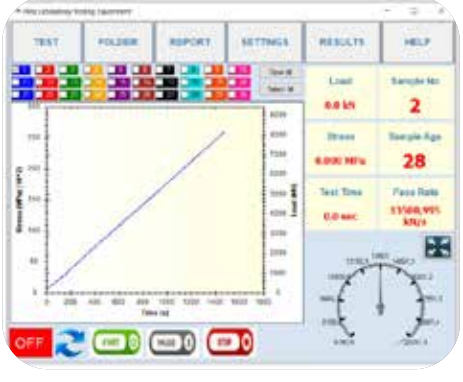
The Automatic Compression Machine can be controlled (Start, Stop commands) by a computer with the HİRATEST H-GUI Software free of charge.

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

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

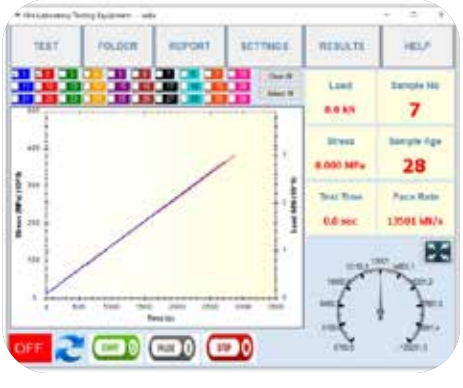
This informations and "Load vs. Time" or "Stress vs. Time" graphics can be seen and printed out on the Test Report.

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



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

Main Features of H-GUI Software;



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

Main Features of the device

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

HR-CE1525

HR-CE1527

HR-CE1528

HİRA TESTING EQUIPMENT

Technical Specifications:

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

Safety Features

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

Technical Specifications:

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

Spare Parts & Accessories:

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

SOIL

For the realization of civil engineering structures, the engineer during the design stage must base his calculations according to the soil properties where the structure will have to integrate.

This section studies and analyses a soil sample to evaluate and to know its characteristics, by proposing a complete range of testing equipment for: sampling, preparation, classification, consolidation, shear strength, triaxial, compaction, penetration, bearing capacity, permeability, density, geotechnical and chemical tests.

When highway or railway earthworks, bases, subbases and dams are constructed and subgrades are prepared, it is necessary to determine the compactability properties of the material.

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SAMPLING EQUIPMENT

HR-S0900

Used to take undisturbed soil sample in soft and fine soils.

The apparatus comprises TY-handle, Extension rod, Jarring link, Stainless steel sample tube 38x230 mm length.

The sample is obtained by percussion, lifting all the upper assembly which slides inside the jarring link and forces the sample tube into the soil.

Technical Specifications

Product Code	Product Name	Weight (kg)
HR-S0900	Sampling equipment to take undisturbed soil sample (for 38 mm dia.)	7

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-S0900/1	Sample tube for HR-S0900	Ø 50 x 230
HR-S0900/2	Single plastic end cap for HR-S0900/1	---
HR-S0900/3	Sample tube for HR-S0900	Ø 38 x 230
HR-S0900/4	Single plastic end cap for HR-S0900/3	---
HR-S0900/5	Hand extruder for 38 mm dia. samples	---
HR-S6675	Straight edge. 40 cm	---

WATER LEVEL INDICATOR

Electrical contact meters are portable, quick and easy to use.

In drilling wells, underground water pipes, reservoirs, lakes and pump experiences underground water level and total depth measurements.

The electronic tip in the probe of the device; When it comes into contact with the water surface, the jeweler gives an audible and illuminated warning. The level is read in meters (m) and centimeters (cm) over the graduated measuring cable.

Cable: Polyamide coated steel tape with transparent polyethylene covering over 2 tinned copper conductors on both sides of the steel strip.

Cable Metrics: Dimensions in millimeters (mm), centimeters (cm) and decimeters (dm) on the yellow steel strip are colored in black and meters (m) in red.

Probe: Made of chrome-nickel plated brass.

Diameter: 14mm, length: 140mm.

Cable Construction: Transparent, hard plastic and heat resistant.

Power Supply: 3V DC, 2 pieces AA size pen battery. Each one 1.5V.

HR-S0875 HR-S0874 HR-S0873

Measurement Range: Models are available in lengths of 50m, 100m, 150m, 200m.

Sensitivity: 100m cable length--- smaller than 1 cm.

Technical Specifications

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S0872	Water Level Indicator, 50 m Cable	250 x 250 x 250	3,4
HR-S0873	Water Level Indicator, 100 m Cable	250 x 250 x 250	5,6
HR-S0874	Water Level Indicator, 150 m Cable	250 x 250 x 250	6,8
HR-S0875	Water Level Indicator, 200 m Cable	250 x 250 x 250	8,8

HAND AUGERS

STANDARDS: ASTM D420, ASTM D1452, AASHTO T 86, AASHTO T202, CNR A VI N.25

Designed for soil investigations and to obtain representative samples.

Hand Boring and Sampling Set supplied complete with T-handle with 1 m long rod, 1 m Extension rod, Ø 80 mm, Ø 100 mm and Ø 150 mm Auger Heads.

Made of galvanized steel.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)
HR-S0905	Hand Boring and Sampling Set	110x20x20

Spare Parts & Accessories:

Product Code	Product Name
HR-S0905/1	T-handle with 1 m long rod
HR-S0905/2	Extension rod, 1 m
HR-S0905/3	Ø 80 mm Auger Head
HR-S0905/4	Ø 100 mm Auger Head
HR-S0905/5	Ø 150 mm Auger Head

HR-S0905

MOTORISED SOIL AUGER

STANDARTLAR: ASTM D420, ASTM D1452, AASHTO T 86, AASHTO T202, CNR A VI N.25

Designed for soil investigations and to obtain representative samples.

Two models are available.
HR-S0910 Model Motorised Soil Auger is 2-stroke, single-person bicycle with arms and gasoline.
HR-S0912 Model Motorised Soil Auger is is 2-stroke, double-person bicycle with arms and gasoline.

In both models, the air filter is atmospheric, crank type bearing and the working system is a rope automatic starter.

Soil Auger Bit should be ordered separately.

Technical Specifications:

Specifications	Motorised Soil Auger	
Product Code	HR-S0910	HR-S0912
Height	100 cm	
Drill length	80 cm	
Engine power	3,1 hp	4,5 hp
Engine capacity	52 cc	68 cc
Gearbox	Oil-bearing	
Engine output Gearbox rate	34:1	
Weight (with Auger bit)	14,5 kg	16,5 kg

HR-S0910

HR-S0912

Spare Parts & Accessories::

Ürün Kodu	Ürün Adı
HR-S0910/1	Ø 80 mm Soil Auger Bit
HR-S0910/2	Ø 100 mm Soil Auger Bit
HR-S0910/3	Ø 150 mm Soil Auger Bit
HR-S0910/4	Ø 200 mm Soil Auger Bit
HR-S0910/5	Ø 250 mm Soil Auger Bit
HR-S0910/6	Ø 300 mm Soil Auger Bit
HR-S0910/7	Ø 400 mm Soil Auger Bit

HR-S0910/1

HR-S0910/7

POCKET SHEAR VANE DEVICE

STANDARDS: ASTM D6951

Pocket Shear Vane Device is practical equipment for determining the shear strength of cohesive soils.

It is widely used to perform onsite measurements of excavations covering trenches and test pits, thin-wall or split core samples, by providing a quick and efficient method for shear strength measurements and it is also suitable for laboratory usage.

Pocket Shear Vane Device is supplied in a plastic carrying case.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S4000	Pocket Shear Vane Device	24x21x5	1,5

Spare Parts & Accessories:

Vane Type	Range (N/cm²)
Standard Ø 25 mm Vane	0-10
Sensitive Vane Adaptor	0-2
High Capacity Vane Adaptor	0-25

HR-S4000

FIELD INSPECTION VANE TESTER

STANDARDS: ASTM D2573

Used to determine the shear strength of undrained (CU) cohesive soft soils, to firm non-fissured soils on site.

The vane is inserted into the soil for 60 mm approx., and the max. torque value is measured on a collar attached to the shaft.

Field Inspection Vane Tester is supplied complete T-handle cylindrical body where a torsional spring is housed, three vanes (16 x 32, 20 x 40 and 25.4 x 50.8 mm), used depending to the expected strength of the soil to be tested, 500 mm long extension rod, tools and carrying case.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S4010	Field Inspection Vane Tester	50x30x10	4

Field Inspection Pocket Vane Tester	
Vane Dimensions (height x dia.)	32x16; 40x20, 50.8x25.4 mm
Measuring Range	0 to 240 kPa (0-24 N/cm²)
Torque Value	5 N - m
Extension Rod	500 mm depth
Overall Dimensions (assembled)	310x105 mm
Weight	1.3 kg

HR-S4010

Spare Parts & Accessories:

Product Code	Product Name
HR-S4010/1	Extension Rod, 500 mm

LABORATORY VANE APPARATUS

STANDARDS: BS 1377:7, ASTM D4648

Laboratory Vane Apparatus is based on a original concept of the Transport and Road Research Laboratory of the United Kingdom.

Laboratory Vane Apparatus is Lightweight, compact and portable, ideal for site or main laboratory, Convenient and rapid method of determining shear strength of soft soils, Easy to use: many hundreds in operation today.

It can be provided with a wide range of vane sizes, although as standard, it is sold with the 12.7 mm square vane and a set of four calibrated springs. The test can be performed directly on the sample or in the sample contained in the sampling tube. In this case Attachment for Ø38 and Ø100 mm sampling tubes, should be used.

HR-S4015

A motorizing unit is also available. Two alternatives are available according to standards.

BS Model is including driving belt, pulley set and fixing studs. Testing speed is 6 to 12°/min.

ASTM Model is including driving belt, pulley set and fixing studs. Testing speed is 60 to 90°/min.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S4015	Laboratory Vane Apparatus	20x40x65	11

HR-S4015/4

Spare Parts & Accessories:

Product Code	Product Name	Power Supply	Testing Speed
HR-S4015/1	Vane, 25.4x25.4 mm	---	---
HR-S4015/2	Vane, 12.7x25.4 mm	---	---
HR-S4015/3	Vane, 12.7x19 mm	---	---
HR-S4015/4	Attachment to hold sample tubes of Ø38 and Ø100 mm	---	---
HR-S4015/5	Spare Vane, 12.7x12.7 mm	---	---
HR-S4015/6	Spare set of four calibrating springs	---	---
HR-S4020	Motorizing attachment, BS 1377:7	220 V, 50 Hz, 1 ph	6 to 12°/min.
HR-S4025	Motorizing attachment, BS 1377:7	220 V, 60 Hz, 1 ph	6 to 12°/min.
HR-S4030	Motorizing attachment, ASTM D4648	220 V, 50 Hz, 1 ph	60 to 90°/min.
HR-S4035	Motorizing attachment, ASTM D4648	220 V, 60 Hz, 1 ph	60 to 90°/min.

SOIL POCKET PENETROMETER

The Pocket Penetrometer was originally developed for use by field personnel in checking visual classification of soils. Data was compiled on several thousand unconfined compressive strength tests of silty clays and clayey soils against the penetrometer readings to develop the scale.

Technical Specifications:

Product Code	HR-S6225
Product Name	Soil Pocket Penetrometer
Range (kg/cm²)	0,25 to 4,5
Scale divisions (kg/cm²)	0,25
Load piston (mm)	Ø 6
Dimensions (cm)	2x17
Weight (kg)	0,2

- Direct-reading scale in tons/sq. ft. and kg/sq. cm.
- Ground and polished stainless steel loading piston.
- Calibrated spring and penetrometer body plated for rust resistance and long life.
- Convenient belt-loop style carrying case.
- Optional Adapter Foot for testing very soft materials.

HR-S6225

DYNAMIC CONE PENETROMETER

STANDARDS: ASTM D6951

This portable hand operated apparatus is used for the rapid in-situ measurement of the structural properties of existing road pavements constructed with unbound materials.

The DCP Penetrometer results can be compared and interpreted with CBR (California Bearing Ratio) as per sperimental Kleyn 1982 studies.

Continuous measurements can be made down to a depth of approximately 800 mm or, when extension shafts are used, to a recommended maximum depth of 2 m.

Dynamic cone penetrometer, consists of;

Drop sliding hammer 8 kg weight dropping mass trough a height of 575 mm,
Penetration rod,
2 pcs. 60° cone,
Anvil with driving rod,
Metal plate coupling for ruler,
Lower extension rod,
Upper extension rod,
Spanners, 13 mm and 17 mm,
A bottle of adhesive,
Steel Ruler,
All contained in a wooden carrying case.

HR-S6000

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S6000	Dynamic Cone Penetrometer	120x35x20	30

Spare Parts & Accessories:

Product Code	Product Name
HR-S6000/1	Drop sliding hammer 8 kg
HR-S6000/2	Spare 60° cone
HR-S6000/3	Anvil with driving rod
HR-S6000/4	Segmented lower extension rod
HR-S6000/5	Segmented upper extension rod
HR-S6000/6	Extension rod

HR-S6000

SURFACE SOIL SAMPLERS

STANDARDS: ASTM D2937; CNR No.22; BS 1377:9

Used to take field samples of compacted fill or undisturbed soils and to evaluate density of compaction samples as the ground surface.

Steel made, galvanized against corrosion.

HR-S6130

The ASTM/CNR version, two models are available.

Both of Surface Soil Sampler (Core Cutter) Sets (Ø 3" and Ø 4") consists of a drive head, 5 kg drive hammer and a thin wall sampling tube. 5 kg sliding weight drop hammer makes a free-fall on to the driving head which is placed on top of the sampling tube.

The BS version, two models are available.

100 mm Surface Soil Sampler (Core Cutter) Set consists of a driving dolly, 13,5 kg driving rammer and Ø 100 mm x 130 mm high core cutter.

150 mm Surface Soil Sampler (Core Cutter) Set consists of a driving dolly, 16 kg driving rammer and Ø 150 mm x 180 mm high core cutter.

Technical Specifications:

Product Code	Product Name	Driving Rammer (kg)
HR-S6110	Surface Soil Sampler Set, Ø 100 mm, BS	10
HR-S6120	Surface Soil Sampler Set, Ø 150 mm, BS	16
HR-S6130	Surface Soil Sampler Set, Ø 3", ASTM/CNR	5
HR-S6140	Surface Soil Sampler Set, Ø 4", ASTM/CNR	5

Spare Parts & Accessories:

Product Code	Product Name
HR-S6110/1	Sampling Tube Ø 100 mm x 130 mm, BS
HR-S6120/1	Sampling Tube Ø 150 mm x 180 mm, BS
HR-S6130/1	Sampling Tube Ø 3" x 70 mm, ASTM/CNR
HR-S6140/1	Sampling Tube Ø 4" x 127 mm, ASTM/CNR

HR-S6110

SOIL PROCTOR PENETROMETER

STANDARDS: ASTM D1558

Used to determine in field the moisture-penetration resistance relationship of fine grained soils. Spring load scale 0-55 Kg, in 1 kg subdivisions, with direct maximum value reading in Kg. on the sliding rod.

Complete with 9 interchangeable stainless steel needles Ø 4,52 - 5,23 - 6,40 - 9,07 - 12,83 - 16,54 - 20, 22 - 24,79 - 28,55 mm, accessories, carrying case.

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S6200	Soil Proctor Penetrometer Set	550X250X80	8

HR-S6200

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-S6200/1	Interchangeable stainless steel needle	Ø 4,52
HR-S6200/2	Interchangeable stainless steel needle	Ø 5,23
HR-S6200/3	Interchangeable stainless steel needle	Ø 6,40
HR-S6200/4	Interchangeable stainless steel needle	Ø 9,07
HR-S6200/5	Interchangeable stainless steel needle	Ø 12,83
HR-S6200/6	Interchangeable stainless steel needle	Ø 16,54
HR-S6200/7	Interchangeable stainless steel needle	Ø 20,22
HR-S6200/8	Interchangeable stainless steel needle	Ø 24,79
HR-S6200/9	Interchangeable stainless steel needle	Ø 28,55

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

SCREW EXTRUDER

STANDARDS: BS 598:107, 1377:4, 1924:2, ASTM D698, D1587, D1883

The unit extrudes samples from Ø35 to 101,6 mm with maximum stroke of 650 mm.

Horizontal Type and 60 kN extrusion force.

There are two models as Hand operated and Motorised.

Supplied complete with adaptors (ring and tamper) to extrude samples having Ø 38 mm and Ø 100 mm, supporting bench, sample receiving table both adjustable in height and lowerable.


HR-S6330

Technical Specifications:

Product Code	HR-S6320	HR-S6330
Product Name	Hand Operated Screw Extruder	Motorised Screw Extruder
Stroke (mm)	650	650
Dimensions (cm)	70x170x120	70x170x130
Weight (kg)	65	120
Power Supply	---	380 V, 50 Hz, 1 ph


HR-S6320

Spare Parts & Accessories:

Product Code	Product Name
HR-S6320/1	Adaptor for Ø 38 mm moulds
HR-S6320/2	Adaptor for Ø 50 mm moulds
HR-S6320/3	Adaptor for Ø 70 mm moulds
HR-S6320/4	Adaptor for Ø 100 mm moulds
HR-S6320/5	Adaptor for Ø 150 mm moulds

38 MM HAND OPERATED HYDRAULIC SAMPLE EXTRUDER

STANDARDS: BS 1377-1

38 mm Hand Operated Hydraulic Sample Extruder with Trimming Knife, 38mm Split Former & Cutting Tool comprises a vertically mounted lever action hydraulic jack, with the body extended to form a chamber which accommodates a 38 mm diameter sample tube.

Supplied complete with Trimming Knife, 38mm Split Former, Wire Saw and 12 pieces Wire.


HR-S6340

Technical Specifications:

Product Code	Product Name
HR-S6340	38 mm Hand Operated Hydraulic Sample Extruder

Spare Parts & Accessories:

Product Code	Product Name
HR-S6340/1	38mm Split Former
HR-G0755	Trimming Knife
HR-G0753	Open Wire Saw
HR-G0754	Wire. Pack of 12

MOTORIZED HYDRAULIC SPECIMEN EXTRUDER

STANDARDS: EN 13286-2, 13286-47, 12697-30; AASHTO T134, T180, T193, T245; ASTM D698, D1557, D1587, D1559, D1883, BS 598-107, 1377-4, 1924-2

The Motorized Hydraulic Extruder is used for quick and smooth extrusion of soil specimens from 38 mm to 160 mm tubes and also Proctor, CBR and Marshall Moulds.

The Extruder has 60 kN capacity and 70 cm ram travel.

Specimens with different sizes can be safely collected after extrusion with the help of the adjustable V shaped sample receiving table. This V table can easily be dismounted for space saving. The hydraulic piston can be stopped at any position during the extraction.

The Motorized Hydraulic Extruder is supplied complete with Adaptors for Ø 100 mm (4") and Ø 150 mm (6") moulds.

Ø 38 mm, Ø 50 mm and Ø 70 mm Adaptors (ring and tamper) should be ordered separately.

Technical Specifications

MOTORIZED HYDRAULIC SPECIMEN EXTRUDER				
Product Code	HR-S6300	HR-S6300/60Hz	HR-S6310	HR-S6310/60Hz
Product Name	Motorized Hydraulic Specimen Extruder			
Type	Horizontal		Vertical	
Capacity (kN)	60			
Ram Travel (cm)	70			
Dimensions (cm)	280x50x125		65x75x175	
Weight (kg)	200			
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

HR-S6300

Spare Parts & Accessories:

Product Code	Product Name
HR-S6300/1	Adaptor for Ø 38 mm moulds
HR-S6300/2	Adaptor for Ø 50 mm moulds
HR-S6300/3	Adaptor for Ø 70 mm moulds
HR-S6300/4	Adaptor for Ø 100 mm moulds
HR-S6300/5	Adaptor for Ø 150 mm moulds

SOIL LATHE

Designed to reduce by trimming the diameter of a soil sample unit is reaching the desired diameter size by using a wire saw.

Soil Lathe can trim and Extrude samples from 35 mm to 100 mm diameter. It should be used together with Open Wire Saw.

The lathe is hand-operated, the height is adjustable up to 230 mm.

Open Wire Saw, Wires, Trimming Knife should be ordered separately.

HR-S6350

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S6350	Soil Lathe	30x30x35	27

Spare Parts & Accessories:

Product Code	Product Name
HR-G0753	Open Wire Saw
HR-G0754	Wire. Pack of 12
HR-G0755	Trimming Knife

HR-G0753
WITH
HR-G0754

HR-G0755

PARTICLE SIZE ANALYSIS OF SOILS

HYDROMETER TEST SET

STANDARDS: ASTM D422; AASHTO T88

This equipment is used to determine the quantitative size distribution of very fine particle in soils such as clay and silt.

Two models are available.

HR-S6450 Hydrometer Test Set is Supplied with Hydrometer Water Bath, Circulation Pump, Heater, High Speed Stirrer, 6 x 1000 ml Sedimentation Cylinder, 0,995 to 1,038 g/ml range 151 H Hydrometer, 1 kg Sodium Hexametaphosphate and 600 ml Beaker.

HR-S6460 Digital Hydrometer Test Set is Supplied with Digital Hydrometer Water Bath, Circulation Pump, Heater, High Speed Stirrer, 6 x 1000 ml Sedimentation Cylinder, 0,995 to 1,038 g/ml range 151 H Hydrometer, 1 kg Sodium Hexametaphosphate and 600 ml Beaker.

The Hydrometer Water Bath, circulation unit, ambient to 35°C working temperature, 50 L capacity tank with 8 pieces Sedimentation cylinder capacity. The Water Bath is available in two models one with Analogue and the other one with Digital Indicator.

High Speed Stirrer operates at over 10,000 rpm, includes dispersion cup, stirring paddle, automatic switch-on by positioning bowl.

-5 to 60 g/l range 152 H Hydrometer should be ordered separately.

Cooling coil and clamps should be ordered separately.

HR-S6410

HR-S6415

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6450	Hydrometer Test Set	35x65x57	25	220 V, 50-60 Hz, 1 ph
HR-S6460	Digital Hydrometer Test Set	35x65x57	26	220 V, 50-60 Hz, 1 ph

HR-S6470 with
HR-S6450/1 HR-S6470/1 HR-S6470/2

HR-S6480 with
HR-S6450/1 HR-S6470/2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6470	Hydrometer Water Bath	20x40x30	5	220 V, 50-60 Hz, 1 ph
HR-S6480	Digital Hydrometer Water Bath	25x40x45	6	220 V, 50-60 Hz, 1 ph
HR-S6470/1	Circulation Pump	---	---	220 V, 50-60 Hz, 1 ph
HR-S6470/2	Heater	---	---	220 V, 50-60 Hz, 1 ph
HR-S6420	151 H Hydrometer, 0,995 to 1,038 g/ml range	---	---	---
HR-S6415	152 H Hydrometer, -5 to 60 g/l range	---	---	---
HR-S6450/1	Sedimentation Cylinder, 1000 ml	---	---	---
HR-S6410	High Speed Stirrer	26x25x57	3,5	220 V, 50-60 Hz, 1 ph
HR-G0930	Sodium Hexametaphosphate, 1 kg	---	1	---
HR-G0007	Beaker, 600 ml	9x9x12,5	0,25	---
HR-S6470/3	Cooling coil and clamps	---	---	---

MEASURING SOIL TEXTURE TEST SET

Texture, or size distribution of mineral particles (or its associated pore volume), is one of the most important measures of a soil because finely divided soil particles have much greater surface area per unit mass or volume than do coarse particles. Thus, a small amount of fine clay and silt will be much more important in chemical reactions, release of nutrient elements, retention of soil moisture, etc., than a large volume of coarse gravel or sand.

Measuring Soil Texture Test Set is supplied with High Speed Stirrer, -5 to 60 g/l range 152 H Hydrometer, Bouyoucos Cylinder, 1205 ml and Stainless Steel Stirring Rod.

High Speed Stirrer operates at over 10,000 rpm, includes dispersion cup, stirring paddle, automatic switch-on by positioning bowl.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6400	Measuring Soil Texture Test Set	25x40x57	4	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6410	High Speed Stirrer	26x25x57	3,5	220 V, 50-60 Hz, 1 ph
HR-S6415	152 H Hydrometer, -5 to 60 g/l range	---	---	---
HR-S6400/1	Bouyoucos Cylinder, 1205 ml, graduated	9x9x12,5	0,25	---
HR-S6400/2	Stirring Rod, Stainless Steel	---	---	---

HR-S6400

CONE PENETROMETER

STANDARDS: BS 1377:2, CEN ISO/TS 17892-6, 17892-12

Semi-Automatic Digital Penetrometer apparatus is used to determine the moisture content at which clay soils pass from a plastic to a liquid state and it is used also for the determination of undrained shear strength.

The penetrometer has a cast iron base with leveling screws, digital penetration measurement gauge 0.01 mm precision, release button and automatic zeroing.

It is provided with lead screw gear arrangement, Leveling screws, and Spirit level. The head can be clamped at any desired height. A rack and pinion and pointer assemble provides fine adjustment of the cone tip to sample. It incorporates a clutch mechanism which makes reading of penetration and subsequent resetting a simple and accurate operation.

Semi-Automatic Digital Penetrometer for Liquid Limit is complete with automatic controller, which automatically releases the plunger by a magnetic device, complete with micrometer vertical adjustment and adjustable electronic timer of the fall time. The penetrometer is equipped with a digital timer, which can be set to the standard 5 second free-fall time or to some other setting for customized tests. When engaged the timer will allow the needle to free fall into the sample for the specific time interval and then lock the needle from advancing while providing a direct reading of the test results.

320 g weight should be added to the 30° angle cone to get a total weight of 400 g for the shear strength test.

The electronic timer allows the user to set up and read the fall time of the needle during testing.

Semi-Automatic Penetrometer for Liquid Limit supplied complete with
- Automatic Penetration Timer Unit,
- 30° Penetration Cone
- Sample Cups, 3 pcs. Aluminum, Ø55 mm x 35 mm.

Mirror is available for easy cone height adjustment and should be ordered separately.

HR-S6500

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6500	Semi-Automatic Digital Penetrometer	20x30x50	10	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (g)
HR-S6500/1	Liquid Limit Penetration Test Cone 30°	---	80
HR-S6500/10	Liquid Limit Penetration Test Cone 30°	---	100
HR-S6500/11	Liquid Limit Penetration Test Cone 30°	---	400
HR-S6500/2	Cone Test Gauge for 30° Test Cone	---	---
HR-S6500/3	Liquid Limit Penetration Test Cone 60°	---	10
HR-S6500/30	Liquid Limit Penetration Test Cone 60°	---	60
HR-S6500/5	Shaft for 60° Test Cone	---	---
HR-S6500/4	Cone Test Gauge for 60° Test Cone	---	---
HR-G0610	Moisture content tin	Ø 5,5 x 3,5	20
HR-G0608	Moisture content tin	Ø 7 x 4,5	30
HR-S6500/6	Mirror	---	---

LIQUID LIMIT DEVICE

Casagrande Method

STANDARDS: BS 1377:2,ASTM D4318, AASHTO T89

Used to evaluate the relationship between the moisture percentage of a soil sample and the number of blows required to close a groove made into the soil; and therefore to determine when a clay soil changes from a plastic to a liquid state.

HR-S6585

The device is available in two models:

- Hand operated,
- Motor operated at 120 drops/min speed, ensuring better uniformity and accuracy.

Comprises a removable brass cup, adjustable crank and cam mechanism, blow counter and base. Supplied with Brass grooving tool.

Resilience Tester is used for measuring the resilience of liquid limit device bases. Resilience Tester consists of a clear acrylic plastic tube, steel ball and a small bar magnet. Resilience Tester should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6580	Liquid Limit Device, Hand operated, BS	25x25x15	2	---
HR-S6585	Liquid Limit Device, Hand operated, ASTM	25x25x15	2	---
HR-S6590	Liquid Limit Device, Motor operated, BS	25x30x20	4	220 V, 50-60 Hz, 1 ph
HR-S6595	Liquid Limit Device, Motor operated, ASTM	25x30x20	4	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-S6585/1	Brass Grooving Tool, ASTM
HR-S6585/2	Plastic Grooving Tool, ASTM
HR-S6585/3	Plastic Grooving Tool, BS
HR-S6585/4	Spare Brass Cup
HR-S6585/5	Resilience Tester, ASTM
HR-S6585/6	Steel Ball, ASTM
HR-S6585/7	Resilience Tester, TS 1900-1, AASHTO
HR-S6585/8	Steel Ball, TS 1900-1, AASHTO

HR-S6585/5

SHRINKAGE LIMIT TEST SET

STANDARDS: ASTM D427, AASHTO T92, BS 1377:2

Used to determine the maximum moisture content at which the soil does not shrink after drying the sample.

Supplied with 2 pieces Ø45 x 10 mm Moisture Content Tin, Ø55 x 35 mm Moisture Content Tin, Shrinkage Plate with three Metal Prongs, Ø120 mm Porcelain Dish, 150 mm Spatula, 25 ml Graduated Glass Cylinder and Carrying Case.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S6550	Shrinkage Limit Test Set	35x30x8	2

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S6550/1	Shrinkage Plate	---	---
HR-G0611	Moisture content tin	Ø 45 x 10	0,02
HR-G0610	Moisture content tin	Ø 55 x 35	0,02
HR-G0369	Porcelain Dish	Ø 120	0,25
HR-G0701	Spatula, 150 mm	40x40x150	0,2
HR-G0021	Graduated Glass Cylinder, 25 ml	20x20x150	0,1
HR-S6550/2	Carrying Case	225x72x220	0,75

HR-S6550

LINEAR SHRINKAGE MOULD

STANDARDS: BS 1377:2

Mould to produce a specimen of 140 mm long x 12,5 mm radius.

