

Hardness Testers - Measuring Quality

XM 70

Much more than just a Vickers Hardness Tester



◀ **XM 70 - D1**

Single tests
1 camera

◀ **XM 70 - D3**

Multiple tests
Small XY table
1 camera

◀ **XM 70 - D5**

Multiple tests
Big XY table
2 cameras
1 laser

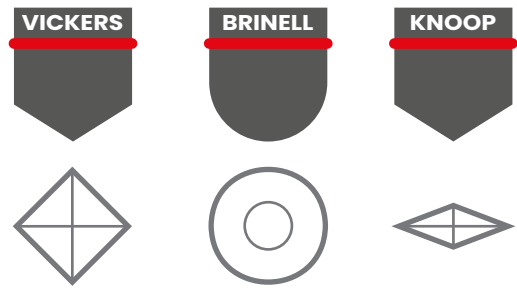
XM70 - D1

The automation of single tests at your fingertips

Fields of application

For single micro and macro Vickers, Knoop and Brinell tests on all ferrous and non-ferrous materials such as: iron, steel, hardened steel, cast iron, brass, aluminium, copper and metal alloys. Heat treated, hardened, nitrided and cemented materials and filler materials. Testing of ceramics and glass.

In full compliance with the international reference standards, including ISO 6506, ISO 6507, ISO 4545, ASTM E10, ASTM E92, ASTM E384



AF

A screenshot of a software interface showing a micrograph of a diamond indenter on a surface. To the right of the micrograph is a data table and a line graph. A red 'AF' icon is positioned to the left of the micrograph.

Fully automatic hardness calculation

after the fast auto focusing process, the indenter generates the indentation, the lens completes the optical analysis and the hardness value immediately appears on the PC monitor. *There you go!*

Motorised measurement head

The vertical movement is sensitive, fast-slow, and electronically controlled. With its large vertical capacity of 250mm, XM70-D1 is ideal for measuring medium to large objects.

A photograph of the motorised measurement head of the XM70-D1 hardness tester, showing its white and red structure and the indenter tip.

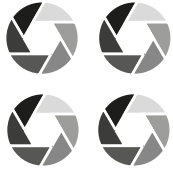
A diagram of a diamond indenter. The top vertex is labeled '62,5 Kg'. The left side is labeled '50 kg'. The right side is labeled '31,25 kg'. The bottom vertex is labeled '1 gr'. A red shaded area at the bottom is labeled 'LOAD' and '10 gr'. The bottom-left corner is labeled '5gr'.

Unparalleled accuracy even at very low loads

thanks to the management of the forces (available from 10gf to 31.25kgf but customisable on request) through load cells with Closed Loop control and high sampling rate (20 bits at 1 kHz).

Turret with 6-position automatic changeover

Designed to ensure **fast use** of the various high-quality optical lenses, which thanks to **energy-saving LED lighting** guarantee a natural colour view of the indentations.



4 lenses applied



1 indenter included



1 Design that ensures ergonomics and comfort of use:

- Indenters and lenses are on a "retractable" system that moves them inside the measurement head for their protection.
- The fixed support base allows the measurement of heavy and bulky objects.
- The instrument has been designed to allow an all-round view of the test sample

2 Possibility of moving the test sample around as you wish:

this can be done manually or using external manipulators such as anthropomorphic robots. Nothing else is needed: it's the measurement head that automatically "searches" for the test sample.

3 Reliability in any situation:

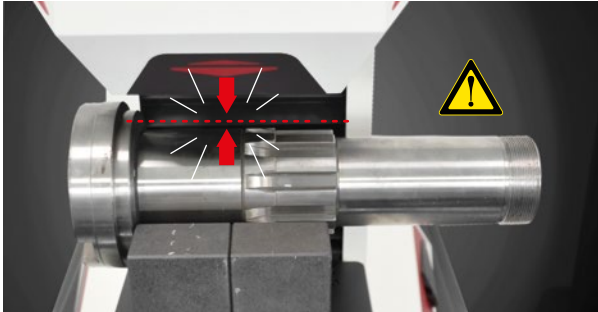
thanks to the load cell system, XM70-D1 guarantees extreme reproducibility and repeatability in any test condition.



Software and connectivity

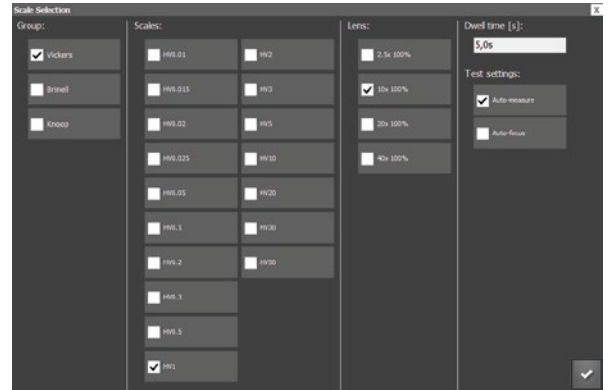
XM70-D1 features a powerful software that thanks to the processing of the image based on an algorithm developed entirely by Axiotek allows fast and accurate optical analysis **even on test samples with less than optimal surface finish**.

