

NEMESIS 9600G2

AUTOMATIC FLOOR TYPE HARDNESS TESTER

UNIVERSAL | ROCKWELL, VICKERS, KNOOP & BRINELL



NEMESIS 9600G2

Engineered for endurance, designed for precision ...

The NEMESIS 9600G2 sets a new benchmark in heavy-duty, floor-standing hardness testing. Evolving from the proven NEMESIS 9100, this second-generation system combines Rockwell, Vickers, Knoop, and Brinell testing in one powerful platform.

Equipped with a revolutionary force application system, a renewed optical design, and an advanced 9-position motorized turret, the NEMESIS 9600G2 integrates indenters, objectives, a cross-laser, touch probe, and dual 18/20 MP cameras with motorized zoom and high-speed autofocus. Designed for maximum flexibility and precision, the NEMESIS 9600G2 delivers performance beyond the most demanding requirements.



HARDNESS SCALES



VICKERS
+ HVD (HVT) 500gf - 150kgf



KNOOP 500gf - 5kgf



BRINELL
+ HBD (HBT) with AI 1kgf - 3000kgf



ROCKWELL 3kgf - 150kgf

Select your required test force range...

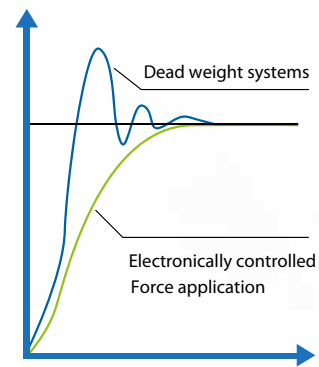
200gf	500gf	250kgf	NEMESIS 9600G2 / A	3000kgf
200gf	3kgf	750kgf	NEMESIS 9600G2 / B	3000kgf
200gf	5kgf		NEMESIS 9600G2 / C	3000kgf

Upgrade now, later, at any moment, during order or online!

OPTION 1	200gf - 500gf	OPTION 2	200gf - 3kgf	OPTION 3	1kgf - 5kgf
OPTION 4	200gf - 5kgf				

HIGHLIGHTS

- 1 Multi load cell, closed loop system, custom test force configuration
- 2 Force range from 200gf up to 3000kgf
- 3 Force upgrade available also years after first installation
- 4 9 position tool changer (turret) with visual LED process indicators
- 5 Free to configure 8 objectives, 8 indenters, cross laser, touch probe, optional tools
- 6 20 megapixel full color measurement camera, bright white LED TTL illumination
- 7 18 megapixel full color sample image & stage overview camera, anti-glare filter, motorized zoom for variable field of view and autofocus at any field of view
- 8 Adjustable & rotatable dual LED workspace illumination
- 9 Various options for CNC X-Y high precision motorized stages (up to 4000kgf load)
- 10 Automatic workpiece height detection
- 11 Unique collision detection and test head retraction system
- 12 Integrated or External high performance, MS Windows based i7 system controller
- 13 IMPRESSIONS 4™ workflow and tester control system with 22" (touch)screen
- 14 Artificial Intelligence (AI) for enhanced Brinell readings
- 15 1100 kg heavy duty structure.



Load cell, closed loop,
force feedback system

SUPPORTED METHODS & SCALES



ROCKWELL

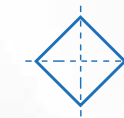
EN-ISO 6508, ASTM E-18, JIS Z 2245

Regular Rockwell scales; Pre Load 10kgf, Main Load 60kgf | 100kgf | 150kgf

A B C D E F G H K L M P R S V

Superficial Rockwell scales; Pre Load 3kgf, Main Load 15kgf | 30kgf | 45kgf

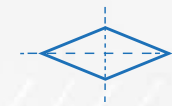
15N 30N 45N 15T 30T 45T 15W 30W 45W 15X 30X 45X 15Y 30Y 45Y



VICKERS

DIN EN ISO 6507, ASTM E-92, ASTM E-384

HV0.2	HV0.3	HV0.5	HV1	HV2
HV2.5	HV3	HV4	HV5	HV10
HV20	HV25	HV30	HV40	HV50
HV100	HV120	HV150		



KNOOP

DIN EN ISO 4545, ASTM E-92, ASTM E-384

HK0.2	HK0.3	HK0.5	HK1	HK2
HK5				



BRINELL

DIN EN ISO 6506, ASTM E-10

HBW1/1	HBW1/1.25	HBW1/2.5	HBW1/5	HBW1/10
HBW1/30	HBW1/31.25	HBW2.5/6.25	HBW2.5/7.8125	HBW2.5/15.625
HBW2.5/31.25	HBW2.5/62.5	HBW2.5/187.5	HBW5/25	HBW 5/31.25
HBW 5/62.5	HBW5/125	HBW5/250	HBW5/750	HBW10/100
HBW10/125	HBW10/250	HBW10/500	HBW10/1000	HBW10/1500
HBW10/3000				



CONVERSIONS

DIN EN ISO 18265, DIN EN ISO 50150, ASTM E140

9-POSITION TOOL CHANGER

Full configuration freedom...

Newly developed 9 position state-of-the-art tool changer. From “turret” to tool changer because the 9600G2 turret offers more than purely holding lenses and indenters. The high-speed rotating mechanism is prepared for future modular plug & play tooling development. The tool changer is fully configurable.

Either 8 indenters or 8 objectives, or any combination, a laser positioning system and touch probe are installed as standard. The standard (removable) skirt protects tooling from damage.

MEDIUM FORCE INDENTER SEATS

This indenter seat allows hardness testing ranging from option A: 500gf up to 250kgf for Vickers, Knoop, Brinell or option B: 3kgf up to 250kgf for Vickers, Knoop Brinell and Rockwell. Multiple indenter seats can be installed on the tool changer.

HIGH FORCE INDENTER SEAT

This indenter seat allows hardness testing ranging from 200gf up to 3000kgf for Vickers, Knoop and Brinell. Multiple indenter seats can be installed on the tool changer.

CROSS LASER & TOUCH PROBE

The cross laser & touch probe can be simultaneously used in the 9th position without loss of tooling positions. Multi touch probes available, with or without cross laser.

LWD OBJECTIVES

High quality long working distance objectives.

COLLISION DETECTION SYSTEM

The collision detection system prevents tooling damage by early detecting obstructions in the testpath. The tool changer is continuously monitored during all movement processes and instantaneously stops and retracts if an obstruction is detected.

PROTECTION SKIRT

The skirt mounted on the rotating centre of the tool changer protects each individually installed tool against accidental damage.

CRYSTAL CLEAR™ RINGLIGHTS

Brinell ringlights optimized for each magnification in combination with Artificial Intelligence (AI see page 21).

STAGE ILLUMINATION

Adjustable power LED banks provide excellent diffused stage illumination.

BRILIGHT OBJECTIVE

Brinell objective optimized with straight bundle LED illumination for better results with shallow Brinell impressions.

The LED bars on the front of the tool changer continuously inform you about the device status. The range of flash intervals and color codes (red, blue, green) indicate the process mode of the tester; red: automatic operation, (busy & hands off), blue: in single test procedure; or green: idle, ready for next task.



The purpose of software is to control complexity...

For the more advanced users, for whom the standard applications would not be sufficient, IMPRESSIONS™ 4 has an unmatched level of optional “apps” that can be installed as plugins, later, at any moment. During the purchase of your tester, decide on what you need at that moment. Widen your options at any moment by a simple e-mail and a few mouse clicks, to install optional functionality. As easy or simpler than installing an app on your mobile phone.

