

SERIE LD 250/750

UNIVERSAL
Rockwell, Brinell and Vickers



LD 250/750

INNOVATIVE VERTICAL MEASURE

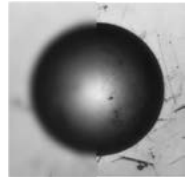
The LD 750 AFFRI® hardness tester is a fully motorized system for automatic preloading, loading and measurements. AFFRI® System hardness testers achieve the highest level of depth accuracy and measurement resolution available for Rockwell tests. Thanks to the AFFRI® System, the real indentation measurement is guaranteed without any external interference in any condition.

ONE BUTTON MEASUREMENTS

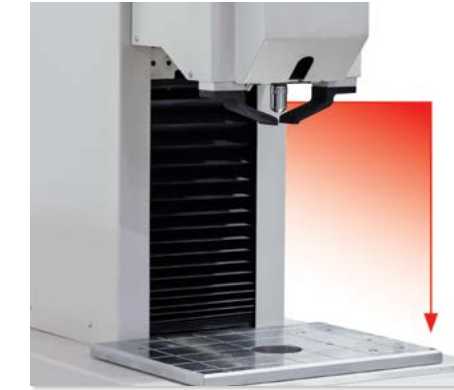
Just push the start button and the head moves down performing the hardness test cycle in automatic succession without breaching a phase:

1. Automatic contact with the specimen
2. Automatic active sliding clamping
3. Automatic preloading and loading
4. Automatic switching to optic lens
5. Autofocus by image brightness scanning
6. Automatic measure through camera
7. Automatic return stroke at programmed distance

The entire test cycle is complete and the result appears on a large display.

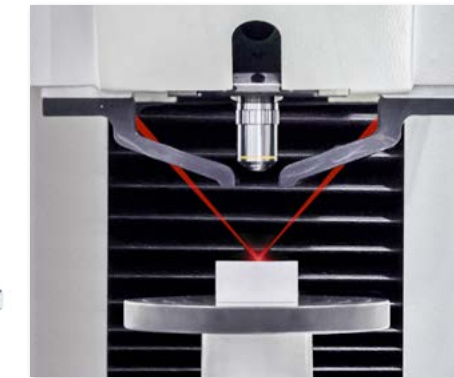


The Auto Focus performs an automatic focus adjustment for the selected optic with precise positioning at any magnification by mean of real image brightness scanning. This system assures high reading accuracy and reduces reading time.



MOTORIZED MEASURING HEAD

Fully motorized adjustable testing stand up to 720 mm / 28" vertical capacity including automatic contact with test surface from every distance with single start input. The activation of the test cycle is automatic, it starts when the head makes contact with the specimen which is automatically recognized at any position within the vertical stroke.



L.I.S.A Laser Indicator System Affri (Patented)

Exclusive application which allows ultra-precise test positioning. The laser pointing system helps to define the indentation area before the contact between the indenter and the specimen. Reach extreme points with lack of illumination, edges of gear teeth or sides of cutting tools and blades.

(This application is optional)

LOAD FORCE RANGE

29.42	49.03	61.29	98.07	147.1	153.2	196	245.2	294.2	306.5	441.3	490.35	588.4	612.9	980.7	1226	1471	1839	2452	4903	7335	9807	14709	29421	N
3	5	6.25	10	15	15.6	20	25	30	31.2	45	50	60	62.5	100	125	150	187.5	250	500	750	1000	1500	3000	kgf

BRINELL HBW / HBWT TESTS - DIN EN ISO 6506 / ASTM E-10

1/5	1/10	1/30	2.5/6.25	2.5/15.625	2.5/31.25	2.5/62.5	2.5/187.5	5/25	5/62.5	5/125	5/250	5/750	10/100	10/250	10/500	10/1000	10/1500	10/3000
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ROCKWELL TESTS - DIN EN ISO 6508 / ASTM E-18

HRA	HRB	HRC	HRD	HRE	HRF	HRG	HRH	HRK	HRL	HRM	HRP	HRR	HRS	HRV	HR15 HR30 HR45 N/T/S/W/XY
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VICKERS TESTS - DIN EN ISO 6507 / ASTM E-384 (Generate indentation)