- Dynamic collision avoidance system: it ensures a safe assisted emergency stop to prevent damage to the machine and the operators;



- Autofocus irrespective of the position of the measurement head, ensuring maximum functionality and minimum error;
- Smart auto-exposure: optimisation of the indentation contrast level, increasing the reproducibility of the automatic measurement even under less than optimal conditions.
- Integrated conversion tables;

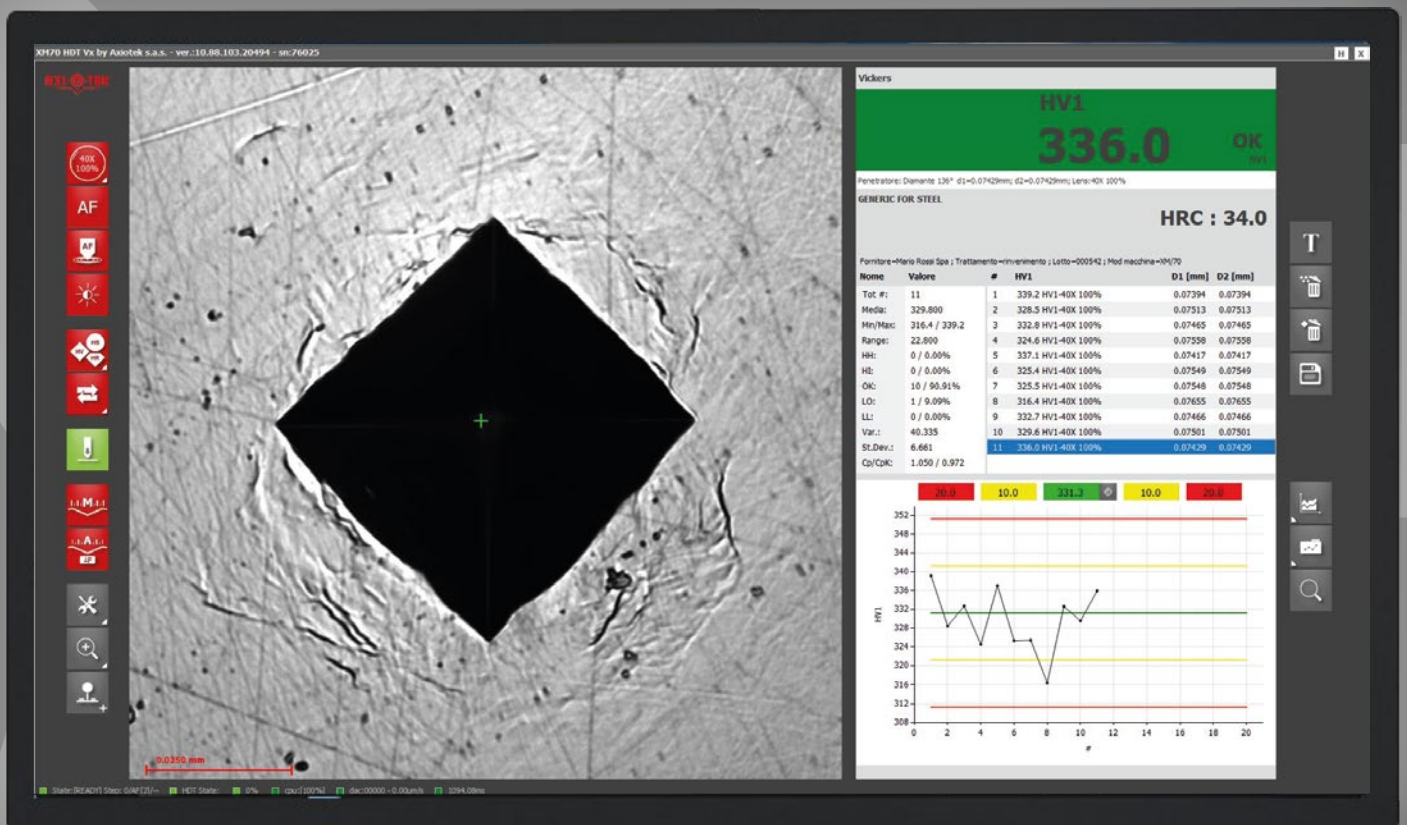
- Change the test method with a simple click: everything is handled through the software without the need to deal with inconvenient load selectors, therefore reducing the possibility of errors.



- Hardness value calculated in automatic or manual mode;
- Quiet operation ensured by recirculating ball bearing movement technology;
- Dynamic zoom with high definition view;

← 24" Full HD screen

← high definition display



A few simple steps to perform a single test:

1 Frame the area
 frame the area on which you want to carry out the test and focus manually

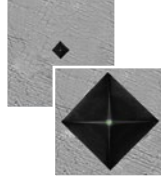


2 Make all the desired adjustments

Lenses



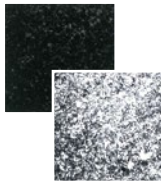
this button allows to select the desired magnification



Exposure:



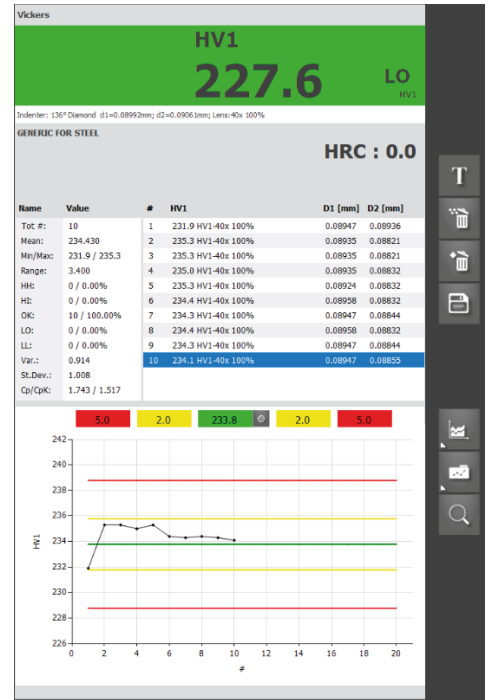
automatic exposure adjustment



3 Press START
 the single test starts and the reading is fully automatic



4 Obtain the results
 obtain statistically relevant results and compare them on tables or charts.



Statistical export/printing of data

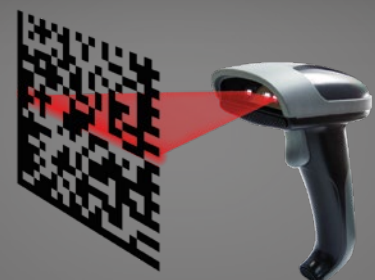
Basic and advanced statistical processing/printing functions with the possibility of direct interface to administration or processing software (such as company ERP) for data export/backup. (on request)

Data output: USB, Ethernet



Barcode scanner:

possibility of combining a barcode scanner (optional) to scan the barcodes found on the individual samples, making all the product details immediately accessible while the test is being carried out



XM70 – D3

The automation of speed

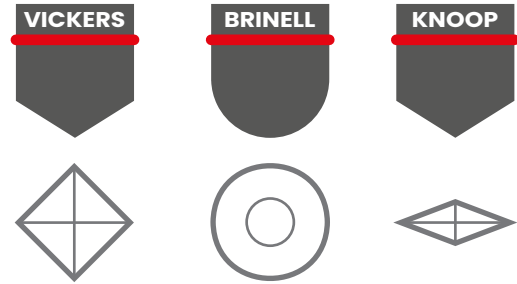
The operation of the instrument is still automatic but faster than the D1 version. Thanks to the multiple tests performed automatically by the software and the XY table, productivity and user comfort will be your great allies.

The acquisition time for scanning a 30mm diameter sample is only 30 seconds!

In full compliance with the international reference standards, including ISO 6506, ISO 6507, ISO 4545, ASTM E10, ASTM E92, ASTM E384.

Fields of applications

for single and multiple Micro/Macro Vickers, Knoop and Brinell tests on small to medium-sized objects (ferrous and non-ferrous) with particularly thin thicknesses and complex geometries.



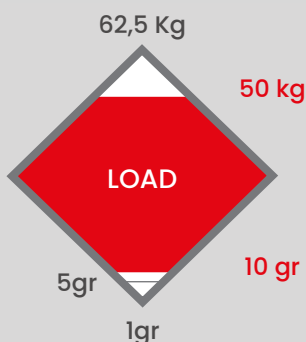
Motorised Z axis

the vertical movement of the head is sensitive, fast-slow, and electronically controlled.



XY table with a pitch accuracy of $\pm 1 \mu\text{m}$

the origin of the patterns can be positioned exactly where required. The XY table with a 100x60 range of motion allows test cycles with multiple indentations and multiple paths, respecting the relative distances and positions. Ideal for performing multiple tests on small to medium-sized objects at the click of a button.

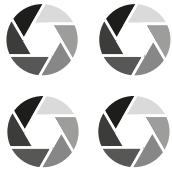


Unparalleled accuracy even at very low loads

thanks to the management of the forces (available from 10gf to 50kgf but customisable on request) through load cells with Closed Loop control and high sampling rate (20 bits at 1 kHz).

Turret with 6-position automatic changeover:

designed to ensure **fast use** of the various high-quality optical lenses, which thanks to **energy-saving LED lighting** guarantee a natural colour view of the indentations.



4 lenses applied



1 indenter included



1 Dynamic collision avoidance system:

system that ensures a **safe assisted emergency stop** to prevent damage to the machine and the operators.

2 Design that ensures ergonomics and comfort of use:

- Indenters and lenses are on a **"retractable" system** that moves them inside the measurement head for their protection.
- The instrument has been designed to allow an all-round view of the test sample.

3 Reliability in any situation:

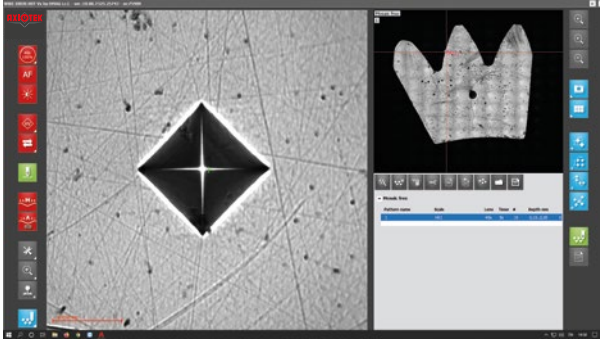
thanks to the load cell system, XM70-D3 guarantees **extreme reproducibility and repeatability in any test condition.**



Software and connectivity

thanks to the processing of the image based on an **algorithm developed entirely by Axiotek**, the specific XM70 line software allows fast and accurate optical analysis **even on test samples with less than optimal surface finish**.