POWERED BY IMPRESSIONS v4

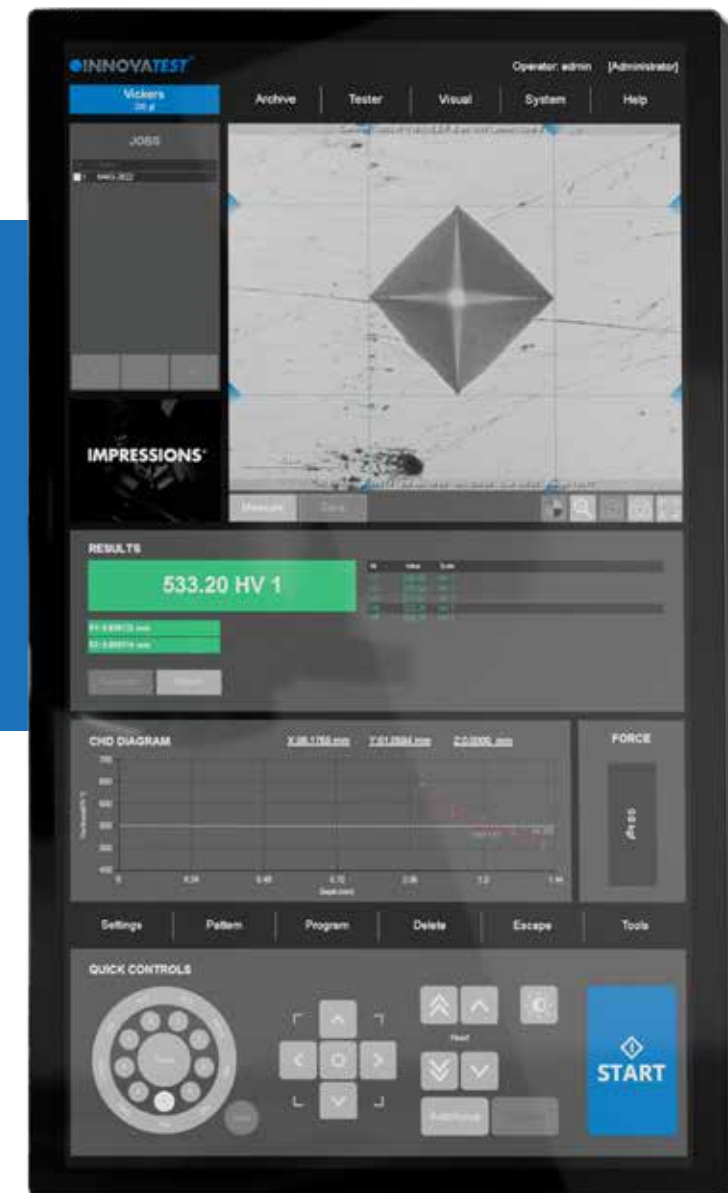
Next gen workflow & tester control...

Just buy a software release ticket, and your tester has added functionality, regardless where it is located. A revolutionary system taking care of all your needs.

In this way we keep the learning curve, the process to work efficiently with our software limited to the level of “need to have” and “need to know”. The proportion of installed and activated software never needs to be more than your requirements.

On the higher end, IMPRESSIONS™ 4 connects flawlessly with quality control systems such as QDAS, exports files in CVS, XML or other formats and if your requirement is not standard, our team of engineers will efficiently find ways to handle your data properly. Bespoke solutions such as connectivity to robotic systems are standard solutions for INNOVATEST™.

Unique to IMPRESSIONS™ 4 is a choice for screen size and position. Whether you wish your interface to be in portrait mode or landscape, all functionality is supported in both positions. For table top solutions like testers in laboratories, users often opt for landscape screen(s).



On the shopfloor the large landscape screens are often an unwanted component either requiring a table top or machine mounted bracket taking a lot of space and cables to deal with. IMPRESSIONS™ 4 leaves you the option to go for landscape or for portrait mode on a large selection of our machines.

TIME REDUCING SOFTWARE SOLUTIONS...



1 PATTERN EDITOR

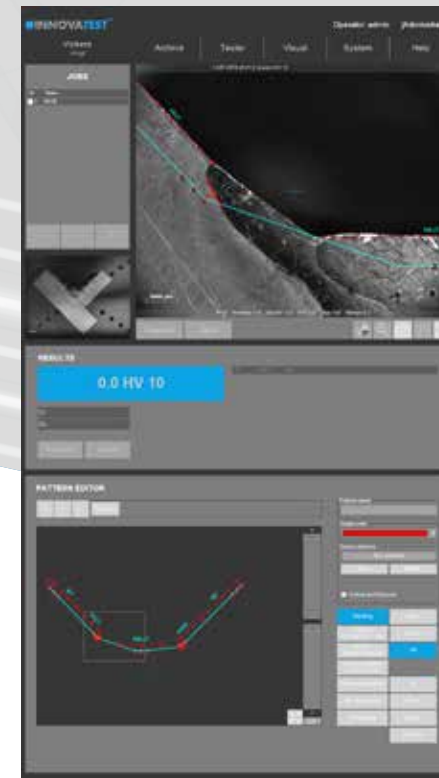
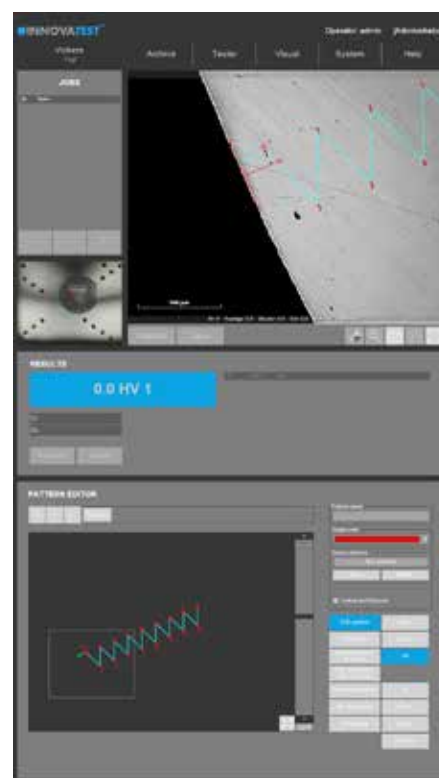
The IMPRESSIONS™ pattern editor allows the user to create any number of test patterns with a large number of variable settings. Create test patterns with great precision and freedom. Verify the settings in the preview mode. Drag & drop patterns from one test sample to another sample. Live vision technique over zoom overview camera, no image stitching required.

Combine different patterns and even different test forces in one program, and run them fully automatically. All test points can be identified individually or to customer specifications. The label is shown in the test result list and in the test results overview and in the results print out. An important function for sample analyses at the end of a test and in the future for review of previous tests.

2 CHD, SHD, NHD

How do you increase throughput in your lab? Make the most common testing design as easy to set up as possible to perform automatically and still adhere to the applicable standards. CHD/SHD/NHD testing can be started directly from the surface view or from the overview. Additional core points of hardness can be defined separately for NHD measurements.

The distances of test points are automatically set to a minimum distance, following the standard, to assure correct testing is conducted. Time saving test mode "complete all indentations – then evaluate" and "auto-stop" to complete test series as soon as the lower hardness limit has been reached. Report Generator is enhanced with reporting features for this application.