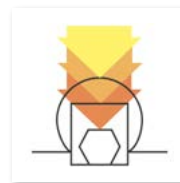
HV3	HV5	HV10	HV15	HV20	HV30	HV60	HV100
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SHORE A/D (Optional) Plastic and rubber EN-ISO 2039: 49 - 132 - 358 - 961 N TEMPERATURE: Measure range from - 40.0 to + 80.0 °C

LD 250/750

SWIVELLING MOTORIZED TURRET

Automatic turret with one indenter and one interchangeable objective as standard. Auto-rotating, auto-tool-switching and auto-centring for a completely automatic single or multi indentation measurement cycle. Each tool can be easily changed with manual screwing.



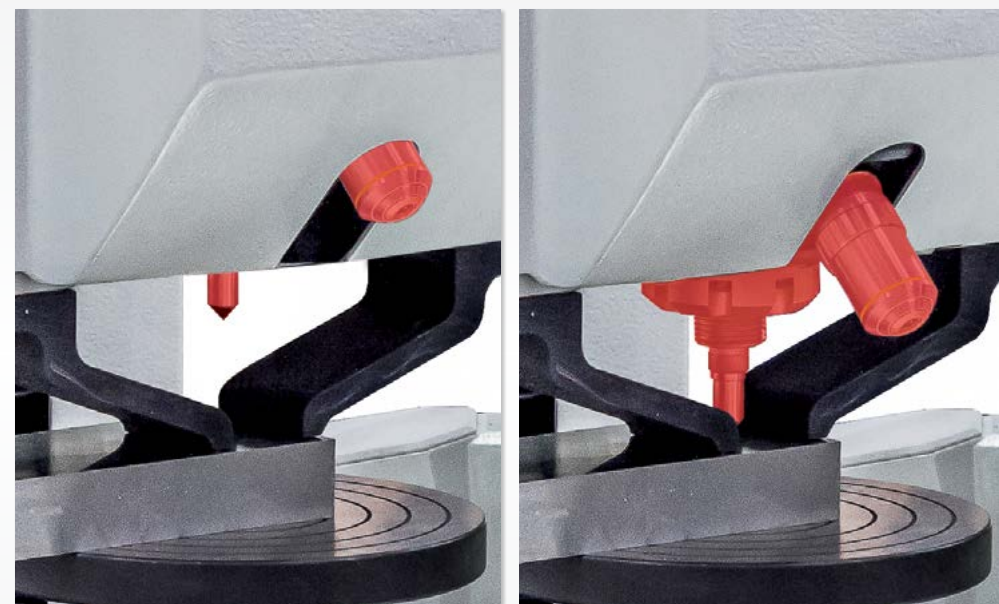
From round to flat surfaces, the tester automatically and quickly makes contact with any test area, up or down, outside or inside it. Special accessories are available for testing inside tubes or over inclined plates.



MOTORIZED INDENTER STROKE

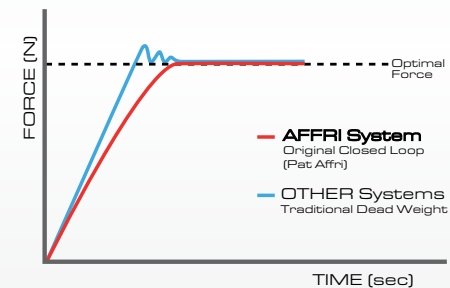
The hardness tester is equipped with an additional motor which moves the indenter and the clamping hood for a stroke of 50 mm / 2". This is a stand-alone extra stroke which works separately from the total head stroke. When testing unstable samples or defective parts, the measuring head follows the sample without losing contact. The top surface referencing design minimizes errors caused by problems associated with dirt or scale. This reduces sample preparation time and increases both accuracy and speed.

The activation of the test cycle is automatic, it starts when the head makes contact with the specimen which is automatically recognized at any position within the 50 mm / 2" of vertical stroke.

