

# DM 8

Vickers, Knoop



# DM 8 - THE MODELS

DM 8



Manual focus - Manual reading

DM 8 SEMI



Manual focus - Automatic reading

DM 8 AUTO



Automatic focus - Automatic reading

Automatic hardness tester for micro and macro Vickers and Knoop method, single or multiple indentations. DM8 series are microhardness testers with high accuracy standards. Equipped with a motorized rotating turret with combined magnification lenses and indenters for reading and indenting. For micro and macro Vickers and case depth test on all metals: Iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Knoop test on ceramic and glass materials.



## 6 SLOTS ROTATING TURRET

Horizontally rotating turret with four slots for magnification lenses and two for indenters. All optical microscope objectives can be pre-installed and combined with indenters for every Vickers and Knoop hardness scales. Optical objectives selection of 2.5x – 5x – 10x – 20x – 40x – 50x – 100x.



## DIGITAL EYE PIECE

Really easy to use. Just spin the two lateral wheels of the eyepiece and match the reference lines with indent's corners. Push the front button for automatic read of the diagonal. Spin the entire eyepiece and repeat the measure for the second diagonal. The result immediately appears on the display with updated statistics.

### DM8 A LOAD FORCE RANGE

0.049	0.098	0.1471	0.1961	0.2452	0.4903	0.9807	1.961	2.942	4.903	9.807	N
0.005	0.01	0.015	0.02	0.025	0.05	0.1	0.2	0.3	0.5	1	kgf

### VICKERS FEASIBLE TESTS - DIN EN ISO 6507 / ASTM E-384

HVO.005	HVO.01	HVO.015	HVO.02	HVO.025	HVO.05	HVO.1	HVO.2	OHV.3	HVO.5	HV1
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### KNOOP FEASIBLE TESTS - DIN EN ISO 4545 / ASTM E-384

HK0.005	HK0.01	HK0.015	HK0.02	HK0.025	HK0.05	HK0.1	HK0.2
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### DM8 B LOAD FORCE RANGE

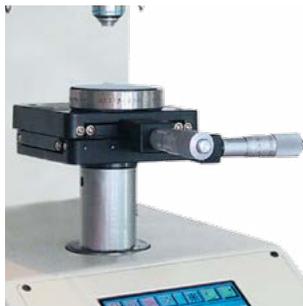
0.0098	0.0196	0.049	0.098	0.1471	0.1961	0.2452	0.4903	0.9807	1.961	2.942	4.903	9.807	19.61	N
0.001	0.002	0.005	0.01	0.015	0.02	0.025	0.05	0.1	0.2	0.3	0.5	1	2	kgf

### VICKERS FEASIBLE TESTS - DIN EN ISO 6507 / ASTM E-384

HVO.001	HVO.002	HVO.005	HVO.01	HVO.015	HVO.02	HVO.025	HVO.05	HVO.1	HVO.2	OHV.3	HVO.5	HV1	HV2
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### KNOOP FEASIBLE TESTS - DIN EN ISO 4545 / ASTM E-384

HK0.001	HK0.002	HK0.005	HK0.01	HK0.015	HK0.02	HK0.025	HK0.05	HK0.1	HK0.2
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### X/Y MANUAL TABLE

Manual XY table 100x100 mm with 10 µm step. This table is a perfect solution for not-daily multi indentation test cycles. The table allows manual CHD case depth tests and can be provided with digital micrometers for automatic CHD graph generation.



### X/Y FULLY MOTORIZED

Only for DM8 AUTO.

XY motorized table with an accuracy of +/- 0.5 µm steps, reference points for patterns indentations can be positioned precisely where they are required. The table allows automatic multi-indentation CHD test cycles on multiple samples with perfect positioning on the entire area, no matter the indentations amount.

# DM8 SEMI SOFTWARE

High definition monitor 24"

Clean vision of the indent

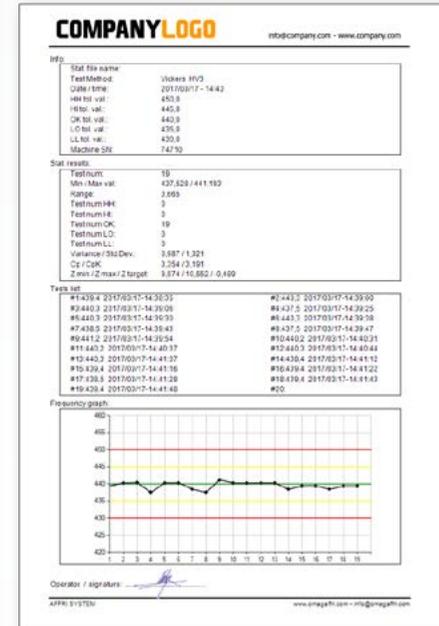
Visual control of all results and live statistics

Direct conversion in HR, HB, HK and any other hardness scale.

Print results from template or save/import tests cycles from archive.

Control the whole instrument with the mouse.

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



The AFFRI Vickers measuring software has been studied to fulfill any client needs 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 needed testing procedures.

