

## 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 and 300 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 U Type 100 kN, 200 kN, 300 kN capacity designed to allow easy and practical front loading of the specimen.

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

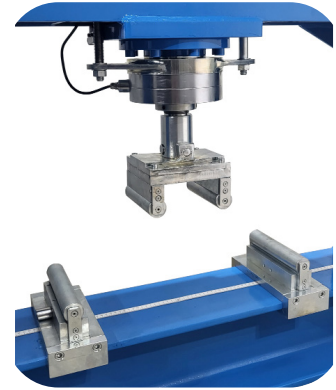
### *Flexural Testing Assembly for Concrete Beams*

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  $\varnothing 38 \times 160$  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  $\varnothing 20 \times 620$  mm and  $\varnothing 40$  mm upper loading piston with ball seating assembly.

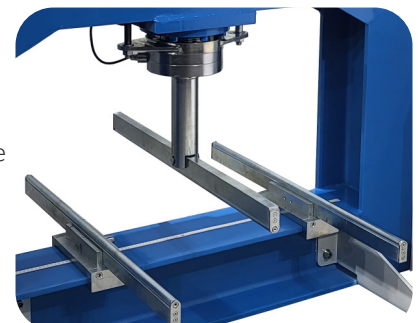
The distance of lower rollers can be adjusted between 100 mm to 800 mm.

### *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  $\varnothing 20 \times 620$  mm.

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



**HR-C5052**



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  $\pm 5\%$ . 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 HIRA 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.

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.

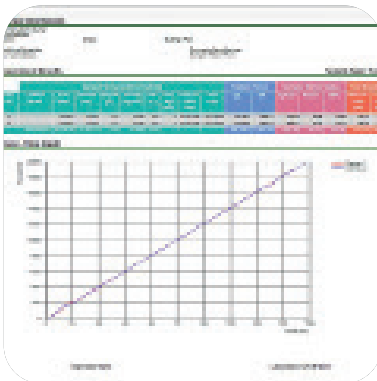
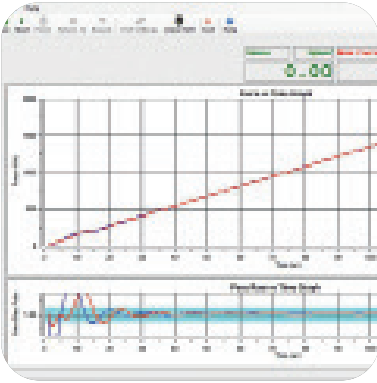
Software can be performed in Turkish and English.

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	Automatic Flexural Testing Machines		
Product Code	HR-C5000	HR-C5005	HR-C5010
Type	U Type	U Type	U Type
Capacity (kN)	100	200	300
Ram Travel (mm)	50		
Max. Vertical clearance (mm)	405 (without accessories)		
Max. Horizontal clearance (mm)	1000		
Max. Clearance Between Lower Rollers (mm)	890		
Class 1 range	1-100 kN	3-200 kN	3-300 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

## 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-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-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)	---	---	---