This test covers the determination of linear shrinkage of soils and indicates the plastic properties of soils with a low clay content.

HR-S6570

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S6570	Linear Shrinkage Mould	2x3x16	0,3

PLASTIC LIMIT TEST SET

STANDARDS: ASTM D4318, AASHTO T90, BS 1377:2

The plastic limit determines the lowest moisture content of a soil, by which a sample can be rolled into threads Ø3 mm without breaking the same either longitudinally or transversely.

Supplied with 6 pieces Ø55 x 35 mm Moisture Content Tins, 300x300x5 mm Glass Plate, Ø12 cm Porcelain Dish, Ø3 x 100 mm Reference Rod, 100 mm Spatula and Carrying Case.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S6600	Plastic Limit Test Set	40x40x20	3

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S6600/1	Plastic Limit Glass Plate	300x300x5	0,1
HR-S6600/2	Plastic Limit Reference Rod	Ø 3 x 100	0,3
HR-G0610	Moisture content tin	Ø 55 x 35	0,02
HR-G0369	Porcelain Dish	Ø 120	0,2
HR-G0700	Spatula, 100 mm	40x40x100	0,2
HR-S6600/3	Carrying Case	350x500x110	1

HR-S6600

PROCTOR MOULDS AND HAMMERS

STANDARDS: ASTM D 698, D 1557, D 558; AASHTO T 99, T180, T 134, CNR No. 69
EN 12386-2, 13286-4, BS 1377:4, BS 1924:2

Used for determining the relationship between the moisture content and density of compacted soils.

Made of plated steel, includes collar, mould body and base plate.

Rammers are used to compact the soil sample in the Proctor Moulds and made of plated steel.

Different models are available conforming to the relevant standards.

Technical Specifications for Proctor Moulds

Product Code	Product Name	Standard	Internal Diameter (mm)	Body Height (mm)	Volume (cm^3)	Weight (kg)
HR-S6650	Standard Proctor Mould	ASTM / AASHTO / CNR	101.6 ± 0,4	116,4 ± 0,5	944 ± 14	4,5
HR-S6655	Modified Proctor Mould	ASTM / AASHTO/ CNR	152.4 ± 0,7	116,4 ± 0,5	2124 ± 25	7,5
HR-S6660	A Type Standard Proctor Mould	EN	100 ± 1	120 ± 1	942	5
HR-S6665	B Type Modified Proctor Mould	EN	150 ± 1	120 ± 1	2120	8
HR-S6670	1 Liter Standard Proctor Mould	BS, TS 1900-1	105 ± 0,5	115,5 ± 0,5	1000	5
HR-S6673	CBR Type Modified Proctor Mould (Vibrating Hammer Mould)	BS, EN, TS-1900-1	152 ± 0,5	127 ± 1	2303	8,5

Technical Specifications for Proctor Rammers

Product Code	Product Name	Standard	Rammer Dia. (mm)	Free Fall Height (mm)	Mass of Rammer (g)	Weight (kg)
HR-S6680	Standard Proctor Rammer	ASTM / AASHTO / CNR	50,8	304.8± 1	2495 ± 23	5
HR-S6685	Modified Proctor Rammer	ASTM / AASHTO/ CNR	50.8	457 ± 1.3	4540 ± 10	8
HR-S6690	A Type Standard Proctor Rammer	EN	50 ± 0.5	305± 3	2500 ± 20	5
HR-S6695	B Type Modified Proctor Rammer	EN	50 ± 0.5	457 ± 3	4500 ± 40	8
HR-S6700	2,5 kg Compaction Rammer	BS	50 ± 0.5	300± 3	2500 ± 25	5
HR-S6705	4,5 kg Compaction Rammer	BS	50 ± 0.5	450 ± 4	4500 ± 50	8

Spare Parts & Accessories:

Product Code	Product Name	Standard
HR-S6660/1	Steel Plate for The End Layer Compaction for HR-S6660	EN
HR-S6665/1	Steel Plate for The End Layer Compaction for HR-S6665	EN
HR-S6675	Straight edge. 40 cm	---

AUTOMATIC SOIL COMPACTOR

STANDARDS: ASTM D558, D559, D560, D698, D1557, D1883, EN 13286 2, 13286-47, BS 1377:4, AASHTO T99, T134, T135, T136, T180, T193, NLT 107/98, 108/91, 111/87; TS 1900-1

Automatic Soil Compactor is designed to compact Standard / Modified and CBR specimens, it ensures an extremely uniform compaction degree, granting reliable and repeatable test results.

The compactor is easy to use, friendly menu driven, of simple and practical maintenance.

Compactor is equipped with programmable digital counter which allows machine to stop at the preset numbers of blows. The height and weight of the rammer is adjustable to suit test requirements. Top quality components and high accuracy mechanical workings grant very long life also under intensive utilizations.

HR-S6800

HR-S6800

The original lift system of the rammer can be selected at 300 mm, 305 mm, 450 mm or 457 mm, granting a correct and constant fall height.

According to the standard used, rammer heads with a diameter of 50 mm or 50.8 mm can be attached to the circular rammer. (The rammer head diameters to be used must be specified at the time of order).

This automatic blow pattern ensures effective and equal compaction for each layer of soil by rotating the base table, so the mould, in equal steps and travelling the rammer across the mould.

The table rotates the mould in equal steps and the number of blows per layer can be set at the beginning of the test by the digital counter. User defined blow number and in-out distribution is also available.

Start button, Stop button and Emergency stop button are located beside the blow counter.

The rammer is circular faced. Rammer weight is adjustable to 2.5 kg or 4.5 kg according to reference standard. When compacting specimens in Standard Proctor moulds, the unit operates on a single radius and when compacting specimens in Modified Proctor or CBR moulds, the unit operates on inner and outer radius to obtain even compaction.

Mould selection, number of blows, count of the number of inner and outer drops can be selected as user defined, as well as 4 different programs defined in accordance with the standards from the digital screen mounted on the side of the device.

Noise Reduction Cabinet is available as optional and should be ordered separately.

HR-S6800
&
HR-S6800/4

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6800	Automatic Soil Compactor	65x55x155	125	220 V, 50 Hz, 1 ph
HR-S6800/60Hz	Automatic Soil Compactor	65x55x155	125	220 V, 60 Hz, 1 ph

Standard	Drop Height (mm)
BS	Adjustable to 300 mm or 450 mm
ASTM / AASHTO / TS EN / TS	Adjustable to 305 mm or 457 mm

Spare Parts & Accessories:

Product Code	Product Name	Circular Faced (mm)	Dimensions (mm)	Weight (kg)
HR-S6800/1	Rammer Face, TS EN/BS/TS	Ø50	Ø50x300	Adjustable to 2.5 kg or 4.54 kg
HR-S6800/2	Rammer Face, ASTM/AASHTO	Ø50,8	Ø50,8x300	Adjustable to 2.5 kg or 4.54 kg
HR-S6800/3	Rammer, ASTM/AASHTO/TS EN/BS/TS	---	---	---
HR-S6800/4	Noise Reduction Cabinet	---	---	---

AUTOMATIC SOIL COMPACTOR (ECONOMIC MODEL)

STANDARTLAR: ASTM D558, D559, D560, D698, D1557, D1883, EN 13286-2, 13286-47, AASHTO T99, T134, T135, T136, T180, T193

Automatic Soil Compactor is designed to compact Standard / Modified and CBR specimens, it ensures an extremely uniform compaction degree, granting reliable and repeatable test results.

The compactor is easy to use, friendly menu driven, of simple and practical maintenance.

HR-S6650

HR-S6820
&
HR-S6655

Compactor is equipped with programmable digital counter which allows machine to stop at the preset numbers of blows. The height and weight of the rammer is adjustable to suit test requirements. Quality and high accuracy mechanical components grant very long life also under intensive utilizations.

The original lift system of the rammer can be selected at 305 or 457 mm, granting a correct and constant fall height. This automatic blow pattern ensures effective and equal compaction for each layer of soil by rotating the base table, so the mould, in equal steps and travelling the rammer across the mould.

The table rotates the mould in equal steps and the number of blows per layer can be set at the beginning of the test by the digital counter. User defined blow number and in-out distribution is also available. A standard proctor / CBR switch, emergency stop and start push buttons are located beside the blow counter.

HR-S6820
&
HR-S6820/3

HR-S6820
&
HR-S6655

The rammer is circular faced. Rammer weight is adjustable to 2.5 kg or 4.5 kg according to reference standard. When compacting specimens in Standard Proctor moulds, the unit operates on a single radius and when compacting specimens in Modified Proctor or CBR moulds, the unit operates on inner and outer radius to obtain even compaction.

The machine is supplied with one rammer and must selected according to the desired Standard (ASTM or EN) (rammers are interchangeable).

Technical Specifications:

Product Code	Product Name	Drop Height (mm)	Dimensions (cm)	Weight (kg)	Power Supply
HR-S6820	Automatic Soil Compactor	305 or 457	45x160x55	115	220 V, 50 Hz, 1 ph
HR-S6820/60Hz	Automatic Soil Compactor	305 or 457	45x160x55	115	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Drop Height (mm)	Circular Faced (mm)	Dimensions (mm)	Weight (kg)
HR-S6820/1	Rammer for HR-S6820, EN/BS	305 or 457	Ø50	Ø50x300	Adjustable to 2.5 kg or 4.54 kg weight
HR-S6820/2	Rammer for HR-S6820, ASTM	305 or 457	Ø50,8	Ø50,8x300	Adjustable to 2.5 kg or 4.54 kg weight
HR-S6820/3	Noise Reduction Cabinet	---	---	---	---

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.

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

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.

CBR Type Modified Proctor Mould (Vibrating Hammer Mould) and C Spanner should be ordered separately.

HR-AS2335
WITH
HR-AS2335/3

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

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-AS2335/4	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	---	---
HR-S6673	CBR Type Modified Proctor Mould (Vibrating Hammer Mould) BS, EN, TS-1900-1	15,2 x 12,7	8,5	---
HR-S6673/1	C- Spanner for HR-S6673, 2 pieces	20x30x10	1	---

DIGITAL CBR TEST MACHINE

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

The Digital CBR Test Machine is designed for performing laboratory evaluation of the CBR value of highway sub-bases and sub-grade and determination of the strength of cohesive materials.

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 or 100 kN and a data acquisition and processing system.

The CBR Test Machine designed to load the penetration piston into the soil sample at a constant rate to measure the applied load and piston penetration at predetermined intervals.

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

Two test speeds are provided 1.0 mm/min for BS and 1.27 mm/min. for ASTM/EN/AASHTO Tests.

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 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, CBR Penetration Piston.

HR-S5000

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S5000	Digital CBR Test Machine, 50 kN capacity	47x70x110	80	220 V, 50 Hz, 1 ph
HR-S5000/60Hz	Digital CBR Test Machine, 50 kN capacity	47x70x110	80	220 V, 60 Hz, 1 ph
HR-S5010	Digital CBR Test Machine, 100 kN capacity	52X72X110	90	220 V, 50 Hz, 1 ph
HR-S5010/60Hz	Digital CBR Test Machine, 100 kN capacity	52X72X110	90	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/F	CBR Testing Frame, 50 kN capacity
HR-S5010/F	CBR Testing Frame, 100 kN capacity
HR-G0981	Load Cell, 50 kN capacity
HR-G0982	Load Cell, 100 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-S5000/2	LCD CBR Control Unit
HR-S5000/1	CBR Penetration Piston

DIGITAL CBR TEST MACHINE
H-TOUCH PRO MAX CBR CONTROL UNIT (TOUCH SCREEN)

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

The Digital CBR Test Machine is designed for performing laboratory evaluation of the CBR value of highway sub-bases and sub-grade and determination of the strength of cohesive materials.

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 or 100 kN and a data acquisition and processing system.

The CBR Test Machine designed to load the penetration piston into the soil sample at a constant rate to measure the applied load and piston penetration at predetermined intervals.

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

Two test speeds are provided 1.0 mm/min for BS and 1.27 mm/min. for ASTM/ EN/AASHTO Tests.

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 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, CBR Penetration Piston, HİRATEST H-GUI CBR Software and LAN Connection Cable.

HR-S5000/TS

H-TOUCH PRO MAX CBR CONTROL UNIT

HİRATEST H-Touch Pro Max CBR Control Unit is designed to control CBR Test Machine to perform according to ASTM/EN/ AASHTO and BS standards by processing of data from displacement transducers which are fitted to the machine.
All the operations of H-Touch Pro Max CBR Control Unit are controlled from the front panel color resistive of TFT-LCD Touchscreen display and function keys.

The Unit can perform CBR tests as a stand-alone without the use of a PC or with the HİRATEST H-GUI CBR 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 Control Unit

- Calculates corrected CBR value at 2.5 and 5 mm.
- 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, 12.5 mm.
- The % CBR at 2.5 mm and % CBR at 5 mm is also 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-S5000/2/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 Software has been designed for EN/ASTM/AASHTO/BS CBR Tests. The software includes control of machine, acquisition of load and displacement data, generating and saving reports.

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 and 10 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. On the general information tab, by entering necessary information, dry density calculations can be made through the software.

Main Features of H-GUI CBR 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

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S5000/TS	Digital CBR Test Machine, 50 kN capacity	47x70x110	80	220 V, 50 Hz, 1 ph
HR-S5000/60Hz/TS	Digital CBR Test Machine, 50 kN capacity	47x70x110	80	220 V, 60 Hz, 1 ph
HR-S5010/TS	Digital CBR Test Machine, 100 kN capacity	52X72X110	90	220 V, 50 Hz, 1 ph
HR-S5010/60Hz/TS	Digital CBR Test Machine, 100 kN capacity	52X72X110	90	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/F	CBR Testing Frame, 50 kN capacity
HR-S5010/F	CBR Testing Frame, 100 kN capacity
HR-G0981	Load Cell, 50 kN capacity
HR-G0982	Load Cell, 100 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-S5000/2/TS	H-Touch Pro Max CBR Control Unit
HR-S5000/3	H-GUI CBR Software
HR-S5000/1	CBR Penetration Piston

CBR TEST MACHINE WITH LOAD RING

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

CBR Test Machine is designed for performing laboratory evaluation of the CBR value of highway sub-bases and sub-grade and determination of the strength of cohesive materials.

The device is composed of a robust and compact two column frame with adjustable upper cross beam.

The CBR Test Machine designed to load the penetration piston into the soil sample at a constant rate to measure the applied load and piston penetration at predetermined intervals.

The frame has 50 kN capacity.

Two test speeds can be chosen by using speed buttons on the device as 1.0 mm/min for BS and 1.27 mm/min. for ASTM/EN/AASHTO Tests.

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 capacity Load Ring fitted to the upper cross beam to read stability values and the 30 x 0.01 mm Analog Dial Indicator fitted to the column.

Supplied complete with 50 kN Load Ring with 0,01 mm resolution Analog Dial gauge, 30 x 0,01 mm Analog Dial Indicator and CBR Penetration Piston.

HR-S5005

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S5005	CBR Test Machine	47x61x115	80	220 V, 50 Hz, 1 ph
HR-S5005/60Hz	CBR Test Machine	47x61x115	80	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-S5000/1	CBR Penetration Piston
HR-G5003	Load Ring, 50 kN capacity with 0,01 mm resolution Analog Dial gauge
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm

CBR MOULD AND ACCESSORIES

STANDARDS: ASTM D1883, AASHTO T193, EN 13286-47, 13286-4, BS 1924:2, BS 1377:4

This method has been developed by the California State Highway Department, and is now accepted by almost all the International Standards in force. The test is aimed to the evaluation of the bearing capacity of soil for flexible pavement design in road construction. The compaction test can be performed both with the manual rammers and the automatic compactor.

The CBR equipment, steel made and plated against corrosion is available in different versions according to the various Standards in force.

Technical Specifications for ASTM D1883, AASHTO T193 Models;

CBR Mould Set is supplied complete with Extension Collar and Perforated Base Plate.

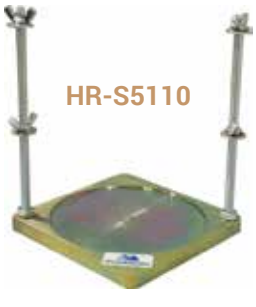
The other accessories should be ordered separately.

Technical Specifications:

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5100	CBR Mould Set	ASTM, AASHTO	200x200x240	8

Spare Parts & Accessories for ASTM D1883, AASHTO T193 Models;

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5100/1	CBR Mould	ASTM, AASHTO	Ø 152.4 (6") x 177.8 (7")	4,5
HR-S5100/2	Extension Collar	ASTM, AASHTO	Ø 152.4 (6") x 50 (2")	1,5
HR-S5100/3	Perforated Base Plate	ASTM, AASHTO	200x200x10	2
HR-S5110	CBR Solid Base Plate	ASTM, AASHTO	200x200x10	3,4
HR-S5115	Spacer Disc with 'T' Handle, Ø 150.8 x 61.4 mm	ASTM, AASHTO	150x150x250	8,5
HR-S5120	Annular Surcharge Weight	ASTM, AASHTO	150x150x20	2,27
HR-S5125	Slotted Surcharge Weight	ASTM, AASHTO	150x150x20	2,27
HR-S5126	Cutting Edge	ASTM, AASHTO	100x100x100	0,5
HR-S5130	Straight edge	---	300x30x5	0,3
HR-S5135	Filter Paper. No.5 x Ø 150 mm. Pack of 100.	ASTM, AASHTO	160x160x30	0,2
HR-S5140	Filter Screen, 150 µm mesh. 144 mm.	ASTM, AASHTO	150x150x10	0,1



Technical Specifications for EN 13286-47 Models;

CBR Mould (B Type Modified Proctor Mould) Set is supplied complete with Extension Collar and Solid Base Plate.

The other accessories should be ordered separately.

Technical Specifications:

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5200	CBR Mould (B Type Modified Proctor Mould)	EN 13286-47	200x240x180	10
HR-S5250	Split CBR Mould (B Type Modified Proctor Mould)	EN 13286-47	200x240x180	10

Spare Parts & Accessories for EN 13286-47 Models;

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5200/1	CBR Mould (B Type Modified Proctor Mould)	EN 13286-47	Ø 150 x 120	5,3
HR-S5200/2	Extension Collar	EN 13286-47	Ø 150 x 500	1,5
HR-S5200/3	CBR Solid Base Plate	EN 13286-47	200x200x100	3,4
HR-S5250/1	Split CBR Mould (B Type Modified Proctor Mould)	EN 13286-47	Ø 150 x 120	5,3
HR-S5210	Perforated Base Plate	EN 13286-47	200x200x100	2
HR-S5215	Spacer Disc with 'T' Handle, Ø 149,5 x 36 mm	EN 13286-47	150x150x170	5
HR-S5220	Annular Surcharge Weight	EN 13286-47	150x150x20	2
HR-S5225	Split Surcharge Weight	EN 13286-47	150x150x20	2
HR-S5235	Filter Paper. Coarse, Ø 148 mm. Pack of 100.	EN 13286-47	150x150x10	0,1
HR-S5130	Straight edge	---	300x30x5	0,3

Technical Specifications for BS 1924:2, BS 1377:4 Models;

CBR Mould Set is supplied complete with Extension Collar and Solid Base Plate.

The other accessories should be ordered separately.

Technical Specifications:

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5300	CBR Mould Set	BS	180x180x190	7

HR-S5335

Spare Parts & Accessories for BS 1924:2, BS 1377:4 Models;

Product Code	Product Name	Standard	Dimensions (mm)	Weight (kg)
HR-S5300/1	CBR Mould	BS	Ø 152 x 127	4,9
HR-S5300/2	Extension Collar	BS	Ø 152 x 50	1,5
HR-S5300/3	CBR Solid Base Plate	BS	200x200x100	3,4
HR-S5310	Perforated Base Plate	BS	200x200x100	2
HR-S5315	Compaction Plug with 'T' Handle, Ø 150 x 50 mm	BS	150x150x190	7
HR-S5320	Annular Surcharge Weight	BS	150x150x20	2
HR-S5325	Split Surcharge Weight	BS	100x100x100	2
HR-S5326	Cutting Collar	BS	150x150x10	0,5
HR-S5335	Filter Paper. No.1 x Ø 150 mm. Pack of 100.	BS	110x380x10	0,1
HR-S5340	C- Spanner for HR-S5300, 2 pieces	---	40x350x10	1
HR-S5345	Assembly Tool for Base Plate for HR-S5300	---	300x30x5	1
HR-S5130	Straight edge	---	300x30x5	0,3

HR-S5415
with
HR-S5400
HR-S5410
HR-G0875

SWELLING

Placed on top of the soil sample to enable monitoring of swelling.

The Swell Test Set consists of Swell Plate with adjustable stem, Dial Indicator (any Dial Gauges are listed below can be chosen) and Tripod for mounting swell dial indicator in position on CBR Mould Collar.

CBR Soaking Tank has two models as 6 or 15 pieces CBR Mould capacity.

Swell Test Set and CBR Soaking Tank should be ordered separately for swelling test.

Technical Specifications for Dial Indicators:

Product Code	Product Name
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm
HR-G0877	Digital Dial Indicator, 12,7 x 0,01 mm
HR-G0878	Digital Dial Indicator, 25 x 0,01 mm
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm
HR-G0880	Digital Dial Indicator, 25 x 0,001 mm

Technical Specifications for Swelling:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5400	Swell Plate	18x18x16	0,5
HR-S5410	Tripod	20x20x30	1
HR-S5415	CBR Soaking Tank, 6 sample capacity	50x70x40	3
HR-S5416	CBR Soaking Tank, 15 sample capacity	77*110*64	5

PLATE BEARING TEST SET

STANDARDS: ASTM D1194, 1195, 1196, BS 1377:9

This test is performed for the determination of the bearing capacity of a soil in-situ on road constructions, foundations, road subgrades, and airport and highway pavements.

HR-S5630 with All Accessories

A wide range of models are available.

100 kN capacity Plate Bearing Test Set consists of a 100 kN capacity Piston Assembly and Hydraulic Hand Pump, Analog Manometer, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø12"(305 mm) and Ø18"(457 mm) Loading Plates.

300 kN capacity Plate Bearing Test Set consists of a 300 kN capacity Piston Assembly and Hydraulic Hand Pump, Analog Manometer, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø12"(305 mm) and Ø18"(457 mm) Loading Plates.

500 kN capacity Plate Bearing Test Set Set consists of a 500 kN capacity Piston Assembly and Hydraulic Hand Pump, Analog Manometer, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø24"(610 mm) and Ø30"(762 mm) Loading Plates.

1000 kN capacity Plate Bearing Test Set Set consists of a 1000 kN capacity Piston Assembly and Hydraulic Hand Pump, Analog Manometer, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø24"(610 mm) and Ø30"(762 mm) Loading Plates.

HR-S5630

Two different digital readout unit options are available for the Digital Models.

100 kN capacity Plate Bearing Test Set Set consists of a 100 kN capacity Piston Assembly and Hydraulic Hand Pump, Pressure Transducer, Battery operated digital readout unit, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø12"(305 mm) and Ø18"(457 mm) Loading Plates.

300 kN capacity Plate Bearing Test Set Set consists of a 300 kN capacity Piston Assembly and Hydraulic Hand Pump, Pressure Transducer, Battery operated digital readout unit, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø12"(305 mm) and Ø18"(457 mm) Loading Plates.

500 kN capacity Plate Bearing Test Set Set consists of a 500 kN capacity Piston Assembly and Hydraulic Hand Pump, Pressure Transducer, Battery operated digital readout unit, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø24"(610 mm) and Ø30"(762 mm) Loading Plates.

1000 kN capacity Plate Bearing Test Set Set consists of a 1000 kN capacity Piston Assembly and Hydraulic Hand Pump, Pressure Transducer, Battery operated digital readout unit, 2.4 m long Datum Bar, 3 pcs. 30 mm travel x 0.01 mm Analog Dial Gauges with Dial Gauge Holders, Ø24"(610 mm) and Ø30"(762 mm) Loading Plates.

HİRA TESTING EQUIPMENT

HR-S5600

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5590	Plate Bearing Test Set, 100 kN capacity	80x33x60	100
HR-S5600	Plate Bearing Test Set, 300 kN capacity	85x33x60	110
HR-S5610	Plate Bearing Test Set, 500 kN capacity	90x33x60	130
HR-S5620	Plate Bearing Test Set, 1000 kN capacity	95x33x60	150
HR-S5625	Plate Bearing Test Set with Digital Readout Unit, 100 kN capacity	80x33x60	100
HR-S5630	Plate Bearing Test Set with Digital Readout Unit, 300 kN capacity	85x33x60	110
HR-S5640	Plate Bearing Test Set with Digital Readout Unit, 500 kN capacity	90x33x60	130
HR-S5650	Plate Bearing Test Set with Digital Readout Unit, 1000 kN capacity	95x33x60	150
HR-S5625/LPI	LPI Plate Bearing Test Set with Digital Readout Unit, 100 kN capacity	80x33x60	100
HR-S5630/LPI	LPI Plate Bearing Test Set with Digital Readout Unit, 300 kN capacity	85x33x60	110
HR-S5640/LPI	LPI Plate Bearing Test Set with Digital Readout Unit, 500 kN capacity	90x33x60	130
HR-S5650/LPI	LPI Plate Bearing Test Set with Digital Readout Unit, 1000 kN capacity	95x33x60	150

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S5590/1	Piston Assembly, 100 kN capacity	---	---
HR-S5600/1	Piston Assembly, 300 kN capacity	---	---
HR-S5610/1	Piston Assembly, 500 kN capacity	---	---
HR-S5620/1	Piston Assembly, 1000 kN capacity	---	---
HR-G9000	Hydraulic Hand Pump, 700 bar	---	---
HR-G9000/1	High Pressure Hose, 1 m	---	---
HR-G9010	Analog Manometer	---	---
HR-S5600/2	Datum Bar, 2.4 m long	---	---
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm	---	---
HR-G0885	Dial Gauge Holder	---	---
HR-S5654	Pressure Transducer	---	---
HR-S5655	Battery Operated Digital Readout Unit	---	---
HR-C9002/LPI	LPI Battery Operated Digital Readout Unit	---	---
HR-S5600/3	Loading Plate, Ø 12"(305 mm)	305	15
HR-S5600/4	Loading Plate, Ø 18"(457 mm)	457	30
HR-S5600/5	Loading Plate, Ø 24"(610 mm)	610	60
HR-S5600/6	Loading Plate, Ø 30"(762 mm)	762	95
HR-S5656/1	Extension Rods. Pack of 16.	Ø 12x250	---
HR-S5656/2	Top End Plates. Pack of 4.	Ø 50	---
HR-S5656/3	Columns. 2 pieces.	Ø 150x250	---
HR-S5656/4	Column	Ø 150x500	---
HR-S5657/1	Mild Steel Plate, Square	750x750x25	---
HR-S5657/2	Mild Steel Plate, Square	600x600x25	---
HR-S5657/3	Mild Steel Plate, Square	450x450x25	---
HR-S5657/4	Mild Steel Plate, Square	300x300x25	---
HR-S5657/5	Mild Steel Plate, Round	Ø 750x25	---
HR-S5657/6	Mild Steel Plate, Round	Ø 500x25	---

HR-C9002/LPI

FIELD CBR TEST SET

STANDARDS: ASTM D4429, BS 1377:7, 1924:2

Used to determine quickly and efficiently the bearing capacity of soils on road constructions, foundations, road subgrades etc.

The Field (In-situ) CBR Test Set is 50 kN capacity.

Manuel Field CBR Test Set consist of 50 kN capacity Mechanical Jack with ball seating, 50 kN capacity Load Ring, CBR Penetration Piston, Analog Penetration Dial Gauge (30 x 0,01 mm), Adjustable Dial Gauge Holder, Set of Extension Rods (2 pieces 102 mm, 1 pieces 305 mm and 1 pieces 610 mm), Datum Bar Assembly with two Tripod Stands, 4,5 kg Annular Surcharge Weight, 4,5 kg Slotted Surcharge Weights and Carrying Case.

Digital Field CBR Test Set consist of 50 kN capacity Mechanical Jack with ball seating, 50 kN capacity Load Cell, Wire for Load Cell connection, CBR Penetration Piston, Digital Dial Indicator (25 x 0,01 mm), Digital Readout Unit, Set of Extension Rods (2 pieces 102 mm, 1 pieces 305 mm and 1 pieces 610 mm), Datum Bar Assembly with two Tripod Stands, 4,5 kg Annular Surcharge Weight, 4,5 kg Slotted Surcharge Weights and Carrying Case.

Conversion Frame is used to convert the In-situ CBR test to a Mechanical Laboratory CBR test machine.

The system is easily assembled onto the Conversion Frame with the addition of some of the accessories included in The Field (In-situ) CBR Test Set. The frame is used with the Jack, Load Ring, CBR Mould and Penetration Piston.

Spare Parts & Accessories:

Product Code	Product Name
HR-S5500/1	Mechanical Jack with ball seating
HR-G5003	Load Ring, 50 kN
HR-G0981	Load Cell, 50 Kn
HR-G0981/1	Wire for Load Cell connection
HR-S5000/1	CBR Penetration Piston
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm
HR-G0885	Adjustable Dial Gauge Holder
HR-G0878	Digital Dial Indicator, 25 x 0,01 mm
HR-S5500/D	Digital Readout Unit
HR-S5500/2	Set of Extension Rods (2 x 102 mm, 1x 305 mm, 1 x 610 mm)
HR-S5500/3	Datum bar assembly with two Tripod Stands
HR-S5500/4	4,5 kg Annular Surcharge Weight
HR-S5500/5	4,5 Kg Slotted Surcharge Weight
HR-S5500/7	Conversion Frame
HR-S5500/8	Wooden Carrying Case

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5500	Manuel Field CBR Test Set	24x165x25	50
HR-S5505	Digital Field CBR Test Set	24x165x25	52

HR-S5505

SAND DENSITY CONE APPARATUS

STANDARDS: ASTM D1556, AASHTO T181, T191

Used to determine the in-situ density of fine grained compacted soil.