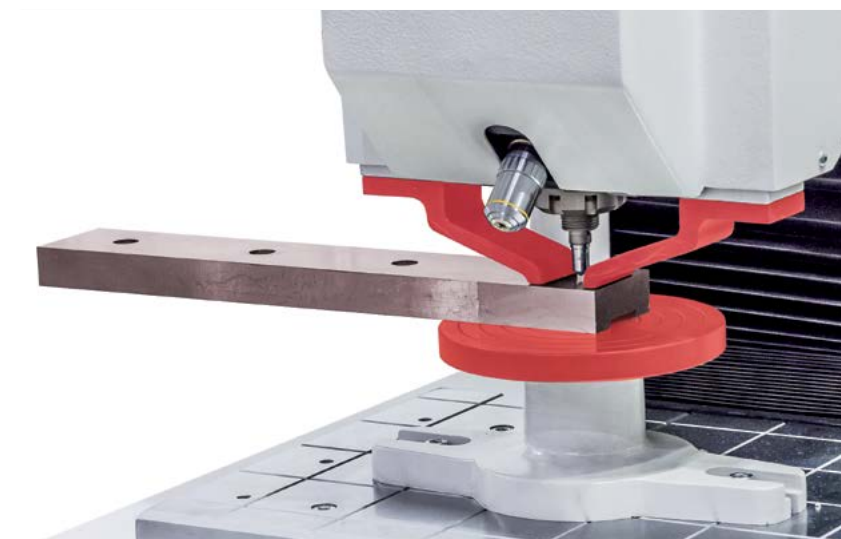


LOAD CELL AND CLOSED LOOP

Load forces are applied through load cells and electronically controlled in "Closed Loop" (Pat. AFFRI) with a frequency of 1 kHz. Each load force is automatically programmed and controlled assuring perfect linearity in every range eliminating the problems associated with traditional dead weight system testers. Results are not affected by any structural deflection, misalignment or external vibration. Accurate measurements, even on the first test, eliminate the need for multiple tests. There is no need to perform a second test, the first one is absolutely precise. The R&R (repeatability and reproducibility) data is at the top of its class.



THE FIRST TEST RESULT IS CORRECT AND ABSOLUTE, SAVING TIME AND MONEY, THUS INCREASING OUTPUT AND PRODUCTIVITY



CLAMPING SYSTEM (Pat. AFFRI)

Secure contact with the specimen is always maintained achieving absolute accuracy under any condition even on unstable, oily or dirty samples. The clamping hood applies constant pressure and prevents accidental sample movements.

The clamping system assures perfect stability of any test piece throughout the test cycle. No additional accessories are required.



WIDE WORK HOLDER

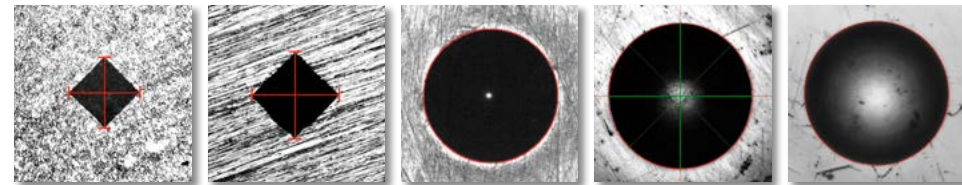
The LD750 wide work table 480 x 675 mm / 19 x 26" (Larger as optional) is capable of bearing masses up to 2000 kg which allows for steady hardness measurements on bulky or irregular pieces which cannot be easily received by the regular bench hardness tester. Also, it offers a comfortable working base for small pieces.



LD 250/750

UNIVERSAL AUTOMATIC TESTER

The AFFRI® LD 750 can perform Vickers, Brinell, Rockwell, Superficial Rockwell and Knoop test methods in compliance with ASTM and ISO standards. Test loads from 3 to 3000 kgf (29,4 to 29421 N). Automatic Rockwell measurements. Automatic reading of Brinell, Vickers and Knoop indentation through camera and optic system.



Auto-measure on critical surfaces: From perfectly polished to rough & etched samples, the software will automatically measure indents on any sample surface.



Thanks to the AFFRI® System, the real indentation measurement is guaranteed without any external interference in any condition.

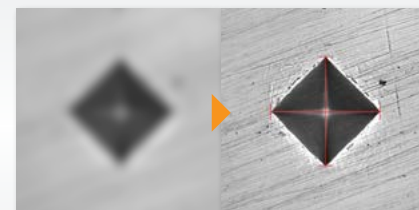


The test cycle is quick! The time needed for one complete measurement is 15" including 10" (ASTM std.) of dwell time. With HBWT and Rockwell scales it is possible to test up to 200pcs per hour.