ONLY 5 ICONS TO GET RESULTS:



1 - MAGNIFICATION



2 - AUTOFOCUS



3 - AUTO-LIGHT



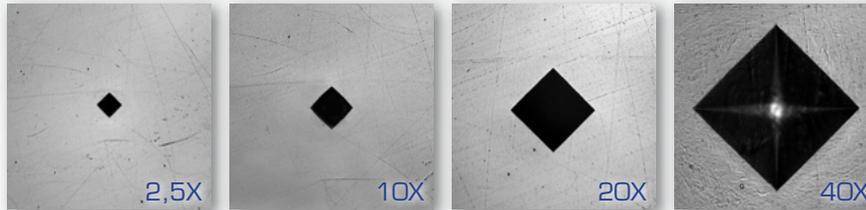
4 - TEST METHOD



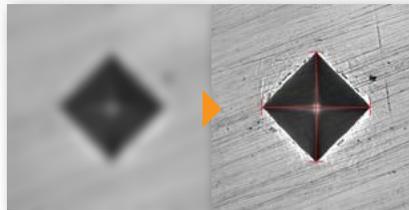
5 - AUTOMATIC MEASURE

# SMART SOFTWARE - MAIN FEATURES

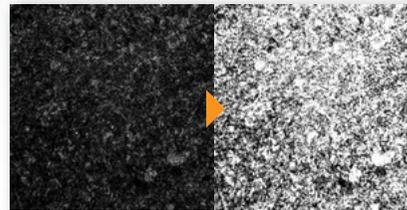
**REAL MAGNIFICATION** - Thanks to motorized turret, different lenses can be selected with a simple click. Digital zoom is also available.



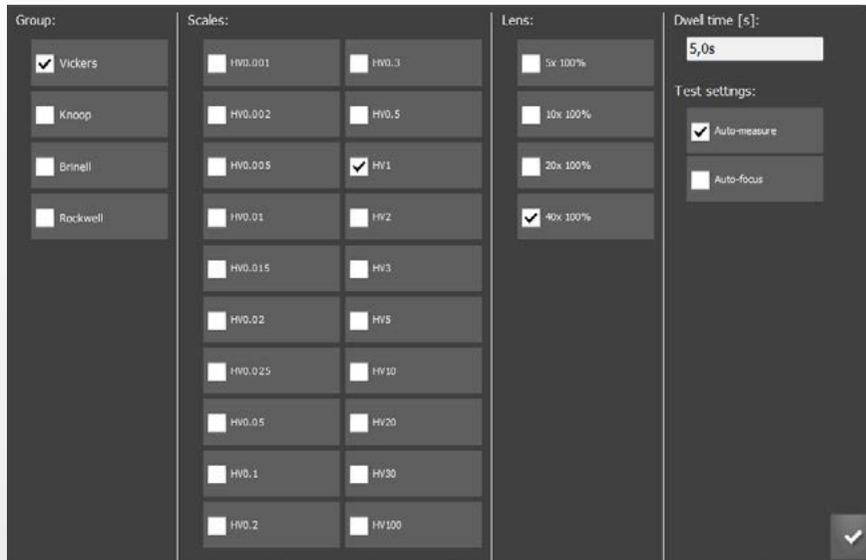
**AUTOFOCUS** - Motorized focus is always at the right linear quote.



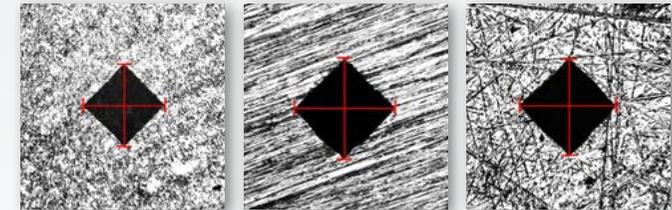
**AUTO-LIGHTING** - Automatic light regulation on any surface.



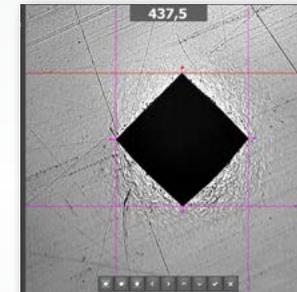
**TEST METHOD SELECTION** - Only one window for the selection of everything you need for the test.



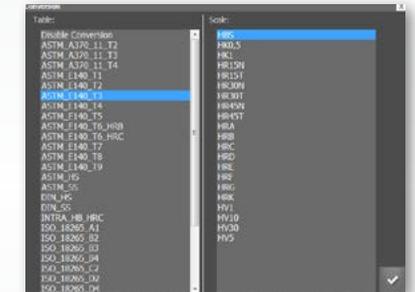
**AUTO MEASURE ON CRITICAL SURFACES**  
From perfectly polished to rough & etched samples the software will automatically measure indents on any sample surface.



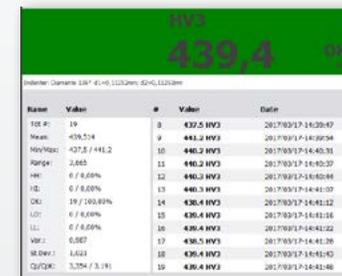
**MANUAL MEASURE**  
Manual indent evaluation.



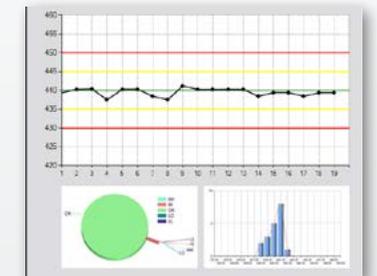
**AUTOMATIC CONVERSION**  
From standards to hardness scale.