The test consists in digging a hole into the ground and then collect, dry and weight the sampled soil.

The hole is than filled with dry sand from the cone container.

6,5" Sand Density Cone Set is supplied with Sand Cone Assembly with valve, Metal Base with Centre Hole and 5lt capacity Plastic Sand Jar.

Calibrating Container for HR-S5700 should be ordered separately.

12" Sand Density Cone Set is supplied with Sand Cone Assembly with valve, Metal Base with Centre Hole and 15 lt capacity Metal Sand Jar.

12" Density Cylinder is used for determining in place density of compacted base courses containing large sizes of coarse aggregates.

HR-S5700/4

HR-S5700

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5700	Sand Density Cone Set, 6,5"	30x30x60	4
HR-S5720	Sand Density Cone Set, 12"	70x70x85	15
HR-S5730	Density Cylinder, 12"	47x32x26	10

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)
HR-S5700/1	Sand Cone Assembly with valve, 6,5"	Ø 6,5x18
HR-S5700/2	Metal Base with Centre Hole for HR-S5700	30x30x2
HR-S5710	Plastic Sand Jar, 5 lt capacity	Ø 16x33
HR-S5700/4	Calibrating Container for HR-S5700	Ø16,5x18,7
HR-S5720/1	Sand Cone Assembly with valve, 12"	Ø 12"x35
HR-S5720/2	Metal Base with Centre Hole for HR-S5720	70x70x5
HR-S5720/3	Metal Sand Jar, 15 lt capacity	25x50

HR-S5720

SAND REPLACEMENT APPARATUS

STANDARDS: BS 1377:9, 1924:2

Used to determine the in-situ density of fine grained compacted soil.

Complete set consists of Sand Pouring Cylinder, Metal Tray with Centre Hole and Calibration Container.

The Sand Pouring Cylinder with shutter made of cast aluminum and accurately machined, The Calibration Container and Metal Tray are made of plated sheet steel.

The test set is available in three different sizes.

HR-S5760

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5750	Sand Replacement Test Set, Ø 100 mm	30x30x44	8
HR-S5760	Sand Replacement Test Set, Ø 150 mm	30x30x57	10
HR-S5770	Sand Replacement Test Set, Ø 200 mm	50x50x66	27

Spare Parts & Accessories:

Product Code	Product Name
HR-S5750/1	Cone With Valve And Upper Cylinder, Ø 100 mm for HR-S5750
HR-S5750/2	Calibration Container for HR-S5750
HR-S5750/3	Metal Tray for HR-S5750
HR-S5760/1	Cone With Valve And Upper Cylinder, Ø 150 mm for HR-S5760
HR-S5760/2	Calibration Container for HR-S5760
HR-S5760/3	Metal Tray for HR-S5760
HR-S5770/1	Cone With Valve And Upper Cylinder, Ø 200 mm for HR-S5770
HR-S5770/2	Calibration Container for HR-S5770
HR-S5770/3	Metal Tray for HR-S5770

STANDARD SAND

STANDARDS: BS 1377:9, 1924:2

Standard Sand for density tests has two alternatives;

- passing 600 micron and retained on 300 micron.
- passing No. 16 (1,18 mm) and retained on No.30 (600 mikron).

HR-S6050

Technical Specifications:

Product Code	Product Name	Specifications
HR-S6050	Standard Sand, Pack of 1000 gr	Between 300-600 micron grain size
HR-S6055	Standard Sand, Pack of 1000 gr	Between 1,18 mm-600 micron grain size

RELATIVE DENSITY TEST

STANDARDS: EN 13286-5, ASTM D4253, ASTM D4254

Relative density relates the dry density of cohesionless soil to the maximum and minimum densities. The degree of compaction of cohesionless soil can be stated in terms of relative density.

This method, in the EN standard, covers the determination of the maximum dry density and water content of cohesionless materials when compacted using a vibrating table. Materials for which this method is applicable may contain up to 12% by mass fines (<0.063 mm). The maximum particle size of the materials to be tested is 80 mm. This method applies to mixtures to be used in road construction.

The ASTM, also specify that it is used for the determination of the relative density of cohesionless soil for which impact compaction will not produce a well-defined moisture-density relationship curve and where the maximum density of impact method will generally be less than by vibratory method.

The two versions: HR-S7500 Conforming to EN and HR-S7505 Conforming to ASTM are practical identical except for the 0.1 cu.ft. mould.

HR-S7500 Relative Density Test Set Supplied complete with 762x762 mm Vibrating Table (3600 rpm) which adjustable vibration magnitude, 14200 cm³ 0,5 cu.ft. Relative Density Mould Set (Mould, Circular surcharge weight with handle, Surcharge base plate with handle and detachable guide sleeve with clamp assembly) and Relative Density Gauge Set.

HR-S7505 Relative Density Test Set Supplied complete with 762x762 mm Vibrating Table (3600 rpm) which adjustable vibration magnitude, 0,1 cu.ft. and 0,5 cu.ft. Relative Density Mould Set (Mould, Circular surcharge weight with handle, Surcharge base plate with handle and detachable guide sleeve with clamp assembly) and Relative Density Gauge Set.

Relative Density Gauge Set is supplied with Analog displacement dial gauge (50 x 0.01 mm division, 0-100 scale) with holder and Metal calibration bar.

Relative Density Pouring Funnel Set is required for loose placement of 9.5mm and finer granular soils in the Mould Set. The Funnel Set includes two Ø152 x 305 mm metal cylinders, each with funnel and 152 mm long delivery spout attached to one end. Spouts are 25.4 mm and Ø 12.7mm. The pouring devices are mandatory according to ASTM D4253 and should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)	Power Supply
HR-S7500	Relative Density Test Set, EN	762x762	290	220 V, 50 Hz, 1 ph
HR-S7500/60Hz	Relative Density Test Set, EN	762x762	290	220 V, 60 Hz, 1 ph
HR-S7505	Relative Density Test Set, ASTM	762x762	310	220 V, 50 Hz, 1 ph
HR-S7505/60Hz	Relative Density Test Set, ASTM	762x762	310	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Power Supply
HR-S7500/1	Vibrating Table, 762x762 mm	220 V, 50 Hz, 1 ph
HR-S7500/1/60Hz	Vibrating Table, 762x762 mm	220 V, 60 Hz, 1 ph
HR-S7500/2	0,1 cu.ft. Relative Density Mould Set	---
HR-S7500/3	0,5 cu.ft. Relative Density Mould Set	---
HR-S7500/4	Relative Density Gauge Set	---
HR-S7500/5	Relative Density Pouring Funnel Set	---

HR-S7500/5

HR-S7500

CONSTANT HEAD PERMEAMETER SET

STANDARDS: ASTM D2434, BS 1377:5, AASHTO T215

Used to determine the permeability of granular, gravel and sandy soils.

The specimen is formed in an acrylic permeability cell and water is passed through it from a constant level tank.

The permeability cell has pressure points at different levels which are connected to the manometer tubes fixed on a stand with graduated scale.

Two Constant Head Permeability Cells are available; Ø75 mm and Ø114 mm.

Constant head permeability cell Ø75 mm, with three pressure take-off points. Formed by an acrylic Plexiglas body held between two aluminum anodized end plates. Supplied with 2 pieces Perforated plates and 2 pieces No.100 screen.

Constant head permeability cell Ø114 mm, with six pressure take-off points and an additional six blanked-off pressure points. Formed by an acrylic Plexiglas body held between two aluminum anodized end plates. Supplied with 2 pieces Perforated plates and 2 pieces No.100 screen.

The Stand, comprising 3 pieces Ø6 mm x 1 m long Manometer Tubes of constant bore, graduated scale, Rubber Tube and Connectors.

Constant Level Tank, made from acrylic Plexiglas, wall mounting, is used to provide constant water level in the manometer tubes. The inlet, outlet and overflow pipes can be adjusted for height within the tank.

HR-S5800 Model, Supplied complete with Ø 75 mm Constant Head Permeability Cell, Stand with 3 pieces Manometer Tubes, Constant Level Tank, Rubber Tube and 1 m Steel Ruler.

HR-S5810 Model, Supplied complete with Ø114 mm Constant Head Permeability Cell, Stand with 3 pieces Manometer Tubes, Constant Level Tank, Rubber Tube and 1 m Steel Ruler.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5800	Constant Head Permeameter Set, Ø 75 mm	30x10x170	15
HR-S5810	Constant Head Permeameter Set, Ø 114 mm	40x10x170	20

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5800/1	Constant Head Permeability Cell, Ø 75 mm	Ø8x40	3
HR-S5810/1	Constant Head Permeability Cell, Ø 114 mm	Ø15x70	7
HR-S5800/2	Stand with 3 pieces Manometer Tubes	22x7x170	6
HR-S5800/3	Constant Level Tank	35x35x35	2
HR-S5800/5	Rubber Tube	---	---
HR-G0478	Steel Ruler, 1 m	100	---
HR-G0762	Tamping Rod	Ø 0,8 x 30	0,5

FALLING HEAD PERMEAMETER

STANDARDS: CEN ISO/TS 17892-11

Used to determine the permeability of fine-grained soils such as clay-like or silty soils.

The specimen is confined within the permeameter which is connected to the manometer tube filled with water. The sample must be completely saturated with water before the test, and the operator will check the rate of fall of the water in the tube passing through the test specimen.

The Falling Head Permeability Cell is manufactured from plated steel with an inside diameter of 100 mm.

The Stand, comprising 4 pieces Ø4, Ø5, Ø6, Ø8 mm x 1,5 m long Manometer Tubes, Rubber Tube and Connectors. The Soaking Reservoir Tank is used for containing the permeability cell during the test.

Falling Head Permeameter Set is supplied complete with Ø100 mm Falling Head Permeability Cell, Stand with 4 pieces Manometer Tubes, Water Tank, Soaking Reservoir Tank, Steel Ruler, Rubber Tube and Connectors.

HR-S5820/1

HR-S5820 & VAKUM PANELİ

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5820	Falling Head Permeameter Set, Ø 100 mm	32x70x170	15

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S5820/1	Falling Head Permeability Cell, Ø 100 mm	Ø10x13	3
HR-S5820/2	Stand with 4 pieces Manometer Tubes	23x10x170	7
HR-S5820/3	Water Tank	35x35x35	2
HR-S5820/4	Soaking Reservoir Tank	32x32x25	4
HR-S5820/5	Rubber Tube	---	---
HR-S5820/6	Connectors	---	---
HR-G0478	Steel Ruler	100	---

BALLOON DENSITY APPARATUS

STANDARDS: ASTM D2167, AASHTO T205

Balloon Density Apparatus is used to determine the in-situ density of compacted or firmly bonded soils.

The HR-S7700 consists of a graduated cylinder 1596 ml capacity, housed inside an aluminium guard, a reversible rubber aspirator pump and a density plate 9" square. The principle of operation is similar to the sand replacement but the hole is filled by a rubber balloon where water is pumped. The amount of water can be easily determined by the graduation of the cylinder. Rubber balloons should be ordered separately.

The HR-S7705 is 3000 ml capacity. A metal cylinder is filled with water which is then pumped into a rubber membrane mounted on the base of the cylinder. The water pressure is controlled by a pressure gauge and the volume of the balloon is measured on the graduated piston stem. Rubber balloons should be ordered separately.

HR-S7705

Technical Specifications:

Product Code	Product Name	Capacity (ml)	Dimensions (cm)	Weight (kg)
HR-S7700	Balloon Density Apparatus	1600	25x25x70	7
HR-S7705	Balloon Density Apparatus	3000	36x36x100	10

Spare Parts & Accessories:

Product Code	Product Name
HR-S7700/1	Rubber balloons, Pack of 12

DE-AIRING WATER SYSTEM

De-Airing Water Apparatus is a compact and self-contained equipment which can de-air water quickly and efficiently down to levels of dissolved oxygen acceptable for geotechnical test methods. The apparatus used in conjunction with the De-Airing Tank. Air is removed from the water by a vacuum system. De-airing tank should be ordered separately.

The first option for De-Airing Water;

- De-Airing Water Apparatus,
- De-Airing Water Tank,
- Vacuum Control and Water Connection Panel with Regulator and Vacuum Gauge Manometer or Connection Panel for Vacuum and Water with Vacuum Gauge (These panels are optional),
- Plastic Hose.
-

The second option for De-Airing Water;

- Filter Flask or Air Drying Unit / Water Trap,
- Vacuum Pump,
- De-Airing Water Tank,
- Vacuum Control and Water Connection Panel with Regulator and Vacuum Gauge Manometer or Connection Panel for Vacuum and Water with Vacuum Gauge (These panels are optional),
- Plastic Hose.

By using Vacuum Control and Water Connection Panel, vacum pressure degree can be regulate.

By using Connection Panel for Vacuum and Water with Vacuum Gage Manometer and Vacuum Control and Water Connection Panel with Regulator, De-Aring Water Equipment can be used without repeated assembling the hoses.

HR-S5850

HR-S5855

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S5850	De-Airing Water Apparatus	50x25x35	15	220V, 50 Hz, 1 ph
HR-S5850/60Hz	De-Airing Water Apparatus	50x25x35	15	220V, 60 Hz, 1 ph
HR-S5850/1	De-Airing Water Tank, 7 lt	25x25x25	3	---
HR-S5855	Vacuum Control and Water Connection Panel with Regulator and Vacuum Gauge Manometer	45x15x50	7	---
HR-S5860	Connection Panel for Vacuum and Water with Vacuum Gage Manometer	15x15x25	0,5	---
HR-G0800	Vacuum Pump, 51 lt/min	30x15x25	8,5	220V, 50-60 Hz, 1 ph
HR-G0083	Filter Flask, 2000 ml	---	---	---
HR-S5850/2	Air Drying Unit / Water Trap, Vacuum Type	70x80x17	0,5	---
HR-S5850/3	Plastic Hose, Ø8mm, 6m	---	---	---

PINHOLE TEST APPARATUS

STANDARDS: BS 1377:5, ASTM D4647

Certain fine-grained soils with high sodium content are highly erodible by the water flowing through them. During the test the flow of water under a high hydraulic gradient through a cavity in the soil is reproduced.

Pinhole Test Apparatus is used for evaluating clay soils for erodibility by flowing water through a small hole that is drilled through the compacted specimen.

The apparatus consists of a cylindrical metal container fitted one end with a water inlet and the other end with an outlet connection, a standpipe tube with scale and a stand to support the apparatus.

Constant Level Tank should be ordered separately.

HR-S7725

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S7725	Pinhole Test Apparatus	15x20x120	4

Spare Parts & Accessories:

Product Code	Product Name
HR-S7725/1	Cylindrical Metal Container
HR-S7725/2	PVC Tubing, Ø 10x8 mm, 10 m Coil
HR-S7725/3	Stand
HR-S7725/4	Constant Level Tank

CORE BOX

Core Box is made of sturdy, yet lightweight plastic material.

Core Box provides stable stacking and can withstand the weight of several boxes full of cores stacked on its top.

A lid comes with each Core Box that is easily removed.

Provides the best protection and is easy to transport.

HR-M4501
with
HR-M4505
HR-M4506

Technical Specifications:

Product Code	Product Name	Type	Core Dia. (mm)	Capacity (m)	Dimensions (cm)	Weight (kg)
HR-M4500	Core Box	BQ	26-36	6x1	107x34x5	1,6
HR-M4501	Core Box	NQ	37-48	5x1	107x34x6	1,8
HR-M4502	Core Box	HQ	49-64	4x1	107x34x8	2
HR-M4503	Core Box	PQ	65-86	3x1	107x34x10	2,1

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-M4505	Lid	107x34x2	0,9
HR-M4506	Separator	---	---

CONSOLIDATION TEST SET

STANDARDS: ASTM D2435, D3877, D4546, AASHTO T216, CEN ISO/TS 17892-5, BS 1377:5

The one-dimensional consolidation test of a soil sample enables to as certain the settlement characteristic over a given period of time. Loads are applied with progressive increases and the settlement values are read on a dial gauge.

Tests are carried out on specimens prepared from undisturbed samples. Data obtained from these tests together with classification data and a knowledge of the soils loading history, enables estimates to be made of the behavior of foundations under load.

The Front Loading Oedometer is rigidly manufactured from aluminum alloy casting to provide a high degree of accuracy with any frame distortions under load. The frame is designed to load the specimen through a lever arm assembly and one of three alternative beam ratios as 9:1, 10:1 and 11:1. The beam is fitted with a counter balance weight and beam support jack. The cell platform will accept the complete range consolidation cells and is fitted with a central spigot to ensure accurate centering of the cell under the loading.

Bench for Consolidation is 3 Oedometer capacity.

The fixed ring Consolidation Cells are manufactured from corrosion-resistant materials and conform to the requirements of the relevant standards. All cells are supplied complete with Upper and Lower Porous Disc, Pressure Pad and Cutting (Specimen) Ring. Any Consolidation Cells are listed below can be chosen. Any Dial Gauges and Set of Weights are listed below can be chosen.

Apparatus for prepare Consolidation Samples and Calibration Disc should be ordered separately.

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-S9000/1	Front Loading Oedometer	870x830x1600	30
HR-S9000/2	Bench for Consolidation, 3 Oedometer Capacity	---	20
HR-S9100	Consolidation Cell, Ø 50 mm	Ø 50	5
HR-S9100/1	Upper and Lower Porous Disc for Ø 50 mm Cell	---	---
HR-S9100/2	Pressure Pad for Ø 50 mm Cell	---	---
HR-S9100/3	Cutting (Specimen) Ring for Ø 50 mm Cell	---	---
HR-S9100/4	Calibration disc for Ø 50 mm Consolidation Cell, stainless steel	---	---
HR-S9100/5	Apparatus for prepare Consolidation Sample for Ø 50 mm samples	---	---
HR-S9200	Consolidation Cell, Ø 63,5 mm	Ø 63.5 (2.5")	6
HR-S9200/1	Upper and Lower Porous Disc for Ø 63,5 mm Cell	---	---
HR-S9200/2	Pressure Pad for Ø 63,5 mm Cell	---	---
HR-S9200/3	Cutting (Specimen) Ring for Ø 63,5 mm Cell	---	---
HR-S9200/4	Calibration disc for Ø 63,5 mm Consolidation Cell, stainless steel	---	---
HR-S9200/5	Apparatus for prepare Consolidation Sample for Ø 63,5 mm samples	---	---
HR-S9300	Consolidation Cell, Ø 75 mm	Ø 75	7
HR-S9300/1	Upper and Lower Porous Disc for Ø 75 mm Cell	---	---
HR-S9300/2	Pressure Pad for Ø 75 mm Cell	---	---
HR-S9300/3	Cutting (Specimen) Ring for Ø 75 mm Cell	---	---
HR-S9300/4	Calibration disc for Ø 75 mm Consolidation Cell, stainless steel	---	---
HR-S9300/5	Apparatus for prepare Consolidation Sample for Ø 75 mm samples	---	---
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm	---	---
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm	---	---
HR-G0877	Digital Dial Indicator, 12,7 x 0,01 mm	---	---
HR-G0878	Digital Dial Indicator, 25 x 0,01 mm	---	---
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm	---	---
HR-G0880	Digital Dial Indicator, 25 x 0,001 mm	---	---

HİRA TESTING EQUIPMENT


HR-S9100


HR-S9100/5

Set of Weights

Product Code	Set of Weights for Consolidation
HR-S9500	16 kg Set (2x 5 kg, 1x 2 kg, 2x 1 kg, 3x 0,5 kg, 2x 0,25 kg)
HR-S9510	32 kg Set (1x 10 kg, 3x 5 kg, 2x 2 kg, 1x 1 kg, 3x 0,5 kg, 2x 0,25 kg)
HR-S9520	50 kg Set (3x 10 kg, 2x 5 kg, 3x 2 kg, 2x 1 kg, 3x 0,5 kg, 2x 0,25 kg)
HR-S9530	64 kg Set (4x 10 kg, 3x 5 kg, 2x 2 kg, 3x 1 kg, 3x 0,5 kg, 2x 0,25 kg)
HR-S9540	80 kg Set (6x 10 kg, 2x 5 kg, 3x 2 kg, 2x 1 kg, 3x 0,5 kg, 2x 0,25 kg)


HR-S9510

AUTOMATIC DIRECT/RESIDUAL SHEAR TEST MACHINE

STANDARDS: ASTM D3080; BS 1377:7; AASHTO T236, CEN-ISO/TS 17892-10

The test measures the consolidated drained shear strength of a soil material in direct shear. Automatic Direct Shear Test Machine is motorized with servo motor and measuring sensors are electronically connected to a digital readout unit to get accurate readings. Supplied with carriage assembly load hanger and integral 9:1, 10:1 and 11:1 lever loading device as standard. The loading arm which is used to amplify the vertical load on the shear box assembly can receive up to 50 kg of weight. The total load on the specimen can reach up to 5 kN.

The shear machine is driven by high resolution servomotor and gear box assembly. Speed range is fully steeples variable over the range 0.00001 to 9.9999 mm/min. 5 kN load cell is used for load measurement. 10 x 0.002 mm and 25 x 0.001 mm sensitivity displacement sensors are used for vertical and horizontal displacement measurements respectively. Displacement limits are controlled by limit switch. Maximum Vertical load is 5000 N from 0 to 500 N, applying using 10:1 beam loading device.

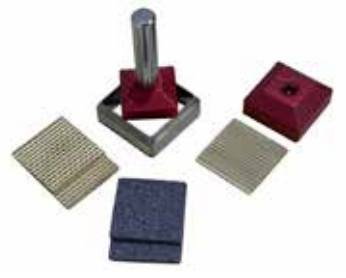
The machine shear box tests on 60 mm and 100 mm square, Ø60 mm round, Ø100 mm round and Ø2,5" round samples. All Shear box assemblies can contain water that surrounds the specimen. The Assemblies consist of a shear box with a rigid wall square, complete with a Vertical Loading Pad grooved back face, a Grooved Retaining Plate, 2 pieces Porous Plates, 1 piece Plane Grid, 2 pieces Perforated Grids and software. Direct Shear Test Machine Supplied with 50 kg Slotted Weight Set.

Shear Box Assembly, Specimen cutter and Extrusion Dolly should be ordered separately depending on the sample size.

Touch Screen Graphic Display Automatic Control Unit

Real time Load vs. Displacement or Stress vs. Displacement graphs can be seen on the Graphic Display. The Software calculates both the maximum and resilient shear stress.

After minimum three tests, the software calculates the cohesion value "c" and shear resistance angle"φ" by using the best straight line fit.



Shear Box Accessories

HR-S2000

Spare Parts & Accessories:

Product Code	Product Name
HR-S2000/1	Slotted Weight Set, 50 kg (4x10 kg + 1x5 kg + 2x2 kg + 1x1 kg)

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Speed Range (mm/min)	Maximum Shear Force (kN)	Power Supply
HR-S2000	Automatic Direct /Residual Shear Test Machine	65x155x135	120	0.0001 to 9.9999	5	220 V, 50-60 Hz, 1 ph

The Accessories of Shear Box Assemblies:

Product Name	Product Code				
	60x60 mm	Ø 60 mm	100x100 mm	Ø 100 mm	Ø 2.5 inch
Shear Box Assembly	HR-S2100	HR-S2200	HR-S2300	HR-S2400	HR-S2500
Shear Box	HR-S2100/1	HR-S2200/1	HR-S2300/1	HR-S2400/1	HR-S2500/1
Loading Pad	HR-S2100/2	HR-S2200/2	HR-S2300/2	HR-S2400/2	HR-S2500/2
Retaining Plate	HR-S2100/3	HR-S2200/3	HR-S2300/3	HR-S2400/3	HR-S2500/3
Porous Plate	HR-S2100/4	HR-S2200/4	HR-S2300/4	HR-S2400/4	HR-S2500/4
Plane Grid	HR-S2100/5	HR-S2200/5	HR-S2300/5	HR-S2400/5	HR-S2500/5
Perforated Grid	HR-S2100/6	HR-S2200/6	HR-S2300/6	HR-S2400/6	HR-S2500/6
Specimen Cutter	HR-S2100/7	HR-S2200/7	HR-S2300/7	HR-S2400/7	HR-S2500/7
Extrusion Dolly	HR-S2100/8	HR-S2200/8	HR-S2300/8	HR-S2400/8	HR-S2500/8

MANUEL DIRECT SHEAR TEST MACHINE

STANDARDS: ASTM D3080; BS 1377:7; AASHTO T236, CEN-ISO/TS 17892-10

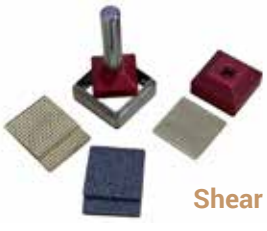
The test measures the consolidated drained shear strength of a soil material in direct shear. Manuel Direct Shear Test Machine is motorized with servo motor and measuring sensors are electronically connected to a digital readout unit to get accurate readings. Supplied with carriage assembly load hanger and integral 9:1, 10:1 and 11:1 lever loading device as standard. The loading arm which is used to amplify the vertical load on the shear box assembly can receive up to 50 kg of weight. The total load on the specimen can reach up to 5 kN.

The shear machine is driven by high resolution servomotor and gear box assembly. Speed range is fully steeples variable over the range 0.00001 to 9.9999 mm/min.

5 kN Load ring is used for load measurement. 10 x 0.01 mm and 30 x 0.01 mm sensitivity displacement sensors are used for vertical and horizontal displacement measurements respectively. Displacement limits are controlled by limit switch.

The machine shear box tests on 60 mm and 100 mm square, 60 mm round, 100 mm round and 2,5" round samples. All Shear box assemblies can contain water that surrounds the specimen. The Assemblies consist of a shear box with a rigid wall square, complete with a Vertical Loading Pad grooved back face, a Grooved Retaining Plate, 2 pieces Porous Plates, 1 piece Plane Grid, 2 pieces Perforated Grids and software. Direct Shear Test Machine Supplied with 50 kg Slotted Weight Set.

Shear Box Assembly, Specimen cutter and Extrusion Dolly should be ordered separately depending on the sample size.



Shear Box Accessories

HR-S2025

Spare Parts & Accessories:

Product Code	Product Name
HR-S2000/1	Slotted Weight Set, 50 kg (4x10 kg + 1x5 kg + 2x2 kg + 1x1 kg)

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Speed Range (mm/min)	Maximum Shear Force (kN)	Maximum Vertical load (N)	Power Supply
HR-S2025	Manuel Direct Shear Test Machine	65x155x135	120	0.0001 to 9.9999	5	0 to 500 N applying 5000 N using 10:1 beam loading device	220 V, 50-60 Hz, 1 ph

The Accessories of Shear Box Assemblies:

Product Name	Product Code				
	60x60 mm	Ø 60 mm	100x100 mm	Ø 100 mm	Ø 2.5 inch
Shear Box Assembly	HR-S2100	HR-S2200	HR-S2300	HR-S2400	HR-S2500
Shear Box	HR-S2100/1	HR-S2200/1	HR-S2300/1	HR-S2400/1	HR-S2500/1
Loading Pad	HR-S2100/2	HR-S2200/2	HR-S2300/2	HR-S2400/2	HR-S2500/2
Retaining Plate	HR-S2100/3	HR-S2200/3	HR-S2300/3	HR-S2400/3	HR-S2500/3
Porous Plate	HR-S2100/4	HR-S2200/4	HR-S2300/4	HR-S2400/4	HR-S2500/4
Plane Grid	HR-S2100/5	HR-S2200/5	HR-S2300/5	HR-S2400/5	HR-S2500/5
Perforated Grid	HR-S2100/6	HR-S2200/6	HR-S2300/6	HR-S2400/6	HR-S2500/6
Specimen Cutter	HR-S2100/7	HR-S2200/7	HR-S2300/7	HR-S2400/7	HR-S2500/7
Extrusion Dolly	HR-S2100/8	HR-S2200/8	HR-S2300/8	HR-S2400/8	HR-S2500/8

UNIAXIAL UNCONFINED COMPRESSIVE TESTING MACHINE

STANDARDS: ASTM D2166, ASTM D1663, AASHTO T208

Uniaxial Unconfined Compressive Testing Machine is designed to perform Uniaxial Unconfined Compressive Tests to examine the behavior of a soil sample that does not need lateral support under axial load. As a result of this test, the unconfined compressive strength (qu) value and the undrained shear strength (cu) value of cohesive soils are obtained.

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 or 100 kN and a data acquisition and processing system.

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

The testing speed can be set between 0,5 mm/min to 2 mm/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.

HR-S1000

Supplied complete with LCD 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, Compression Platens with ball seating assembly,

Technical Specifications:

Product Code	HR-S1000	HR-S1005
Product Name	Uniaxial Unconfined Compressive Testing Machine	
Test Speed	0,5 - 2 mm/min.	
Capacity (kN)	50	100
Dimensions (cm)	47x70x110	52X72X110
Weight (kg)	80	90
Power Supply	220 V, 50-60 Hz, 1 ph	

Spare Parts & Accessories:

Product Code	Product Name
HR-S1000/F	Uniaxial Unconfined Compressive Testing Frame, 50 kN
HR-S1005/F	Uniaxial Unconfined Compressive Testing 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-S1000/2	LCD Uniaxial Control Unit
HR-S1010	Compression Platens with ball seating assembly

UNIAXIAL UNCONFINED COMPRESSIVE TESTING MACHINE
H-TOUCH PRO MAX UNIAXIAL CONTROL UNIT (TOUCH SCREEN)

STANDARDS: ASTM D2166, ASTM D1663, AASHTO T208

HR-S1000/TS

Uniaxial Unconfined Compressive Testing Machine is designed to perform Uniaxial Unconfined Compressive Tests to examine the behavior of a soil sample that does not need lateral support under axial load. As a result of this test, the unconfined compressive strength (qu) value and the undrained shear strength (cu) value of cohesive soils are obtained.

