

## X-VICK Automatic and Interactive Image Analysis Software for Vickers-Knoop Microhardness Test

Interactive Vickers - Knoop test measurements on live or still images.  
Image acquisition from digital and analog videocameras, with resolution up to 32,000x32,000 pixels, 32-bit color.  
Camera control supports wide range of dedicated single or sequential image acquisition sequences.  
WDM-compatible camera support also includes measurements overlaid on live image and transparency effects between the live image and previously acquired images for quantitative and qualitative visual comparison.  
Acquisition with TWAIN videocameras.  
Control and acquisition from digital photcameras with dedicated interfaces.  
Custom toolbars.  
Importing and exporting of images in different graphic formats.

Positioning of measurement reticule lines from mouse or keyboard.  
Automatic measurement mode: vertex search or line interpolation on the borders (vertex search even if absent).  
Automatic measuring even with several impressions in the visual field.  
Standard test loads selectable between 1 g and 50 Kg.  
Display of up to 9 curves of hardness per chart.  
Display of results in Rockwell C.  
Up to 9 result tables.  
Editor of results.  
Equivalent hardness.  
Loading and saving of all test parameters.  
Insertion of markers and text annotations.  
Sends "Core" to the report.  
Manual or automatic image processing.  
Customizable charts: line thickness and color, marker size, manual or automatic scaling.  
Up to 20 calibration memories for as many objectives. Automatic recalibration when zoom factor changes.  
Manual and automatic export of measurements to Excel.  
Automatic report generation in MS Word format. Includes values for all test parameters, tables of results and the relative chart.  
Export of data also in CSV format.

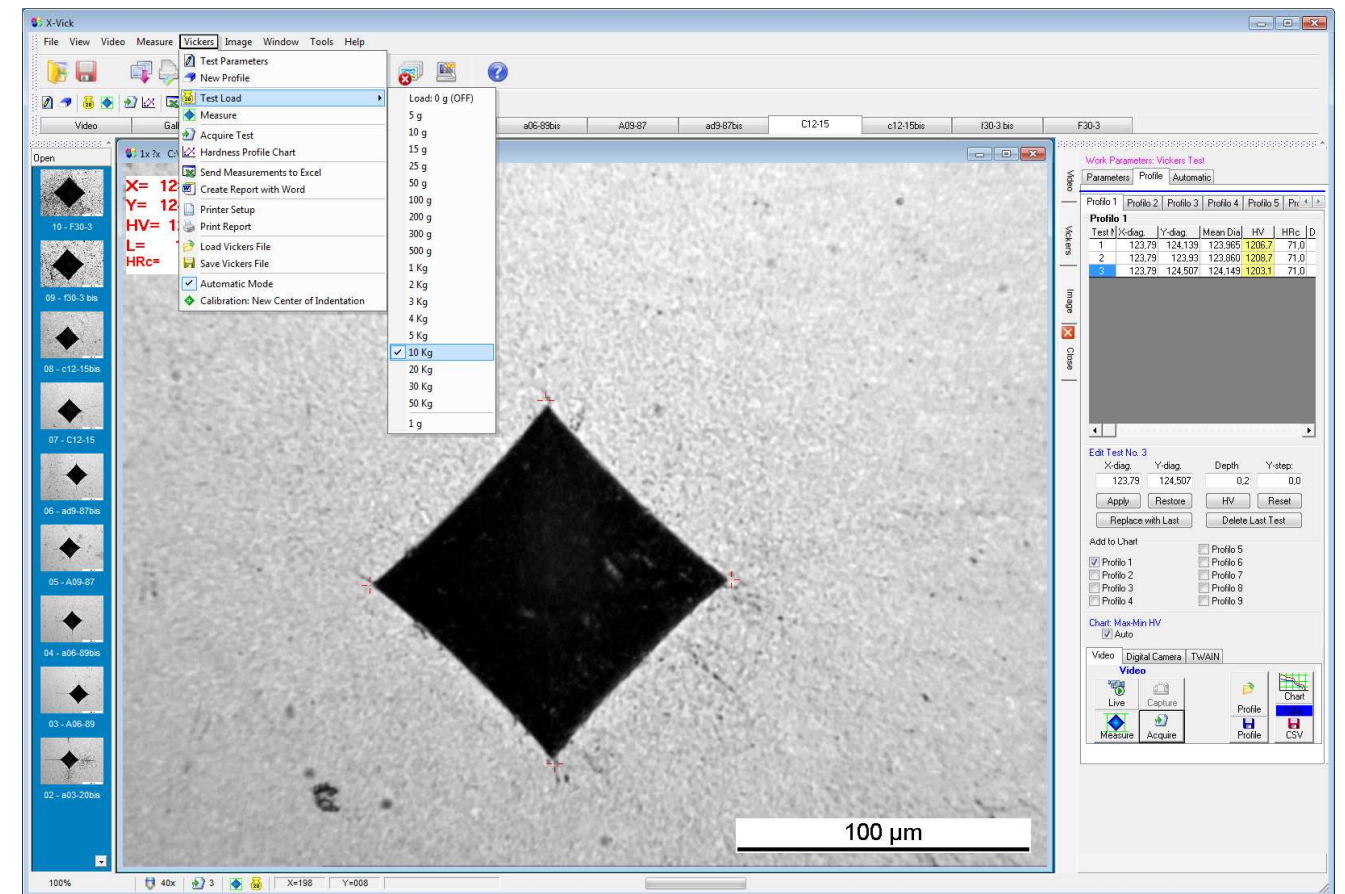
Complete filter set for image processing.  
Single or multiple filter use mode. All filter settings for multiple filters can be saved and used again.  
Three-dimensional reconstruction (surface 3D) from a set of partially in-focus images.  
Multifocus for creating a perfectly in-focus image from a series of only partially in-focus images.  
Display of a surface 3D model from: multifocus image, color and vectorial scale. Controls for rotation, autorotation, traslation and zoom from mouse and keyboard.  
Saving and loading of 3D models in standard DirectX and saving of the image in graphic formats.  
Macro generator and editor.  
Reports customizable with MS Word (not included).  
English and Italian interactive help.