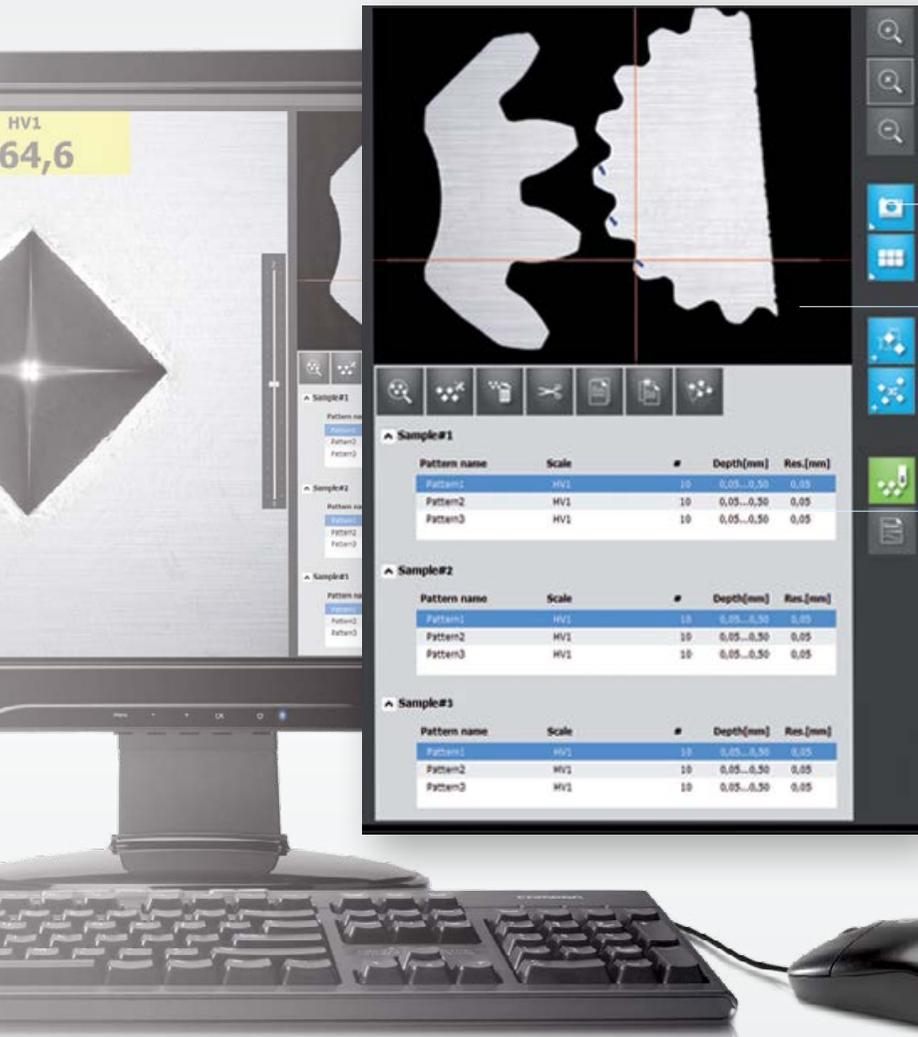
**DYNAMIC RESULTS**  
Color highlighted results and live statistics. Watch result list and edit or modify single tests.



**LIVE GRAPHS**  
Choose between 4 graphs. Print results from template or save and import tests cycles from archive.



# DM8 AUTO SOFTWARE

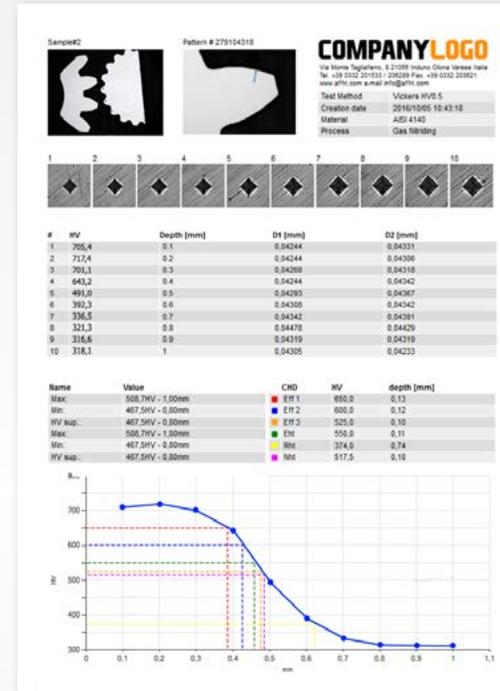


Get real and detailed images of each sample.

Visual control of each sample and patterns.

See a list of each sample and each pattern. Save or import traverses, edit, move, copy and paste.

Control the whole instrument with the mouse including dynamic movements on X/Y/Z axis at fast or slow speed.



Customizable test report with client logo and information. Put as many sample information as you need, including pictures of the specimen and test area. See the pattern and each indentation at a glance. Examine results, statistics and CHD diagram with outlined depth. Results can be exported also as CSV file.

**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.

The software is designed for an intuitive and simple use. With three easy steps, it provides added precision when positioning indents thanks to its integrated macroview 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.