- ◉ **Automatic test surface scanning:** ideal for hardness calculations on samples with complex geometries;



- ◉ **CAD system:** Free drawing on the test surface, allowing the creation of indentation execution and reading orientation geometries (on request);

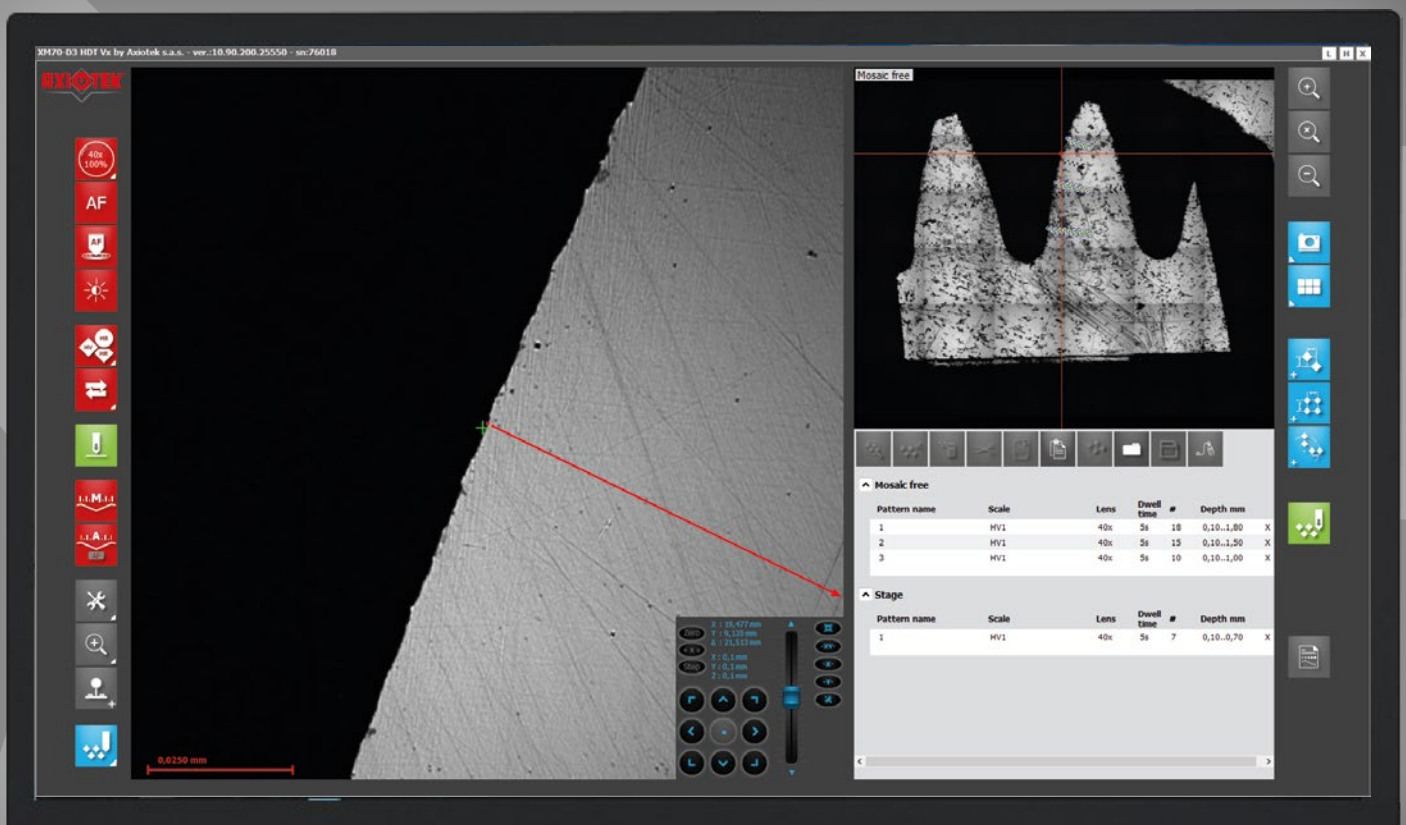


- ◉ **Autofocus** irrespective of the position of the measurement head, ensuring maximum functionality and minimum error;
- ◉ **Automatic reading** of the indentation;
- ◉ **Setting of patterns at the click of a button:** just move the mouse and we'll take care of the rest;

- ◉ **Quiet operation** ensured by recirculating ball bearing movement technology;
- ◉ **Change of the test method** with one click;
- ◉ **Dynamic zoom** with high definition view.
- ◉ **Integrated conversion tables;**

◀ 24" Full HD screen

◀ high definition display



A few simple steps to carry out a test cycle:

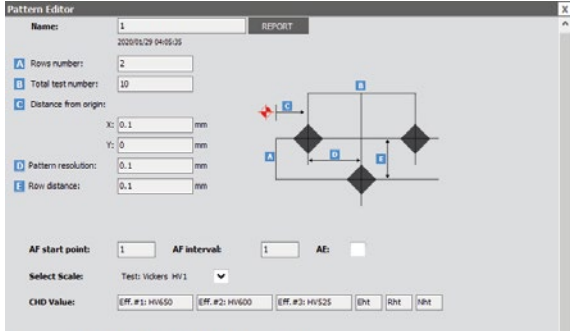
1 frame the area

obtain a fast, high-resolution, detailed and bright frame of the entire sample holder.



2 Set the patterns

copy and paste or create and save new patterns. Position and rotate them with a simple click.