### SW/HW Requirements

Operating System: Windows 7, Windows 7 64-bit, Windows Vista, Windows Vista 64-bit, Windows XP  
Report Generator (not included): Microsoft Office 2000 or later  
Video Card: 256 Mb RAM, DirectX9 compatible  
Minimum Resolution: 1280x900 pixels, 32-bit color  
CPU: 2.0 GHz  
System RAM memory: 1 GByte  
DVD R/RW Reader  
Hard Disk Space: 500Mbyte

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## IMAGE ANALYSIS SOFTWARE FOR AUTOMATIC AND MANUAL VICKERS – KNOOP MICROHARDNESS MEASUREMENT



- AUTOMATIC VICKERS – KNOOP HARDNESS TEST
- MEASUREMENT EVEN WHEN VERTEX IS ABSENT
- IMAGE ANALYSIS PERFORMED ON STILL IMAGES
- MANUAL VICKERS – KNOOP HARDNESS TEST
- MOVABLE RETICULE PATTERNS
- ROCKWELL C CONVERSION
- TEST MEASUREMENT DRIVEN USER INTERFACE
- UP TO 9 GHAPHS ON THE SAME CHART
- THREE-DIMENSIONAL SURFACE RECONSTRUCTION
- EXPORTS RESULTS TO MS EXCEL
- EXPORTS REPORTS TO MS WORD
- MULTIPLE IMAGE FILTERS
- USER ANNOTATIONS, MARKERS
- DYNAMIC ALBUMS
- RELATIONAL DATABASE (OPTIONAL)

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## X-VICK

**Interactive and automatic measurement software for Vickers-Knoop microhardness test in multidocument environment for Windows 7, Vista, XP.**

Image acquisition in multidocument environment with resolution up to 32.000x32.000 pixels, 32-bit color, with digital or analog videocameras.

Wide range of digital videocameras with control interfaces dedicated to the acquisition of single or sequential images.

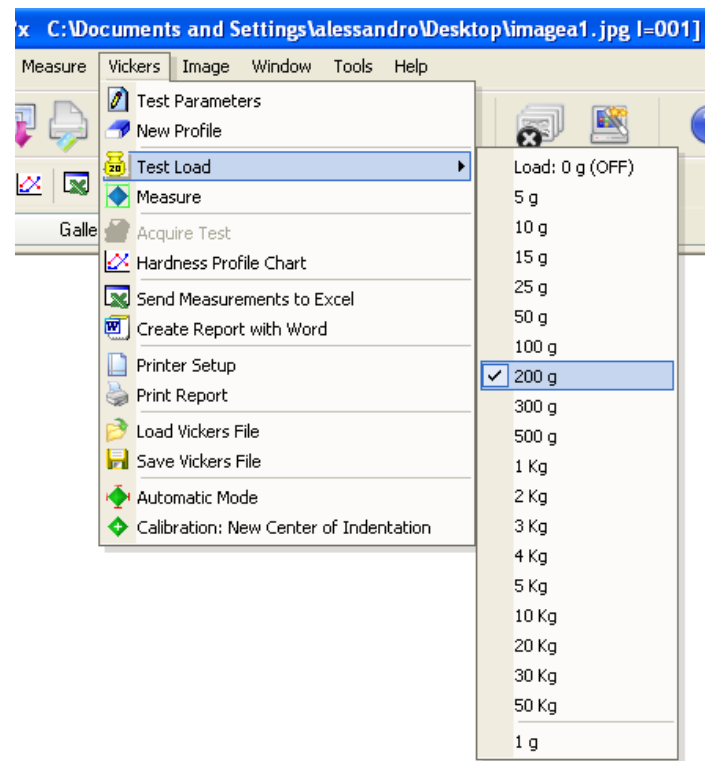
Image acquisition with WDM-compatible (Windows Driver Model) videocameras with all the features offered by DirectX10 and 9 technology: measurements on live image (overlay) and/or transparency effects between the live image and previously acquired images for quantitative and qualitative visual comparing.