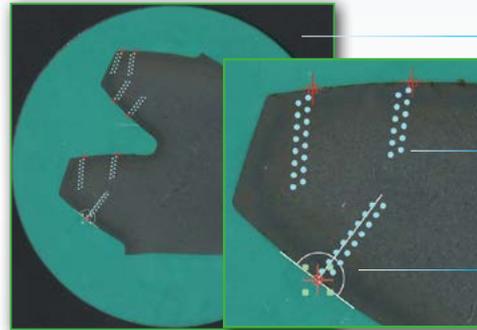
## 01 SURFACE MAPPING

Obtain a perfect, detailed, high resolution view of the whole sample holder offering sharp close-ups as well as global views. Multi sample vision offers a complete image of a sample without any distortion, no matter its size. No need for a second camera.



## 02 SETUP PATTERNS

Save, open, modify, copy and paste or create new patterns to predefined locations with a simple click. Traverses and patterns can be individually adjusted. Create case depth traverses or fill a surface with indentation points to control sample uniformity.



Samples can be mapped separately. Singular identification allows to group patterns regarding only one sample. Results storing and reporting will be well organized.

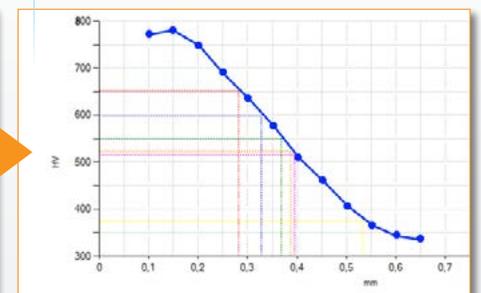
Traverse's indents can be modified at any time: delete, move or place a new one. Set where to perform autofocus and choose a different test load for each pattern if needed.

Rotate traverses with T-Bar tool.

Reports are automatically generated and archived during the test cycle. Just click on one plot to check the indentation.

## 03 PRESS START GET RESULTS

The software follows the patterns, indents the sample, measures, and generates data dynamically. Review results in graphical and/or tabular format. Export results to any spreadsheet application, or simply print standard or customized reports.



**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.

# AUTOMATIC MEASUREMENT CYCLE ON MULTIPLE SAMPLES

## CHD TRAVERSES AND PATTERNS

Single or multiple traverses/patterns can be rapidly created. With one simple click of the mouse the line is determined, the angle and the point of departure of the impressions.

## CREATE, SAVE AND RELOAD

No need to create the same pattern over and over again. This feature is extremely useful for users who analyze the same kind of areas repeatedly. Once a pattern has been created, you can save it and re-load it later to duplicate the analysis on a new sample.

## EDIT, MOVE OR DELETE

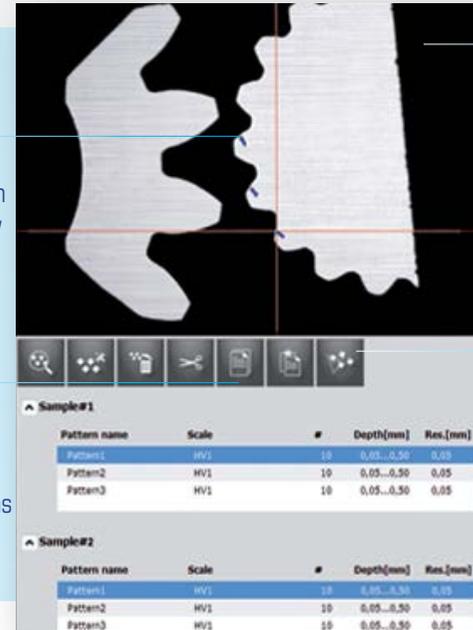
Select the pattern from preview image and modify direction, position, hardness scale, number and distances of indent, pattern name and point of focus.

## ZOOM IN AND OUT

Zoom up to look at the entire sample in order to identify the pattern position and direction. Zoom in to verify pattern distances and spot surface imperfection.