The software controls the whole measurement avoiding settings errors or operator mistakes. The repeatability of the automatic measure avoid human subjectivity.

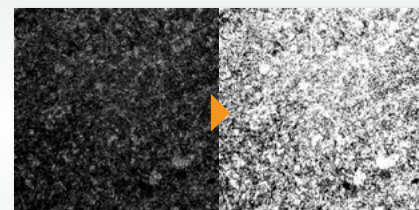
AUTOFOCUS

Motorized focus at the right point



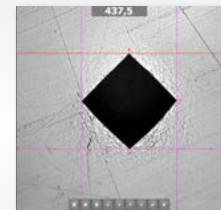
AUTO-LIGHTING

Automatic illumination adjustment



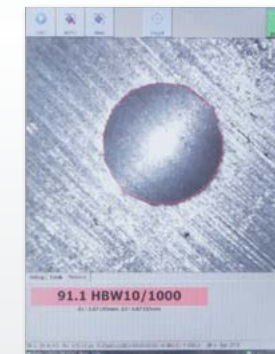
MANUAL MEASURE

Manual indent evaluation.

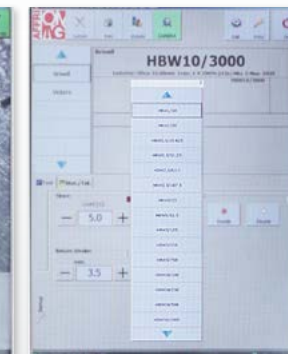


THE TOUCHSCREEN AND THE SOFTWARE

Wide touchscreen for easy test planning and a clear view of results. User friendly Windows® interface. Setup the hardness test scales, the properties of the camera and the test method settings. Choose result conversion in any other hardness scale. Use offset and round correction values for tests on convex cylindrical surfaces or various diameters. Manage the instrument tools and check if the installed tool is correct for the selected hardness test method. Statistics charts and custom reports can be generated at a touch of a button. All results and testing sessions can be stored on the large archive using the on board software database.



Clear view of the indent and the tested area



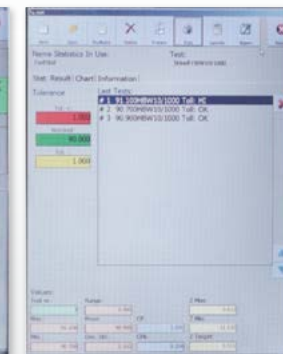
Selection of the hardness scale and the test parameters



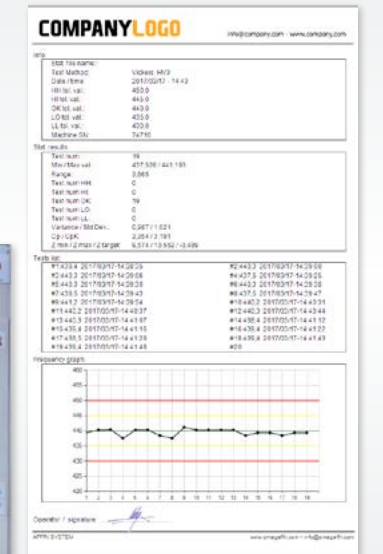
List of results with tolerances LOW-OK-HIGH and statistics



Three types of graphic charts including standard deviation



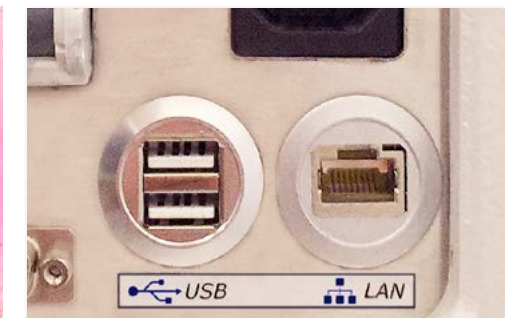
Managing of results, report templates and printing