Acquisition with TWAIN videocameras.

Control and acquisition from digital photocameras with dedicated interfaces.

Custom toolbars.

Importing and exporting of images in different graphic formats.



## Manual or Automatic Measurement

The Automatic mode is enabled by selecting the function from the Vickers menu: **Automatic Mode**.

### Manual Mode

In Manual mode if an image is displayed in the work environment and if the test load is different from zero the Vickers measuring reticule will be displayed.

The measurement can be performed both on the acquired image and the **live image** with compatible WDM acquisition peripherals.

The measuring reticule consists of two pairs of cross hairs with full screen size. The left mouse button allows you the alternate selection of the pairs. Once the four lines are made to coincide with the four vertices of the impression, by clicking the right mouse button the measuring graticule will be locked. Once the graticule is locked a further collimation is possible by using the arrow keys. If the <Shift> key is kept pressed the arrow keys allow you to move the other pair of cross hairs.

The upper left window displays in real time the horizontal and vertical measurements, the Vickers hardness, the test load and the Rockwell equivalent.

The line colors, fonts and window background color can be selected from the Tools menu.

## Automatic Mode

To perform the first measurement you need to have already indicated the New Center of Indentation with the **Calibration: New Center of Indentation** function.

The program automatically searches for the the position of the four vertices of the impression, displays the measurement values and the processing window.

## Parameters

The field names can be customized

**Profile:** Name of the current profile.

**Test Total No.:** Number of acquired measurement tests.

**Load:** The value of the load is the current one. If you wish to send to the report the value in Newton instead of Kg. select the Newton check box.

**Distance from Edge (surface):** Insert the distance of the first impression from the edge.

**Depth:** Insert only one value in mm if the step between an impression and another is constant. Otherwise insert the various steps separated by the hyphen - as shown in the figure.

**Y-Step:** Insert the value of the displacement perpendicular to the direction of the profile (zigzag) if different from zero.

## Image Acquisition

The image of the impression can be acquired by three types of devices: **Video (WDM), Digital Cameras and TWAIN** by pressing the appropriate tab.

## Profile Data

There are 9 tabs above the table section, from Profile1 to Profile9.

The tab selection determines the active profile and moves the table with the performed measurements to the foreground.

Test N	X-diag.	Y-diag.	Mean Dia	HV	HRc	D
1	123,79	124,139	123,965	1206,7	71,0	
2	123,79	123,93	123,860	1208,7	71,0	
3	123,79	124,507	124,149	1203,1	71,0	

## Measurement

If the performed measurement is correct by pressing **Acquire Test** the data will be sent to the open table.

Edit Test No.: Every row in the table can be modified manually. Select it with the mouse and modify the values.

**HV** allows you to set a microhardness value for the test selected in the table. The diagonal lengths will be automatically recalculated and the new value inserted in the table.

## Processing Dialog (automatic mode)

In automatic mode, once the measurement has been carried out, the **Processing Dialog** is displayed. It consists of three folders: **Zoomed Vertices, Levels** and **Advanced**.

### Zoomed Vertices

Finds and magnifies the 4 vertices of the indentation.

Vertices can be changed manually:

Point to the new position and click the left mouse button. A red square will appear next to the image to indicate that the new measurement will be performed according to the manual position you have entered.

Point to the other vertices to be modified manually.

Press the Measure button to obtain the new measurement. The border of the manually modified image will be colored red.

### Add to Chart

Only the selected profiles will be added to the chart.

The **Char** button displays the page for customizing the chart.

The stroke color for each profile can be customized with the **Color** button.

Reports can be generated with any Word or WordPad version or other Word-compatible editor.

In the program folder a selection of sample reports is available.

## Document Template

A template is a correctly formatted document with keywords inserted between braces {...}.

Each keyword identifies data or images in an X-Vick window and allows you to transfer its content automatically to the report.

## Report

Once the hardness profile chart is completed, select a **Report** from the **Hardness Profile Chart** and select the desired template. All the data of interest will be transferred to the report automatically.

The resulting report can then be modified like any other Word document and sent to the printer or stored.

## Report Sample

Text in light blue, the values of effective depth of cementation and the hardness profile chart have been transferred automatically from X-Vick.