3 WELD INSPECTION (ISO 9015)

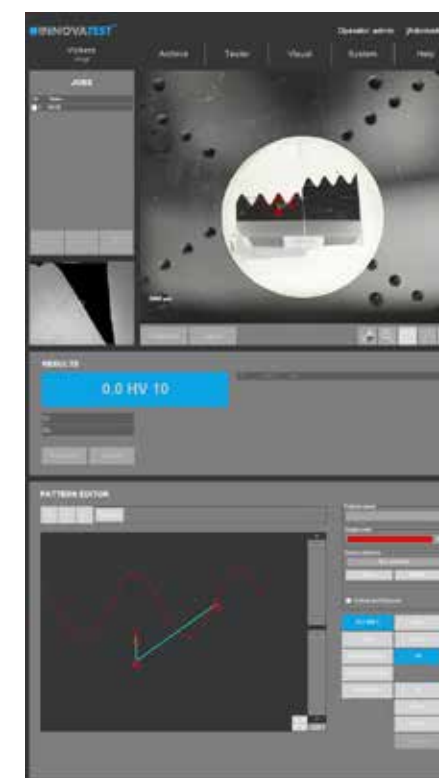
This especially developed tool enables you to conduct hardness testing on welded parts or segments according to ISO standard. Setting up the pattern according to the requirements becomes "easy-to-do", due to pre-set test points in the different zones of the weld and automatic correlation between test points. The system will run a fully automatic test procedure and display and record the results accordingly.

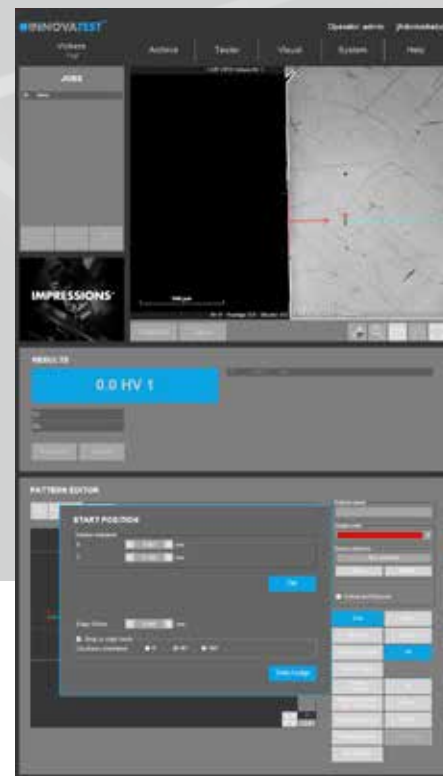
The Report Generator is enhanced with reporting features for this application.

4 HARDNESS OF SCREW THREAD DECARBONIZED ZONE (ISO898-1)

A specialized software tool of IMPRESSIONS™ allows you to set up and conduct fully automatic testing as per ISO898-1 for screw thread measurement of (de)-carbonized part.

The Report Generator is enhanced with reporting features for this application.



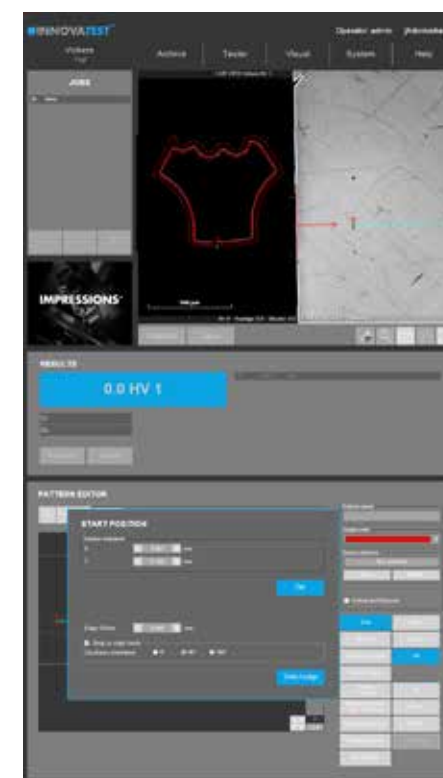
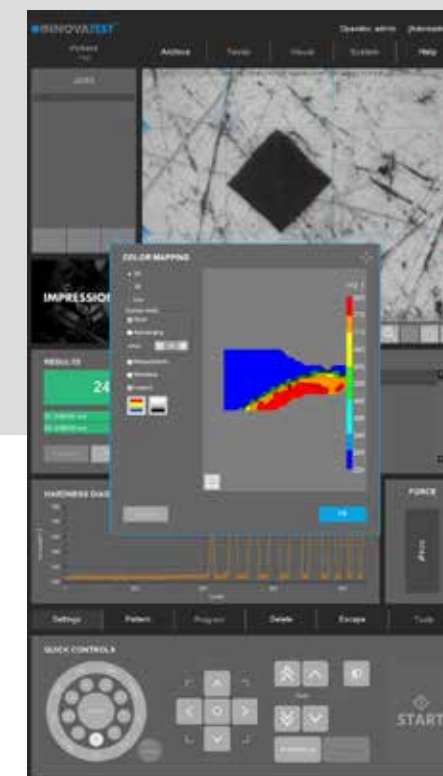


5 EDGE DETECTION

Technology that automatically or at a mouse click recognizes the edge of your sample. This helps to determine and fix the desired starting position for CHD or other pattern testing jobs.

7 2D HARDNESS CHART

The application „Plane hardness chart“, is also referred to as Color Mapping happens to be the perfect tool for securing the detail of the effective hardness distribution over the total sample cross section of heat treated samples. An important feature in material exploration, weld testing or in damage analysis.

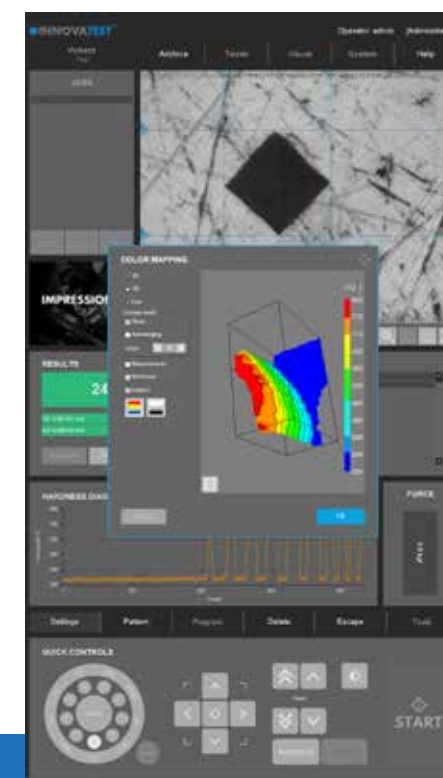


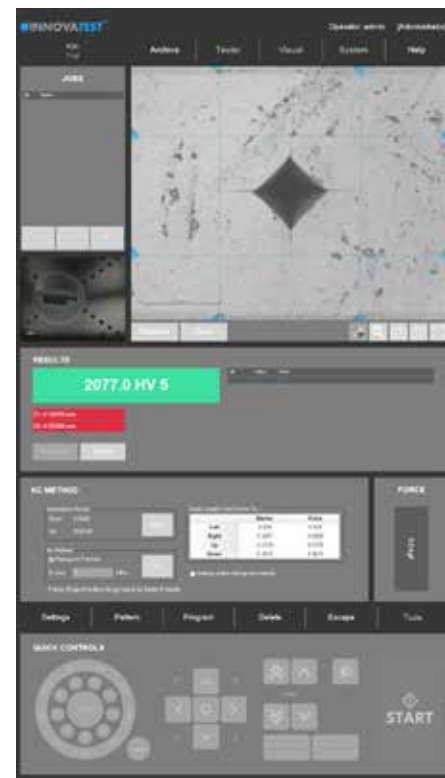
6 AUTOMATIC CONTOUR SCANNING

This application scans the entire outline (or partial) area of a sample. The function can be used with an objective by using the overview zoom camera for high speed scanning. The system scans the entire outline defined and stores all relevant data in the test program.