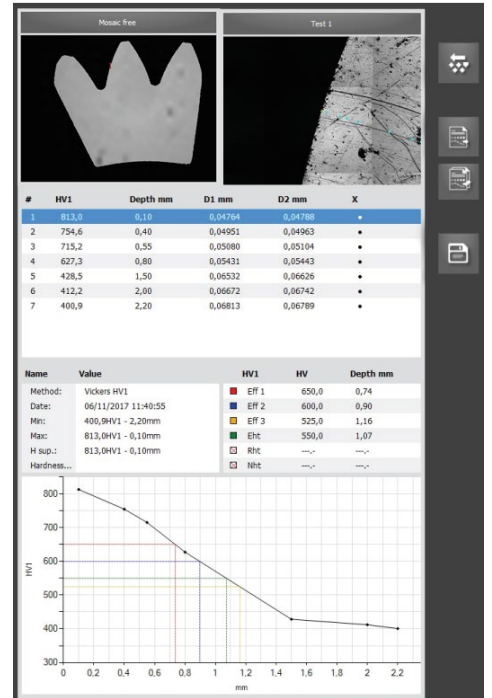
3 Press START

the test starts and the reading is fully automatic



4 Obtain the results

obtain statistically relevant results and compare them on tables or charts.



Statistical export/printing of data

Basic and advanced statistical processing/printing functions with the possibility of direct interface to administration or processing software (such as company ERP) for data export/backup. (on request)

Data output: USB, Ethernet



Barcode scanner:

possibility of combining a barcode scanner (optional) to scan the barcodes found on the individual samples, making all the product details immediately accessible while the test is being carried out



XM70 - D5

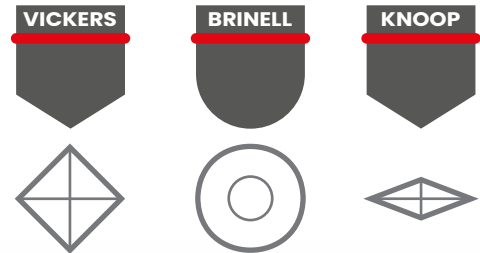
The most comprehensive, fast and versatile solution for your needs

Perfect for in-depth investigations: the panoramic lens and the laser integrated in the turret ensure a meticulous and detailed study of the tests performed.

Ideal for those who don't want to waste time: thanks to the multiple tests performed automatically by the software and the even larger XY table, **the acquisition time for scanning is reduced to a matter of seconds.** *Not bad, is it?*

Fields of application

to carry out particularly thorough investigations through single and multiple Micro/Macro Vickers, Knoop and Brinell tests. Ideal for small to medium-sized objects (ferrous and non-ferrous) with small thicknesses and complex geometries. In full compliance with the international reference standards, including ISO 6506, ISO 6507, ISO 4545, ASTM E10, ASTM E92, ASTM E384



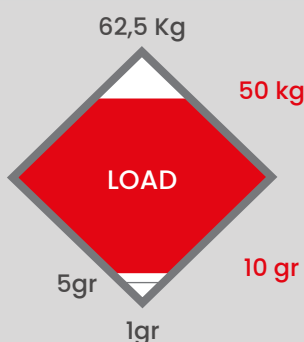
Motorised Z-axis

the vertical movement of the head is sensitive, fast-slow, and electronically controlled.



340x200mm CNC controlled XY table

thanks to its wide 200x100 stroke, a 8 sampleholder with $\varnothing 40\text{mm}$ can be positioned on the XY table, in order to carry out multiple tests with great simplicity.



Unparalleled accuracy even at very low loads

thanks to the management of the forces (available **from 10gf to 50kgf** but customisable on request) through **load cells with Closed Loop control** and high sampling rate (20 bits at 1 kHz)

Turret with automatic 6 + 1 position changeover

the **panoramic lens** and the **laser pointer** make it easier to identify the exact test position and ensure a detailed study of the completed investigation.



3 lenses and
1 panoramic
lens applied



1 laser
applied



1 indenter
included



1 Automatic and precise positioning of the test sample

thanks to the convenient XY table, it is the measurement head that automatically "searches" for the test sample. In addition, the laser pointer ensures the prompt identification of the test position.

2 Ultra-fast automatic scanning of the test surface

thanks to the additional built-in camera: just a few seconds are enough to capture the panoramic view of a \varnothing 40mm sample.

Macro function with dedicated panoramic lens

to always ensure the availability of the complete image of the sample being tested, and therefore maximum comfort in the immediate calculation of the hardness value on extremely complex geometries.

Autofocus

available irrespective of the position of the measurement head, ensuring maximum functionality and minimum error

3 Reliability in any situation

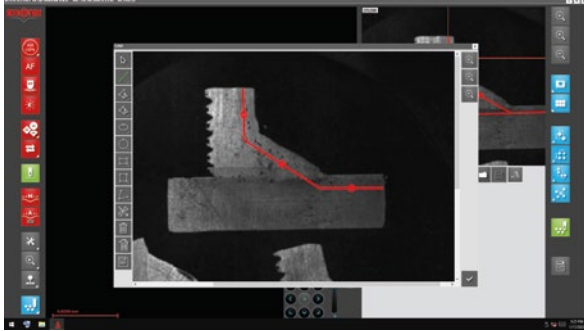
thanks to the load cell system, XM70-D5 guarantees extreme reproducibility and repeatability in any test condition.