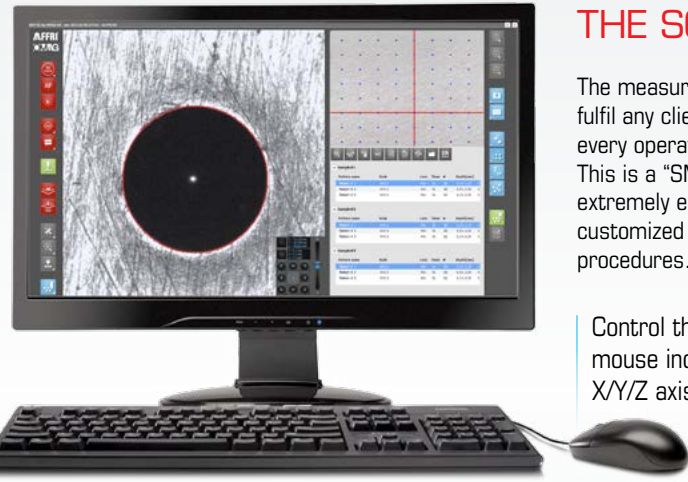
Customizable test report with client logo, specimen information, statistics and graphs or export as CSV file.

TEST DATA IMPORT AND EXPORT

Data enter via code bar scanning. Test cycles or sample drawings can be loaded directly from a central system by means of a bar code scanner. This hardness tester gets all information fully automatically. After test run the bar code data are added with results and immediately returned to the order management system. File import and export is configurable freely and therefore adaptable individually. USB and LAN outputs. Connect to database networks, PC's and printers.



LD 250/750 XY



THE SOFTWARE

The measuring software has been studied to fulfil any client need and to be accessible to every operator. This is a "SMART SOFTWARE" which results extremely easy to be used and can be customized to display only the needed testing procedures.

Control the whole instrument with the mouse including dynamic movements on XYZ axis at fast or slow speed.