8 3D HARDNESS CHART

In addition to 2D graphic diagrams, the system can also automatically generate 3D diagrams. 2D and 3D hardness charts are included in one application.





9 K_{ic} CRACK MEASUREMENT

For those requiring more in depth knowledge on materials behavior, wishing to study material fracture and fatigue, crack growth can be predicted and measured by using the K_{ic} application.

The software supports K_{ic} crack detection under load with customized K_{ic} result reporting. By way of one or both methods, Palmqvist or Median / Radial, fracture toughness is now a repeatable and reproducible test across multiple operators.

ISO/IEC 17025 UKAS ACCREDITED.

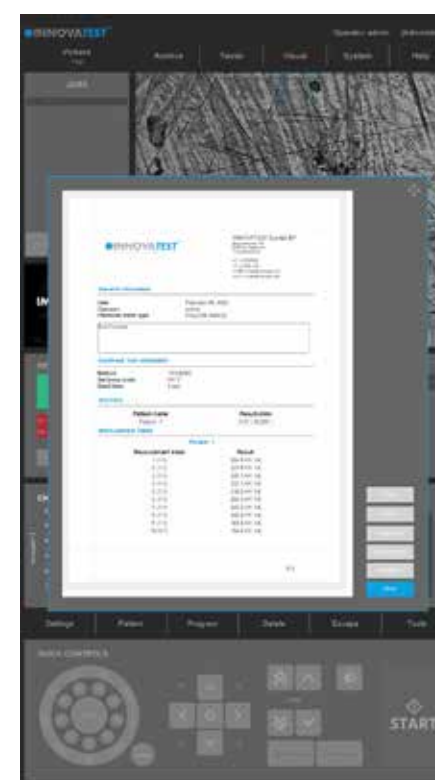
11 USER DEFINED PROGRAMS

For repeating jobs, IMPRESSIONS™ utilizes the option of setting up and storing custom test programs. For each task, a "job" can be created. All application specific parameters, such as hardness scale, force, dwell-time, pattern, conversion and the report template are stored in the same program.



10 SNAPSHOT FUNCTION

This handy function in IMPRESSIONS™ allows you to make screen captures of the viewing area by way of objective view and/or Overview camera. It gives the opportunity to store such images with comments or to paste them into the report generator for further processing.



12 REPORT GENERATOR

Imagine having a report created for you that includes: Your company name, address, contact information, labeled results related to patterns or sequential, pictures of your optical measurements, stitched images, notes section for each result or pictures, rendition of the pattern performed, overview picture of your pattern on your sample, full statistics, summary of your results, go no-go results, Pass or fail...

All this information or having the ability to only have what you need reported, we call this our Report Configurator. You decide how much or how little you report by PDF or laser printer. We even keep it simple by choosing export to CSV file, to a thumb drive or network file location. Data management at its best!

MONITORING

Our world is going through processes that have influence on climate and environment. More often we see extreme heat, extreme cold and periods of extreme rain. To assure that such disturbances of nature do not coincidentally effect your measuring or testing results, we have prepared our machines to climate change and forces of nature.



13 VIBRATION & EARTH QUAKE MONITORING

The integrated high precision accelerometer electronics continuously monitor your tester's stability environment. While the tester has vibration isolators (machine dampers) installation environment is often not ideal. Think of heavy traffic, loaded fork lift trucks, excentre presses or other equipment making shop floor installation a base of trouble.

For certain countries/area's in the world where light earthquakes are so common that they are hardly noticed, the vibration monitoring system will give a warning message and stop the hardness testing process to avoid incorrect readings.



14 TEMPERATURE & HUMIDITY MONITORING

Extreme high or low temperatures might not only effect the hardness readings of your machine (think of installation in extremely warm countries or nearby furnaces) extreme humidity might even damage the sensitive electronics.

IDENTIFICATION

- 15 The basic function of the barcode reader is to load data in to determined user fields. The BAR | QR code module of INNOVATEST connects the machine to a database or network environment loading samples and data.



Whether simply inserting header files (single or serial) or the complete integration of reading devices for the automatic selection of database templates, retrieving data from connected ERP or quality systems (optional) QR and barcode readers simplify complicated work procedures for the operator.



In the above application, a turbo part has been engraved with a QR code. Extra challenging was the fact that the QR code was engraved in a high polished part of the turbo shaft.

All data for the particular turbo part was fixed in the underlying QR code. The scanner loads all customer data in the hardness testing machine and assures that the testing outcome is included in the particular test report database, fully automatic.

AUTOMATIC IMAGE EVALUATION



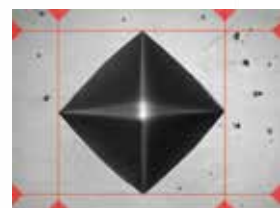
AUTO FOCUS

Fast & precise, observe how IMPRESSIONS™ finds focus from a large distance, as far as the travel of the Z-axis allows. Algorithms used for close distance autofocus set new standards in AF speed.



AUTOMATIC MEASUREMENT

Manual positioning of filar lines is no longer required. IMPRESSIONS™ refined measurement algorithms detect indents even on very poor or scratched surfaces and measure the relevant indent dimensions according to standards. Stay in control by switching to manual measure mode and have the option of adjusting measurements by touching the screen or using the mouse. Filar lines can be colored to give the best contrast against the specimen's surface. To assure that measurements meet relevant standards on symmetry, enable the automatic indent check. All hardness values can be converted to other scales according to ISO 18265, ISO 50150, ASTM E140.



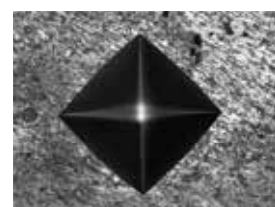
ILLUMINATION SETTINGS

IMPRESSIONS™ software automatic illumination system adapts to the correct illumination regardless of the sample surface quality, wherever on the sample, independent from material (steel, carbide, coated or ceramic). Contrast, Brightness and program, can be set automatically for each measurement or controlled manually. Sharpness can be stored with the pre-determined test.

Too bright

OK

Too dark



Irregular surface

Regular surface

Poor surface

Complex, refined algorithms ensure reproducible measurements on different materials and even on scratched and damaged surfaces.

SUPERIOR ARTIFICIAL INTELLIGENCE (AI)

Hardness testing is only as reliable as its ability to detect the true edges of an indentation.

On polished specimens the task is straightforward, but on rough, uneven, or reflective surfaces, even skilled operators struggle with consistency. Traditional image-processing tools often fail when indent edges are faint or distorted.

INNOVATEST solves this challenge with a proprietary AI-based measurement system that supports Brinell, Vickers, and Knoop testing. The result is machine-driven evaluations that mimic the accuracy of the human eye, but with the repeatability and speed of automation.