Software and connectivity

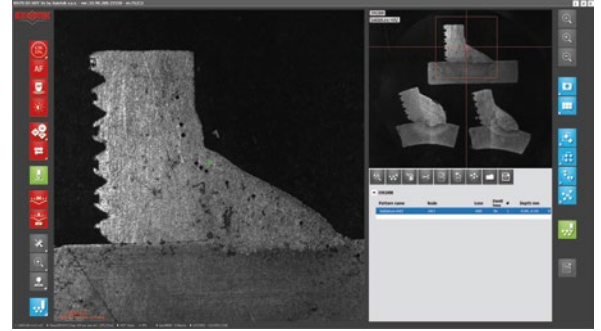
XM70-D5 is the flagship of Axiotek: equipped with a software with the **most advanced and innovative functions** currently available on the market, it's a benchmark in the execution of micro and macro hardness tests even on samples with less than optimal surface finish.

- ◉ **CAD system:** Free drawing on the test surface, allowing the creation of indentation execution and reading orientation geometries (on request);



- ◉ **Automatic reading** of the indentation;
- ◉ **Dynamic collision avoidance system:** it ensures a safe assisted emergency stop to prevent damage to the machine and the operators;
- ◉ **Integrated conversion tables;**
- ◉ **Dynamic zoom** with high definition view

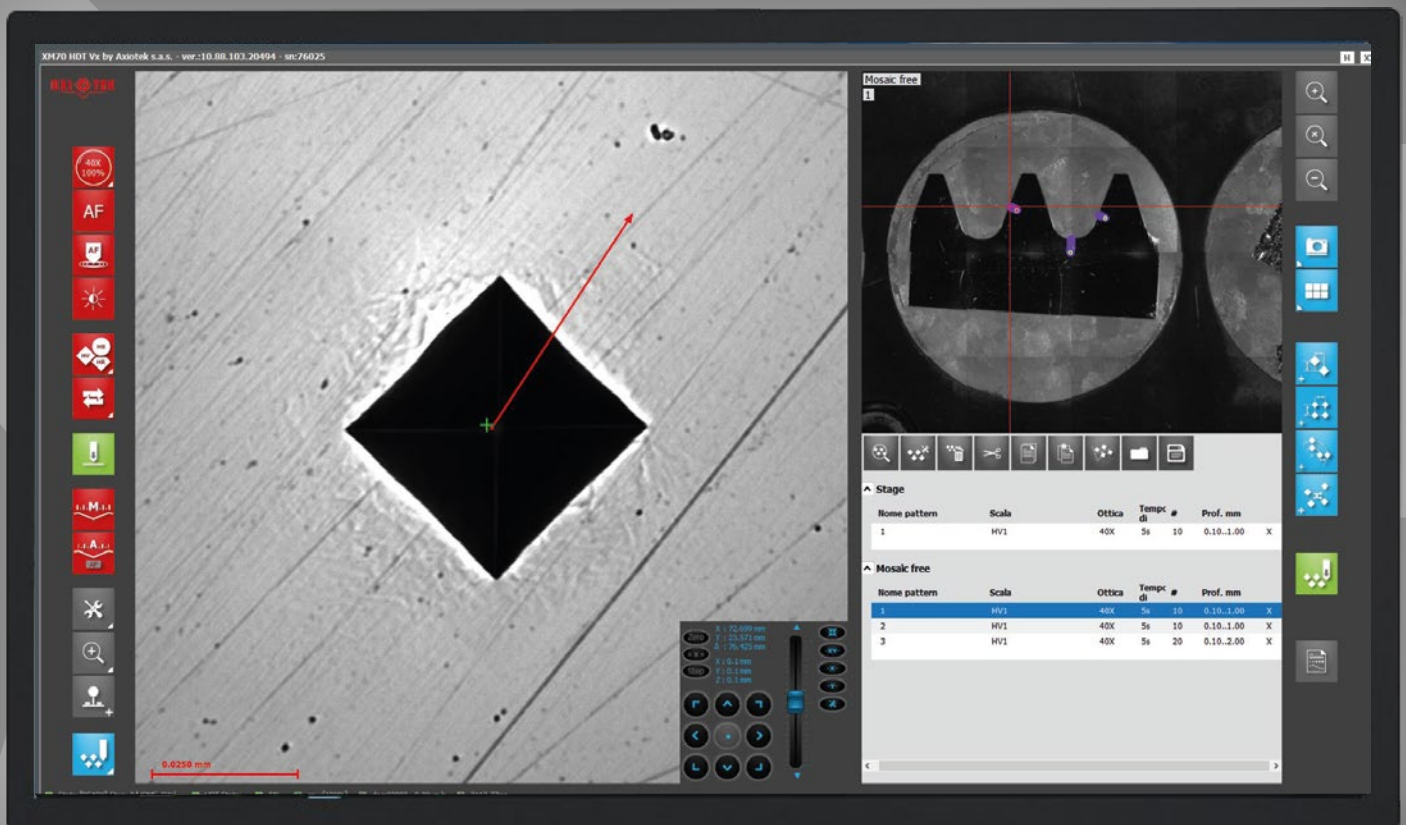
- ◉ **Standardised welding tests:** to determine the hardness values of the base material, the heat altered zone (HAZ) and the filler material according to ISO 9015 and ISO 22826 (on request).