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 or 100 kN and a data acquisition and processing system.

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

The testing speed can be set between 0,5 mm/min to 2 mm/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 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, Compression Platens with ball seating assembly, HİRATEST H-GUI Uniaxial Software and LAN Connection Cable.

H-TOUCH PRO MAX UNIAXIAL CONTROL UNIT

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

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

The Unit can perform Uniaxial Unconfined Compressive Tests as a stand-alone without the use of a PC or with the HİRATEST H-GUI 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 Uniaxial Control Unit

- 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-S1000/2/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 Uniaxial Software has been designed for Uniaxial Unconfined Compressive Test.

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

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

The unconfined compressive strength (qu) value and the undrained shear strength (cu) value of cohesive soils are obtained.

Main Features of H-GUI 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

Technical Specifications:

Product Code	HR-S1000/TS	HR-S1005/TS
Product Name	Uniaxial Unconfined Compressive Testing Machine	
Test Speed	0,5 - 2 mm/min.	
Capacity (kN)	50	100
Dimensions (cm)	47x70x110	52X72X110
Weight (kg)	80	90
Power Supply	220 V, 50-60 Hz, 1 ph	

Spare Parts & Accessories:

Product Code	Product Name
HR-S1000/F	Uniaxial Unconfined Compressive Testing Frame, 50 kN
HR-S1005/F	Uniaxial Unconfined Compressive Testing 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-S1000/2/TS	H-Touch Pro Max Uniaxial Control Unit
HR-S1000/3	H-GUI Uniaxial Software
HR-S1010	Compression Platens with ball seating assembly

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.

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

HR-AS5000/1

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 & Unaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Unaxial 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

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.

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-S5000/1
HR-S5100

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

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 & MARSHALL & UNAXIAL TESTING MACHINE
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.

HR-AS0500/TS & HR-S5000/1 & HR-S5100

HR-AS5000/1

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 (qu) value and the undrained shear strength (cu) 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 & Unaxial Frame, 50 kN
HR-AS0501/1	CBR & Marshall & Unaxial 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

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.

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-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.

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

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 & 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	0,01	0,01	0,001
Test Speed	Can be selected as 1.0 & 1.27 & 50.8 mm/min		
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

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

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

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

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

TRIAXIAL TEST MACHINE, UU TEST SYSTEMS

STANDARDS: ASTM D2850, D4767, D7181, AASHTO T297, BS 1377-7, BS 1377-8

Triaxial Testing Machine is used to make Triaxial Tests. Determining the mechanical properties of soils is a very important step to design foundations, embankments and other soil structures.

Building constructions, excavations, tunneling and similar applications have several effects on the subsoil structures and these effects are successfully simulated with Triaxial Tests where the stress-strain relation of undisturbed soil specimen are investigated by subjecting the soil sample to different stress levels and drainage conditions.

The Triaxial Test System provides Automated Triaxial Compression Tests on cylindrical undisturbed and remolded soil samples. Unconsolidated Undrained (UU) Compression Tests can be automatically run, controlled and reported using this apparatus.

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 5 kN.

The testing speed can be set between 0,0001 mm/min to 9,9999 mm/min. The test automatically stops when load and displacement is reached to 95% value of the set measuring range.

Triaxial Testing Machine is supplied complete with 5 kN Load Cell, 25 mm Displacement Sensor and Digital Readout and Control Unit.

The other Test Accessories should be ordered separately.

HR-E4000

UNCONSOLIDATED UNDRAINED (UU) TEST

The System is Supplied with Triaxial Testing Machine, 5 kN capacity Load cell, Triaxial Cell for Ø38 and Ø50 mm samples or Triaxial Cell for Ø70 and Ø100 mm samples (Choose the suitable cell for the specimen size), Analog Manometer, Air and Water Constant Pressure System, Software to Perform UU Triaxial Tests and De-Airing Water Tank and Hose.

Digital Manometer is optional and should be ordered separately instead of Analog Manometer.

Technical Specifications:

Product Code	HR-E4000
Product Name	Triaxial Test Machine
Test Speed (mm/min)	0,0001 – 9,9999
Capacity (kN)	5
Dimensions (cm)	50x50x135
Weight (kg)	120
Power Supply	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-E5000/1	Triaxial Testing Frame
HR-G0980	Load Cell, 5 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-E9000	Digital Readout and Control Unit

TRIAXIAL CELLS

The cell has been designed and treated to minimize corrosion. Particular attention has been paid to the quality of finish between the piston and the head. The piston load capacity is designed to accept high axial loads which may be present during the final stages of a test.

Spare Parts & Accessories:

Product Code	Product Name
HR-E4100	Triaxial Cell for Ø 38 and Ø 50 mm samples
HR-E4300	Triaxial Cell for Ø 70 and Ø 100 mm samples
HR-G9010	Analog Manometer
HR-G9015	Digital Manometer (Optional)
HR-E4000/1	Air and Water Constant Pressure System
HR-E4000/2	Software to Perform UU Triaxial Tests
HR-E4000/3	De-Airing Water Tank, 7 lt
HR-E4000/4	Plastic Hose, Ø 8 mm x 6 m

HR-E4100

Technical Specifications for Triaxial Cells

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-E4100	Triaxial Cell for Ø 38 and Ø 50 mm samples	16x16x40	4.5
HR-E4300	Triaxial Cell for Ø 70 and Ø 100 mm samples	21x21x55	12

Triaxial Cell Accessories

Product Name	Product Code			
Sample Diameter (mm)	38	50	70	100
Base Adaptor	HR-E4130	HR-E4330	HR-E4430	HR-E4530
Porous Top Cap	HR-E4131	HR-E4331	HR-E4431	HR-E4531
Nylon Tubing for Drainage	HR-E4132	HR-E4332	HR-E4432	HR-E4532
Pair of Porous Discs	HR-E4133	HR-E4333	HR-E4423	HR-E4533
Rubber Membrane	HR-E4134	HR-E4334	HR-E4434	HR-E4534
Membrane Placing Tool (Strecher)	HR-E4135	HR-E4335	HR-E4435	HR-E4535
0 Ring (Pack of 10)	HR-E4136	HR-E4336	HR-E4436	HR-E4536
0 Ring Placing Tool	HR-E4137	HR-E4337	HR-E4437	HR-E4537
Lateral Filter Paper (Pack of 50)	HR-E4138	HR-E4338	HR-E4438	HR-E4538
Filter Paper Discs (Pack of 100)	HR-E4139	HR-E4339	HR-E4439	HR-E4539
Plastic Discs (Pack of 2)	HR-E4140	HR-E4340	HR-E4440	HR-E4540

Sample Preparation Accessories

Product Name	Product Code			
Sample Diameter (mm)	38	50	70	100
Split Sand Former	HR-E4125	HR-E4325	HR-E4425	HR-E4525
Split Mould	HR-E4126	HR-E4326	HR-E4426	HR-E4526
Cutter	HR-E4127	HR-E4327	HR-E4427	HR-E4527
Aluminum Dolly	HR-E4128	HR-E4328	HR-E4428	HR-E4528

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G9010	Analog Manometer	---	---	---
HR-G9015	Digital Manometer	---	---	---
HR-E4000/1	Air and Water Constant Pressure Unit	30x25x25	7.5	220-240V, 50-60Hz, 1ph

MULTIPLEX TESTING MACHINE

Multiplex Testing Machine is used to make Uniaxial, CBR, Marshall and Triaxial 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 testing speed can be set between 0,001 mm/min to 51mm/min. The test automatically stops when load and displacement is reached to 95% value of the set measuring range.

The Multiplex Testing Machine features a microprocessor controlled drive system with an advanced servo motor enabling the operator to easily set any test speed via the membrane keyboard. The keyboard comprises adjustment buttons such as "start", "stop", "down", "up".

The HR-E5000 Servo Controlled Multiplex Testing Machine is supplied complete with 50 kN Load Cell, 25 mm Displacement Sensor and Digital Readout and Control Unit.

The other Test Accessories should be ordered separately according to the test. 5 kN Load Cell for Triaxial Tests, Compression Platens with ball seating assembly for Unaxial Tests, Penetration Piston for CBR Tests and Breaking Head for Marshall Tests should be ordered separately.

HR-E5000

Technical Specifications:

Product Code	HR-E5000
Product Name	Multiplex Testing Machine
Test Speed	0,001 - 51 mm/min.
Capacity (kN)	50
Dimensions (cm)	50x50x135
Weight (kg)	120
Power Supply	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-E5000/1	Multiplex Testing Frame
HR-G0981	Load Cell, 50 kN capacity
HR-G0995	Displacement Sensor, 25 x 0,01 mm
HR-E9000	Digital Readout and Control Unit

TRIAXIAL TEST SYSTEMS

STANDARDS: ASTM D2850, D4767, D7181, AASHTO T-297, BS 1377-7, BS 1377-8

Determining the mechanical properties of soils is a very important step to design foundations, embankments and other soil structures.

Building constructions, excavations, tunneling and similar applications have several effects on the subsoil structures and these effects are successfully simulated with Triaxial Tests where the stress-strain relation of undisturbed soil specimen are investigated by subjecting the soil sample to different stress levels and drainage conditions.

The Triaxial Test System provides Automated Triaxial Compression Tests on cylindrical undisturbed and remolded soil samples. Unconsolidated Undrained (UU) Compression Tests can be automatically run, controlled and reported using this apparatus.

5 kN Load Cell should be ordered separately for Triaxial Tests.

UNCONSOLIDATED UNDRAINED (UU) TEST

The System is Supplied with Multiplex Testing Machine, Load cell, 5 kN capacity, Triaxial Cell for Ø38 and Ø50 mm samples or Triaxial Cell for Ø70 and Ø100 mm samples (Choose the suitable cell for the specimen size), Analog Manometer, Air and Water Constant Pressure System, Software to Perform UU Triaxial Tests and De-Airing Water Tank and Hose.

Digital Manometer is optional and should be ordered separately instead of Analog Manometer.

TRIAXIAL CELLS

The cell has been designed and treated to minimize corrosion. Particular attention has been paid to the quality of finish between the piston and the head. The piston load capacity is designed to accept high axial loads which may be present during the final stages of a test.

Spare Parts & Accessories:

Product Code	Product Name
HR-G0980	Load Cell, 5 kN capacity
HR-E4100	Triaxial Cell for Ø 38 and Ø 50 mm samples
HR-E4300	Triaxial Cell for Ø 70 and Ø 100 mm samples
HR-G9010	Analog Manometer
HR-G9015	Digital Manometer (Optional)
HR-E4000/1	Air and Water Constant Pressure System
HR-E4000/2	Software to Perform UU Triaxial Tests
HR-E4000/3	De-Airing Water Tank, 7 lt
HR-E4000/4	Plastic Hose, Ø 8 mm x 6 m

HR-E4100

Technical Specifications for Triaxial Cells

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-E4100	Triaxial Cell for Ø 38 and Ø 50 mm samples	16x16x40	4.5
HR-E4300	Triaxial Cell for Ø 70 and Ø 100 mm samples	21x21x55	12

Triaxial Cell Accessories

Product Name	Product Code			
Sample Diameter (mm)	38	50	70	100
Base Adaptor	HR-E4130	HR-E4330	HR-E4430	HR-E4530
Porous Top Cap	HR-E4131	HR-E4331	HR-E4431	HR-E4531
Nylon Tubing for Drainage	HR-E4132	HR-E4332	HR-E4432	HR-E4532
Pair of Porous Discs	HR-E4133	HR-E4333	HR-E4423	HR-E4533
Rubber Membrane	HR-E4134	HR-E4334	HR-E4434	HR-E4534
Membrane Placing Tool (Strecher)	HR-E4135	HR-E4335	HR-E4435	HR-E4535
0 Ring (Pack of 10)	HR-E4136	HR-E4336	HR-E4436	HR-E4536
0 Ring Placing Tool	HR-E4137	HR-E4337	HR-E4437	HR-E4537
Lateral Filter Paper (Pack of 50)	HR-E4138	HR-E4338	HR-E4438	HR-E4538
Filter Paper Discs (Pack of 100)	HR-E4139	HR-E4339	HR-E4439	HR-E4539
Plastic Discs (Pack of 2)	HR-E4140	HR-E4340	HR-E4440	HR-E4540

Sample Preparation Accessories

Product Name	Product Code			
Sample Diameter (mm)	38	50	70	100
Split Sand Former	HR-E4125	HR-E4325	HR-E4425	HR-E4525
Split Mould	HR-E4126	HR-E4326	HR-E4426	HR-E4526
Cutter	HR-E4127	HR-E4327	HR-E4427	HR-E4527
Aluminum Dolly	HR-E4128	HR-E4328	HR-E4428	HR-E4528

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-G9010	Analog Manometer	---	---	---
HR-G9015	Digital Manometer	---	---	---
HR-E4000/1	Air and Water Constant Pressure Unit	30x25x25	7.5	220-240V, 50-60Hz, 1ph

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

HR-E5000/1
HR-G0981
HR-G0995
HR-AS5000/1

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-E5000/1
HR-G0981
HR-G0995
HR-S5000/1
HR-S5100

CLAY ABRASION TESTER

STANDARDS: TS 10521, TS10521-T1

Clay Abrasion Tester is used to determine the abrasion property of materials like clay, calcite, sepiyolit, talcum which are used in production of paper, ink, pigment, paint etc.

The device work like the same principle of Voith Allis Valley abrasion testing device.

The motor rotates Abrasive apparatus and the weight on it works 75-80 rpm (forward-backward 1 revolution, total hit 170 can be adjustable)

The device works without any problem in that revolution rate for 2 hours (6000 revolutions)

The device control unit stop the device at any given revolution value.

Metal plate supports the abrasion wire is made of stainless steel. The plate is locked by a locking mechanism.

The suspension tank has a 3,5 lt capacity and made of corrosion and wear resistant material.

The capacity of the circulation pump which send suspension to abrasion wire is 190 lt/h(50 gal/h).

The device is complete with a 210 µm opening, 22,4 x 8,7 cm wide brass wire, Pack of 1000.

HR-S7000

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)	Power Supply
HR-S7000	Clay Abrasion Tester	120x40x100	150	220 V, 50- 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)
HR-S7000/1	Wide Brass Wire	22,4 x 8,7

GRAVEL ROAD TEST KIT

STANDARDS: BS 1337:2, CEN ISO/TS 17892-6, 17892-12

The implementation of labour-based construction techniques is beneficial in that it creates opportunities and assists with the development of small contractors whilst upgrading the transportation network.

The performance of a gravel road is primarily a function of the material selected, as well as testing and control of constructed layer work. A field test kit to evaluate borrow materials for use as wearing course on unsealed roads and to ensure that the quality of the construction is appropriate, has been developed in conjunction with the International Labour Organisation (ILO).

The Field Gravel Road Test Kit allows materials grading, cohesion (liquid limit and linear shrinkage), compacted strength and aggregate strength of the borrow material to be determined. The thickness probe and RCCD in the kit ensure construction quality assurance. The kit is designed to make use of local water and solar energy (solar oven and calculator) and therefore does not require electricity and running water to be available.

Supplied with 3 pieces Shrinkage Moulds, Shrinkage Mould Plate, Drop cone apparatus and Thickness probe.

Canvas sheet for quartering sample, 5 test sieves with pan and cover (37.5, 26.5, 4.75, 2 and 0.425 mm),
2 stiff and 2 soft brushes, 5 pans, Steel rule, Spatula, Silicone spray and Water bottle should be ordered separately.

HR-S0915

Technical Specifications:

Product Code	Product Name
HR-S0915	Gravel Road Test Kit

Spare Parts & Accessories:

Product Code	Product Name	Weight (kg)
HR-S0915/1	Shrinkage Moulds (3 pieces)	2,5
HR-S0915/2	Shrinkage Mould Plate	1,5
HR-S0915/3	Drop cone apparatus	25
HR-S0915/4	Thickness probe	1

NON-NUCLEAR SOIL ELECTRICAL DENSITY GAUGE

STANDARDS: ASTM D 7698

The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations.

•It does not require a highly- trained or licensed technician,
•It does not require special handling for shipping or regulatory compliance for hazardous materials
•It is easy to learn and easy to use with its step-by-step menu
•Lightweight and easily transportable
•It is accurate and repeatable with results that mirror known testing methods

Supplied complete with Hammer, EDG Console/Computer, Dart Template, Soil Darts, Temperature Probe, Electric Soil Measurement Sensor, Cables/Clips for Soil Measurement Sensor and Battery Charger.

HR-S0925

OPERATIONAL FEATURES:

Display: 240*128 LCD screen display with backlight for easy visibility in daylight or dark situations.

Status Bar: Displays GPS status, battery voltage, low battery and date and time.

Project Details: Stores Up to 60 projects with details.

Soil Model: 15 sets of soil models can be stored

Material Details: Stores up to 20 materials, details include Material Name, Description, Max Dry Density, Opt. Moisture, Dry Density Offset, % Moisture Offset, % Greater than 3", % Greater than 3/4", % Gravel, % Sand, % Fines, PL, LL, Cu and Cc.

Data Logging: Ability to store all measurements

Reports: Export to the computer software.

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 feature is enabled (Status Bar Icon)

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/m3, lb/ft3), Temp (°C, °F)
Standardization: While gauge is still in the case, a quick one touch measurement will ensure the gauge is still in proper working mode

Enhanced customer support: Diagnostic screen to aid in factory Support

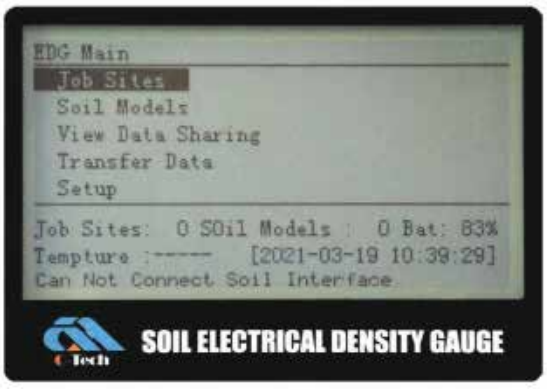
User Programmable Target Density: Used for calculating % compaction

WORKING INTERFACE

Software

The software will allow you to communicate effortlessly with your EDG gauges and only requires minimal setup by the user. EDG Software provides a complete solution for the acquisition, storing, and presentation of Job and Soil Model data. EDG Software Works in conjunction with Microsoft Excel to present test data in easy-to-read Excel workbook format files, which can be evaluated directly or sent to any computer using Microsoft Excel. Jobs can be grouped together within projects for organization and reporting.

Software Features



- Communicate with all your EDG gauges.
- Download Job Data.
- Create customized reports from downloaded job data.
- Download Soil Model Data.
- Create reports from downloaded soil model data.
- Upload soil models to any EDG.
- Input proctor data for use in job or soil model data.
- Time/Date, GPS stamps for each test.

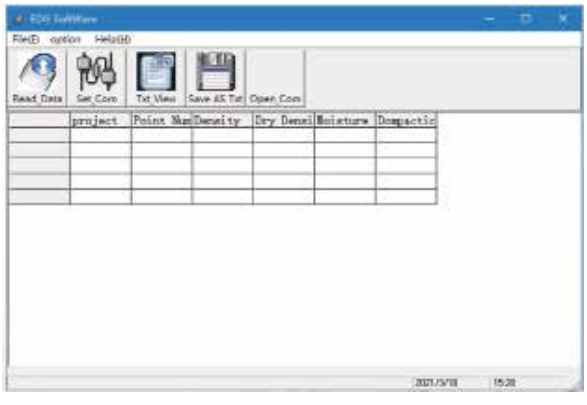
OPERATIONAL SPECIFICATIONS:

MEASUREMENT MODE:

Average: Averages four (4) readings and stores data including location, date and time. Stores infinite records.

Functions: Wet & Dry Density, % Compaction, % Moisture

SOIL SPECIFICATIONS:



Designed to operate with standard soils used in civil construction projects.

Requires inputs from standard

- Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318)
- Particle Size Distribution (ASTM D422)
- Proctor Test (ASTM D698 and D1557)

Operating Temperature: 0 °C to 50°C

MEASUREMENT SPECIFICATIONS:

Sensing Area: 9.5 in. (24.1 cm) square Dart Template allows optimum measurement on fine and coarse material types. A larger sensing area can be achieved by customizing the darts and dart template.

Measurement Depth: The standard dart is 15 cm, and 30, 50 and 80 cm darts can be customized.

Measurement Display: Dry Density, % Compaction, % Moisture, GPS Data, Material Information and Project Name

Accuracy: The accuracy can reach ± 1% except for the measurement of Collapsible loess. (The measurement accuracy of collapsible loess is ±3%.)

ELECTRICAL SPECIFICATIONS:

Microprocessor Controlled

Battery: 2000mAh Ni-MH, 13.2V

Battery Time: about 12 hours

Battery Charger: 110-240 V 50/60 Hz.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S0925	Non-Nuclear Soil Electrical Density Gauge	60x46x37	10

NON-NUCLEAR SOIL ELECTRICAL DENSITY GAUGE, TOUCH SCREEN

STANDARDS: ASTM D 7698

The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations.

The EDG is a portable, battery-powered instrument capable of being used anywhere without the concerns and regulations associated with nuclear safety.

Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with traditional methods, including the nuclear gauge and/ or a sand-cone and oven moisture test combination.

Its user-friendly, step-by-step menu guides the user through each step of the testing procedure and cautions the user when values do not correspond to established curves for the material being tested.

- Color touch screen
- More accurate data
- New GPS function (Optional)
- USB connection, more convenient for data transmission and software upgrading later

HR-S0930

Supplied complete with Hammer, EDG Console/Computer, Dart Template, Soil Darts, Temperature Probe, Electric Soil Measurement Sensor and Cables/Clips for Soil Measurement Sensor.

OPERATIONAL FEATURES:

Display: Full color graphics driven user interface, 7"TFT (800*480) touch screen, display with LED backlight for easy visibility in daylight or dark situations

Status Bar: Displays GPS status, battery voltage, low battery and date and time.

Project Details: Stores Up to 200 projects with details.

Soil Model: 48 sets of soil models can be stored

Material Details: Stores up to 20 materials, details include Material Name, Description, Max Dry Density, Opt. Moisture, Dry Density Offset, % Moisture Offset, % Greater than 3", % Greater than 3/4", % Gravel, % Sand, % Fines, PL, LL, Cu and Cc.

Data Logging: Ability to store all measurements

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 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/m3, lb/ft3), Temp (°C, °F)

Standardization: While gauge is still in the case, a quick one touch measurement will ensure the gauge is still in proper working mode

Enhanced customer support: Diagnostic screen to aid in factory Support

User Programmable Target Density: Used for calculating % compaction

WORKING INTERFACE

Software

The software will allow you to communicate effortlessly with your EDG gauges and only requires minimal setup by the user. EDG Software provides a complete solution for the acquisition, storing, and presentation of Job and Soil Model data. EDG Software Works in conjunction with Microsoft Excel to present test data in easy-to-read Excel workbook format files, which can be evaluated directly or sent to any computer using Microsoft Excel. Jobs can be grouped together within projects for organization and reporting.

Software Features

- Communicate with all your EDG gauges.
- Download Job Data.
- Create customized reports from downloaded job data.
- Download Soil Model Data.
- Create reports from downloaded soil model data.
- Upload soil models to any EDG.
- Input proctor data for use in job or soil model data.
- Time/Date, GPS stamps for each test.

OPERATIONAL SPECIFICATIONS:

MEASUREMENT MODE:

Average: Averages four (4) readings and stores data including location, date and time. Stores infinite records.

Functions: Wet & Dry Density, % Compaction, % Moisture

SOIL SPECIFICATIONS:

Designed to operate with standard soils used in civil construction projects.

Requires inputs from standard

- Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318)
- Particle Size Distribution (ASTM D422)
- Proctor Test (ASTM D698 and D1557)

Operating Temperature: 0 °C to 50°C

MEASUREMENT SPECIFICATIONS:

Sensing Area: 9.5 in. (24.1 cm) square Dart Template allows optimum measurement on fine and coarse material types. A larger sensing area can be achieved by customizing the darts and dart template.

Measurement Depth: The standard dart is 15 cm, and 30, 50 and 80 cm darts can be customized.

Measurement Display: Dry Density, % Compaction, % Moisture, GPS Data, Material Information and Project Name

Accuracy: The accuracy can reach ± 1% except for the measurement of Collapsible loess. (The measurement accuracy of collapsible loess is ±3%.)

ELECTRICAL SPECIFICATIONS:

Microprocessor Controlled

Battery: 16800mAh, Li-on battery

Battery Time: about 48 hours

Battery Charger: Input AC100V-245V, 50-60HZ, DC5V/1A

Computer Ports: 1 USB Port

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S0930	Non-Nuclear Soil Electrical Density Gauge, Touch Screen	48x38,5x20	9

NON-NUCLEAR SOIL ELECTRICAL DENSITY GAUGE, TOUCH SCREEN

STANDARDS: ASTM D 7830

The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations.

HR-S0935

The EDG is a portable, battery-powered instrument capable of being used anywhere without the concerns and regulations associated with nuclear safety.

Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with traditional methods, including the nuclear gauge and/ or a sand-cone and oven moisture test combination.

•Full color graphics driven user interface, touch screen operation.
•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.

OPERATIONAL FEATURES:

Status Bar: Displays GPS 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

Units: Interchangeable settings for Density (kg/m3, lb/ft3), 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

OPERATIONAL SPECIFICATIONS:

MODES:

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

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

Continuous: Instantaneous density readings.

FUNCTIONS:

Wet & Dry Density, % Compaction, % Moisture

SOIL SPECIFICATIONS:

Designed to operate with standard soils used in civil construction projects.

Requires inputs from standard

•Standard Test Methods for Liquid Limit,
•Plastic Limit, and Plasticity Index of Soils (ASTM D4318)
•Particle Size Distribution (ASTM D422)
•Proctor Test (ASTM D698 and D1557)

Operating Temperature: -20 °C to 40°C

MEASUREMENT SPECIFICATIONS:

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

Measurement Depth: 110 mm

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

ELECTRICAL SPECIFICATIONS:

Microprocessor Controlled

Battery: 2,5 Amp-hr NiMH, 12 V

Battery Time: 4 hours

Battery Charger: 12 V Universal AC Charge

Computer Ports: 1 USB Port

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-S0935	Non-Nuclear Soil Electrical Density Gauge, Touch Screen, ASTM D 7830	49x39x22	9

MINE

Mineral processing is a major division in the science of Extractive Metallurgy. Extractive metallurgy has been defined as the science and art of extracting metals from their ores, refining them and preparing them for use.

In mineral processing, a number of unit operations are required to prepare and classify ores before the valuable constituents can be separated or concentrated and then forwarded on for use or further treatment. The field of mineral processing has also been given other titles such as mineral dressing, ore dressing, mineral extraction, mineral beneficiation, and mineral engineering. These terms are often used interchangeably.

Finding new mineral reserves is critical. Locating, extracting and processing these natural resources is a multiyear process that involves complex scientific, environmental and social planning.

HİRA's mission is to product useful device to sustainable mining business and environmental stewardship.

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CORE CUTTING MACHINE

Core Cutting Machine is mainly used to cut rock, concrete and core specimens of various sizes and to obtain two half cylinders from core specimens.

Made of 5 mm sheet metal.

Cutting capacity up to Ø 110 mm and 1200 mm length.

Movement is given by means of a gear motor to Core Cutting motor.

The Core Cutting Machine has a water cooling system which prevents the heating of the cutting stone.

The forward and backward speeds of the movement which has given by the gear motor can be adjusted separately. The forward and backward distances can be adjusted with switches.

The motion motor which moves the Core Cutting motor by means of forward and backward reducer is 0.55 kW.

The Core Cutting motor has an IP 55 protection class, with a power of 5.5 kW and a rotation speed of 4000 rpm.

It has a long-lasting electric pump with cooler.

HR-M1200

In the reducer which is used to reduce the motor output cycle by means of gears by passing through certain steps, rate of the input/output cycle is 7.5.

The Core Cutting Machine do not make cutting head oscillating movement.

There is shield apparatus to prevent scattering of particles.

There is a V bedding system on the purpose of to obtain a half cylinder that up to 1200 mm to cut the core. The V bedding system has a specimen rest support and precautions have been taken to prevent the specimen from slipping during cutting of the specimen.

It is painted with electrostatic dye to resistant the scratch.

Thermic magnetic switch for motor protection is available.

The Core Cutting Machine has 4 feets with a height of 90 cm.

It can circulate its own water thanks to the water tank and water pump to be installed on the Concrete Cutting Machine.

The Concrete Cutting Machine is equipped with Quintet three-phase industrial type male plugs with grounded and 3 phase, neutral, earth connection.

The Concrete Cutting Machine is supplied with the wrench and equipment for removing and installing the Core Cutting Blade.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Power Supply
HR-M1200	Concrete Cutting Machine	170x60x130	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-M1200/1	Core Cutting Blade	350

MANUEL CORE CUTTING MACHINE

Manuel Core Cutting Machine is mainly used to cut rock, concrete and core specimens of various sizes and to obtain two half cylinders from core specimens.