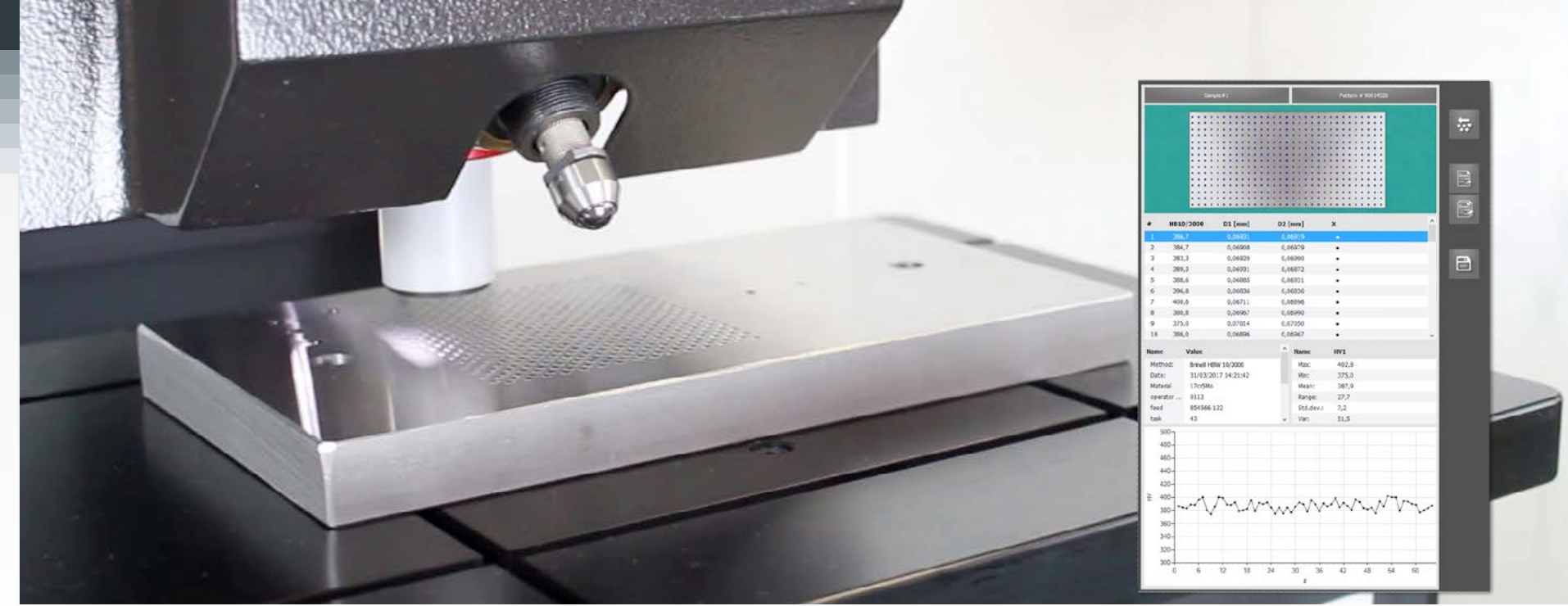
XY MOTORIZED STAGE

Motorized X-Y axis table 200 x 100mm division 0.01 mm combined with automatic start test cycle for hardness case depth. Supported weight 3000kg. (Other dimensions at request)

PROTECTIVE STRUCTURE

Ergonomic working station with transparent protection box for secure test cycles. The protection is also available with open front panel with photocell column.

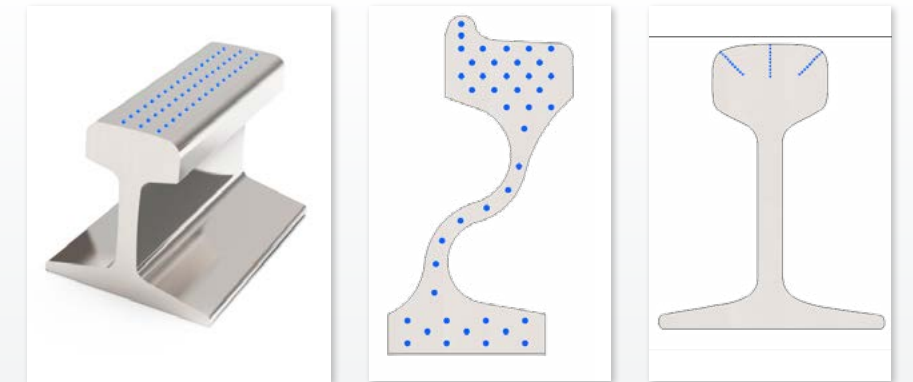
SINGLE OR MULTIPLE SAMPLES IN AUTOMATIC CYCLE: Just map out indentation traverses where they are required, set the load and press START, the hardness tester intelligently follows the predefined patterns, indents the sample, focuses when needed, measures, and generates data dynamically.



FULLY AUTOMATIC MULTI-INDENTATION CYCLES

The software is designed for an intuitive and simple use. It provides added precision when positioning indents thanks to its integrated macro view technique and layout tools. By visualizing the complete sample or a single sample, traverses and/or patterns can now be mapped out with unequalled precision.

Reference points for indentation patterns can be positioned precisely where they are required. The table allows automatic multi-indentation test cycles and CHD on multiple samples with perfect positioning on the entire area, no matter the indentations amount.