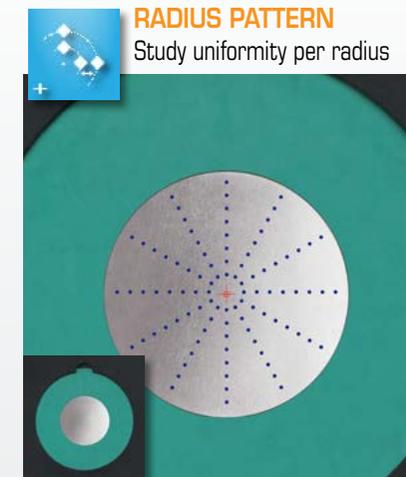
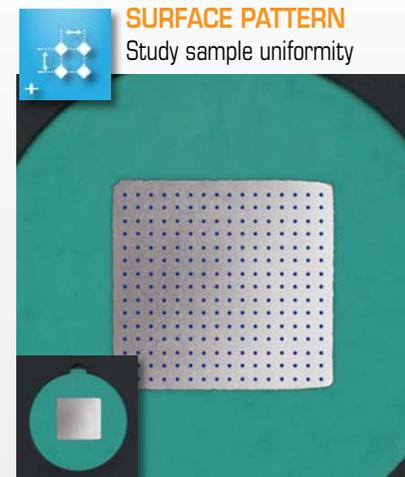
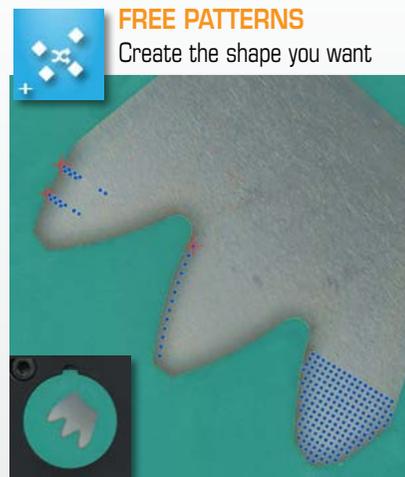
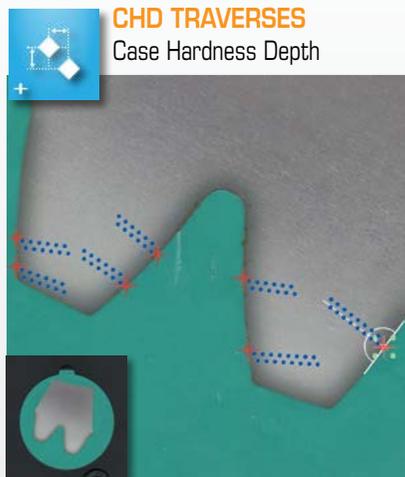
Traverse layouts and test points can be programmed by simple clicking on the desired test point locations.

Save, cut, copy, or paste traverses/patterns to predefined locations with a simple click of the mouse.



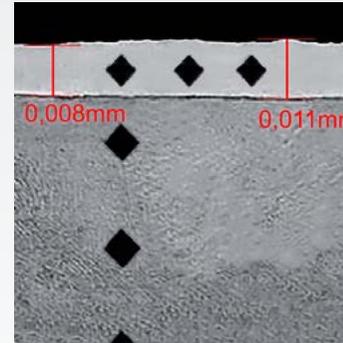
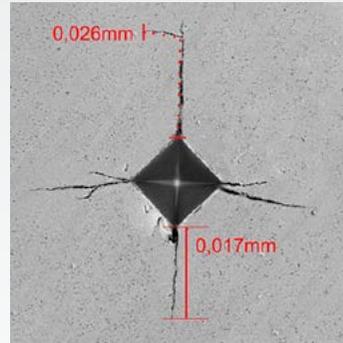
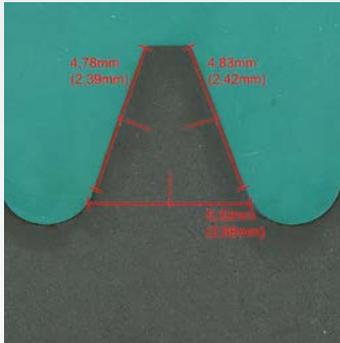
Use image preview to control the whole sample patterns. Identify test zone and place patterns with a simple mouse click.

The T-Bar tool rotates traverses to any angle to ensure its perpendicularity with the sample edge or to accommodate sample tilt.



## LENGTH AND DRAWING TOOLS

Use this feature to place reference points, find the middle, text some notes and measure the length of anything.



No matter the complexity of the pattern layout, combining intelligent macroviews with drawing and length tools allows traverses and/or patterns to be positioned precisely where they are needed.

This features also help in finding the center of the sample or the center of a gear tooth flank and the pitch point. Placing traverses and pattern is made easy.

Use this tool to draw straight and/or parallel lines, add text notes and measure length for report purposes.

## RESULTS INSTANTANEOUS DATA REVIEW

Following an automated run, individual indents can be tracked by clicking on the numbered impression. Intelligent software accurately remembers where the impression was made and automatically moves the stage to the chosen indent.

You can choose to not include, re-measure the impression manually with the movable gridlines or make a new indent. When excluded or re-measured, statistics are updated on the fly. Instant graphical view of Effective Case Depth.

## REPORT CREATION

Print results directly from the software or export data to the spreadsheet program of your choice for further statistical analysis.

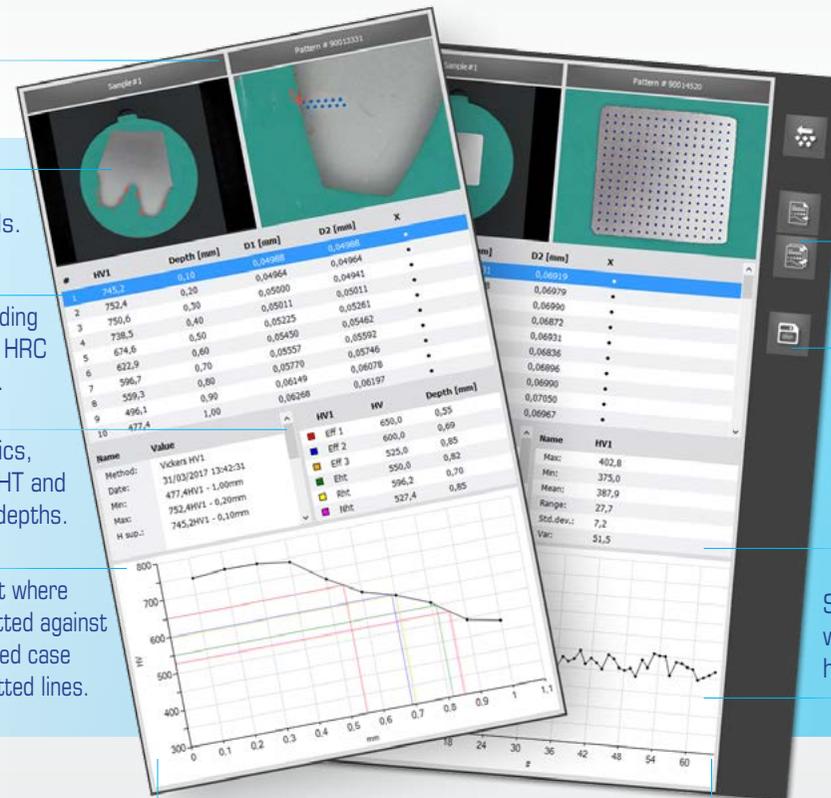
Select the sample and the pattern.