The Manuel Core Cutting Machine has a water-cooling system which prevents the heating of the cutting stone. The Manuel Core Cutting motor has an IP 55 protection class.

It has a long-lasting electric pump with cooler. The Manuel Core Cutting Machine do not make cutting head oscillating movement.

There is shield apparatus to prevent scattering of particles. It is painted with electrostatic dye to resistant the scratch.

It can circulate its own water thanks to the water tank and water pump to be installed on the Concrete Cutting Machine.

The Manuel Concrete Cutting Machine is supplied with the wrench and equipment for removing and installing the Core Cutting Blade.

HR-M1250

Technical Specifications:

Product Code	HR-M1250	HR-M1300	HR-M1300/220	HR-M1305	HR-M1305/220
Product Name	Manuel Core Cutting Machine				
Blade Diameter (cm)	35	30		30	
Cutting Depth (cm)	10,5	9,5		9,5	
Cutting Length (cm)	180	90		120	
Engine Power	4 hp - 380 V	3 hp - 380 V	3 hp - 220 V	3 hp - 380 V	3 hp - 220 V
Water Pump Power	0.37 hp - 220 V	0.37 hp - 220 V		0.37 hp - 220 V	
Blade Speed (rpm)	2800	2800		2800	
Water Tank Capacity (lt)	220	75		90	
Weight (kg)	190	170		180	
Dimension (cm)	240x70x140	135x60x125		165x70x125	

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)
HR-M1250/1	Core Cutting Blade	350
HR-M1300/1	Core Cutting Blade	300
HR-M1305/1	Core Cutting Blade	300

ROLLING MILL

The Rolling mill is used to change the physical properties of the mines by using rollers that compress as they pass through the mines.

Flat, without grooves. The speed is adjustable. It can work with Forward-Back-Stop commands.

Technical Specifications:

Product Code	HR-M7500
Roller Diameter	50 mm
Flat Area	60 mm
Maximum sheet thickness	6 mm
Total roller width	130 mm
Max. Speed	20 rpm
Dimensions (cm)	80x40x60 cm
Weight (kg)	80
Power Supply	220 V, 50-60 Hz, 1 ph

HR-M7500

ROTARY SAMPLE DIVIDER

A perfect and comparable analysis is closely related to the correct sampling. Based on that, rotary sample divider is designed for sampling, dustless separation and reduction of large quantities of powder or granular bulk materials.

This machine is used in various area such as materials Portland cement clinker, chemicals, construction materials, fertilizers, fillers, flours, grains, metal powders, minerals, nut, sand, seeds, soil, dust washing etc. in areas of agriculture, biology, chemical, plastic, building materials, engineering, electronic, environment, recycling, food, geology, metallurgy, glass, ceramic.

The added material is divided equally into the buckets which rotating in a "circle" motion.

Sample buckets are made of 304 quality stainless steel with a sheet thickness of 2 ± 0,1 mm and are made up of 8 divisions, each with 10 lt chambers or 12 divisions, each with 2,5 lt chambers in triangular prism shape. Depending on demand, production can be done in special dimensions.

The feeding chamber is made of 304 quality stainless steel, and the other parts are made of electrostatic powder paint on steel.

HR-M8100

HR-M8150

Sample buckets have handles to easy and safe carrying.

Feeding speed and quantity are adjustable steplessly with the help of magnetic vibration system.

Sample feeding system is vibratory.

Dividing speed of sample buckets can be adjusted between 0 and 60 rpm steplessly with electronic speed control panel and can be viewed via digital screen on the device during the test.

Technical Specifications:

Product Code	HR-M8000	HR-M8100	HR-M8050	HR-M8150
Product Name	Rotary Sample Divider		Rotary Sample Divider with Lever	
Material Feed Size	0-50 mm	0-20 mm	0-50 mm	0-20 mm
Rotation Speed	0-60 rpm		0-60 rpm	
Capacity	80 lt	30 lt	80 lt	30 lt
Electrical Unit	220 V, 50-60 Hz, 1 ph		220 V, 50-60 Hz, 1 ph	
Dimensions (cm)	110x170x185	74x125x120	160x170x200	125x125x135
Weight (kg)	380	140	540	300

The sample buckets can be rotated with the rotation adjusted drive motor.

The sample buckets are attached to each other with removable, made of steel suitable material with edge of the buckets to avoid the material coming from the feeder during the sample flow to the gap between sample buckets.

Sample feeding Speed can be adjusted steplessly by vibration coil and electronic system.

Rotary table control and vibration control panel is easy to use.

Rotary Sample Divider can be manufactured with wheels as optional and Wheeled models have a stabiliser safety system on the wheel.

Rotary Sample Divider can be manufactured with Lever for Feeder part and with Electromagnetic Feeder as optional.

SMALL ROTARY SAMPLE DIVIDER

Small Rotary Sample Divider has 8 pieces 250ml graduated bottles.

The Divider can divide 0-6 mm grain size material to 8 pieces equivalent samples up to 4 lt automatically.

Can be prepared samples which equiponderate with ± % 1 sensitivity on the 250 ml graduated bottles.

Small Rotary Sample Divider is equipped with 5 lt stainless steel feeding chamber and magnetic vibrating feeder.

HR-M8250 with HR-M8250/1

Technical Specifications:

Product Code	Product Name	Power Supply
HR-M8250	Small Rotary Sample Divider	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name	Capacity (ml)
HR-M8250/1	Graduated bottles	250

ROTATING SAMPLE DIVIDER

Rotating Sample Divider can divide 25 kg of sample at one time.

The division rate of the divider from 2% to 50% can be adjusted.

The fed sample is collected in two separate containers as the desired sample and the remaining sample after the division process.

Sample division amount is 25 kg/minute.

The maximum feed grain size of the sample is 10 mm.

The sample feeding speed can be adjusted with the vibrating feeder control system.

HR-M8300

Technical Specifications:

Product Code	Product Name	Power Supply
HR-M8300	Rotating Sample Divider	380 V, 50-60 Hz, 3 ph

ROLLER CRUSHER

The Roller Crusher is used for the rapid, safe and efficient crushing and secondary crushing of medium-hard, hard, brittle and tough materials. It is a very useful for bulk working and pilot plant working. Application Examples: Alloys, basalt, cement clinker, ceramics, chamotte, coal, coke, construction materials, feldspar, glass and various materials.

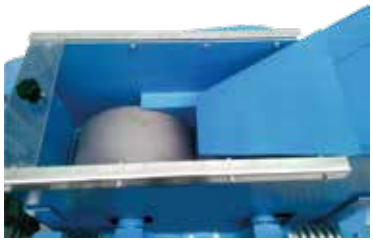
Size of roller is 250*150 mm.

The size of the crushed parts is maximum 12 mm and the size of the crushed material is 3 - 0,2 mm, depending on the clearance between rollers. The body of the crusher is designed as steel construction.

Rolls are tapered. It is possible to adjust the roller distances by means of an arm.

The lid that covers the rollers where the material inlet hopper is also connected does not leak dust. The carrier body is completely closed and there is a collecting container inside.

HR-M7000



The revolutions of the rolls are supplied by a reducer with appropriate strength.

The tension in the roller is absorbed by a spring system.

Capacity for 2 mm thick material is 0,3-0,5 m3.

Technical Specifications:

Product Code	Product Name	Power Supply
HR-M7000	Roller Crusher	380 V, 50-60 Hz, 3 ph

BALL MILL

Ball Mill is suitable for both wet and dry milling processes.

Supplied with 22 lt capacity cylindrical tank, receiver and balls.

Thanks to the digital timer, it can be operated for the desired time.

Rotational Speed is 70 rpm.

The grinding mill is located in a sound and dust proof cabinet for CE safety standards.

The cover of the mill is 10x30 cm wide and sides are isolated by dust proof material. The device is supplied with an emergency stop button and safety on/off switch.

The balls are made of corrosion resistance steel.

Complete with Ball Set and a receiver.

HR-M2200

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Ext. Dimensions (cm)	Weight (kg)	Power Supply
HR-M2200	Ball Mill	Ø 30,5 x 30,5	55x135x145	300	220 V, 50 Hz, 1 ph
HR-M2200/60Hz	Ball Mill	Ø 30,5 x 30,5	55x135x145	300	220 V, 60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name	Pieces	Dimensions (mm)
HR-M2200/1	Ball Set	43	Ø 38,10
		67	Ø 31,75
		10	Ø 25,40
		71	Ø 19,05
		94	Ø 15,87

BOND GRINDING TEST MILL

The FC Bond Mill was designed by F. C. Bond for use in determining the Bond Index, a measure of grindability and power required for grinding applications. The FC Bond Mills are used in laboratories throughout the world. A copy of Fred C. Bond's Method of Crushing and Grinding for determination of the Bond Index is included with each mill. This mill can be used to calculate the grindability of all ores.

The bond mill can be used continuously (in all cycles) or in any cycle, depending on the desired grinding type. The grinding mill is located in a sound and dust proof cabinet for CE safety standards.

The cover of the mill is 10x30 cm wide and sides are isolated by dust proof material. The device is supplied with an emergency stop button and safety on/off switch.

Thanks to the digital timer, it can be operated for the desired time.

The rotation speed can adjustable up to 70 rpm via second Digital screen on the screen (Can be increased optionally).

Bond Grinding Test Mill with Power Analyzer is also available. On this model, can be seen the Power values on third Digital Screen.

The balls are made of corrosion resistance steel.

Cylindrical tank capacity is 22 lt.

Supplied with receiver and balls.

HR-M2500

Technical Specifications:

Product Code	Product Name	Int. Dimensions (cm)	Weight (kg)	Power Supply
HR-M2500	Bond Grinding Test Mill	Ø 30,5 x 30,5	350	220 V, 50-60 Hz, 1 ph
HR-M2505	Bond Grinding Test Mill with Power Analyzer	Ø 30,5 x 30,5	350	220 V, 50-60 Hz, 1 ph

HR-M2505

Spare Parts & Accessories:

Product Code	Product Name	Pieces	Dimensions (mm)
HR-M2200/1	Ball Set	43	Ø 38,10
		67	Ø 31,75
		10	Ø 25,40
		71	Ø 19,05
		94	Ø 15,87

JAW CRUSHER

Jaw crusher is used for crushing the natural rocks, ores and minerals to millimetric scale by crushing. It is a very useful for sample preparation in laboratories and industrial plants. Application Examples: alloys, basalt, cement clinker, ceramics, chamotte, coal, coke, construction materials, feldspar, glass and various materials.

It has suitable base for stable fitting the ground. If necessary, can be screwed on the floor or wheel connections can be made to become mobile.

Material Feeding dimension is Ø 100 mm. After crushing, %75 of the all specimens become smaller to 2 mm and also lower than 2 mm. The capacity of crushing is 200 kg per hour and it is suitable for adding specimens continuously. 3 kW motor is used.

Jaw crusher consists of three main parts; Feeding Funnel, Body and Collector. All of this main parts are manufactured of metal alloy materials which are durable. All of this main parts are electrostatic painted.

The Feeding Funnel has an interior design which allows the user to put his hand inside and which prevent to rebounding the fed material by hitting to jaws. At the same time it is connected to the main body with hinge so that it can be opened easily during cleaning.

The Feeding Funnel can be locked to the body by a locking mechanism to prevent accidental opening of the crusher during the operation of the crusher. In case of manual opening of the lock, it has a safety arrangements to stop the device instantly.

The Body is designed the way that as dust will not leak out during operation. The noise emission level according to the working atmosphere is maximum 85 dB.

HR-M9000

Drive of the mechanical parts that move the crusher jaws is made by V-belt system which attached to motor and there is also a central lubrication system that is easy to maintain for all moving parts.

HR-M9000

The device has an electronic-mechanical equipment that can protect itself and stop working if wedge of the material and in such situations as overheating of the crusher during operation of the device.

The jaws can be easily removed from the place where they are mounted because the device is suitable for cleaning, maintenance or changing purposes.

Crusher material is 16-18 1,5 Chrome Manganese Steel of the Jaw Crusher. Wear Plates of the Jaw Crusher are manufactured from 450 Brinell material.

The distance between jaws can be adjusted between 0-15 mm and uninterruptedly.

Zeroing setting can be made for the distance between jaws. And also both the zero point and the distance between jaws can be easily read from the outside with an analog display. There is a Collector at the bottom of the Jaw Crusher.

Flat Jaws are optional and should be ordered separately.

HR-M9000

Spare Parts & Accessories:

Product Code	Product Name
HR-M9000/1	Spare Jaws (2 pieces)
HR-M9000/2	Flat Jaws (2 pieces)

Technical Specifications:

Product Code	Product Name	Jaws (mm)	Dimensions (cm)	Weight (kg)	Power Supply
HR-M9000	Jaw Crusher	100x100	45x90x80	250	380 V, 50-60 Hz, 3 ph

PNEUMATIC VIBRATORY DISC MILL

The Pneumatic Vibratory Disc Mill is used for the very rapid, safe and efficient grinding of medium-hard, hard, brittle and tough materials. It is a very useful for sample preparation in laboratories and industrial plants. Application Examples: Alloys, basalt, cement clinker, ceramics, coal, coke, construction materials, feldspar, glass and various materials.

Material feed size is between 0,075 - 5 mm.

The Pneumatic Vibratory Disc Mill can grind between range as 1-10 minutes depend on the type and size of specimen.

Loss of material is minimum during the pulverizing.

Grinding Jars are tightened and connected with air bellows pneumatically.

The material is placed between the jars and pulverized by vibration.

The jars are easily taken out and thus facilitating cleaning.

The complete system is taken into a sheet construction cabinet.

The device has a door safety switch and There is an Adjustable Timer.

The Pneumatic Vibratory Disc Mill stop when the door opens or the air pressure decrease, automatically.

Safety Lock, Lifter and Air Compressor should be ordered separately.

HR-M5000

GRINDING JARS

The Grinding Jars is used for the very rapid, safe and efficient grinding of medium-hard, hard, brittle and tough materials on the vibratory disc mill.

Supplied with Made of special alloy hardened steel 250 cc Grinding Jar.

50 cc and 100 cc Grinding Sets should be ordered separetely.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Power Supply
HR-M5000	Pneumatic Vibratory Disc Mill	100x75x130	380 V, 50-60 Hz, 3 ph

HR-M5000/1
HR-M5000/2
HR-M5000/3

HR-M6002

Spare Parts & Accessories:

Product Code	Product Name	Size (cc)
HR-M5000/1	Grinding Jar	50
HR-M5000/2	Grinding Jar	100
HR-M5000/3	Grinding Jar	250
HR-M6005/1	Safety Lock	---
HR-M6002	Lifter	---

DISC MILL

Disc Mill is used for pulverizing the soil, rock, cement, limestone, ceramic, metal oxides etc. rigid fragile materials.

Supplied with 800 cc Standard Steel Grinding Set.

100 cc and 1000 cc Steel Grinding Set is available as an optional and should be ordered seperately.

Loss of material is minimum during the pulverizing.

The Steel Grinding Set vibrates the Grinding Jar and Pulverizing is carried out by means of a disk in the Jar.

Material feed size is <20 mm and the final fineness for % 85 of grinded material is < 0.075 mm depending on feed material and instrument configuration/settings.

Disc Mill is designed the way that as dust will not leak out during operation. The noise emission level according to the working atmosphere is maximum 85 dB.

Internal body is covered with fireproof acoustics noise insulation material and dust and dirt entry onto the machinery parts are prevented.

The cover mechanism has been designed appropriately in terms of occupational health and safety.

The Disc Mill has a locking mechanism and a cover for ve sound insulation.

There is an Adjustable Timer.

The Disc Mill stop when the door opens or the air pressure decrease, automatically.

Safety Lock, Lifter and Air Compressor should be ordered separately.

HR-M6500

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Power Supply
HR-M6500	Disc Mill	100x75x130	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name	Size (cc)
HR-M6000/1	Steel Grinding Set	100
HR-M6000/2	Steel Grinding Set	800
HR-M6000/2S	Steel Grinding Set (High Quality Tool Steel)	800
HR-M6000/3S	Steel Grinding Set (High Quality Tool Steel)	1000
HR-M6005/1	Safety Lock	---
HR-M6002	Lifter	---

HR-M6500 & HR-M6002

HR-M6000/2

HR-M6000/2

PNEUMATIC DISC MILL

Pneumatic Disc Mill is used for pulverizing the soil, rock, cement, limestone, ceramic, metal oxides etc. rigid fragile materials.

Supplied with 800 cc Standard Steel Grinding Set. 100 cc and 1000 cc Steel Grinding Set is available as an optional and should be ordered seperately. Loss of material is minimum during the pulverizing. The Steel Grinding Set vibrates the Grinding Jar and Pulverizing is carried out by means of a disk in the Jar.

With the belt pulley system, achieves three-dimensional vibration by moving the shaft.

Material feed size is <20 mm and the final fineness for % 85 of grinded material is < 0.075 mm depending on feed material and instrument configuration/settings.

The Pneumatic Disc Mill is designed the way that as dust will not leak out during operation. The noise emission level according to the working atmosphere is maximum 85 dB.

Internal body is covered with fireproof acoustics noise insulation material and dust and dirt entry onto the materials such as motor and shaft are prevented. The cover mechanism has been designed appropriately in terms of occupational health and safety.

The Pneumatic Disc Mill has a locking mechanism and a cover for ve sound insulation. There is an Adjustable Timer. The Pneumatic Disc Mill stop when the door opens or the air pressure decrease, automatically.

HR-M6000

4 models are available.

HR-M6000 has standard specifications.
The HR-M6005 is Wheeled in addition to the standard model.
The HR-M6010 is Wheeled in addition to the standard model. It has PLC Time Controlled Digital Touch Screen. Time periods at different Set values can be saved in the memory and can be selected quickly during the Test.
The HR-M6015 is Wheeled in addition to the standard model. It has PLC Time and Speed Controlled Digital Touch Screen. Time periods and Speed at different Set values can be saved in the memory and can be selected quickly during the Test.

Safety Lock, Lifter and Air Compressor should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Power Supply
HR-M6000	Pneumatic Disc Mill, Standard	100x75x130	380 V, 50-60 Hz, 3 ph
HR-M6005	Pneumatic Disc Mill, Equipped with wheels	100x75x130	380 V, 50-60 Hz, 3 ph
HR-M6010	Pneumatic Disc Mill, PLC Time Controlled	100x75x130	380 V, 50-60 Hz, 3 ph
HR-M6015	Pneumatic Disc Mill, PLC Time and Speed Controlled	100x75x130	380 V, 50-60 Hz, 3 ph

Spare Parts & Accessories:

Product Code	Product Name	Size (cc)
HR-M6000/1	Steel Grinding Set	100
HR-M6000/2	Steel Grinding Set	800
HR-M6000/2S	Steel Grinding Set (High Quality Tool Steel)	800
HR-M6000/3S	Steel Grinding Set (High Quality Tool Steel)	1000
HR-M6005/1	Safety Lock	---
HR-M6002	Lifter	---

HR-M6000/2

HR-M6000/2

HR-M6500 & HR-M6002

BALL & ROD MILL

Ball & Rod Mill is designed for grinding wet and dry products. It is used for the processing and grinding of many products called soft, hard and very hard.

The rotation speed can be adjusted. The device with a digital panel; information such as speed, working time can be entered and the device can grind at the desired micron level. It can grind wet and dry.

HR-M2300

Electric motor; 1.5 hp, 1500 rpm, V belt driven.

Samples of 500-1500 ml up to 8 millimeters can be fed to the Ball & Rod Mill and after the grinding process, the samples can be reduced to 40 microns.

Ball and Rod Mill is supplied with 2 rubber coated rollers of Ø80x800 mm, whose rotation speed can be adjusted between 0-300 rpm.

It can work with two stainless steel grinding bowls at the same time.

Ø200×200 mm, 6 lt internal volume Grinding bowl and Ø200×300 mm, 9 lt internal volume Grinding bowl made of AISI 304 material should be ordered separately upon request.

Grinding Ball Set (heat treated hardened alloy steel) and Grinding Rods (AISI 304 stainless steel) must be ordered separately upon request.

Technical Specifications:

Product Code	Product Name	Weight (kg)	Power Supply
HR-M2300	Ball & Rod Mill	230	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-M2300/1	Grinding Ball Set for Ball & Rod Mill
HR-M2300/2	Grinding Rod Set Ball & Rod Mill

HR-M2300/2

BALL & ROD MILL WITH TILTING MECHANISM

Ball & Rod Mill with Tilting Mechanism is designed to meet industrial requirements for grinding coal, cement and a wide variety of ores.

Ball & Rod Mill with Tilting Mechanism, consists of Grinding bowl, 0.75 kW geared motor mounted on a high precision robust steel chassis, speed converter, suitable separation sieves and sampler. The drum is made of AISI 304 material.

The device includes a locking mechanism to allow easy access to the contents of the mill.

It is equipped with a speed controller to control the drum speed between 0-100 rpm.

The device has a digital timer that automatically stops the grinder when the grinding time is reached.

The lid has a quick-release locking mechanism.

Thanks to the locking mechanism, the cylindrical axis of the device can be brought to the position exactly parallel to the ground (Grinding position) and to the fully vertical position (Mill loading and unloading position).

HR-M2350

Grinding Ball Set (heat treated hardened chrome alloy) and Grinding Rods (AISI 304 stainless steel) must be ordered separately upon request.

Drum dimensions for Model HR-M2350 are Ø 200mm x 200 mm and 6 liter capacity.

Drum dimensions for Model HR-M2355 are Ø 250mm x 250 mm and 12 liters capacity.

Drum dimensions for Model HR-M2360 are Ø 305mm x 305 mm and 22 liters capacity.

Technical Specifications:

Product Code	Product Name	Power Supply
HR-M2350	Ball & Rod Mill with Tilting Mechanism, 6 lt	220 V, 50-60 Hz, 1 ph
HR-M2355	Ball & Rod Mill with Tilting Mechanism, 12 lt	220 V, 50-60 Hz, 1 ph
HR-M2360	Ball & Rod Mill with Tilting Mechanism, 22 lt	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Product Code	Product Name
HR-M2350/1	Grinding Ball Set, for HR-M2350 & HR-M2355 & HR-M2360
HR-M2350/2	Grinding Rod Set, for HR-M2350 & HR-M2355 & HR-M2360

LARGE CAPACITY SAMPLE SPLITTER

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

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

Large Capacity Sample Splitter consist of three parts;
- Carrier,
- Splitter,
- Collecting pan

All parts are manufactured from steel and electrostatic painted.

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

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

Wheels are available as an option and should be ordered separately.

HR-M4000 &
HR-M4000/1

Technical Specifications:

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

Spare Parts & Accessories:

Product Code	Product Name
HR-M4000/1	Wheels (4 pieces)

MAGNETIC PEN

It is designed as a pen with a pocket clip and a small magnet at the end.

There is a spring wire clip on it.

When the Pencil Magnet is held by this wire clip, rock etc. brought close to the magnet are drawn towards the magnetic minerals found in the samples.

Technical Specifications:

Product Code	Product Name
HR-M0500	Magnetic Pen

HR-M0500

PRESSURE FILTER DEVICE

The Cylinder Reservoir of Pressure Filter Device which made the filtration is manufactured from 304 stainless steel.

The Cylinder Reservoir capacity is 20 lt and the top and bottom surfaces are smooth.

The bottom part of the chamber where the filter paper is placed provides the evacuation of water and liquid by means of special grooves.

There is a cover that compress from the top of the Cylinder Reservoir of Pressure Filter Device which made the filtration. Silicone gaskets are used to provide the sealing under this cover.

There is a gauge on the top of cover, showing a pressure of at least 10 bar. At the same time there is an inlet which discharges the air in the compressor.

There is a safety valve that discharges in high pressure applications.

To transfer the air in the compressor, a pressure resistant 3 m special hose is used. The other end of this hose has an connecting apparatus for air compressor.

There is a valve through which the air can be evacuated from the cover.

At the last stage, there is a handle which can lift a little the Cylinder Reservoir to get the material that on the filter paper.

There is a valve on the underside of the device to flow the filtered liquid from the filter paper.

The device is wheeled. Wheels can be locked.

HR-M3000

Technical Specifications:

Product Code	Product Name
HR-M3000	Pressure Filter Device

GEOLOGIST HAMMER

Geological hammers are a necessity for field work. Specially forged or manufactured for breaking rock in a variety of ways.

Whether using the hammer to expose fresh rock surfaces or as a means to extract samples for further analysis, they are of chief importance to the geologist.

All geological hammers come with at least one flat face which is primarily for breaking rock where accuracy is not required or to break down larger pieces into smaller fragments.

Chisel end hammers are for cutting rock where as pointed tip hammers are for accurate delicate work or extraction of crystals or fossils.

Technical Specifications:

Product Code	Product Name
HR-M3500	Geologist Hammer, Pointed Tip
HR-M3600	Geologist Hammer, Chisel End

HR-M3500

HR-M3600

VACUUM FILTER

Vacuum Filter supplied complete with Ø 250 x 60 mm two-piece steel filter chamber and cover made of steel, 1000 ml Filter Flask (water collection container), 400x400 mm, 40 micron pore size, white filter paper (Pack of 100), 2 pieces of Ø 340 mm cloth tarpaulin filter paper pad, 2 pieces of Ø 240 mm stainless steel cloth tarpaulin pad made of woven wire screen mesh 1 mm, Dual Stage Vacuum Pump, 1,5 meter Tubing for Vacuum and Vacuum connectors.

HR-M3250

Technical Specifications:

Product Code	Product Name
HR-M3250	Vacuum Filter

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-M3250/1	Filter chamber and cover	Ø 250 x 60	---
HR-G0082	Filter Flask, 1000 ml	207x207x315	1
HR-M3250/2	White filter paper, (Pack of 100)	400 x 400	---
HR-M3250/3	Cloth tarpaulin filter paper pad, 2 pieces	Ø 340	---
HR-M3250/4	Woven wire Cloth tarpaulin pad, 2 pieces	Ø 240	
HR-M3250/5	Vacuum Pump, Dual Stage	335x140x250	11
HR-G0815	Tubing for Vacuum. 1,5 m	---	---
HR-M3250/6	Vacuum connectors	---	---

Technical Specifications for Dual Stage Vacuum Pump:

Product Code		HR-M3250/5
	Flow Rate	5 CFM 142 l/min
Ultimate Vacuum	Partial Pressure (Pa)	2 Pa, 0,02 mbar
	Total Pressure (micron)	15
	Power	0,37 kW
	Inlet Port (Flare)	¼" & 3/8"
	Oil Capacity	325 ml
	Dimensions (mm)	335x140x250
	Weight(kg)	11
	Power Supply	230 V, 50-60 Hz, 1 ph

PELLET PRESS

Solid, high-quality pellets are an important precondition for reliable and meaningful XRF analysis. Pellet Presses are used for preparation of pellets for spectral analyses. Can be used construction materials, metallurgy, geology, ceramics plastics, environment, recycling, chemistry, glass, etc. fields.

The Pellet Press is a compact benchtop unit with particularly simple and safe operation. With a pressure force of 20 ton it is ideally suited for the preparation of solid samples for XRF analysis. The pellets produced are of high quality and are characterized by their high degree of stability.

Maximum pressure is 20 ton. It offers precise loading with double-flow pump. Pellet Press has 4-side closed Plexiglass Covers and Aluminum Frame.

Two models are available as Manual or Digital.

On the Manual Pellet Press; the piston pressure can be read off from the clearly visible manometer scale.

On the Digital Pellet Press; the measurements are carried out very precisely thanks to the Load cell. Digital Pellet Press consists has a digital LCD screen which the load values can be read sensitively.

Pelet Mould is manufactured as Ø 40 mm from special tool-steel. Its entire surface is grinded and hardness is 60 HRC. Pelet Mould should be ordered separately.

HR-M0200

Technical Specifications:

Product Code	Product Name	Power Supply
HR-M0200	Manual Pellet Press	---
HR-M0250	Digital Pellet Press	220 V, 50-60 Hz, 1 ph

Spare Parts & Accessories:

Ürün Kodu	Product Name	Dimensions (mm)
HR-M0200/1	Pellet Mould	Ø 40

CORE BOX

Core Box is made of sturdy, yet lightweight plastic material.

Core Box provides stable stacking and can withstand the weight of several boxes full of cores stacked on its top.

A lid comes with each Core Box that is easily removed.

Provides the best protection and is easy to transport.

HR-M4501
with
HR-M4505
HR-M4506

Technical Specifications:

Product Code	Product Name	Type	Core Dia. (mm)	Capacity (m)	Dimensions (cm)	Weight (kg)
HR-M4500	Core Box	BQ	26-36	6x1	107x34x5	1,6
HR-M4501	Core Box	NQ	37-48	5x1	107x34x6	1,8
HR-M4502	Core Box	HQ	49-64	4x1	107x34x8	2
HR-M4503	Core Box	PQ	65-86	3x1	107x34x10	2,1

Spare Parts & Accessories:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-M4505	Lid	107x34x2	0,9
HR-M4506	Separator	---	---

GENERAL EQUIPMENTS

To perform the different tests on all building materials: Aggregates, Cement, Concrete, Soil, Rock, Asphalt etc., very often, a vast range of General Laboratory Apparatus is required.

General equipment section offers a wide range of laboratory products and accessories that can be used to perform different tests. Some of this general equipment are used as a part of other testing devices.

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BALANCES

MECHANICAL BALANCES

CENT-O-GRAM & DIAL-O-GRAM MECHANICAL BALANCES

HR-G8000

OHAUS Cent-O-Gram and Dial-O-Gram Overhead Balances offer the accuracy and convenience of an integrated weigh below balance while allowing students to visualize mass measurement principles.

Designed with a hanging pan system, both balances offer 10 times the readability of the OHAUS Triple Beam and Dial-O-Gram top-loading balances.