The AI was trained on millions of indentation images, covering a wide range of materials, surface finishes, and lighting conditions. Powerful supercomputers optimized the network so it can "see" indents as an expert operator would. During testing, the embedded model performs inference: analyzing each image, generating a precise mask, and automatically measuring the indent with minimal operator input.

For Brinell testing, the system interprets large, shallow, or irregular indents with ease, even on rough castings, forged surfaces, and low-contrast samples. In Vickers testing, it consistently detects pyramid-shaped indents and ensures reliable corner recognition without manual line tracing. For Knoop testing, it provides accuracy on the elongated indent shape, which is notoriously error-prone when identified manually, ensuring repeatability on thin coatings, microstructures, and brittle materials.

AI is paired with INNOVATEST's advanced optical platform, including 18 & 20 megapixel cameras, motorized zoom, and high-speed autofocus. This ensures images are captured under optimal conditions, while the AI interprets them with unmatched reliability.

The benefits are clear: accuracy and repeatability without human bias, significant time savings through automatic detection, and full versatility across Brinell, Vickers, and Knoop applications. With continuous development, the AI models remain adaptable and ready for new materials and test requirements.

INNOVATEST's AI measurement function is more than a tool—it represents a revolution in hardness testing. By applying advanced neural networks to Brinell, Vickers, and Knoop measurements, it provides precision, consistency, and efficiency unmatched by traditional methods.

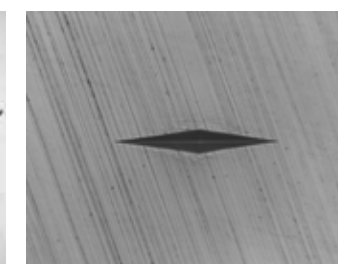
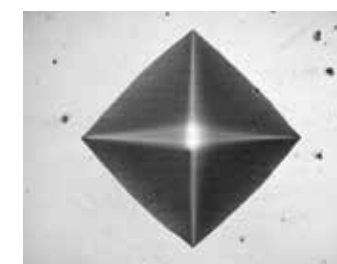


fig.1-2

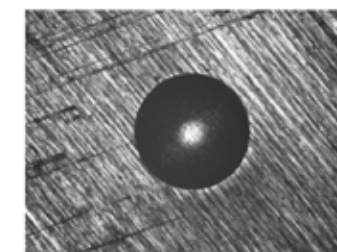


fig.3-4

STEP 1: Select machine type

A

B

C

500gf - 250kgf 3kgf - 750kgf 5kgf - 3000kgf

STEP 2: Additional force range

OPTION 1

200gf - 500gf

OPTION 2

200gf - 3kgf

OPTION 3

1kgf - 5kgf

OPTION 4

200gf - 5kgf

STEP 3: Indenter seats

1 Laser & touch probe

A

B

C

Cross laser
Touch probe
Touch probe laser

2 Indenter seats

A

B

C

200gf - 62.5kgf
1kgf - 250kgf
200gf - 20kgf

✓ = Standard included

STEP 4: Indenters

3 Indenters

A

B

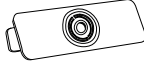
C

D

Rockwell
Brinell
Vickers
Knoop

STEP 5: Optical

4 Overview camera



5 Objectives

x 0.7

x 2.5

x 5

x 10

x 20

x 40

x 60

x 100

6 Ringlights

A

B

STEP 6: Stages/Anvils

7 Stages

A

B

8 Anvils

A

B

C

D

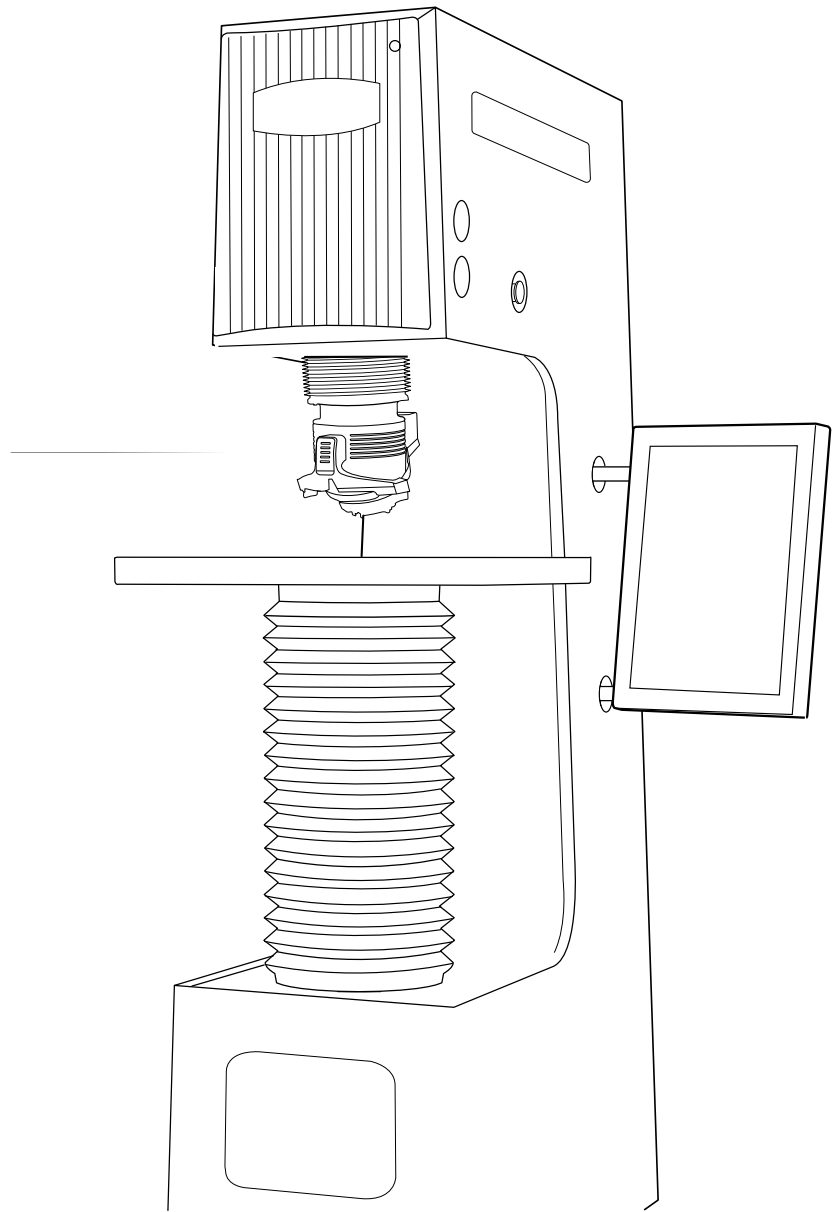
E

F

G

H

I



STEP 8: Fixtures & Vices

9 Fixtures & Vices

A

B

C

D

E

F

G

H

I

J

K

L

STEP 9: Software

MANUAL ON-SCREEN MEASUREMENT

AUTOMATIC MEASUREMENT

AUTOMATIC FOCUSING

REPORT GENERATOR

SNAPSHOT FUNCTION

VIDEO OVERLAY PATTERN EDITOR

IMAGE STITCHING

KIC CRACK MEASUREMENT

AUTOMATIC CONTOUR SCANNING

2D / 3D HARDNESS CHART

DRAWING & MEASURING APPLICATION

AUTOMATIC EDGE DETECTION

FORCE DEPTH/TIME DIAGRAM

HARDNESS OF SCREW THREAD (ISO 898-1)

HARDNESS OF TAPPING SCREWS (ISO 2702)

USER LEVEL MANAGEMENT

CHD, SHD, NHD CONFIGURATOR

Q-DAS

AMMUNITION TESTING PATTERN

WELD INSPECTION (ISO 9015)

VIBRATION, TEMPERATURE & HUMIDITY MONITORING

AI SOFTWARE

BARCODE & QR SOLUTIONS

✓ = Standard included

20

Not all accessories are displayed on this page. Full details can be found on the Order details page.