Spot tested zone from number labels.

See each result including depth, diagonals and HRC conversion or others.

See dynamic statistics, define CHD, RHT, NHT and three custom case depths.

See Case Depth chart where hardness value is plotted against depth. Identify specified case depth values from dotted lines.



Export single or all reports in PDF.

Export data as text file or CSV.

See preselected statistics including max, min, mean and deviation.

See uniformity chart with high and low highlighted tolerances.

Detect unexpected results, click the plot to go to indent. Verify, measure again or replace with a new indent.



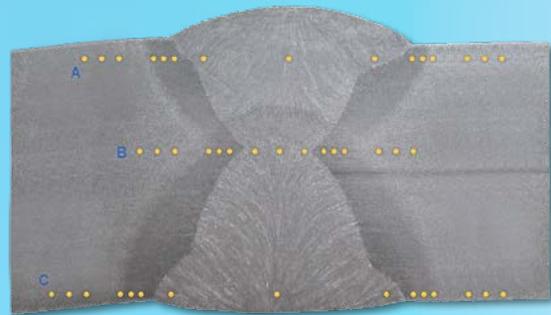
# AUTOMATIC MEASUREMENT CYCLE ON WELDS

## TESTING ON WELDS

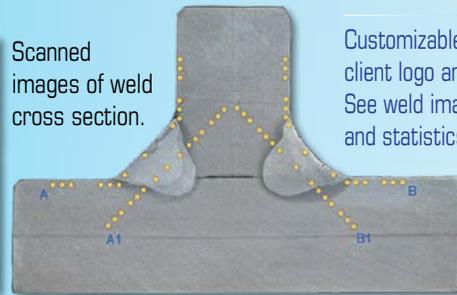
After scanning the whole sample, the fusion zones and the HAZ are clearly visible and distinguishable from the base material, even with a scratched surface.

Using software's tools it is easy to draw different indentation patterns lines with correct and precise positioning. In less than one minute add pattern positions with determined spacing between indents, defined distance from the border, from inside and outside surface, from fusion line or weld centreline.

The entire indentation distance can be simply measure in one complete view and added to your final report.



Scanned images of weld cross section.



Customizable test report with client logo and sample information. See weld image, pattern, results and statistics at a glance.

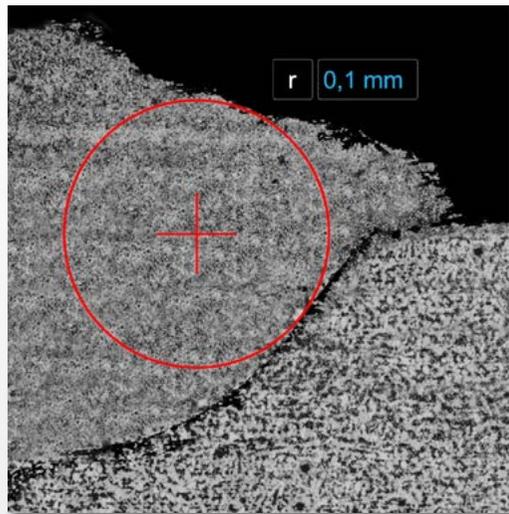
See hardness curves grouped all together.

**COMPANY LOGO**  
Via Roma, 49 - 21020 - Mantova, Italia  
Tel. +39 0376 201633 - 206288 Fax. +39 0352 235821  
www.pffri.com - email: info@pffri.com

Test Method: Vickers HV0.5  
Creation Date: 2016/10/05 16:43:15  
Material: A52-4140  
Process: Gas welding

Pattern A			Pattern B			Pattern C		
Name	Value		Name	Value		Name	Value	
Min:	202,8HV		Min:	250,3HV		Min:	251,5HV	
Max:	208,4HV		Max:	254,9HV		Max:	250,1HV	
Mean:	230,5HV		Mean:	241,4HV		Mean:	241,2HV	
Range:	44,5HV		Range:	15,8HV		Range:	20,3HV	
Std.dev:	12,388HV		Std.dev:	5,905HV		Std.dev:	7,178HV	
Var:	139,521HV		Var:	31,701HV		Var:	48,849HV	