HR-G8005

- **Applications**
  Weighing
- **Display**
  Easy to-read deep-notched, tiered beams and dial plates
- **Operation**
  N/A
- **Communication**
  N/A
- **Construction**
  Metal base and beam, stainless steel pan
- **Design Features**
  Self-aligning beam design, magnetic damping to minimize oscillation and speed weighing, zero adjust compensator

Technical Specifications:

Product Name	Cent-O-Gram Mechanical Balance	Dial-O-Gram Mechanical Balance
Product Code	HR-G8000	HR-G8005
Maximum Capacity (g)	311	310
Readability (g)	0,01	0,01
Linearity (g)	± 0.01	
Beams	4 Beams	2 Beams with Dial
Pan Size	0.5 in x 3.5 in (13 mm x 89 mm)	
Pan Type	Removable Pan	
Pan Construction	Stainless Steel	
Dimensions (mm)	249 x 360 x 166	
Net Weight (kg)	1,6	1,4

TRIPLE BEAM MECHANICAL BALANCE

Accurate, dependable and truly the BEST IN CLASS; the OHAUS Triple Beam Pro offers the convenience of a top loading balance while allowing your students to gain the understanding of measurement garnered through hands-on activities.

HR-G8010

- **Applications**
  Weighing
- **Display**
  Easy to-read deep-notched, tiered beams and dial plates
- **Operation**
  N/A
- **Communication**
  N/A
- **Construction**
  Metal base and beam, stainless steel pan
- **Design Features**
  Two notched and tiered beams, positive poise positioning, spring loaded zero adjust compensator, self-aligning beam design, magnetic dampening to minimize oscillation and speed weighing, security loop, included weight set and storage compartment.

Technical Specifications:

Product Name	Triple Beam Pro Mechanical Balance
Product Code	HR-G8010
Maximum Capacity (g)	2610
Readability (g)	0,1
Linearity (g)	± 0.1
Calibrations:	
Front beam	10 g x 0.1 g
Middle beam	500 g x 100 g
Rear beam	100 g x 10 g
Pan Size	5.8 in x 5.8 in (147 mm x 147 mm)
Pan Construction	ABS with Stainless Steel Inset
Dimensions (mm)	168 x 451 x 161
Net Weight (kg)	2

ELECTRONIC BALANCES

ANALYTICAL BALANCES

The AS.R series represents a new standard level for analytical balances. It features modern, readable LCD display which allows a clearer presentation of the weighing result. The display has a new text information line presenting additional messages and data, e.g. product name or tare value.

Additionally, the new R series balance uses great number of pictograms to signal the active working mode, connection with the Internet, the battery charge level, balance service functions. Measuring units number has also been increased.

The balance precision and the measurement accuracy is assured by automatic internal adjustment, which analyses temperature changes and time flow.

AS.R series balance features several communication interfaces: 2 x RS 232, type A USB, type B USB and optional Wireless Connection.

The balance may cooperate with computer by means of USB interface supposing a supplementary software has been installed (respective driver). The said driver may be downloaded from RADWAG website – SOFTWARE link or SUPPORT section.

HR-G8025

The housing is made of plastic, and the pan is made of stainless steel.

In new AS.R series balance the information system is based on 5 databases, which allows several users to work with several product databases, and the registered weighing results can be subject to further analysis.

The data is registered in 5 databases:
- users (up to 100 users),
- products (up to 1000 products),
- Weighings (up to 5000 weighings),
- tares (up to 100 tares),
- ALIBI memory (up to 100 000 weighments).

There is two-direction data exchange within the system thanks to a quick USB interface. New balance allows to import and export databases using USB pen drives.

HR-G8030

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Name	Electronic Analytical Balance		
Product Code	HR-G8025	HR-G8030	HR-G8035
Max capacity (gr)	60/220	220	310
Minimum load (mg)	1	10	10
Readability (mg)	0,01 / 0,1	0,1	0,1
Tare range (g)	-220	-220	-310
Linearity (mg)	± 0,06 mg (to 60 g) ± 0,2 mg (60 g ÷ 220 g)	± 0,2 mg	± 0,3 mg
Pan Size	ø 90 mm open-work	Ø 100 mm	Ø 100 mm
Working temperature (°C)	(+10) ÷ (+ 40)		
Interface	2×RS 232, USB-A, USB-B		
Wireless connection (option)*	802.11 b/g/n		
Power supply	12 ÷ 16 V DC		
Adjustment	internal		
Display	LCD (with backlight)		
Net weight/Gross weight (kg)	5,3/7,3		
Packaging size (mm)	495×400×515		

* optional solution on purchase order

PRECISION BALANCES

PS.R1 series balances represent a new standard of precision balances. They feature a new, readable LCD display which allows a clearer presentation of the weighing result. Besides, the display has a new text information line allowing to show additional messages and data, e.g. product name or tare value.

New PS.R1 balances, like previously designed PS series balances, have pans in two possible dimensions: 128x128 mm or 195x195 mm. Balances with a smaller pan have a draft shield. They were equipped with the system of external mass adjustment.

PS.R1 balances feature several communication interfaces: 2 x RS 232, type A USB, type B USB and optional Wireless Connection.

The balance may cooperate with computer by means of USB interface supposing a supplementary software has been installed (respective driver). The said driver may be downloaded from RADWAG website – SOFTWARE link or SUPPORT section.

The housing is made of plastic, and the pan is made of stainless steel. The balances have a possibility to weigh products out of the pan (under-pan weighing) - the load hangs under the pan.

DATABASES IN R SERIES BALANCES

The information system is based on 5 databases, which allows for several users to work with several products databases, and the registered weighing results can be subject to further analysis.

The data is registered in 5 databases:
- users (up to 100 users),
- products (up to 1000 products),
- weighments (up to 5000 weighments),
- tares (up to 100 tares),
- ALIBI memory (up to 100 000 weighments).

There is two directions data exchange within the system thanks to a quick USB interface. New balances allow to import and export databases using USB pen drives.

HR-G8050

Quick access to information

Direct access to functions and databases is possible from the level of keyboard.

- **Database**

a direct access to databasis

- **Function**

a direct access to the basic functions

- **F1 to F4**

programmable function and navigation keys on the menu

ALIBI MEMORY

The used ALIBI memory is a data secure area and allows to record up to 100 000 weighment records. It ensures security of constant data register in the long time period.

Technical Specifications:

Product Name	Electronic Precision Balance			
Product Code	HR-G8049	HR-G8050	HR-G8055	HR-G8056
Max capacity (gr)	360	510	750	1000
Minimum load (g)	0,02			
Readability (g)	0,001			
Tare range (g)	-360	-510	-750	-1000
Repeatability* (g)	0.001		0.0015	
Linearity (g)	±0.002	±0.002	±0.003	
Pan Size (mm)	128 x 128			
Working temperature (°C)	(+10) ÷ (+ 40)			
Stabilization time (s)	2			
Interface	2×RS 232, USB-A, USB-B			
Wireless connection (option)**	802.11 b/g/n			
Power supply	12 ÷ 16 V DC			
Adjustment/Calibration	external			
Display	LCD (with backlight)			
Net weight/Gross weight (kg)	3,2/4,8			
Packaging size (mm)	470×380×340			

* Repeatability is expressed as a standard deviation from 10 weighing cycles.
** optional solution on purchase order

Technical Specifications:

Product Name	Electronic Precision Balance			
Product Code	HR-G8059	HR-G8060	HR-G8070	HR-G8075
Max capacity (gr)	3500	4500	6000	10100
Minimum load (g)	0,5			
Readability (g)	0,01			
Tare range (g)	-3500	-4500	-6000	-10100
Repeatability* (g)	0.01		0.015	0.012
Linearity (g)	±0.02		±0.03	
Pan Size (mm)	195 x 195			
Working temperature (°C)	(+10) ÷ (+ 40)			
Stabilization time (s)	1,5			
Interface	2×RS 232, USB-A, USB-B			
Wireless connection (option)**	802.11 b/g/n			
Power supply	12 ÷ 16 V DC			
Adjustment/Calibration	external			internal
Display	LCD (with backlight)			
Net weight/Gross weight (kg)	3,6/5,1		3,9/5,4	
Packaging size (mm)	470×380×336			

* Repeatability is expressed as a standard deviation from 10 weighing cycles.
** optional solution on purchase order

HİRA TESTING EQUIPMENT

DIGITAL BALANCES

Designed for laboratory General Purposes, most of them are fitted with under balance weighting facility for Specific Gravity Tests.

The Digital Balances provide a wide range of maximum capacity and readability characteristics which make them economical and easy to use, they are ideal for central and site laboratories who require a range of balances for various applications.

Sturdy and precise, they are fitted with Load Cells and large backlighted LCD displays that give precise measurements within the 0°C to 40°C temperature range.

Counting with Sample, Weight Percentage, Overload and Shock Protection.

HR-G8100

Technical Specifications:

Product Code	HR-G8044	HR-G8045	HR-G8085	HR-G8096	HR-G8090	HR-G8090/S	HR-G8095
Product Name	Digital Balance						
Max capacity (gr)	300	500	600	1000	3000	3000	5000
Readability (g)	0,001	0,001	0,01	0,01	0,01	0,01	0,01
Working temperature (°C)	(+0) – (+ 40)						
Battery Powered	√	√	√	√	√	√	√
Power supply	External Power Adaptor / 220 V, 50 Hz, 1 ph						
Specific Gravity	---	---	---	---	---	√	---
Adjustment/Calibration	external						
Display	LCD						
Pan size (mm)	Ø 90		Ø 130			Ø 160	170x140
Net weight/Gross weight (kg)	4				5		

Product Code	HR-G8100	HR-G8100/S	HR-G8105	HR-G8105/S	HR-G8110	HR-G8115
Product Name	Digital Balance					
Max capacity (gr)	6000	6000	30000	30000	30000	30000
Readability (g)	0,1	0,1	0,5	0,5	0,1	1
Working temperature (°C)	(+0) – (+ 40)					
Battery Powered	√	√	√	√	√	√
Power supply	External Power Adaptor / 220 V, 50 Hz, 1 ph					
Specific Gravity	---	√	---	√	---	---
Adjustment/Calibration	external					
Display	LCD					
Pan size (mm)	270x210					250x210
Net weight/Gross weight (kg)	5					

DIGITAL PLATFORM BALANCES

The Digital Platform Scale Series provides a reliable macroscale weighing facility up to 300 kg maximum capacity with 5 g, 10 g, 20g and 50 g readability values, for fast and economical weight measurements. These modern balances are designed to perform precise and accurate measurements under the heaviest industrial conditions.

Technical Specifications:

Product Code	HR-G8120	HR-G8121	HR-G8125	HR-G8130	HR-G8135	HR-G8136	HR-G8140
Product Name	Digital Platform Balances						
Max capacity (kg)	60	60	150	150	150	150	150
Readability (g)	5	5	5	10	10	20	50
Platform Size (cm)	40x50	50x60	50x60	50x60	40x50	40x50	50x60
Working temperature (°C)	(+0) – (+ 40)						
Power supply	Rechargeable Battery and External Power Adaptor / 220 V, 50 Hz, 1 ph						
Adjustment/Calibration	external						
Display	LCD						

Technical Specifications:

Product Code	HR-G8145	HR-G8146	HR-G8150	HR-G8151
Product Name	Digital Platform Balances			
Max capacity (kg)	300	300	600	600
Readability (g)	10	50	20	100
Platform Size (cm)	50x60	50x60	60x70	60x70
Working temperature (°C)	(+0) – (+ 40)			
Power supply	Rechargeable Battery and External Power Adaptor / 220 V, 50 Hz, 1 ph			
Adjustment/Calibration	external			
Display	LCD			

HR-G8125

MOISTURE ANALYSERS

Moisture analyzer is a laboratory measuring instrument intended to determine relative humidity for small samples of different materials. Moisture analyzers redefines moisture analyzers standards. This series has been equipped with brand new readable LCD display providing an extra text line for information such as supplementary messages and data, e.g. product name or tare value. The moisture analyzer, using respective pictograms, signalizes currently activated mode, computer connection and functions, both balance and service ones.

The Moisture analyzer is enriched with various interfaces: RS232, USB type A, USB type B and Wi Fi as an option. The moisture analyzer is housed in a plastic casing.

Information system of Moisture Analyzers is based on 6 databases, allowing many operators to operate product database comprising many samples. Collected measurements may be subjected to subsequent analysis.

Collected data is registered in 6 databases:

- Users (up to 100 users)
- Products (up to 1000 products)
- Weighments (up to 1000 weighments)
- Tares (up to 100 tares)
- Programs (up to 100 drying programs)
- Drying process reports (up to 1000 reports)

Exchange of information within the system is performed by means of USB port on bi-directional basis. It is possible to import and export databases using memory sticks.

Direct access to information
It is possible to access functions and databases directly, using keyboard soft keys.
Database – access to databases
Function – access to basic functions
F1 and **F2** – programmable function keys and menu navigation keys
Reports – access to database of drying process reports
Profile – access to parameters settings
Sample – access to products database

HR-G8160

HR-G8160

HİRA TESTING EQUIPMENT

Technical Specifications:

Product Code	HR-G8160	HR-G8165	HR-G8170
Product Name	Moisture Balance (Analyzer)		
Max capacity (gr)	50	110	210
Readability (mg)	1	1	1
Tare range (g)	-50	-110	-210
Operating Temperature (°C)	(+10) – (+ 40)		
Max sample weight (g)	50	110	210
Moisture content readability (%)	0,001 %	0,001 %	0,001 %
Moisture content repeatability	± 0,05% (sample weight of 2 g), ± 0,01% (sample weight of 10 g)		
Max sample height	h= 20 mm		
Weighing pan size	Ø 90 mm, h= 8 mm		
Drying temperature range	max. 160° C		
Heating module *	IR emitter		
Drying method	4 drying profiles (standard, fast, step, mild)		
Finish mode	4 modes (automatic, manual, time-defined, user-defined)		
Additional functions	sample traceability		
Heating module power	450 W		
Power consumption	4 W		
Power supply	230 V, 50 Hz, AC		
LCD display	LCD (backlit)		
Communication Interface	1 × RS 232, USB-A, USB-B, WiFi (option)		
Net weight/Gross weight (kg)	4,8 / 6,3		
Packaging size (mm)	470×380×336		

* Heating element options: WH - halogen (max= 250° C), NS - metal heater (max=160° C)

STANDARD CALIBRATION WEIGHTS

Used for the periodic verification of the balance readings.

M1 class weights are manufactured from stainless steel or cast iron coated with black epoxy based paint, F1 and E2 class weights are manufactured from stainless steel.

Plastic or Wooden Boxes and Calibration Certificates should be ordered separately.

Technical Specifications for Class M1 Calibration Weights:

Product Code	Material	Design	Weight
HR-G7000	Stainless Steel	Wire	1 mg
HR-G7001	Stainless Steel	Wire	2 mg
HR-G7002	Stainless Steel	Wire	5 mg
HR-G7003	Stainless Steel	Wire	10 mg
HR-G7004	Stainless Steel	Wire	20 mg
HR-G7005	Stainless Steel	Wire	50 mg
HR-G7006	Stainless Steel	Wire	100 mg
HR-G7007	Stainless Steel	Wire	200 mg
HR-G7008	Stainless Steel	Wire	500 mg
HR-G7009	Stainless Steel	Cylindrical	1 g
HR-G7010	Stainless Steel	Cylindrical	2 g
HR-G7011	Stainless Steel	Cylindrical	5 g
HR-G7012	Stainless Steel	Cylindrical	10 g
HR-G7013	Stainless Steel	Cylindrical	20 g
HR-G7014	Stainless Steel	Cylindrical	50 g
HR-G7015	Stainless Steel	Cylindrical	100 g
HR-G7016	Stainless Steel	Cylindrical	200 g
HR-G7017	Stainless Steel	Cylindrical	500 g
HR-G7030	Steel-Nickel	Cylindrical	500 g
HR-G7018	Stainless Steel	Cylindrical	1 kg
HR-G7031	Cast Iron	Cylindrical	1 kg
HR-G7019	Stainless Steel	Cylindrical	2 kg
HR-G7032	Cast Iron	Cylindrical	2 kg
HR-G7020	Stainless Steel	Rectangular	5 kg
HR-G7033	Cast Iron	Rectangular	5 kg
HR-G7021	Stainless Steel	Rectangular	10 kg
HR-G7034	Cast Iron	Rectangular	10 kg
HR-G7022	Stainless Steel	Rectangular	20 kg
HR-G7035	Cast Iron	Rectangular	20 kg
HR-G7036	Cast Iron	Rectangular	50 kg
HR-G7037	Cast Iron	Rectangular	100 kg
HR-G7038	Cast Iron	Cylindrical	200 kg
HR-G7039	Cast Iron	Cylindrical	500 kg
HR-G7040	Cast Iron	Rectangular	1000 kg

Class M1, Stainless Steel, Cylindrical Series

HR-G7021

HR-G7036

HR-G7035

HR-G7033

HR-G7034

Spare Parts & Accessories for Class M1 Calibration Weights:

Product Code	Product Name
HR-G7030/1	Plastic Box for 1 - 500 g, Class M1, Stainless Steel Calibration Weight
HR-G7018/1	Plastic Box for 1 kg, Class M1, Stainless Steel Calibration Weight
HR-G7019/1	Plastic Box for 2 kg, Class M1, Stainless Steel Calibration Weight
HR-G7020/1	Plastic Box for 5 kg, Class M1, Stainless Steel Calibration Weight
HR-G7033/1	Wooden Box for 5 kg, Class M1, Cast Iron Calibration Weight
HR-G7021/1	Plastic Box for 10 kg, Class M1, Stainless Steel Calibration Weight
HR-G7034/1	Wooden Box for 10 kg, Class M1, Cast Iron Calibration Weight
HR-G7022/1	Plastic Box for 20 kg, Class M1, Stainless Steel Calibration Weight
HR-G7035/1	Wooden Box for 20 kg, Class M1, Cast Iron Calibration Weight
HR-G7050	Calibration Certificate for 500 g - 5 kg Calibration Weight
HR-G7051	Calibration Certificate for 10 kg - 20 kg Calibration Weight
HR-G7052	Calibration Certificate for 50 kg Calibration Weight

Technical Specifications for Class F1 Calibration Weights:

Product Code	Material	Design	Weight
HR-G7070	Stainless Steel	Leaf Aluminum	1 mg
HR-G7071	Stainless Steel	Leaf Aluminum	2 mg
HR-G7072	Stainless Steel	Leaf Aluminum	5 mg
HR-G7073	Stainless Steel	Leaf Aluminum	10 mg
HR-G7074	Stainless Steel	Leaf Aluminum	20 mg
HR-G7075	Stainless Steel	Leaf Aluminum	50 mg
HR-G7076	Stainless Steel	Leaf Aluminum	100 mg
HR-G7077	Stainless Steel	Leaf Aluminum	200 mg
HR-G7078	Stainless Steel	Leaf Aluminum	500 mg
HR-G7079	Stainless Steel	Leaf Aluminum	1 g
HR-G7080	Stainless Steel	Leaf Aluminum	2 g
HR-G7081	Stainless Steel	Leaf Aluminum	5 g
HR-G7082	Stainless Steel	Leaf Aluminum	10 g
HR-G7083	Stainless Steel	Leaf Aluminum	20 g
HR-G7084	Stainless Steel	Leaf Aluminum	50 g
HR-G7085	Stainless Steel	Leaf Aluminum	100 g
HR-G7086	Stainless Steel	Leaf Aluminum	200 g
HR-G7087	Stainless Steel	Leaf Aluminum	500 g
HR-G7088	Stainless Steel	Cylindrical	1 kg
HR-G7089	Stainless Steel	Cylindrical	2 kg
HR-G7090	Stainless Steel	Cylindrical	5 kg
HR-G7091	Stainless Steel	Cylindrical	10 kg
HR-G7092	Stainless Steel	Cylindrical	20 kg
HR-G7093	Stainless Steel	Cylindrical	50 kg

Class F1, Stainless Steel, Cylindrical Series

HR-G7090

Spare Parts & Accessories for Class F1 Calibration Weights:

Product Code	Product Name
HR-G7100	Plastic Box for 1 mg - 500 g, Class F1, Stainless Steel Calibration Weight
HR-G7101	Plastic Box for 1 kg - 2 kg, Class F1, Stainless Steel Calibration Weight
HR-G7102	Plastic Box for 5 kg, Class F1, Stainless Steel Calibration Weight
HR-G7103	Plastic Box for 10 kg, Class F1, Stainless Steel Calibration Weight
HR-G7104	Plastic Box for 20 kg, Class F1, Stainless Steel Calibration Weight
HR-G7105	Plastic Box for 50 kg, Class F1, Stainless Steel Calibration Weight
HR-G7125	Calibration Certificate for 1 mg - 2 kg Calibration Weight
HR-G7126	Calibration Certificate for 5 kg - 10 kg Calibration Weight
HR-G7127	Calibration Certificate for 20 kg Calibration Weight
HR-G7128	Calibration Certificate for 50 kg Calibration Weight

Technical Specifications for Class E2 Calibration Weights:

Product Code	Material	Design	Weight
HR-G7140	Stainless Steel	Wire	1 mg
HR-G7141	Stainless Steel	Wire	2 mg
HR-G7142	Stainless Steel	Wire	5 mg
HR-G7143	Stainless Steel	Wire	10 mg
HR-G7144	Stainless Steel	Wire	20 mg
HR-G7145	Stainless Steel	Wire	50 mg
HR-G7146	Stainless Steel	Wire	100 mg
HR-G7147	Stainless Steel	Wire	200 mg
HR-G7148	Stainless Steel	Wire	500 mg
HR-G7149	Stainless Steel	Cylindrical	1 g
HR-G7150	Stainless Steel	Cylindrical	2 g
HR-G7151	Stainless Steel	Cylindrical	5 g
HR-G7152	Stainless Steel	Cylindrical	10 g
HR-G7153	Stainless Steel	Cylindrical	20 g
HR-G7154	Stainless Steel	Cylindrical	50 g
HR-G7155	Stainless Steel	Cylindrical	100 g
HR-G7156	Stainless Steel	Cylindrical	200 g
HR-G7157	Stainless Steel	Cylindrical	500 g
HR-G7158	Stainless Steel	Cylindrical	1 kg
HR-G7159	Stainless Steel	Cylindrical	2 kg
HR-G7160	Stainless Steel	Cylindrical	5 kg
HR-G7161	Stainless Steel	Cylindrical	10 kg
HR-G7162	Stainless Steel	Cylindrical	20 kg
HR-G7163	Stainless Steel	Cylindrical	50 kg

HR-G7160

Class E1-E2, Stainless Steel, Cylindrical Series

Spare Parts & Accessories for Class E2 Calibration Weights:

Product Code	Product Name
HR-G7157/1	Plastic Box for 1 mg - 500 g, Class E2, Stainless Steel Calibration Weight
HR-G7158/1	Plastic Box for 1 kg, Class E2, Stainless Steel Calibration Weight
HR-G7159/1	Plastic Box for 2 kg, Class E2, Stainless Steel Calibration Weight
HR-G7160/1	Plastic Box for 5 kg, Class E2, Stainless Steel Calibration Weight
HR-G7161/1	Plastic Box for 10 kg, Class E2, Stainless Steel Calibration Weight
HR-G7162/1	Plastic Box for 20 kg, Class E2, Stainless Steel Calibration Weight
HR-G7163/1	Plastic Box for 50 kg, Class E2, Stainless Steel Calibration Weight
HR-G7175	Calibration Certificate for 1 mg - 2 kg Calibration Weight
HR-G7176	Calibration Certificate for 5 kg - 10 kg Calibration Weight
HR-G7177	Calibration Certificate for 20 kg Calibration Weight
HR-G7178	Calibration Certificate for 50 kg Calibration Weight

Class M1 Stainless Steel Calibration Weight Sets:

Product Code	Weight Set	Weights
HR-G7060	1 mg- 500 mg	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg
HR-G7061	1 mg- 100 g	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100 g
HR-G7062	1 mg- 500 g	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g
HR-G7063	1 mg- 1 kg	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g, 1x1 kg
HR-G7064	1 g- 500 g	1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g
HR-G7065	1 g- 1 kg	1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g, 1x1 kg

Class F1 Stainless Steel Calibration Weight Sets:

Product Code	Weight Set	Weights
HR-G7260	1 mg- 500 mg	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg
HR-G7261	1 mg- 100 g	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100 g
HR-G7262	1 mg- 500 g	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g
HR-G7263	1 mg- 1 kg	1x1 mg , 2x2 mg, 1x5 mg, 1x10 mg , 2x20 mg, 1x50 mg, 1x100 mg, 2x200 mg, 1x500 mg, 1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g, 1x1 kg
HR-G7264	1 g- 500 g	1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g
HR-G7265	1 g- 1 kg	1x1 g, 2x2 g, 1x5 g, 1x10 g, 2x20 g, 1x50 g, 1x100g, 2x200 g, 1x500 g, 1x1 kg

LABORATORY GLASSWARE

HİRA Test supplies high quality General Laboratory Glassware for various material testing applications.

Glass Measuring Cylinders

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0020	Glass Measuring Cylinder, 10 ml	13x13x140	0.05
HR-G0021	Glass Measuring Cylinder, 25 ml	20x20x145	0.1
HR-G0022	Glass Measuring Cylinder, 50 ml	26x26x180	0.1
HR-G0023	Glass Measuring Cylinder, 100 ml	30x30x250	0.1
HR-G0024	Glass Measuring Cylinder, 250 ml	40x40x320	0.2
HR-G0025	Glass Measuring Cylinder, 500 ml	50x50x390	0.25
HR-G0026	Glass Measuring Cylinder, 1000 ml	65x65x460	0.5
HR-G0027	Glass Measuring Cylinder, 2000 ml	120x120x550	0.75

Glass Beakers

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0001	Glass Beaker 10 ml	34x34x50	0.01
HR-G0002	Glass Beaker 25 ml	42x42x60	0.05
HR-G0003	Glass Beaker 50 ml	50x50x70	0.1
HR-G0004	Glass Beaker 100 ml	60x60x80	0.1
HR-G0005	Glass Beaker 250 ml	70x70x95	0.1
HR-G0006	Glass Beaker 400 ml	80x80x100	0.2
HR-G0007	Glass Beaker 600 ml	90x90x125	0.25
HR-G0008	Glass Beaker 800 ml	100x100x135	0.5
HR-G0009	Glass Beaker 1000 ml	105x105x145	0.75
HR-G0010	Glass Beaker 2000 ml	130x130x185	1
HR-G0011	Glass Beaker 3000 ml	130x130x300	2
HR-G0012	Glass Beaker 5000 ml	130x130x485	3

Pyknometers (Specific Gravity Bottle, Gay Lussac Type)

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

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0040	Pyknometer (Specific Gravity Bottle), 25 ml	40x40x90	0.05
HR-G0041	Pyknometer (Specific Gravity Bottle), 50 ml	50x50x100	0.05
HR-G0042	Pyknometer (Specific Gravity Bottle), 100 ml	60x60x120	0.05
HR-G0043	Pyknometer (Specific Gravity Bottle), 250 ml	100x100x150	0.1
HR-G0044	Pyknometer (Specific Gravity Bottle), 500 ml	110x110x200	0.1
HR-G0045	Pyknometer (Specific Gravity Bottle), 1000 ml	150x150x220	0.2

Hubbard & Carmick Specific Gravity Bottle

STANDARDS: EN ISO 3838, ASTM D70, AASHTO T228, AASHTO T43

It is used for determining the specific gravity or relative density of bitumen.

Technical Specifications:

Product Code	Product Name	Capacity (ml)
HR-G0056	Hubbard Specific Gravity Bottle, Cylindrical	24
HR-G0057	Hubbard-Carmick Specific Gravity Bottle, Conical	25

Pyknometer (Bottle Type)

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

Double Edged and Capillary Tubed Funnel should be ordered separately.