21

ORDER DETAILS

NEMESIS 9600G2

	NEMESIS 9600G2/A Universal hardness tester, 500gf - 250kgf	NEMESIS 9600G2/A	
	NEMESIS 9600G2/B Universal hardness tester, 3kgf -750kgf	NEMESIS 9600G2/B	
	NEMESIS 9600G2/C Universal hardness tester, 5kgf - 3000kgf	NEMESIS 9600G2/C	
	Option 1: Force range extension 200gf - 500gf, for 9600G2/A only	F9100G2O1	
	Option 2: Force range extension 200gf - 3kgf, for 9600G2/B only	F9100G2O2	
	Option 3: Force range extension 1kgf - 5kgf, for 9600G2/C only	F9100G2O3	
	Option 4: Force range extension 200gf - 5kgf, for 9600G2/C only	F9100G2O4	
	Plug & Play prepared, calibration, sea & airworthy packing in "non coniferous wood" material	P&PSEAPACK130	

ACCESSORIES

STEP 3		Indenter seats			
1	Laser & touch probe	A	Cross laser & touch probe base	SA-05-0027	STANDARD
		B	Touch probe laser based, closed	SA-10-0036	STANDARD
		C	Touch probe laser based, open	SA-10-0045	STANDARD
2	Indenter seats	A	Indenter seat 6.35mm, 200gf - 62.5kgf	SA-10-0035	
		B	Indenter seat 6.35mm, 1kgf - 250kgf	SA-10-0034	
		C	Indenter seat 6.35mm, 200gf - 20kgf (For A version only)	SA-10-0047	
		D	Fixed indenter seat base 6.35mm, 3000kg	SA-10-0046	
			Indenter seat adjustment base, mounting set (1 for each SA-10-0034, 35 & 47)	SA-10-0031	
STEP 4		Indenters			
3	Rockwell	A	Rockwell C Diamond Indenter, ISO & ASTM certified	UPI/6005	
			Rockwell Ball Indenter 1/16". Includes 1 carbide ball, ISO & ASTM certified	UPI/7506	
			Rockwell Ball Indenter 1/8". Includes 1 carbide ball, ISO & ASTM certified	UPI/7606	
			Rockwell Ball Indenter 1/4". Includes 1 carbide ball, ISO & ASTM certified	UPI/7706	
			Rockwell Ball Indenter 1/2". Includes 1 carbide ball, ISO & ASTM certified	UPI/7806	
	Brinell	B	Brinell Indenter 1mm. Includes 1 carbide ball. Ø6.35mm. ISO & ASTM certified	UPI/7000	
			Brinell Indenter 2.5mm. Includes 1 carbide ball. Ø6.35mm. ISO & ASTM certified	UPI/7005	
			Brinell Indenter 5mm. Includes 1 carbide ball. Ø6.35mm. ISO & ASTM certified	UPI/7010	
			Brinell Indenter 10mm. Includes 1 carbide ball. Ø6.35mm. ISO & ASTM certified	UPI/7015	
	Vickers	C	Macro Vickers Indenter Ø6.35mm, ISO & ASTM certified	UPI/8010	
Knoop	D	Macro Knoop Indenter Ø6.35mm, ISO & ASTM certified	UPI/8220		
STEP 5		Optical			
4	Overview camera		Overview / Full view zoom camera + software functionality, field of view 57x60mm up to 225x180mm, Includes overview lights	SA-05-0038	
5	Objectives		BRILIGHT objective 0.7x	SA-05-0046	
			2.5x Long Working Distance objective	ASSUN-OBJ2.5X	
			5x Long Working Distance objective	ASSUN-OBJ5X	
			10x Long Working Distance objective	ASSUN-OBJ10X	
			20x Long Working Distance objective	ASSUN-OBJ20X	

			Adjustable objective socket 2.5x – 100x (1x required for each objective)	SA-05-0025	
			Adjustable objective socket 0.7x (required for 0.7 objective)	SA-05-0026	
6	Ringlights	A	Crystal™ Clear LED ring light, multi use for 2.5x objectives	SA-05-0021	
		B	Crystal™ Clear LED ring light, multi use for 5x objectives	SA-05-0022	
STEP 6	Stages/Anvils				
7	Stages		Large flat surface testing table 650X500mm, thickness 45mm with 2 T-slots, for large components	UN-TESTTABLE/017	
	Clamping, locking & fixing adapters		Lock flange	AS9500-11-12	
			iSMART™ motorized CNC X-Y stage, 215x160mm, total load up to 400Kgf max. Displacement: 75x75mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY7575S	
			iSMART™ stage, 260x205mm, total load up to 400Kgf max. Displacement: 120x120mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY1212S	
			iSMART™ stage, 360x205mm, total load up to 400Kgf max. Displacement: 220x120mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY2212S	
			iSMART™ stage, 490x224mm, total load up to 400Kgf max. Displacement: 340x120mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY3412S	
			iSMART™ stage, 410x265mm, total load up to 4000Kgf max. Displacement: 200x150mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY2015S	
			iSMART™ stage, 510x265mm, total load up to 4000Kgf max. Displacement: 300x150mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY3015S	
			iSMART™ stage, 560x265mm, total load up to 4000Kgf max. Displacement: 400x150mm, resolution 0.001mm, repeatability+/-0.0015mm	MA-XY4015S	
			Motorized CNC X-Y stage, 257x188mm, total load up to 400Kgf max Displacement: 120x120mm, resolution 0.001 mm, repeatability+/-0.003mm	UN-XY571212	
			Motorized CNC X-Y stage, 357x208mm, total load up to 400Kgf max Displacement: 220x120mm, resolution 0.001mm, repeatability +/- 0.003mm	UN-XY572212	
			Motorized CNC X-Y stage, 337X238mm, total load up to 400Kgf max. Displacement: 200x150mm, resolution 0.001mm, repeatability +/- 0.003mm	UN-XY902015	
			Motorized CNC X-Y stage, 437x238mm, total load up to 450Kgf max. Displacement: 300x150mm, resolution 0.001mm, repeatability +/- 0.003mm	UN-XY903015	
			Motorized CNC X-Y stage, 630x238mm, total load up to 450Kgf max Displacement: 400x150mm, resolution 0.001mm, repeatability +/-0.003mm	UN-XY904015	
			Motorized CNC X-Y stage, 410X280mm, total load up to 4000Kgf max. Displacement: 200x150mm, resolution 0.001mm, repeatability +/- 0.008mm	UN-XY932015	
			Motorized CNC X-Y stage, 510x280mm, total load up to 4000Kgf max. Displacement: 300x150mm, resolution 0.001mm, repeatability +/- 0.008mm	UN-XY933015	
			Motorized CNC X-Y stage, 630x238mm, total load up to 4000Kgf max. Displacement: 400x150mm, resolution 0.001mm, repeatability +/- 0.008mm	UN-XY934015	
	Cable sets, mounting & Connectivity for motorized stage		Mounting plate for lock flange	UN-XYZ30FP50-100	
			iSMART™ X-Y stage connection cable	CE-99-0031	
			Lock flange	AS9500-11-12	
			Mounting plate for lock flange	UN-XYZ30FP50-100	
			Dove tail mounting plate, for UN motorized stages	CM-08-0033	
			Cable set for connecting CNC stage to embedded driver (1 set for 2-axis) 155cm	UN-XY2CABLENBL	