HV	D1 [mm]	D2 [mm]	HV	D1 [mm]	D2 [mm]	HV	D1 [mm]	D2 [mm]			
1	252,0	0,19005	0,18702	1	244,3	0,19789	0,19177	1	251,0	0,19505	0,19326
2	228,4	0,20124	0,20111	2	248,5	0,19054	0,19120	2	234,9	0,18790	0,19079
3	225,8	0,20074	0,20453	3	249,8	0,19363	0,19173	3	236,8	0,19884	0,19695
4	239,5	0,19464	0,19886	4	242,5	0,19552	0,19502	4	244,9	0,19267	0,19446
5	237,3	0,19894	0,19837	5	237,3	0,19897	0,19840	5	237,8	0,19899	0,19790
6	233,4	0,19789	0,20074	6	236,7	0,19744	0,19837	6	247,3	0,19504	0,19220
7	228,5	0,19742	0,20548	7	237,9	0,19409	0,20073	7	242,5	0,19505	0,19601
8	226,9	0,20372	0,20121	8	234,5	0,19884	0,19885	8	235,9	0,18702	0,19741
9	218,1	0,20587	0,20853	9	238,2	0,20028	0,19599	9	233,3	0,20217	0,19650
10	208,4	0,21280	0,20928	10	230,3	0,19270	0,19220	10	230,1	0,20454	0,19897
11	243,1	0,19982	0,19077	11	237,8	0,20077	0,19414	11	244,3	0,19647	0,19317



## REFERENCE CIRCLE TOOL

Ideal for irregular or curved samples, where indents need to be at a given distance from the edge.. This exceptional tool allows indents to be positioned at precise distances from the sample's edge. Once a radius is specified, the software shows a red circle around the indent position. Use this reference to go across a border and/or zone and add the indent position.

This visual guide is the fastest way to create a defined pattern on a multi-zoned or irregular sample.



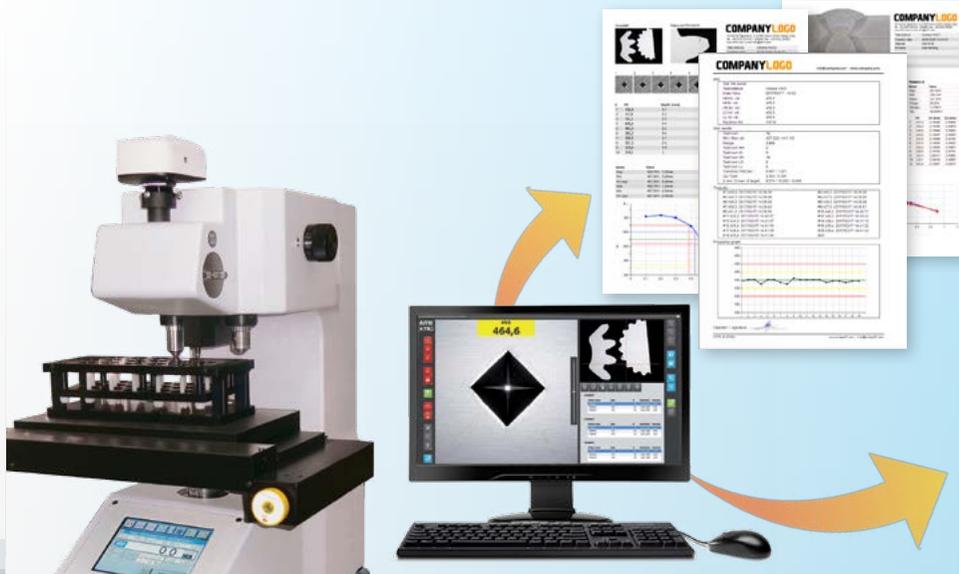
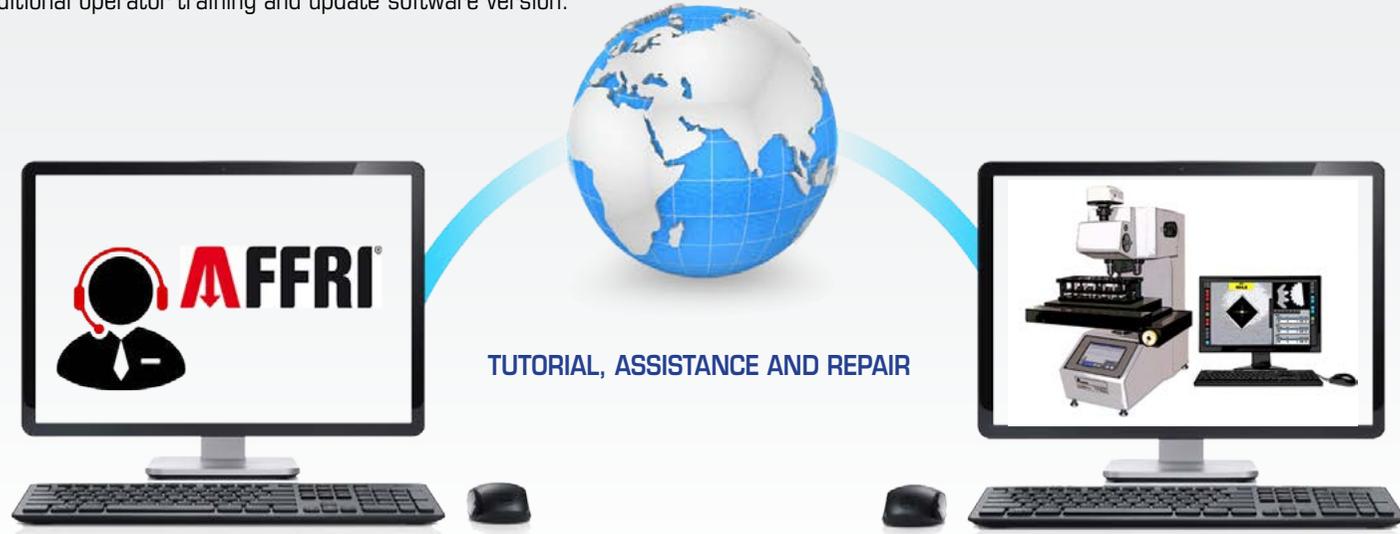
## CUSTOM STEP TOOL