- ◉ **Setting of patterns at the click of a button:** just move the mouse and we'll take care of the rest;
- ◉ **Quiet operation** ensured by recirculating ball bearing movement technology;
- ◉ Change of the test method with one click;

◀ 24" Full HD screen

◀ high definition display



A few simple steps to carry out a test cycle:

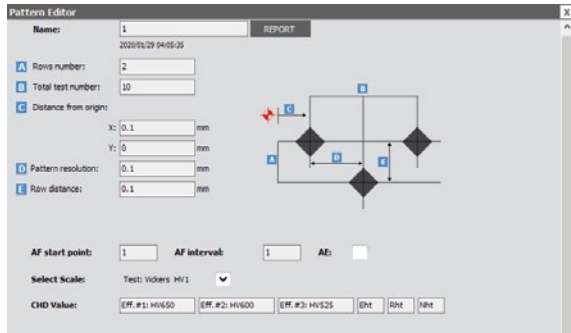
1 Frame the area

obtain a fast, high-resolution, detailed and bright frame of the entire sample holder.



2 Set the patterns

copy and paste or create and save new patterns. Position and rotate them with a simple click.



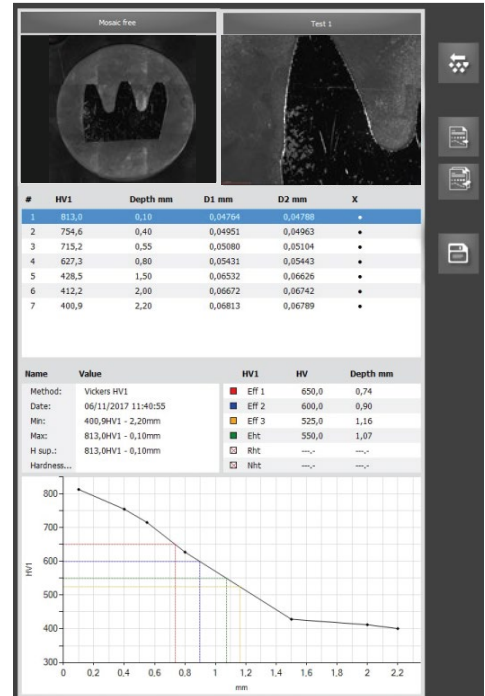
3 Press START

the test starts and the reading is fully automatic



4 Obtain the results

obtain statistically relevant results and compare them on tables or charts.



Statistical export/printing of data

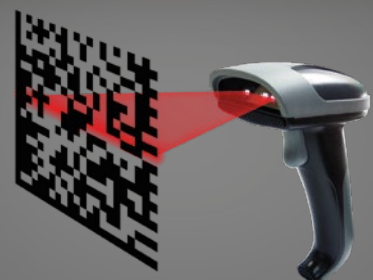
Basic and advanced statistical processing/printing functions with the possibility of direct interface to administration or processing software (such as company ERP) for data export/backup. (on request)

Data output: USB, Ethernet



Barcode scanner:

possibility of combining a barcode scanner (optional) to scan the barcodes found on the individual samples, making all the product details immediately accessible while the test is being carried out



XM70 - D1



download the data sheet
at the bottom of the page

XM70 - D3



download the data sheet
at the bottom of the page

XM70 - D5



download the data sheet
at the bottom of the page

TEST FORCES:

Vickers:

0,098 - 0,147 - 0,196 - 0,245 - 0,980 -
1,961 - 2,942 - 4,903 - 9,807 - 19,61 -
29,42 - 49,03 - 98,07 - 196,1 - 294,2 N
(0,01 - 0,015 - 0,02 - 0,025 - 0,1 - 0,2 -
0,3 - 0,5 - 1 - 2 - 3 - 5 - 10 - 20 - 30 Kgf)

Knoop:

0,098 - 0,196 - 0,254 - 0,490 - 0,980 -
1,961 - 2,942 - 4,903 - 9,81 N (0,01 -
0,02 - 0,025 - 0,05 - 0,1 - 0,2 - 0,3 - 0,5
- 1 Kgf)

Brinell:

9.81 - 24.52 - 49.03 - 98.07 - 294.2 -
306.5 N (1 - 2.5 - 5 - 10 - 30 - 31.25 Kgf)

POSSIBLE TESTS:

Vickers:

HV0,01 - HV0,015 - HV0,02 -
HV0,025 - HV 0,1 - HV 0,2 - HV 0,3 -
HV 0,5 - HV 1 - HV 2 - HV 3 - HV 5 -
HV 10 - HV 20 - HV 30

Knoop:

HK0,01 - HK0,02 - HK0,025 - HK0,05
- HK 0,1 - HK 0,2 - HK 0,3 - HK 0,5 - HK 1

Brinell:

HBW 1/1 - HBW 1/2.5 - HBW 1/5 -
HBW 1/10 - HBW 1/30 - HBW 2.5/31.25

TEST FORCES:

Vickers:

0,098 - 0,147 - 0,196 - 0,245 - 0,980 -
1,961 - 2,942 - 4,903 - 9,807 - 19,61 -
29,42 - 49,03 - 98,07 - 196,1 - 294,2 -
490,3 N (0,01 - 0,015 - 0,02 - 0,025 - 0,1
- 0,2 - 0,3 - 0,5 - 1 - 2 - 3 - 5 - 10 - 20 -
30 - 50 Kgf)