8	Anvils	A	Spot anvil 10mm	UN-ANVIL/016	
		B	V block with bracket 40x40x50mm (LxBxH)	UN-VBLOCK404050	
		C	Steel, cross type, (X) V-block 60x120x100mm 8-90mm pair	UN-CROSSBLOCK01	
		D	V-anvil ø120mm 17-100mm	UN-ANVIL/060	
		E	V-anvil ø120mm 3.3-20mm	UN-ANVIL/065	
		F	V-anvil ø120mm 33-200mm	UN-ANVIL/070	
		G	Small V-Anvil 3-20mm requires base plate (Requires Manual/Autom. X-Y stage)	UN-ANVILSV/105	
		H	Large V-Anvil 20-75mm requires base plate (Requires Manual/Autom. X-Y stage)	UN-ANVILLV/106	
		I	Base plate for V-anvils un-anvilsv/105 & 106	UN-VANVILBASEPL	
	Clamping, locking & fixing adapters		Lock flange	AS9500-11-12	
STEP 7	Sample holders				
10	Sample holders	A	1 position sample holder, for 1 embedded sample, diameter 50mm or 2"	UN-ESH1	
		B	4 position sample holder, for max. 4 embedded samples, diameter 50mm or 2"	UN-ESH4	
		C	6 position sample holder, for max. 6 embedded samples, diameter 50mm or 2"	UN-ESH6	
		D	1 position sample holder, for 1 embedded sample, diameter 50mm or 2" with front operation elevator knob	BM-08-0052	
		E	4 position sample holder, for max. 4 embedded samples, diameter 50mm or 2" with front operation elevator knob	BM-08-0053	
		F	6 position sample holder, for max. 6 embedded samples, diameter 50mm or 2" with front operation elevator knob	BM-08-0054	
			12 position sample holder, for max. 12 embedded samples, diameter 50mm or 2" with front operation elevator knob	BM-08-0056	
			1 insert reduction ring 25mm	UN-ESHI25	
			1 insert reduction ring 30mm	UN-ESHI30	
			1 insert reduction ring 40mm	UN-ESHI40	
			1 insert reduction ring 1"	UN-ESHI1	
			1 insert reduction ring 1 1/4"	UN-ESHI125	
			1 insert reduction ring 1,5"	UN-ESHI15	
STEP 8	Fixtures & vices				
11	Fixtures & vices	A	Polished precision vice with lock down system, jaw width 25mm, opens 20mm	UN-VICE/210	
		B	Polished precision vice with lock down system, jaw width 36mm, opens 42mm	UN-VICE/215	
		C	Polished precision vice with lock down system, jaw width 48mm, opens 75mm	UN-VICE/220	
		D	Polished precision vice with lock down system, jaw width 75mm, opens 100mm	UN-VICE/230	
		E	Axle chuck 500 series for cylinder parts, dia. 0.4mm to 5mm	UN-AXLECHUCK	
		F	Universal Clamp & Leveling Device	UN-CLAMP/105	
		G	Thin metal clamp	UN-CLAMP/115	
		H	V groove clamp for small round parts dia.0.8-5mm	UN-VGROOVE- CLAMP	
		I	Wire Testing Fixture for specimen dia. 0.8-3.5mm	UN-WIRE/105	
		J	JOMINY Fixture, for 1 quench end test sample, quick release function	UN-JOMFIX1	
		K	JOMINY Fixture, for 3 quench end test sample, quick release function	UN-JOMFIX3	
		L	Small parts vice jaw width 55mm, open 50mm, self centering	UN-VICE/115	

STEP 9	Software			
	Additional software	Manual on-screen measurement	UN-MANM	STANDARD
		Automatic measurement	UN-AUTOM	STANDARD
		Automatic focussing	UN-AUTOFOC	STANDARD
		Report configurator	UN-REPORTA	STANDARD
		Snapshot function	UN-SNAPSH	STANDARD
		Advanced 3 axis coordinate & free style indent pattern configurator, for motorized stage only	UN-TESTPAT01	
		Advanced 3 axis coordinate & free style indent pattern configurator, + CHD, SHD, NHD and edge detection, (supports manual & digital micrometer stages only)	UN-TESTPAT02	
		Image stitching, composes full stage overview, and detailed sample overview in high resolution. Requires a motorized stage.	UN-IMST01	
		K _{IC} crack detection under load. Palmqvist & Median / Radial fracture toughness	UN-CRKPAR	
		Automatic Contour scanning	UN-CSCAN	
		2D / 3D hardness scanning (mapping, includes automatic contour scanning)	UN-CSCAN2D3D	
		Drawing and measuring (distance & angles) application	UN-DRMEAS	
		Automatic edge detection	UN-EDGEDTC	
		Force depth/time diagram	UN-FDDIAGR	
		ISO898-1 screw thread measurement of (de)-carbonized part. Requires UN-CSCAN	UN-ISO898/1	
		ISO-2702 tap screw thread measurement	UN-ISO2702	
		User level management	UN-LEVMAN	STANDARD
		CHD, SHD, NHD configurator & graphic interface for analogue and digital micro meter stage only (not including full pattern editor)	UN-MCHD	
		CHD, SHD, NHD configurator & graphic interface requires: indent pattern configurator (TESTPAT01)	UN-PATCHD	
		Q-DAS Certified connectivity protocol	UN-QDAS	
		Advanced 3-axis communication protocol for robotic systems	UN-REMC	
		ISO bullets casings pattern configurator and reporting system	UN-SHELLCONF	
		ISO 9015 Weld pattern configurator (automatic weld pattern configurator), requires overview camera or AS9000-0.7OBJ	UN-WELDPAT	
		Vibration, temperature & humidity monitoring	UN-VIBCLC	
		Artificial Intelligence Deep Learning Brinell module	UN-AIDLB01	STANDARD
		Barcode & QR data mapping software	UN-SCANFLOW	