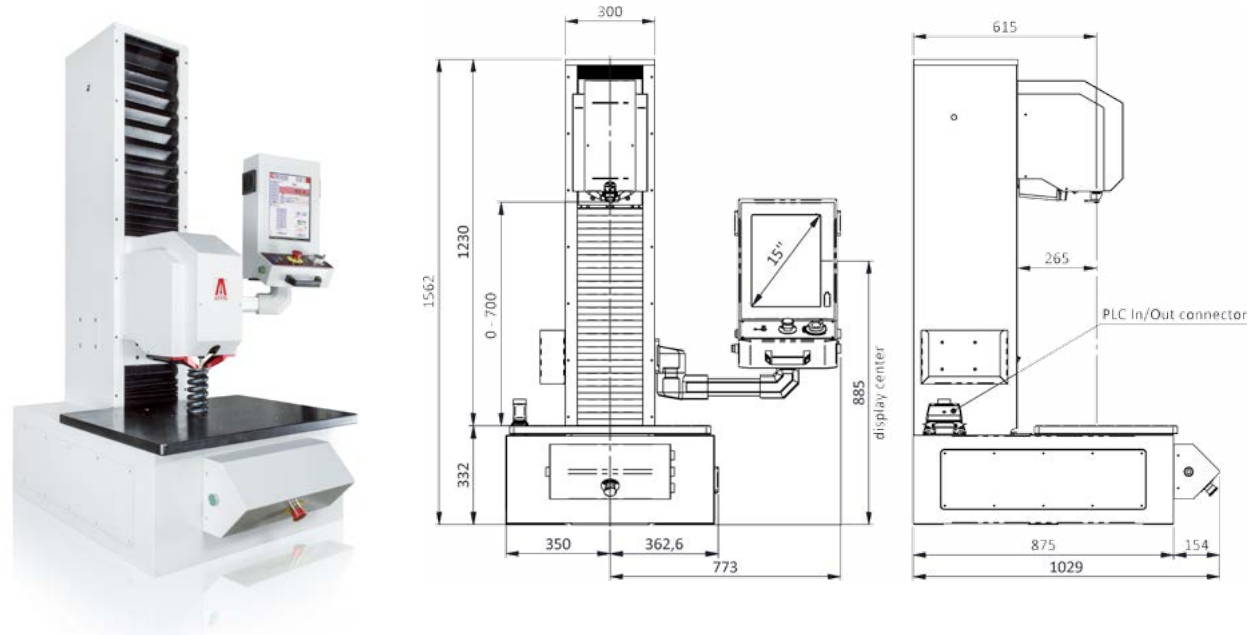


EVERYTHING IS AUTOMATED, FREEING USERS FOR OTHER TASKS: Auto focusing, automatic measuring and reporting, allows this system to function unattended for hours without interruption, saving time and money, thus increasing output and productivity.

LD 750

Test loads from 3 to 3000 kfg
 Height Capacity: 720 mm / 28 "
 Depth Capacity: 265 mm / 10.5 "
 Working table: 480 x 675 mm / 19 x 26 "

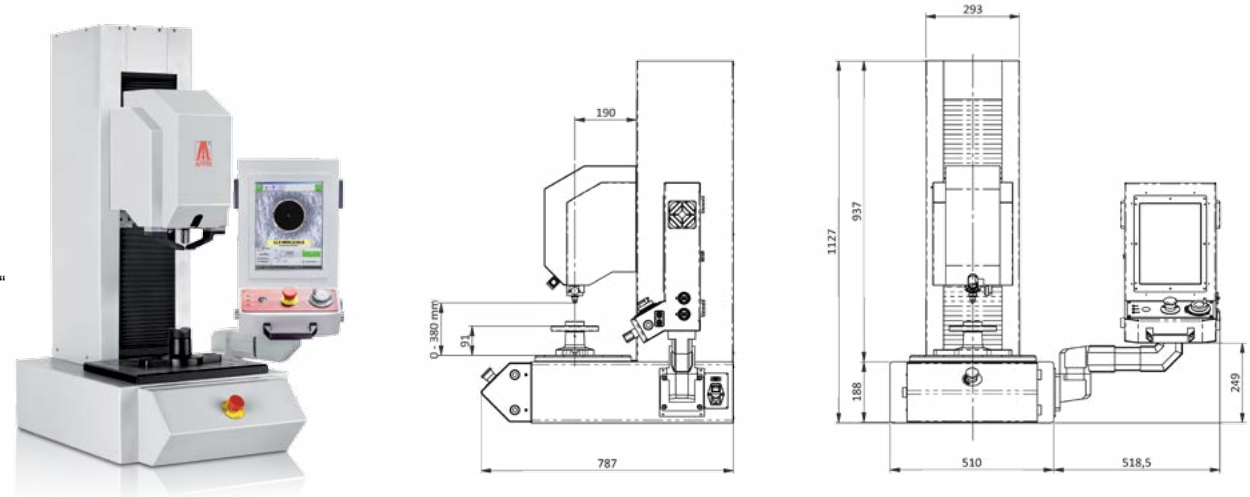
LD750 A: HR HRS HV HBW HBWT
 LD750 B: HV HBW HBWT



LD 250

Test loads from 1 to 250 kfg
 Height Capacity: 390 mm / 15 "
 Depth Capacity: 190 mm / 7.5 "
 Working table: 330 x 390 mm / 13 x 15.5 "

LD250 A: HV HBW HBWT
 LD250 B: HR HRS HV HBW HBWT



ACCESSORIES

Affri provides a large variety of accessories to fulfil any purpose of test. Customized solutions based on client needs can be made for perfect tests on rough pieces. A series of different anvils is available to test every size of test piece. Variety of accessories to facilitate testing on small or oddly shaped items. Large variety of high quality indenters with certificate. Ball, cone, tungsten or diamond indenters for each hardness scale Rockwell, Vickers, Brinell, Knoop and Shore. Test blocks for the hardness tester periodic calibration with UKAS/ACCREDIA certificate, for any hardness scale and value.