Knoop:

0,098 - 0,196 - 0,254 - 0,490 - 0,980 -
1,961 - 2,942 - 4,903 - 9,81 N (0,01 -
0,02 - 0,025 - 0,05 - 0,1 - 0,2 - 0,3 - 0,5
- 1 Kgf)

Brinell:

9.81 - 24.52 - 49.03 - 98.07 - 294.2 -
306.5 N (1 - 2.5 - 5 - 10 - 30 - 31.25 Kgf)

POSSIBLE TESTS:

Vickers:

HV0,01 - HV0,015 - HV0,02 -
HV0,025 - HV 0,1 - HV 0,2 - HV 0,3 -
HV 0,5 - HV 1 - HV 2 - HV 3 - HV 5 -
HV 10 - HV 20 - HV 30 - HV50

Knoop:

HK0,01 - HK0,02 - HK0,025 - HK0,05
- HK 0,1 - HK 0,2 - HK 0,3 - HK 0,5 -
HK 1

Brinell:

HBW 1/1 - HBW 1/2.5 - HBW 1/5 -
HBW 1/10 - HBW 1/30 - HBW 2.5/31.25

TEST FORCES:

Vickers:

0,098 - 0,147 - 0,196 - 0,245 - 0,980 -
1,961 - 2,942 - 4,903 - 9,807 - 19,61 -
29,42 - 49,03 - 98,07 - 196,1 - 294,2 -
490,3 N (0,01 - 0,015 - 0,02 - 0,025 - 0,1
- 0,2 - 0,3 - 0,5 - 1 - 2 - 3 - 5 - 10 - 20
- 30 - 50 Kgf)

Knoop:

0,098 - 0,196 - 0,254 - 0,490 - 0,980 -
1,961 - 2,942 - 4,903 - 9,81 N (0,01 -
0,02 - 0,025 - 0,05 - 0,1 - 0,2 - 0,3 - 0,5
- 1 Kgf)

Brinell:

9.81 - 24.52 - 49.03 - 98.07 - 294.2 -
306.5 N (1 - 2.5 - 5 - 10 - 30 - 31.25 Kgf)

POSSIBLE TESTS:

Vickers:

HV0,01 - HV0,015 - HV0,02 -
HV0,025 - HV 0,1 - HV 0,2 - HV 0,3 -
HV 0,5 - HV 1 - HV 2 - HV 3 - HV 5 -
HV 10 - HV 20 - HV 30 - HV50

Knoop:

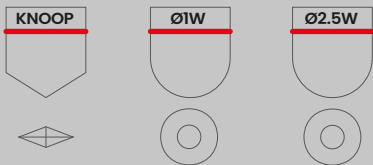
HK0,01 - HK0,02 - HK0,025 -
HK0,05 - HK 0,1 - HK 0,2 - HK 0,3 -
HK 0,5 - HK 1

Brinell:

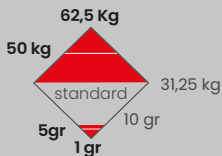
HBW 1/1 - HBW 1/2.5 - HBW 1/5 -
HBW 1/10 - HBW 1/30 - HBW
2.5/31.25



Lens available to replace the standard ones: 2,5X



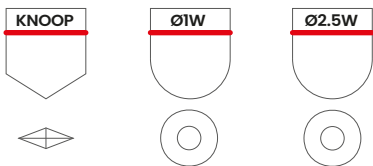
Indenters of your choice available to replace the standard one: Knoop; Ø1W; Ø2.5W



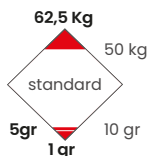
Range of customisable forces: up to 1gf; 5gf; 50kgf or 62,5kgf



Lens available to replace the standard ones: 20X



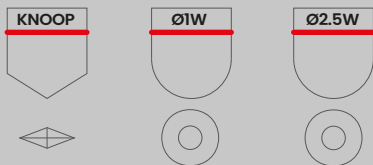
Indenters of your choice available to replace the standard one: Knoop; Ø1W; Ø2.5W



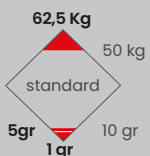
Range of customisable forces: up to 1gf; 5gf or 62,5kgf



Lens available to replace the standard ones: 2,5X e 20X



Indenters of your choice available to replace the standard one: Knoop; Ø1W; Ø2.5W



Range of customisable forces: up to 1gf; 5gf or 62,5kgf

Service & Maintenance

Our generational experience based on more than 60 years of field work allows us to answer any of your questions or concerns.

Our highly strategic geographical position allows us to support you in the maintenance of your instrument, offering you completely made in Italy spare parts.

Why choose us?

- ◉ We guarantee **100% Italian quality**.
- ◉ We believe in **true innovation**: listening to your needs and making an hardness tester that can meet them.
- ◉ We promote an **empathic design**, which ensures functionality and harmony in the interaction with measuring instruments.
- ◉ **We are pragmatic and result-oriented**: what we design and produce is the result of years of study, research and experimentation.
- ◉ **We love to accompany you step by step**, listening and advising you what better embraces your needs



WHERE WE ARE

Via Monte Tagliaferro 8,
21056 Induno Olona
(VA) - Italy



PHONE NUMBER

+39 0332 1892847



EMAIL

service@axiotek.eu



WWW

www.axiotek.eu

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