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0050	Pyknometer (Bottle Type), 500 ml	130x130x270	0,7
HR-G0051	Pyknometer (Bottle Type), 1000 ml	150x150x270	0,9
HR-G0052	Pyknometer (Bottle Type), 2000 ml	180x180x330	1,25
HR-G0053	Pyknometer (Bottle Type), 3000 ml	200x200x340	1,35
HR-G0054	Pyknometer (Bottle Type), 5000 ml	250x250x400	1,6
HR-G0055	Funnel for Pyknometer (Bottle Type)	55x55x270	0,2

Conical Flasks, Erlenmeyer

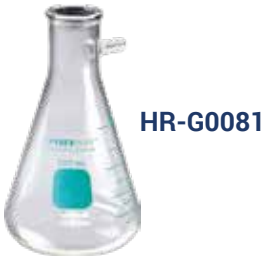
Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0065	Conical Flask, Erlenmeyer, 50 ml	51x51x95	0.05
HR-G0066	Conical Flask, Erlenmeyer, 100 ml	64x64x110	0.1
HR-G0067	Conical Flask, Erlenmeyer, 150 ml	74x74x115	0.13
HR-G0068	Conical Flask, Erlenmeyer, 250 ml	85x85x145	0.2
HR-G0069	Conical Flask, Erlenmeyer, 300 ml	87x87x150	0.45
HR-G0070	Conical Flask, Erlenmeyer, 500 ml	105x105x174	0.6
HR-G0071	Conical Flask, Erlenmeyer, 1000 ml	70x70x120	1
HR-G0072	Conical Flask, Erlenmeyer, 2000 ml	131x131x220	1.6
HR-G0073	Conical Flask, Erlenmeyer, 5000 ml	166x166x280	3

Filter Flasks for Vacuum Filtering

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0080	Filter Flask, 250 ml	187x187x310	0.2
HR-G0081	Filter Flask, 500 ml	166x166x260	0.25
HR-G0082	Filter Flask, 1000 ml	207x207x315	1
HR-G0083	Filter Flask, 2000 ml	207x207x315	2
HR-G0090	Carsten-Röhrchen Flask	---	---



Volumetric Flasks

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0095	Volumetric Flask, 5 ml	20x20x40	0.01
HR-G0096	Volumetric Flask, 10 ml	30x30x50	0.05
HR-G0097	Volumetric Flask, 25 ml	45x45x70	0.1
HR-G0098	Volumetric Flask, 50 ml	51x51x95	0.1
HR-G0099	Volumetric Flask, 100 ml	64x64x110	0.1
HR-G0100	Volumetric Flask, 250 ml	70x70x120	0.2
HR-G0101	Volumetric Flask, 500 ml	85x85x145	0.25
HR-G0102	Volumetric Flask, 1000 ml	105x105x175	0.5
HR-G0103	Volumetric Flask, 2000 ml	131x131x200	0.75
HR-G0104	Volumetric Flask, 3000 ml	166x166x260	1
HR-G0105	Volumetric Flask, 5000 ml	207x207x315	2

Graduated Impurities Test Bottles

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0110	Graduated Impurities Test Bottle, Glass 250 ml	100x100x200	0.25
HR-G0111	Graduated Impurities Test Bottle, Glass 500 ml	200x200x400	0.5
HR-G0112	Graduated Impurities Test Bottle, Glass 1000 ml	300x300x500	1
HR-G0113	Graduated Impurities Test Bottle, Glass 2000 ml	450x450x700	1.75

HR-G0111

Glass Funnels

Technical Specifications:

Product Code	Product Name
HR-G0120	Glass Funnel, 40 mm
HR-G0121	Glass Funnel, 60 mm
HR-G0122	Glass Funnel, 75 mm
HR-G0123	Glass Funnel, 100 mm
HR-G0124	Glass Funnel, 120 mm
HR-G0125	Glass Funnel, 200 mm

HR-G0122

İmhoff Funnel

Technical Specifications:

Product Code	Product Name
HR-G0127	İmhoff Funnel, 1000 ml

HR-G0127

Watch Glasses

Technical Specifications:

Product Code	Product Name
HR-G0135	Watch Glass, 70 mm
HR-G0136	Watch Glass, 100 mm
HR-G0137	Watch Glass, 120 mm
HR-G0138	Watch Glass, 150 mm

HR-G0137 & HR-G0138

HR-G0136 HR-G0135

Petri Dishes

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0150	Petri Dish, 100 mm	120x120x80	0.25
HR-G0151	Petri Dish, 120 mm	100x100x80	0.25

HR-G0150

HR-G0151

Weighing Bottles

Technical Specifications:

Product Code	Product Name
HR-G0244	Weighing bottle, 30x30 mm
HR-G0245	Weighing bottle, 40x40 mm
HR-G0246	Weighing bottle, 50x30 mm
HR-G0247	Weighing bottle, 60x30 mm
HR-G0248	Weighing bottle, 70x35 mm
HR-G0249	Weighing bottle, 80x40 mm

HR-G0246

HİRA TESTING EQUIPMENT

Graduated Pipettes

Technical Specifications:

Product Code	Product Name
HR-G0160	Pipette, 1 ml
HR-G0161	Pipette, 2 ml
HR-G0162	Pipette, 5 ml
HR-G0163	Pipette, 10 ml
HR-G0164	Pipette, 25 ml
HR-G0170	Pasteur Pipette, 150 mm. Pack of 250
HR-G0171	Pasteur Pipette, 230 mm. Pack of 250

HR-G0164 & HR-G0163
HR-G0162 & HR-G016
HR-G0160

Burettes

Technical Specifications:

Product Code	Product Name
HR-G0180	Burette, 10 ml
HR-G0181	Burette, 25 ml
HR-G0182	Burette, 50 ml
HR-G0183	Burette, 100 ml
HR-G0190	Amber Burette, 10 ml
HR-G0191	Amber Burette, 25 ml
HR-G0192	Amber Burette, 50 ml
HR-G0193	Automatic Burette, Single Tap, 10 ml
HR-G0194	Automatic Burette, Single Tap, 25 ml
HR-G0195	Automatic Burette, Single Tap, 50 ml
HR-G0196	Automatic Burette, Double Tap, 10 ml
HR-G0197	Automatic Burette, Double Tap, 25 ml
HR-G0198	Automatic Burette, Double Tap, 50 ml
HR-G0199	Automatic Burette, Double Tap, 100 ml
HR-G0205	Automatic Amber Burette, Double Tap, 10 ml
HR-G0206	Automatic Amber Burette, Double Tap, 25 ml
HR-G0207	Automatic Amber Burette, Double Tap, 50 ml
HR-G0208	Amber Automatic Burette Storage Bottle, 2000 ml
HR-G0210	Automatic Burette Storage Bottle, 2000 ml

HR-G0182

HR-G0192

HR-G0198

HR-G0210

HR-G0208

Stirring Rods

Technical Specifications:

Product Code	Product Name
HR-G0215	Stirring Rod, 6*200 mm
HR-G0216	Stirring Rod, 8*300 mm

HR-G0216

Desiccators

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (kg)
HR-G0220	Desiccator, Ø210 mm	310x310x250	3.50
HR-G0221	Desiccator, Ø240 mm	340x340x300	3.50
HR-G0222	Desiccator, Ø300 mm	400x400x350	3.50
HR-G0223	Desiccator, Ø210 mm. Vacuum Type	310x310x250	3.50
HR-G0224	Desiccator, Ø240 mm. Vacuum Type	340x340x300	3.50
HR-G0225	Desiccator, Ø300 mm. Vacuum Type	400x400x350	3.50
HR-G0229	Safety Cage	---	2

HR-G0223

HR-G0221

HYDROMETERS

Technical Specifications:

Product Code	Product Name
HR-G0230	Hydrometer, 700-800
HR-G0231	Hydrometer, 800-900
HR-G0232	Hydrometer, 900-1000
HR-G0233	Hydrometer, 1000-1100
HR-G0234	Hydrometer, 1100-1200
HR-G0235	Hydrometer, 1200-1300
HR-G0236	Hydrometer, 1300-1400
HR-G0237	Hydrometer, 1400-1500
HR-G0238	Hydrometer, 1500-1600
HR-G0239	Hydrometer, 1600-1700
HR-G0240	Hydrometer, 1700-1800
HR-G0241	Hydrometer, 1800-1900
HR-G0242	Hydrometer, 1900-2000
HR-S6420	151 H Hydrometer, 0,995 to 1,038 g/ml range
HR-S6415	152 H Hydrometer, -5 to 60 g/l range

Chapman Flask

Used for field determination of the amount of surface moisture in fine aggregates.

Graduated to 200 ml between the two bulbs and from 375 up to 450 ml above the second bulb.

Technical Specifications:

Product Code	Product Name	Weight (gr)
HR-G0128	Chapman Flask	500

HR-G0128

PLASTIC LABORATORY PRODUCTS

HİRA Test supplies high quality General Laboratory Plastic Products for various material testing applications.

Plastic Measuring Cylinders

Technical Specifications:

Product Code	Product Name
HR-G0250	Plastic Measuring Cylinder, 10 ml
HR-G0251	Plastic Measuring Cylinder, 25 ml
HR-G0252	Plastic Measuring Cylinder, 50 ml
HR-G0253	Plastic Measuring Cylinder, 100 ml
HR-G0254	Plastic Measuring Cylinder, 250 ml
HR-G0255	Plastic Measuring Cylinder, 500 ml
HR-G0256	Plastic Measuring Cylinder, 1000 ml
HR-G0257	Plastic Measuring Cylinder, 2000 ml

Plastic Beakers

Technical Specifications:

Product Code	Product Name
HR-G0275	Plastic Beaker, 25 ml
HR-G0276	Plastic Beaker, 50 ml
HR-G0277	Plastic Beaker, 100 ml
HR-G0278	Plastic Beaker, 250 ml
HR-G0279	Plastic Beaker, 500 ml
HR-G0280	Plastic Beaker, 1000 ml
HR-G0281	Plastic Beaker, 2000 ml
HR-G0290	Plastic Beaker, Handled, 250 ml
HR-G0291	Plastic Beaker, Handled, 500 ml
HR-G0292	Plastic Beaker, Handled, 1000 ml
HR-G0293	Plastic Beaker, Handled, 2000 ml
HR-G0294	Plastic Beaker, Handled, 3000 ml
HR-G0295	Plastic Beaker, Handled, 5000 ml

Plastic Beakers

Plastic Volumetric Flasks

Technical Specifications:

Product Code	Product Name
HR-G0305	Plastic Volumetric Flask, 25 ml
HR-G0306	Plastic Volumetric Flask, 50 ml
HR-G0307	Plastic Volumetric Flask, 100 ml
HR-G0308	Plastic Volumetric Flask, 250 ml
HR-G0309	Plastic Volumetric Flask, 500 ml
HR-G0310	Plastic Volumetric Flask, 1000 ml

Plastic Funnels

Technical Specifications:

Product Code	Product Name
HR-G0311	Plastic Funnel, 50 mm
HR-G0312	Plastic Funnel, 70 mm
HR-G0313	Plastic Funnel, 90 mm
HR-G0314	Plastic Funnel, 100 mm
HR-G0315	Plastic Funnel, 120 mm
HR-G0316	Plastic Funnel, 150 mm

Wash Bottles

Technical Specifications:

Product Code	Product Name
HR-G0265	Wash Bottle, 100 ml
HR-G0266	Wash Bottle, 250 ml
HR-G0267	Wash Bottle, 500 ml
HR-G0268	Wash Bottle, 1000 ml

HR-G0268

HR-G0267

HR-G0266

Plastic Buckets

Technical Specifications:

Product Code	Product Name
HR-G0317	Plastic Bucket, 25 lt
HR-G0318	Plastic Bucket, 35 lt
HR-G0319	Plastic Bucket, 50 lt
HR-G0320	Plastic Bucket, 70 lt

HR-G0319

Sample Bags

Technical Specifications:

Product Code	Product Name
HR-G0330	Sample Zip Lock Bag, Pack of 300. 17x23 cm
HR-G0331	Sample Zip Lock Bag, Pack of 300. 19x25 cm
HR-G0332	Sample Zip Lock Bag, Pack of 300. 21x27 cm
HR-G0333	Sample Zip Lock Bag, Pack of 300. 23x31 cm
HR-G0334	Sample Zip Lock Bag, Pack of 200. 26x35 cm

HR-G0331

Pipette & Pumps

Technical Specifications:

Product Code	Product Name
HR-G0345	Plastic Pasteur Pipette, 3 ml, Pack of 500
HR-G0346	Hand Pump for Pipette/Burette
HR-G0347	Hand Pump, Three-Way for Pipette/Burette
HR-G0348	Pipet Pump, 2 ml (Blue), 10 ml(Green), 25 ml (Red)

HR-G0347

HR-G0345

HR-G0348

HR-G0346

PORCELAIN LABORATORY PRODUCTS

HİRA Test supplies high quality General Laboratory Porcelain Products for various material testing applications.

Porcelain Mortars with Pestle

Technical Specifications:

Product Code	Product Name
HR-G0355	Porcelain Mortar with Pestle, Ø80 mm
HR-G0356	Porcelain Mortar with Pestle, Ø100 mm
HR-G0357	Porcelain Mortar with Pestle, Ø130 mm
HR-G0358	Porcelain Mortar with Pestle, Ø160 mm
HR-G0359	Porcelain Mortar with Pestle, Ø190 mm

HR-G0356

Porcelain Evaporating Dishes

Technical Specifications:

Product Code	Product Name
HR-G0365	Porcelain Evaporating Dish, Ø50 mm
HR-G0366	Porcelain Evaporating Dish, Ø70 mm
HR-G0367	Porcelain Evaporating Dish, Ø80 mm
HR-G0368	Porcelain Evaporating Dish, Ø100 mm
HR-G0369	Porcelain Evaporating Dish, Ø120 mm

HR-G0366

HR-G0368

Porcelain Crucibles

Technical Specifications:

Product Code	Product Name
HR-G0375	Porcelain Crucible, 15 ml
HR-G0376	Porcelain Crucible, 30 ml
HR-G0377	Porcelain Crucible, 40 ml

HR-G0376

Porcelain Buchner Funnels

Technical Specifications:

Product Code	Product Name
HR-G0380	Porcelain Buchner Funnel, 100 mm
HR-G0381	Porcelain Buchner Funnel, 120 mm

HR-G0380

TEMPERATURE & TIME MEASUREMENT

HİRA Test supplies high quality Temperature & Time Measurement Products for various material testing applications.

Digital Thermometers

Complete with depth stainless steel probe for temperature measurements of liquid, fluid, semisolid, granular materials and air.

The probe is directly connected to the digital unit.

Technical Specifications:

Product Code	Product Name	Measurement Range	Resolution (°C)
HR-G0385	Digital Thermometer, 10 cm prob	(-50) – (+300)°C	0,1
HR-G0384	Digital Thermometer, 31 cm prob	(-50) – (+300)°C	0,1
HR-G0386	Digital Max-Min Thermometer with cable	(-50) + (70)°C	0,1
HR-G0387	Digital Max-Min Thermo-Hygrometer with cable	(-50) + (70)°C	0,1
HR-G0388	Digital Infrared (Laser) Thermometer	(-50) + (380)°C	0,1

HR-G0388

HR-G0387

HR-G0384

HR-G0385

HR-G0386

Glass Thermometers

Glass Stem and Mercury system for General Laboratory use.

Technical Specifications:

Product Code	Product Name
HR-G0391	Glass Thermometer, Max. 110°C
HR-G0392	Glass Thermometer, Max. 360°C

HR-G0391

HR-G0398

MECHANICAL THERMOMETERS & HYGROMETER & BAROMETER

Product Code	Product Name	Measurement Range	Resolution (°C)	Dimensions (cm)
HR-G0396	Mechanical Thermometer	(-10) – (+110)°C	± 2	Ø 2,5 x 12
HR-G0397	Mechanical Thermometer	(0) – (+120)°C	± 2	Ø 5,4 x 13
HR-G0398	Mechanical Thermometer	(0) – (+250)°C	± 2	Ø 5 x 12,5
HR-G0399	Mechanical Thermometer	(+20) – (+280)°C	± 2	Ø 5,4 x 18
HR-G0389	Manuel Hygrometer	%20 - %100	---	---
HR-G0390	Mechanical Barometer	940...1060 mb	---	Ø 10

HR-G0396

HR-G0389

HR-G0390

HR-G0396

HR-G0397

HR-G0399

HİRA TESTING EQUIPMENT

Time Measurement & Calculation

Technical Specifications:

Product Code	Product Name
HR-G0395	Digital Stop Watch
HR-G1396	Calculator

HR-G1396

HR-G0395

IP & ASTM THERMOMETERS

HİRA Test supplies high quality IP & ASTM Thermometers for various material testing applications.

IP & ASTM THERMOMETERS

Technical Specifications:

Product Code	IP Ref.	ASTM Ref.	Range (°C)	Graduation	Height (mm)	Immersion (mm)	Dimensions (mm)	Weight (kg)
HR-G1385	38C	-	23 - 27	0.1 °C	260	Total	30x30x300	0,1
HR-G1386	76C	-	10 - 55	0.5 °C	240	93	30x30x300	0,1
HR-G1387	8C	-	0 - 45	0.2 °C	340	65	30x30x300	0,1
HR-G1388	42C	-	-38 - (+30)	0.5 °C	370	250	30x30x300	0,1
HR-G1389	5C	7C	-2 - (+300)	1 °C	385	Total	30x30x300	0,1
HR-G1390	6C	8C	-2 - (+400)	1 °C	385	Total	30x30x300	0,1
HR-G1391	15C	9C	-5 - (+110)	0.5 °C	290	57	30x30x300	0,1
HR-G1392	16C	10C	90 - 370	2 °C	290	57	30x30x300	0,1
HR-G1393	28C	11C	-6 - (+400)	2 °C	310	25	30x30x300	0,1
HR-G1394	47C	13C	155 - 170	0.5 °C	155	Total	30x30x300	0,1
HR-G1395	60C	15C	-2 - (+80)	0.2 °C	395	Total	30x30x300	0,1
HR-G1397	61C	16C	30 - 200	0.5 °C	395	Total	30x30x300	0,1
HR-G1398	-	17C	19 - 27	0.1°C	275	Total	30x30x300	0,1
HR-G1399	-	18C	34 - 42	0.1°C	275	Total	30x30x300	0,1
HR-G1400	-	19C	49 - 57	0.1°C	275	Total	30x30x300	0,1
HR-G1401	-	20C	57 - 65	0.1°C	275	Total	30x30x300	0,1
HR-G1402	-	21C	79 - 87	0.1°C	275	Total	30x30x300	0,1
HR-G1403	-	22C	95 - 103	0.1°C	275	Total	30x30x300	0,1
HR-G1404	-	23C	18 - 28	0.2 °C	212	90	30x30x300	0,1
HR-G1405	-	24C	39 - 54	0.2 °C	237	90	30x30x300	0,1
HR-G1406	-	25C	95 - 105	0.2°C	212	90	30x30x300	0,1
HR-G1407	20C	33C	-38 - (+42)	0.2°C	420	50	30x30x300	0,1
HR-G1408	59C	35C	90 - 170	0.2°C	420	50	30x30x300	0,1
HR-G1409	35C	47C	58.6 - 61.4	0.05 °C	305	Total	30x30x300	0,1
HR-G1410	-	38C	24 - 78	0.2°C	395	100	30x30x300	0,1
HR-G1411	-	57C	-20 - (+50)	0.5 °C	287	57	30x30x300	0,1
HR-G1412	63C	63C	-8 - (+32)	0.1 °C	395	Total	30x30x300	0,1
HR-G1413	93C	110C	133.6 - 136.4	0.05 °C	305	Total	30x30x300	0,1
HR-G1414	89C	113C	-1 - (+175	0.5 °C	405	Total	30x30x300	0,1

LABORATORY HARDWARE

HİRA Test supplies high quality General Laboratory Hardware Products for various material testing applications.

Calipers

Technical Specifications:

Product Code	Product Name
HR-G0400	Caliper, 150 mm
HR-G0401	Caliper, 300 mm
HR-G0402	Caliper, 500 mm
HR-G0403	Caliper, 600 mm
HR-G0404	Caliper, 1000 mm
HR-G0410	Digital Caliper, 150 mm
HR-G0411	Digital Caliper, 200 mm
HR-G0412	Digital Caliper, 300 mm
HR-G0413	Digital Caliper, 500 mm

HR-G0410

HR-G0400

Gloves

Technical Specifications:

Product Code	Product Name
HR-G0420	Latex Gloves, Pack of 100
HR-G0421	Heat Resistant Gloves
HR-G0422	Leather Gloves
HR-G0423	Cotton Gloves
HR-G0424	Rubber Gloves
HR-G0425	Nitrile Gloves. Pack of 100

HR-G0424

HR-G0422

HR-G0421

HR-G0425

HR-G0420

HR-G0423

Brushes

Technical Specifications:

Product Code	Product Name
HR-G0430	Bristle brush No.1
HR-G0431	Bristle brush No.1,5
HR-G0432	Bristle brush No.2
HR-G0433	Bristle brush No.2,5
HR-G0434	Bristle brush No.3
HR-G0435	Bristle brush No.4
HR-G0440	Wire brush with handle
HR-G0441	Mini Brush Set with wooden handle. Pack of 3. Nylon/Brass/Stainless Steel.
HR-G0442	Mini Brush Set with plastic handle. Pack of 3. Nylon/Brass/Stainless Steel.
HR-G0443	Brush Set with plastic handle. Pack of 3. Nylon/Brass/Stainless Steel.
HR-G0444	Round Bristle Brush

Bristle Brushes

HR-G0442

HR-G0443

HR-G0441

HR-G0440

HR-G0444

HİRA TESTING EQUIPMENT

Length Measurement

Technical Specifications:

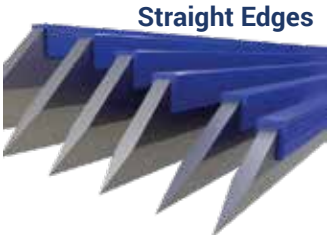
Product Code	Product Name
HR-G0460	Steel Tape, 3 m
HR-G0461	Steel Tape, 5 m
HR-G0465	Micrometer, Analog, 0-25 x 0,01 mm
HR-G0466	Micrometer, Analog, 25-50 x 0,01 mm
HR-G0467	Micrometer, Digital, 0-25 mm
HR-G0470	Feeler gauge. 20 pieces. 0,05 to 1,00 / 0,05 mm Interval
HR-G0475	Steel Ruler, 150 mm
HR-G0476	Steel Ruler, 300 mm
HR-G0477	Steel Ruler, 500 mm
HR-G0478	Steel Ruler, 1000 mm
HR-G0479	Steel Ruler, 2000 mm
HR-G0550	Precision Knife Straight Edge, Stainless Steel, 75 mm
HR-G0551	Precision Knife Straight Edge, Stainless Steel, 100 mm
HR-G0552	Precision Knife Straight Edge, Stainless Steel, 150 mm
HR-G0553	Precision Knife Straight Edge, Stainless Steel, 200 mm
HR-G0554	Precision Knife Straight Edge, Stainless Steel, 250 mm
HR-G0560	Square Knife Edges, 50x40 mm
HR-G0561	Square Knife Edges, 75x50 mm
HR-G0562	Square Knife Edges, 100x70 mm
HR-G0563	Square Knife Edges, 150x100 mm
HR-G0564	Square Knife Edges, 200x130 mm
HR-G0570	Square with Base, 100x70 mm
HR-G0571	Square with Base, 150x100 mm
HR-G0572	Square with Base, 200x130 mm
HR-G0573	Square with Base, 250x165 mm
HR-G0574	Square with Base, 300x175 mm
HR-G0575	Square with Base, 400x200 mm
HR-G0576	Square with Base, 500x250 mm
HR-G0585	Square Flat, 100x70 mm
HR-G0586	Square Flat, 150x100 mm
HR-G0587	Square Flat, 200x130 mm
HR-G0588	Square Flat, 250x165 mm
HR-G0589	Square Flat, 300x175 mm
HR-G0590	Square Flat, 400x200 mm
HR-G0591	Square Flat, 500x250 mm
HR-G0595	Square, 300x175 mm

HR-G0467

HR-G0465

HR-G0470

Precision Knife Straight Edges



HR-G0585

Steel Rulers

HR-G0561

HR-G0595

HR-G0571

HR-G0460

HR-G0461

Mixing Bowls

Technical Specifications:

Product Code	Product Name
HR-G0480	Mixing Bowl, Stainless Steel, Ø160 mm
HR-G0481	Mixing Bowl, Stainless Steel, Ø180 mm
HR-G0482	Mixing Bowl, Stainless Steel, Ø200 mm

HR-G0481

HR-G0480

HR-G0482

Moisture Tins

Technical Specifications:

Product Code	Product Name
HR-G0615	Test Cup (Circular Cross Section), EN 1015-19, Ø: 200 x 100 mm
HR-G0600	Moisture Tin with Cover, Aluminum, Ø: 150 x 170 mm
HR-G0601	Moisture Tin with Cover, Aluminum, Ø: 140 x 9,5 mm
HR-G0602	Moisture Tin with Cover, Aluminum, Ø: 120 x 120 mm
HR-G0603	Moisture Tin with Cover, Aluminum, Ø: 125 x 100 mm
HR-G0604	Moisture Tin with Cover, Aluminum, Ø: 105 x 100 mm
HR-G0605	Moisture Tin with Cover, Aluminum, Ø: 100 x 70 mm
HR-G0606	Moisture Tin with Cover, Aluminum, Ø: 80 x 90 mm
HR-G0612	Moisture Tin with Cover, Aluminum, Ø: 80 x 80 mm
HR-G0607	Moisture Tin with Cover, Aluminum, Ø: 80 x 45 mm
HR-G0608	Moisture Tin with Cover, Aluminum, Ø: 70 x 45 mm
HR-G0609	Moisture Tin with Cover, Aluminum, Ø: 60 x 60 mm
HR-G0610	Moisture Tin with Cover, Aluminum, Ø: 55 x 35 mm
HR-G0611	Moisture Tin with Cover, Aluminum, Ø: 45 x 10 mm

Round Aluminum Scoops

Technical Specifications:

Product Code	Product Name
HR-G0620	Round Aluminum Scoop, Small
HR-G0621	Round Aluminum Scoop, Medium
HR-G0622	Round Aluminum Scoop, Large
HR-G0623	Round Aluminum Scoop, Extra Large
HR-G0624	Round Stainless Steel Scoop, 5 kg of Concrete, EN 12350-1, BS 1881:101

Flexible Spatulas

Technical Specifications:

Product Code	Product Name
HR-G0700	Flexible Spatula, 100 mm
HR-G0701	Flexible Spatula, 150 mm
HR-G0702	Flexible Spatula, 200 mm

Rigid Spatulas

Technical Specifications:

Product Code	Product Name
HR-G0705	Rigid Spatula, Small
HR-G0706	Rigid Spatula, Medium
HR-G0707	Rigid Spatula, Large
HR-G0708	Chattaway Spatula. 10 cm
HR-G0709	Chattaway Spatula. 13 cm
HR-G0710	Chattaway Spatula. 15 cm
HR-G0711	Chattaway Spatula. 18 cm
HR-G0712	Chattaway Spatula. 21 cm


HR-G0706


HR-G0708

Sample Bags

Technical Specifications:

Product Code	Product Name
HR-G0335	Sample Bag. Tarpaulin, 25x40 cm
HR-G0336	Sample Bag. Tarpaulin, 40x80 cm
HR-G0337	Sample Bag. Tarpaulin, 50x80 cm
HR-G0338	Sample Bag. Tarpaulin, 60x40 cm
HR-G0339	Sample Bag. Tarpaulin, 50x100 cm


Sample Bags

Mixing Pans

Technical Specifications:

Product Code	Product Name
HR-G0630	Mixing Pan, Stainless Steel, 20x30x4 cm (No.1)
HR-G0631	Mixing Pan, Stainless Steel, 23x33x4 cm (No.2)
HR-G0632	Mixing Pan, Stainless Steel, 26x38x4 cm (No.3)
HR-G0633	Mixing Pan, Stainless Steel, 29x44x4 cm (No.4)
HR-G0634	Mixing Pan, Stainless Steel, 31x48x4 cm(No.5)
HR-G0660	Mixing Pan, Galvanised, 20x20x5 cm
HR-G0661	Mixing Pan, Galvanised, 30x30x5 cm
HR-G0662	Mixing Pan, Galvanised, 40x40x5 cm
HR-G0663	Mixing Pan, Galvanised, 50x50x5 cm
HR-G0664	Mixing Pan, Galvanised, 60x60x5 cm
HR-G0665	Mixing Pan, Galvanised, 100x100x5 cm
HR-G0666	Mixing Pan, Galvanised, 30x30x7 cm
HR-G0667	Mixing Pan, Galvanised, 40x40x7 cm
HR-G0668	Mixing Pan, Galvanised, 50x50x7 cm
HR-G0669	Mixing Pan, Galvanised, 60x60x7 cm
HR-G0670	Mixing Pan, Galvanised, 100x100x7 cm
HR-G0671	Mixing Pan, Galvanised, 30x30x8 cm
HR-G0672	Mixing Pan, Galvanised, 40x40x8 cm
HR-G0673	Mixing Pan, Galvanised, 50x50x8 cm
HR-G0674	Mixing Pan, Galvanised, 60x60x8 cm
HR-G0675	Mixing Pan, Galvanised, 100x100x8 cm
HR-G0676	Mixing Pan, Galvanised, 40x40x10 cm
HR-G0677	Mixing Pan, Galvanised, 50x50x10 cm
HR-G0678	Mixing Pan, Galvanised, 60x60x10 cm
HR-G0679	Mixing Pan, Galvanised, 100x100x10 cm
HR-G0635	Mixing Pan, Stainless Steel, 20x20x5 cm
HR-G0636	Mixing Pan, Stainless Steel, 30x30x5 cm
HR-G0637	Mixing Pan, Stainless Steel, 40x40x5 cm
HR-G0638	Mixing Pan, Stainless Steel, 50x50x5 cm
HR-G0639	Mixing Pan, Stainless Steel, 60x60x5 cm
HR-G0640	Mixing Pan, Stainless Steel, 100x100x5 cm
HR-G0641	Mixing Pan, Stainless Steel, 30x30x7 cm
HR-G0642	Mixing Pan, Stainless Steel, 40x40x7 cm
HR-G0643	Mixing Pan, Stainless Steel, 50x50x7 cm
HR-G0644	Mixing Pan, Stainless Steel, 60x60x7 cm
HR-G0645	Mixing Pan, Stainless Steel, 100x100x7 cm
HR-G0646	Mixing Pan, Stainless Steel, 30x30x8 cm
HR-G0647	Mixing Pan, Stainless Steel, 40x40x8 cm
HR-G0648	Mixing Pan, Stainless Steel, 50x50x8 cm
HR-G0649	Mixing Pan, Stainless Steel, 60x60x8 cm
HR-G0650	Mixing Pan, Stainless Steel, 100x100x8 cm
HR-G0651	Mixing Pan, Stainless Steel, 40x40x10 cm
HR-G0652	Mixing Pan, Stainless Steel, 50x50x10 cm
HR-G0653	Mixing Pan, Stainless Steel, 60x60x10 cm
HR-G0654	Mixing Pan, Stainless Steel, 100x100x10 cm

Stainless Steel Mixing Pans

General

Technical Specifications:

Product Code	Product Name
HR-G0715	Crucible Tong, 250 mm
HR-G0716	Crucible Tong, 300 mm
HR-G0717	Crucible Tong, 450 mm
HR-G0720	Tong
HR-G0725	Water Level, 60 cm
HR-G0726	Water Level, 100 cm
HR-G0730	Coarse Filter Paper, Pack of 250
HR-G0731	Adjustable Pliers
HR-G0732	Clipper
HR-G0733	Flat Screwdriver
HR-G0734	Fillister Head Screwdriver
HR-G0735	Allen Wrench Set
HR-G0736	Knife
HR-G0737	Pick
HR-G0738	Sampling Spoon
HR-G0739	Ladle, Stainless Steel
HR-G0740	Trowel
HR-G0741	Rectangular Trowel

HR-G0716

HR-G0720

HR-G0725

HR-G0730

HR-G0731

HR-G0732

HR-G0733

HR-G0734

HR-G0735

HR-G0736

HR-G0737

HR-G0738

HR-G0739

HR-G0740

HR-G0741

HİRA TESTING EQUIPMENT

Product Code	Product Name
HR-G0742	Steel Hammer, 0,5 kg
HR-G0743	Steel Hammer, 1 kg
HR-G0744	Steel Hammer, 1,5 kg
HR-G0745	Steel Hammer, 2 kg
HR-G0746	Sledge Hammer, 3 kg
HR-G0747	Sledge Hammer, 5 kg
HR-G0748	Rubber Mallet
HR-G0749	Shovel
HR-G0750	Broach with Plastic Handle, 30 cm
HR-G0751	Chisel
HR-G0752	Bill
HR-G0753	Open Wire Saw
HR-G0754	Wire. Pack of 12
HR-G0755	Trimming Knife
HR-G0756	Hand Lamp
HR-G0757	Iron Wire Gauze, 12x12 cm
HR-G0758	Iron Wire Gauze, 16x16 cm
HR-G0759	Laboratory Trolley
HR-G0760	Wheel Barrow
HR-G0761	Tool Kit

HR-G0744

HR-G0746

HR-G0748

HR-G0749

HR-G0750

HR-G0751

HR-G0753 with HR-G0754

HR-G0752

HR-G0755

HR-G0756

HR-G0757

HR-G0761

HR-G0759

HR-G0760

COOKTOP STOVE

Two, Three or Four Eyed Set-Top Cookers used in for sample drying processes are available with natural gas or LPG cylinder options.