All AFFRI accessories are customizable according to customers specifications, depending on dimensions and geometry of the samples and finished products.

REAL TIME SUPPORT

Real Time Support. Connect your hardness tester to Internet, so that we can remotely diagnose any technical issue, provide additional operator training and update software version.

Connect to www.affri.com for more details.



LD 250/750

FORCE RANGE **LD750:** from 3 to 3000 kgf. **LD250:** from 1 to 250 kgf.

Preload:	29.4 - 98.1 N (3 - 10 kgf)
Rockwell / Superficial R.:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 24.52 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 - 2452 - 4903 - 7355 - 9870 - 29421 N (1 - 2.5 - 5 - 6.25 - 10 - 15.625 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 - 250 - 500 - 750 - 1000 - 3000 kgf)
Vickers/Knoop:	9.807 - 19.60 - 29.42 - 49.03 - 98.07 - 196.14 - 294.2 - 490.3 - 980.7 N (1 - 2 - 3 - 5 - 10 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

FEASIBLE TESTS (Depending on the models)

Rockwell / Superficial R.:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV - HR15N/T/S/W/X/Y - HR30N/T/S/W/X/Y - HR45N/T/S/W/X/Y
Brinell HBW:	1/1 - 1/2.5 - 1/5 - 1/10 - 1/30 - 2.5/6.25 - 2.5/15.625 - 2.5/31.25 - 2.5/62.5 - 2.5/187.5 - 5/25 - 5/31.25 - 5/62.5 - 5/125 - 5/250 - 5/750 - 10/100 - 10/125 - 10/250 - 10/500 - 10/1000 - 10/1500 - 10/3000
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and alloys) - 2.5/62.5(2) (Aluminum and alloys) - 2.5/187.5(6) (Aluminum and alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron) - 5/125 - 5/250 - 5/750 - 10/500 - 10/1000 - 10/1500 - 10/3000
Vickers:	HV 1 - HV 2 - HV 3 - HV 5 - HV 10 - HV 20 - HV 30 - HV 50 - HV 100
Shore (As Option):	ISO 2039, Shore A and D hardness scales for plastic
CHD (As Option):	Automatic Case Hardness Depth tests with automatic graph

TECHNICAL DATA

LD750

LD250

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS	
Accuracy:	Better than 0.5 %	
Readout Division:	0.1 HBW / HBWT / HV - 0.01 HR	
Lighting and Objectives	LED - 1X, 2X, 5X, 10 X, 20X, 40X, 50X, 100X	
Focus and Reading	Automatic and Manual	
Dwell Time	From 1 to 99 seconds	
Indenter Stroke:	Motorized 50 mm / 2"	Motorized 30 mm / 1.2"
Height Capacity:	Fully motorized 720 mm / 28"	Fully motorized 390 mm / 15" (As optional up to 700 mm / 27.5")
Depth Capacity:	265 mm / 10.5"	190 mm / 7.5" (As option 290 mm / 11.5")
X-Y Table	480 x 675 mm / 19 x 26" (Larger as optional)	330 x 390 mm / 13 x 15.5" (Larger as optional)
Tolerable Weight:	3000 kg	
Temperature Range:	From 10 °C to 35 °C	
Data Output:	USB (RS 232C, LAN, wireless upon request)	
Power Supply:	110 or 220 V / 50÷60 Hz	
Software:	Affri - OMAG	
Principle of Operation:	Load Cell and Closed Loop (Affri patent)	
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.	
Packing:	700 kg - 140 x 110 x 185 cm / 55 x 44 x 73"	300 kg - 120 x 120 x 160 cm / 50 x 50 x 63"



Made by:

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