When the tool is active, the virtual Joystick commands move the stage for the distance defined by step instead of a continuous movement.

Use this feature to create a pattern line where groups of spaced indents are placed in base material, HAZ and fusion. Define and fix a custom stage movement in X, Y or Z axis. Move on the point of interest (eg. fusion line) and add an indent position for each spacing distance step.

### REAL TIME SUPPORT:

The remote control connects AFFRI's testers from anywhere in the world with AFFRI's engineers. Our experts can remotely diagnose any technical issues, provide additional operator training and update software version.



### CUSTOMIZABLE REPORT TEMPLATES

Report are created directly by Affri team. Templates can be 100% customized basing on any need. Not only company logo, sample map and indentation images, the report layout can be filled with any test information. Time by time, after the test cycle, choose what to export in final report by flagging or deflagging simple options.

### TABULAR AND TXT DATA EXPORT

Print result directly from Affri software or export datas in txt, csv and tabular format to the spreadsheet program of your choice for further statistical analysis. Images and statistics can be saved or copied easily and laid out in a standard, or customized, MS Office templates. Use "paste as link" native tool to update your data sheet with exported results and build a well organized database.

SL. NO.	NAME	TEST	TEMP	INDENT	INDENT	INDENT	INDENT	INDENT	INDENT
1	Steel	100	20	100	100	100	100	100	100
2	Steel	100	20	100	100	100	100	100	100
3	Steel	100	20	100	100	100	100	100	100
4	Steel	100	20	100	100	100	100	100	100
5	Steel	100	20	100	100	100	100	100	100
6	Steel	100	20	100	100	100	100	100	100
7	Steel	100	20	100	100	100	100	100	100
8	Steel	100	20	100	100	100	100	100	100
9	Steel	100	20	100	100	100	100	100	100
10	Steel	100	20	100	100	100	100	100	100

# DM 8

## DM8 A FORCE RANGE

Vickers/Knoop:	0.049 - 0.098 - 0.1471 - 0.1961 - 0.2452 - 0.4903 - 0.9807 - 1.961 - 2.942 - 4.903 - 9.807 N (0.005 - 0.01 - 0.015 - 0.02 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 kgf)
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## DM8 A FEASIBLE TESTS

Vickers:	HVO.005 - HVO.01 - HVO.025 - HVO.05 - HVO.1 - HVO.2 - HVO.3 - HVO.5 - HV1
Knoop:	HK0.005 - HK0.01 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1

## DM8 B FORCE RANGE

Vickers/Knoop:	0.0098 - 0.0196 - 0.049 - 0.098 - 0.1471 - 0.1961 - 0.2452 - 0.4903 - 0.9807 - 1.961 - 2.942 - 4.903 - 9.807 - 19.61 N (0.001 - 0.002 - 0.005 - 0.01 - 0.015 - 0.02 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2 kgf)
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## DM8 B FEASIBLE TESTS

Vickers:	HVO.001 - HVO.003 - HVO.005 - HVO.01 - HVO.025 - HVO.05 - HVO.1 - HVO.2 - HVO.3 - HVO.5 - HV1 - HV2
Knoop:	HK0.001 - HK0.003 - HK0.005 - HK0.01 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1 - HK2

## TECHNICAL DATA

Accuracy:	Better than 1 %
Readout Division:	0.1 HV / HK
Standards:	EN-ISO 6507 / EN-ISO 4545 / ASTM-E384 / JIS
Vertical Stroke:	Motorized 120 mm / 5"
Depth Capacity:	160 mm / 6"
Turret:	Automatic and motorized - 6 positions
Indenter:	Vickers - As option Knoop and Brinell
Camera:	1.3 MP USB2 B/W HD
Focus and Reading:	<b>Manual:</b> Manual focus and manual reading - <b>Semi:</b> Manual focus with auto reading - <b>Auto:</b> Automatic focus with auto reading
Lighting:	Energy Efficient Cool LED Light Source
Network:	Wire connection for technical assistance and auto-diagnosis
X-Y Table:	<b>Manual / Semi:</b> X-Y: Manual 100 x 100 mm with 10 µm step - <b>Auto:</b> X -Y: 100 x 60 mm or 200 x 100 mm (automatic) with 0.5 µm step
Tolerable weight:	50 kg
Dwell Time:	From 5 to 99 seconds programmable
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS232 / USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Fields Of Use:	For micro and macro Vickers and case depth test on every metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Knoop test on ceramic and glass materials.
Packaging:	60 x 60 x 90 mm / 23 x 23 x 31 " - 70kg



### Europe/Asia:

**AFFRI®**  
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