2 kg or 12 kg Tube, Decanter Set and Tube Head for 2 kg Tube should be ordered separately for LPG Cylinder compatible furnaces.

HR-G0770

Technical Specifications:

Product Code	Product Name
HR-G0770	Two Eyed Gas Cooktop Stove
HR-G0771	Three Eyed Gas Cooktop Stove
HR-G0772	Four Eyed Gas Cooktop Stove
HR-G0773	Two Eyed Lpg Cooktop Stove
HR-G0774	Three Eyed Lpg Cooktop Stove
HR-G0775	Four Eyed Lpg Cooktop Stove

Spare Parts & Accessories:

Product Code	Product Name
HR-G0777	Tube, 2 kg
HR-G0777/1	Tube Head for 2 kg Tube
HR-G0778	Tube, 12 kg
HR-G0778/1	Decanter Set

HR-G0772

HR-G0778

HR-G0777

HR-G0778/1

HR-G0771

BUNSEN BURNER

HR-G0765 Model Bunsen Burner can be used with all gases; natural gas, air gas and butane gas.

It is equipped with a control ring for air and gas flow velocities, allowing precise control of the flame force at the lowest and highest levels.

Tripod is manufactured from metal. It is used to keep the glass materials above fire. Should be ordered separately.

HR-G0766 Model Multipurpose Portable Bunsen Burner offers practical and suitable solutions in laboratories with limited or no gas connection possibilities. It allows precise control of the flame force. The perforated design gas outlet grille acts as a balancer that allows the gas to exit at low speed at the first exit. The lighter on the Bunsen burner provides easy use. It can burn for 4-6 hours with 190 gr cartridge. Gas cartridge should be ordered separately.

Technical Specifications:

Product Code	Product Name
HR-G0765	Bunsen Burner
HR-G0766	Portable Bunsen Burner

Spare Parts & Accessories:

Product Code	Product Name
HR-G0765/1	Tripod, 150 mm
HR-G0766/1	Gas Cartridge, 190 gr

HR-G0766

HR-G0765/1

HR-G0766/1

HR-G0765

VACUUM PUMPS

HİRA Test supplies high quality Single and Dual Stage Vacuum Pumps for various material testing applications.

The Vacuum Pumps is more Reliable and has a Higher Ultimate Vacuum property.

The devices equipped with Forced Oil Cycling System, Integrated Body Structure and has a Big Sight Glass.

Technical Specifications:

Product Code	Product Name
HR-G0800	Vacuum Pump, Single Stage, 51 l/min
HR-G0801	Vacuum Pump, Single Stage, 70 l/min
HR-G0802	Vacuum Pump, Single Stage, 100 l/min
HR-G0803	Vacuum Pump, Single Stage, 170 l/min
HR-G0805	Vacuum Pump, Dual Stage, 42 l/min
HR-G0806	Vacuum Pump, Dual Stage, 70 l/min
HR-G0807	Vacuum Pump, Dual Stage, 128 l/min
HR-G0808	Vacuum Pump, Dual Stage, 170 l/min
HR-G0809	Vacuum Pump, Dual Stage, 226 l/min

HR-G0816

HR-G0801

Spare Parts & Accessories:

Product Code	Product Name
HR-G0815	Tubing for Vacuum, 1,5 m
HR-G0816	Vacuum Gauge Manometer, 1000 mbar, Ø63 mm

Technical Specifications for Single Stage Vacuum Pumps

Product Code		HR-G0800	HR-G0801	HR-G0802	HR-G0803
Flow Rate	50 Hz	1,8 CFM 51 l/min	2,5 CFM 70 l/min	3,5 CFM 100 l/min	6 CFM 170 l/min
	60 Hz	2 CFM 57 l/min	3 CFM 84 l/min	4 CFM 113 l/min	7 CFM 198 l/min
Ultimate Vacuum	Partial Pressure (Pa)	2	2	2	2
	Total Pressure (micron)	150	150	150	150
Power (HP)		¼	¼	1/3	½
Inlet Port (Flare)		¼"	¼"	¼" & 3/8"	¼" & 3/8"
Oil Capacity (ml)		250 ml	250 ml	250 ml	415 ml
Dimensions (mm)		290x124x224	290x124x224	318x124x234	338x138x244
Weight(kg)		6,6	7,1	8	9,9

Technical Specifications for Dual Stage Vacuum Pumps

Product Code		HR-G0805	HR-G0806	HR-G0807	HR-G0808	HR-G0809
Flow Rate	50 Hz	1,5 CFM 42 l/min	2,5 CFM 70 l/min	4,5 CFM 128 l/min	6 CFM 170 l/min	8 CFM 226 l/min
	60 Hz	1,8 CFM 50 l/min	3 CFM 84 l/min	5 CFM 142 l/min	7 CFM 198 l/min	9 CFM 254 l/min
Ultimate Vacuum	Partial Pressure (Pa)	2x10-1	2x10-1	2x10-1	2x10-1	2x10-1
	Total Pressure (micron)	15	15	15	15	15
Power (HP)		¼	1/3	½	¾	1
Inlet Port (Flare)		¼"	¼"	¼" & 3/8"	¼" & 3/8"	¼" & 3/8"
Oil Capacity (ml)		200 ml	200 ml	325 ml	580 ml	500 ml
Dimensions (mm)		318x124x234	318x124x234	338x138x244	395x145x257	395x145x257
Weight(kg)		8,5	8,5	10,4	15,8	16,2

AIR COMPRESSORS

HİRA Test supplies high quality Laboratory Air Compressors for various material testing applications.

The devices are durable machines for supplying compressed air required by several analysis in material testing.

Technical Specifications:

Product Code	Product Name	Capacity (lt)	Max. Working Pressure (bar)	Air Suction Capacity (lt/min)	Dimen-sions (cm)	Weight (kg)	Power Supply
HR-G0825	Air pressure Pump	25	8	192	60x30x60	30	220 V, 50 Hz
HR-G0826	Air pressure Pump	50	8	192	60x30x60	40	220 V, 50 Hz
HR-G0828	Air pressure Pump	100	8	250	100x40x70	62	220 V, 50 Hz, 2 hp
HR-G0829	Air pressure Pump	100	10	210	105x45x75	69	230 V, 50 Hz, 2 hp
HR-G0830	Air pressure Pump	200	8	370	146x47x86	98	220 V, 50 Hz

Spare Parts & Accessories:

Product Code	Product Name
HR-G0831	Spiral Air Hose
HR-G0832	Air-Cleaning Gun
HR-G0833	Check Valve

HR-G0825

HR-G0828

HR-G0829

HR-G0831

HR-G0830

HR-G0832

HR-G0833

PH METERS

HİRA Test supplies high quality pH Meters for various material testing applications.

The Pocket Type pH meter is microprocessor based pH tester, assure to produce fast and stable readings. It also comes with features such as automatic temperature compensation, large and easy to read LCD screen, low battery indication, automatic shut-off after 8 minutes and others.

The Pocket Type pH meter is incorporated with easy push buttons for automatic calibration and splash proof keypad that prevents water infiltration.

Supplied in a carton box complete with protective cap, calibration solution in sachets (pH 7 and pH 4, 20 ml each), 4 x 1.5V batteries and user manual.

The Portable pH meter is a compact pH meter featuring automatic pH calibration, Hold function, low battery indication, temperature measurement and compensation. In addition, can measure in the mV range.

The Portable pH meter is 2 points push-button calibration with auto-buffer recognition in 3 points (pH 4.01, pH 7.01 and pH 10.01).

Auto-off after 8 minutes of non-use conserves energy and lengthens battery life-span.

Supplied complete with A1230B pH electrode with Epoxy body, BNC connector and 1 m cable, stainless steel temperature probe, pH 4.01 and pH 7.01 calibration buffers (20 ml each), batteries (4 x 1.5V AA alkaline) and instruction manual.

The Laboratory pH Meter is a professional bench meter for pH, ORP (Oxidation Reduction Potential) and temperature measurements. Relative mV readings are also provided.

Up to 5-point calibration with 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 & 12.45) and 2 custom buffers, Calibration time-out alarm.

Supplied complete with A1131B refillable pH electrode and 1 m cable, A7662 stainless steel temperature probe, pH 4.01 & pH 7.01 calibration buffers (20 ml each), batteries (4 x AA alkaline) and instruction manual.

Technical Specifications:

Product Code	Product Name
HR-G0850	Pocket Type pH Meter
HR-G0852	Portable pH Meter
HR-G0854	Laboratory pH Meter
HR-G0857	pH Indicator Papers, pH Range: 0-14
HR-G0858	pH meter Calibration Solution, 100 ml
HR-G0859	pH meter Calibration Solution, 250 ml
HR-G0860	pH meter Calibration Solution, 500 ml

HR-G0854

HR-G0857

HR-G0858

Technical Specifications:

Product Code	HR-G0850	HR-G0852	HR-G0854
Measurement Range			
Ph	-2.0 ... 16.0 pH	-2.0 ... 16.0 pH	-2.0 ... 16.0 Ph
mV	---	± 1000 mV	± 2000 mV
°C	-5 to 60 °C	-5 to 105 °C	-20 to 120 °C
Sensitivity			
Ph	± 0,1 pH	± 0,02 Ph	± 0,002 Ph
mV	---	± 2 mV	± 0,2 Mv
°C	± 0,5 °C	± 0,5 °C*	± 0,4 °C
Resolution			
Ph	0,1 Ph	0,01 Ph	0,001 Ph
mV	---	1 mV	0,1 Mv
°C	0,1 °C	0,1 °C	0,1 °C

*±0.5°C (up to 60°C), ±1°C (after 60°C)

HR-G0850

HR-G0852

DIGITAL LASER MEASURES

The Laser Rangefinders are equipped with state-of-the-art laser technology.

They provide measurements with ultimate precision and reliability because one thing is certain: nothing is more precise than measuring with a laser.

The exact measurement point is displayed at distances of up to 25 m or 50 m thanks to the laser point. The large display makes all measurement results easy to read. The option of measuring from the front or back edge makes it possible to also use the devices in hard-to-reach areas. The non-slip soft grip sits securely in your hand. The integrated targeting aid helps you to aim at the target over longer distances. Practical function buttons with self-explanatory symbols make the instrument easier to operate, for example when calculating areas and volumes.

Complete with 4 x 1,5 V LR03 (AAA) batteries, Hand loop, Protective case.

Technical Specifications:

Product Code	Product Name
HR-G0840	Digital Laser Measure, 25 m
HR-G0841	Digital Laser Measure, 50 m

Technical Specifications:

Product Code	HR-G0840	HR-G0841
Laser diode (nm)	635	635
Laser class	2	2
Measurement range (m)	0.05 – 25	0,05 – 50,00
Measurement accuracy, typical (mm)	± 2,0	± 2,0
Measurement time, typical (s)	0,5	0,5
Max. Measurement time (s)	4	4
Automatic deactivation (mins)	5	5
Dimension (mm)	100 x 55 x 25	104 x 58 x 36
Weight (kg)	0,09	0,13
Battery	2 x 1.5 V LR03 (AAA)	3 x 1.5 V LR03 (AAA)

HR-G0840

HR-G0841

DIAL GAUGES

Dial Gauges are essential instruments that are used to measure accurately very small and diminutive liner distances.

HİRA Test supplies high quality Dial Gauge for various material testing applications.

Technical Specifications:

Product Code	Product Name
HR-G0875	Analog Dial Indicator, 10 x 0,01 mm
HR-G0876	Analog Dial Indicator, 30 x 0,01 mm
HR-G0877	Digital Dial Indicator, 12,7 x 0,01 mm
HR-G0878	Digital Dial Indicator, 25 x 0,01 mm
HR-G0879	Digital Dial Indicator, 12.7 x 0,001 mm
HR-G0880	Digital Dial Indicator, 25 x 0,001 mm
HR-G0885	Adjustable Dial Gauge Holder

HR-G0885

HR-G0876

HR-G0879

HR-G0877

LOAD RINGS

HİRA Test supplies high quality Load Rings for various material testing applications.

Technical Specifications:

Product Code	Product Name
HR-G5000	Load Ring, 5 kN capacity with 0,01 mm resolution Analog Dial Gauge
HR-G5001	Load Ring, 10 kN capacity with 0,01 mm resolution Analog Dial Gauge
HR-G5002	Load Ring, 28 kN capacity with 0,01 mm resolution Analog Dial Gauge
HR-G5003	Load Ring, 50 kN capacity with 0,01 mm resolution Analog Dial Gauge
HR-G5004	Load Ring, 100 kN capacity with 0,01 mm resolution Analog Dial Gauge
HR-G5005	Load Ring, 5 kN capacity with 0,001 mm resolution Digital Dial Gauge
HR-G5006	Load Ring, 10 kN capacity with 0,001 mm resolution Digital Dial Gauge
HR-G5007	Load Ring, 28 kN capacity with 0,001 mm resolution Digital Dial Gauge
HR-G5008	Load Ring, 50 kN capacity with 0,001 mm resolution Digital Dial Gauge
HR-G5009	Load Ring, 100 kN capacity with 0,001 mm resolution Digital Dial Gauge
HR-G5010	Load Ring, 5 kN capacity with 0,01 mm resolution Digital Dial Gauge
HR-G5011	Load Ring, 10 kN capacity with 0,01 mm resolution Digital Dial Gauge
HR-G5012	Load Ring, 28 kN capacity with 0,01 mm resolution Digital Dial Gauge
HR-G5013	Load Ring, 50 kN capacity with 0,01 mm resolution Digital Dial Gauge
HR-G5014	Load Ring, 100 kN capacity with 0,01 mm resolution Digital Dial Gauge

HR-G5001 HR-G5003 HR-G5002

HR-G5012

RAIN GAUGE (PLUVIOMETER)

A practical rain gauge for easy and accurate determination of rainfall amounts.

It is made of high-grade and stable plastic with integrated holder. It is durable and resistant to weather conditions.

There is no stud bar, it can only be hung. In order for the result to be as accurate as possible,the rain gauge should be placed on a suitable rod at a height of about one meter above ground. It should stand upright and free from obstructions such as buildings or trees.

Technical Specifications:

Product Code	Product Name	Dimensions (mm)	Weight (gr)
HR-G0845	Rain Gauge	81x128x203	112

HR-G0845

WATER STILL

Used to produce distilled water for laboratory purposes, they are equipped with an automatic device to keep the water at a constant level and to cut off the current in case of shortage of water.

Technical Specifications:

Product Code	Product Name	Capacity (l/h)	Power Supply
HR-G0950	Water Still	4	220 V, 50 Hz, 1 ph
HR-G0951	Water Still	6	380 V, 50-60 Hz, 3 ph
HR-G0952	Water Still	7	380 V, 50-60 Hz, 3 ph
HR-G0953	Water Still	8	380 V, 50-60 Hz, 3 ph
HR-G0954	Water Still	10	380 V, 50-60 Hz, 3 ph
HR-G0955	Water Still	12	380 V, 50-60 Hz, 3 ph
HR-G0956	Water Still	14	380 V, 50-60 Hz, 3 ph

HR-G0952

CHEMICALS

Technical Specifications:

Product Code	Product Name
HR-G0900	Mercury. 100 gr
HR-G0901	Trichloroethylene. 5 lt
HR-G0902	Trichloroethylene. 20 kg
HR-G0903	Trichloroethylene. 50 kg
HR-G0904	Trichloroethylene. 30 lt
HR-G0905	Trichloroethylene. 50 lt
HR-G0906	Trichloroethylene Can for 30 lt
HR-G0907	Trichloroethylene Can for 60 lt
HR-G0908	Trichloroethylene. (1 barrel=300kg)
HR-G0909	Silver Nitrate. 100 g
HR-G0910	Potassium Nitrate. 1 kg
HR-G0911	Potassium Chromate. 1 kg
HR-G0912	Graphite. 1 kg
HR-G0913	Graphite. 25 kg
HR-G0914	Sulphur. 1 kg
HR-G0915	Sulphur. 25 kg
HR-G0916	Sodium Hydroxide, 1 kg
HR-G0916/A	Sodium Hydroxide, 25 kg
HR-G0917	Sodium Hydroxide, 1 kg (MERCK)
HR-G0918	Sodium Sulphate, 1 kg
HR-G0919	Sodium Sulphate, 50 kg
HR-G0920	Barium Chloride. 1 kg
HR-G0921	Potassium Hydroxide, 1 kg (MERCK)
HR-G0922	Distilled Water. 5 lt
HR-G0923	Ethyl alcohol. 5 lt
HR-G0924	Hydrochloric Acid. 1 lt
HR-G0925	Sulphuric acid. 1 lt
HR-G0926	Kaolinite, 500 gr
HR-A0400/5	Methylene Blue. 100 gr
HR-G0927	Crystal Calcium Chloride. 1 kg
HR-G0929	Glycerin. 5 kg
HR-G0930	Sodium hexametaphosphate. 1 kg
HR-G0931	Formaldehyde. 1 lt
HR-G0932	Paraffin Wax. 1 kg
HR-G0933	Magnesium Sulphate. 1 kg
HR-G0934	Magnesium Sulphate. 25 kg
HR-G0935	Silica Gel. 1 kg
HR-G0936	Lithium Chloride. 250 gr (MERCK)
HR-CE9285	Standard sand 1350gr
HR-S6050	Special Sand for Sand Replacement Tests. 1 kg Between 300-600 micron grain size
HR-S6055	Special Sand for Sand Replacement Tests. 1 kg Between 1,18 mm-600 micron grain size

Note: Several chemicals classified as dangerous, cannot be supplied for shipping safety problems.

WATER TEST KIT

Total Water Hardness Test Kit is supplied with Indicator, Titration Solution, Titration Vessel and Prospectus.

pH Test Kit is supplied with pH Indicator, Colour Scale and Prospectus.

Free Chlorine Test Kit is supplied with Chlorine Indicator, Chlorine Colour Scale and Prospectus.

Chloride Test Kit is supplied with 1 bottle Chloride Indicator Solution, 1 bottle Chloride Titration Solution, Test Tube and Prospectus.

Alkalinity Test Kit is supplied with Titration Solution, Indicator, Test Tube and Prospectus.

Technical Specifications:

Product Code	Product Name	Sensitivity
HR-G1900	Total Water Hardness Test Kit	1 drop= 1Fr hardness 1 drop= 1Hd hardness
HR-G1901	pH Test Kit	6,8 - 8,2 ph
HR-G1902	Free Chlorine Test Kit	0,1-3 ppm Chlorine
HR-G1903	Chloride Test Kit	1 drop= 30 ppm Cl
HR-G1904	Alkalinity Test Kit	1 drop= 50 ppm

HR-G1904

HR-G1903

HR-G1902

HR-G1901

HR-G1900

HAMMER DRILL

Technical Specifications:

Product Code	HR-G0835	HR-G0836
Product Name	Hammer Drill	Hammer Drill
Rated Power Input (W)	650	500
Output Power (W)	338	260
No-load Speed (min^{-1})	50 – 3.000	50 – 3.000
Impact Rate (min^{-1})	48000	33000
Rated Torque (Nm)	1,7	1,1
Torque at max. Output Power (Nm)	9	7,5
Max. Drilling Diameter (mm)		
- Concrete	14	10
- Steel	12	8
- Wood	30	25
Weight without extraction device (kg)	1,7	1,6

HR-G0835

HR-G0836

MOBILE DUST & EXTRACT SYSTEM

This type of Mobile Dust & Extract Systems are usually used as the dust suction system of the such as CNC, banding and sizing machines etc.

Thanks to the wheeled metal bucket, the accumulated sawdust can be easily discharged.

Its Vibration engine is time controlled so It activates for a minute in half an hour and provides convenience in filter cleaning.

HR-G6400

Technical Specifications:

Product Code	HR-G6400
Flow	5000 m³/h
Engine Power	5.5 kw 7,5 hp 3000d/d
Extraction Speed	28 m/sn
Extraction Diameter	Ø280 mm
Filter Type	Needle Polyester
Filter Permeability:	5 micron
Filter Measure	Ø160x935 mm
Filter Piece	35 Pieces
Capatiy of gathering sawdust/swarf	2 metal buckets
Power Supply	380 V
Dimensions	925x1985x2280 mm
Weight	350 kg

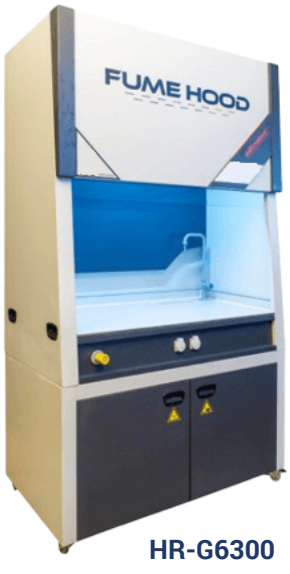
FUME HOOD

Fume Hoods, which form the basis of modern laboratories, are used for the realizatior of sensitive tests, but can also be used to remove potentially dangerous aesols.

The Fume Hoods are the device that assigns harmful air to the outdoors with ar evacuation system that can remove gases such as acid vapor and heat process aroma secession during operation.

Optional Specifications:

- Production of special sizes and different features.
- Dashboard controlled gas, flammable gas and water fittings for use in the aspiratior cabinet can be placed according to the user's request.
- Material cabinet that can be used with the device.
- Automatic on and off windshield.



HR-G6300

Technical Specifications:

Product Code	HR-G6300	HR-G6301	HR-G6302	HR-G6303
Cabinet Dimensions (cm)	86x65x97	116x65x97	146 x 65 x 97	176 x 65 x 97
External Dimensions (cm)	90x75x230	120x75x230	150 x 75 x 230	180 x 75 x 230
Fan - Air suction engine (m³)	1080	1080	1250	1450
Fan - Air suction engine	Made of acid and water vapor resistant PP (Polypropylene) material.			
Working Floor	Anti-acid Compact Laminant, Stainless, PP Polypropylene, G LAB, Ceramic, Stonwear Ceramic			
In-Cab Lighting	It is provided by fluorescent lamp. It is not affected by chemical vapours.			
Acoustic	Noise doesn't cause pollution during operation, the volume is less than 60 db.			
Cabin Glass	Motorised Control			

LABORATORY STORAGE CABINET FOR CHEMICALS

The chemical and solvents in the laboratory release toxic gas over time, even if they are in closed containers. This has very harmful consequences for users. Such chemicals should be stored in special cabinets in terms of laboratory standards and occupational safety.

It plays an important role in applications made in chemicals and microbiological laboratories. The chemical risk can be reduced by minimizing the amount of chemicals used in applications. However, the chemical risk is greatly reduced by proper storage and use of stored chemicals. Standard storage features require determination of combustion control, temperature, ventilation, separate eclipse and labelling. It minimizes the risk of each chemical being flammable, toxic or polluting the environment when storing harmful chemicals. Chemical storage safety stores provide an effective solution in working with harmful chemicals in laboratories and workshops.

The main body and interior are made of steel. Electrostatic epoxy powder painted on steel. It has two doors. Locked cover system is available.

All cabinet interior ventilation panels are double-walled. There is a 150 mm ventilation outlet for ventilation connection.

It has sealed gasket system. There is sealing system with telescopic rail system.

Supplied with 4 metal shelves. Optionally, the front panel can be made of acrylic glass.

HR-G6455

Technical Specifications:

Product Code	Product Name	Dimensions (cm)	Weight (kg)
HR-G6450	Laboratory Storage Cabinet for Chemicals	50x60x195	75
HR-G6455	Laboratory Storage Cabinet for Chemicals	90x60x195	90

MOBILE LABORATORY

HİRA TEST manufactures a complete range of Mobile Laboratories as: Van-mounted mobile laboratory or Container mounted laboratory.

Both of small or large dimensions, by supplying also the mobile structure, benching, furniture, generators, air conditioning, electronic and plumbing installation etc; or by simply fixing the Testing Equipment on the mobile structure supplied by the customer.

Supplied complete with Electrical Installation, Plumbing, kitchen Cabinet and Kitchen Bench.

Technical Specifications:

Product Code	Product Name	Dimensions (m)
HR-M0001	Container	3x7

*Different size are available, please contact with us.

HR-M0001

Legend

AASHTO = American Association of State Highway and Transportation Officials. USA
ASTM = USA Standard
BS = British Standard
CSA = Canadian Standard
CEN = European Committee for Standardization. EU
CNR = Italian National Research Council
DIN = German Standard
EN = European Standard (Mandatory)
ISO = International Organization for Standardization
NF = French Standard NF (AFNOR) = French Standard
NLT = Spanish “Norma de Laboratorio Transporte”
TS = Turkish Standard
UNE = Spanish Standard
UNI = Italian Standard

CONVERSION FACTORS

The italic symbols are those concerning the “SI” units.

FORCE

1 N = 0.10197 kgf = 0.224809 lbf

1 kN = 1000 N = 101.971 kgf = 224.809 lbf = 0.101971 t

1 kgf = 9.80665 N = 2.20462 lbf

MASS

1 kg = long: 0.01968413 cwt; short: 0.02204622 cwt = 2.20462 lb

1 g = 0.03527 oz

1 t = 1000 kg = long: 0.984221 ton; short: 1.102311 ton

1 cwt = long: 50.802424 kg; short: 45.35929 kg

1 lb = 0.45359 kg

1 oz = 28.349 g

CAPACITY, VOLUME

1 m3 = 1.30795 yd3

1 dm3 (litre) = 0.03531 ft3 = 1.7605 pint = 0.21997 imp gal = 0.2642 US gal

1 cm3 (ml) = 0.06102 in3 = 0.0352 fl oz

1 yd3 = 0.76455 m3

1 ft3 = 28.3168 dm3

1 in3 = 16.3871 cm3

1 imp gal = 4.54609 dm3

1 US gal = 3.78541 dm3

1 pint = 0.56826 dm3

1 fl oz = 28.4131 cm3

LENGTH

1 m = 1.0936 yard = 3.281 ft = 39.370 in

1 km = 0.6214 mile

1 yard = 0.9144 m

1 ft = 30.48 cm

1 in = 25.4 mm

1 mile = 1.6094 km

PRESSURE, STRESS

1 Pa (N/m2) = 0.01 mbar = 0.000145 lbf/in2 (psi)

1 kPa (kN/m2) = 0.01 kgf/cm2 = 10 mbar = 20.885 lbf/ft2 = 0.2953 in Hg

1 MPa = 10.2 kgf/cm2

1 lbf/in2 (psi) = 0.07031 kgf/cm2 = 6.89476 kPa

1 lbf/ft2 = 47.8803 Pa

1 tonf/ft2 = 1.094 kgf/cm2 = 107.252 kPa

1 bar = 100 kPa = 14.5038 lbf/in2

1 mbar = 100 Pa = 2.0885 lbf/ft2

1 atm = 101.325 kPa = 14.6959 lbf/in2

1 mm Hg (torr) = 133.322 Pa = 0.01934 lbf/in2

1 mm H2O = 9.80665 Pa

DENSITY

1 kg/m3 = 1.686 lb/yd3

1 g/cm3 = 62.4280 lb/ft3

1 ton/yd3 = 1328.94 kg/m3

1 lb/yd3 = 0.593 kg/m3

1 lb/in3 = 27.6799 g/cm3

ENERGY

1 MJ = 0.277778 kWh

1 J = 0.737562 ft lbf

1 kgf m = 9.80665 J

1 Btu = 1.05506 kJ