	Connectivity plus	Powerfull external intel core i7 pc, with 16GB ram, and 512GB SSD drive Windows 11 pre-installed including wiring and integration with tester.	UN-SYSPCIMP01	
		Powerful external intel core i9 pc, with 16GB ram, and 512GB SSD drive Windows 11 pre-installed including wiring and integration with tester.	UN-SYSPCIMP02	
		Application of customer supplied PC, plus wiring and integration with tester	UN-SYSPCIMP03	
		Bluetooth connectivity	UN-BTADAPT	
		Utility software; Import test results in MS applications like Excel	UN-SW/905	
		USB to USB null modem cable 2.5M	BE-99-0025	
		Wireless system Keyboard & wireless mouse	UN-SKBSET	STANDARD
		Virtual joystick, on screen		STANDARD
	Additional items			
	Fan Filter Unit	Dust Protection System	SA-16-0001	
	Machine stands	A Cabinet test table with drawer for hardness testers 71x90x57cm	UN-STAND/955	
		B Cabinet test table with drawer for hardness testers 150x75x80cm	UN-STAND/965	
		Seaworthy packing box for 950/960	PACK/100	
		Seaworthy packing box for 965	PACK/200	
	Printer	Laser Printer	UN-PRINT	
	Projector	On request, any brand of choice	UN-PROJECTOR	
	ISO 17025 ISO / ASTM Calibration	BRINELL direct & indirect calibration & certification in compliance with ISO & ASTM, NADCAP, (ILAC-MRA)	DID17025CERT B	
	ISO 17025 ISO / ASTM Calibration	VICKERS direct & indirect calibration & certification in compliance with ISO & ASTM, NADCAP, (ILAC-MRA)	DID17025CERT V	
	ISO 17025 ISO / ASTM Calibration	KNOOP direct and indirect calibration & certification in compliance with ISO & ASTM, NADCAP, (ILAC-MRA)	DID17025CERT K	
	ISO 17025 ISO / ASTM Calibration	ROCKWELL direct & indirect calibration & certification in compliance with ISO & ASTM, NADCAP, (ILAC-MRA)	DID17025CERT R	
	Cover	Machine cover 800x1150x2100mm	UN-COVER9	

ACCESSORIES

INDENTER SEATS

Laser & touch probe

A
SA-05-0027

B
SA-10-0036

C
SA-10-0045

Indenter seats

A
SA-10-0035

B
SA-10-0034

C
SA-10-0047

D
SA-10-0046

INDENTERS

Indenters

A
Rockwell Diamond Indenter

B
1mm Carbide Ball Indenter Ø6.35mm

C
Macro Vickers Indenter Ø6.35mm

D
Macro Knoop Indenter Ø6.35mm

1/16" Carbide Ball Indenter

2.5mm Carbide Ball Indenter Ø6.35mm

1/8" Carbide Ball Indenter

5mm Carbide Ball Indenter Ø6.35mm

1/4" Carbide Ball Indenter

10mm Carbide Ball Indenter Ø6.35mm

1/2" Carbide Ball Indenter

OPTICAL

Overview camera

SA-05-0038

Objectives

2.5x Long Working Distance objective

5x Long Working Distance objective

10x Long Working Distance objective

20x Long Working Distance objective

BRILIGHT objective 0.7x

Ringlights

A
SA-05-0021

B
SA-05-0022

STAGES/ANVILS

Stages

A
UN-TESTTABLE/017

B

Motorized CNC XY-Stages

MA-XY571212
MA-XY902015
MA-XY932015
MA-XY572212
MA-XY903015
MA-XY933015
MA-XY904015
MA-XY934015

iSMART™ stages

MA-XY7575S
MA-XY2212S
MA-XY2015S
MA-XY1212S
MA-XY3412S
MA-XY3015S

STAGES/ANVILS

Anvils



UN-ANVIL/016



UN-VBLOCK404050



UN-CROSSBLOCK01



UN-ANVIL/060



UN-ANVIL/065



UN-ANVIL/070



UN-ANVILSV/105



UN-ANVILSV/106



UN-VANVILBASEPL

SAMPLE HOLDERS

Sample holders - Regular model



UN-ESH1



UN-ESH4



UN-ESH6



UN-ESHI25



UN-ESHI30



UN-ESHI40

Sample holders - Front operation



BM-08-0052



BM-08-0054



BM-08-0056



UN-ESHI1



UN-ESHI125



UN-ESHI15

FIXTURES & VICES

Fixtures & vices



UN-VICE/210



UN-VICE/215



UN-VICE/220



UN-VICE/230



UN-AXLECHUCK



UN-CLAMP/105



UN-CLAMP/115



UN-VGROOVE-CLAMP



UN-WIRE/105



UN-JOMFIX1



UN-JOMFIX3



UN-VICE/115

ADDITIONAL ITEMS

Fan Filter Unit



SA-16-0001

Machine stands



UN-STAND/955



UN-STAND/965

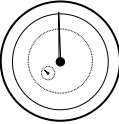
Covers



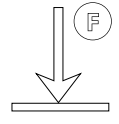
UN-COVER9

SPECIFICATIONS

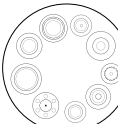
HARDNESS SCALES

	ROCKWELL	Regular Rockwell scales; Pre Load 10kgf, Main Load 60kgf 100kgf 150kgf A B C D E F G H K L M P R S V
	EN-ISO 6508 ASTM E-18 JIS Z 2245	Superficial Rockwell scales; Pre Load 3kgf, Main Load 15kgf 30kgf 45kgf 15N 30N 45N 15T 30T 45T 15W 30W 45W 15X 30X 45X 15Y 30Y 45Y
	VICKERS	HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV4, HV5, HV10, HV20, HV25, HV30, HV40, HV50, HV60, HV100, HV120, HV150
	ISO 6507 ASTM E384, E92 JIS B 7725	
	K_{IC} Fracture toughness	All Vickers forces & scales
	KNOOP	HK0.2, HK0.3, HK0.5, HK1, HK2, HK2.5, HK3, HK4, HK5
	ISO 4545 ASTM E92 JIS Z 2251	
	BRINELL	HBW1/1 HBW1/1.25 HBW1/2.5 HBW1/5 HBW1/10 HBW1/30 HBW1/31.25 HBW2.5/6.25 HBW 2.5/7.8125 HBW2.5/15.625 HBW2.5/31.25 HBW2.5/62.5 HBW2.5/187.5 HBW5/25 HBW5/31.25 HBW5/62.5 HBW5/125 HBW5/250 HBW5/750 HBW10/100 HBW10/125 HBW10/250 HBW10/500 HBW10/1000 HBW10/1500 HBW10/3000
	ISO 6506, ASTM E10 JIS Z 2243	
	HVD (HVT)	HV0.2 HV0.3 HV0.5 HV1 HV2 HV2.5 HV3 HV4 HV5 HV10 HV20 HV25 HV30 HV40 HV50 HV100 HV120 HV150
	VDI/VDE 2616-1	
	HBD (HBT)	HBD (HBT): HBW1/1 HBW1/1.25 HBW1/2.5 HBW1/5 HBW1/10 HBW1/30 HBW2.5/6.25 HBW2.5/7.8125 HBW2.5/15.625 HBW2.5/31.25 HBW2.5/62.5 HBW2.5/187.5 HBW5/25 HBW5/31.5 HBW5/62.5 HBW5/125 HBW5/187.5 HBW5/250 HBW10/100 HWB10/125 HBW10/250 HBW10/750 HBW10/1000 HBW10/1500 HBW10/3000
	VDI/VDE 2616-1	
	PLASTIC	49,03 N, 132,9 N, 357,9 N, 961 N
	ISO 2039	
	CARBON	HR 2.5/7 HR 5/7 HR 5/15 HR 5/20 HR 5/40 HR 5/60 HR 5/100 HR 5/150 HR 10/20 HR 10/40 HR 10/60 HR10/100 HR 10/150
	CONVERSIONS	Conversion to other hardness scales according to ASTM E140, ISO 18265, GB/T 1172

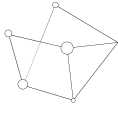
TEST FORCE

	Force application	Servo drive, precision gearbox, motion & torque feedback system
		Multi-load cell, closed loop, force feedback
	Test forces	500gf – 3000kgf
	Force range per model	NEMESIS 9600G2/A 500gf - 250kgf
		NEMESIS 9600G2/B 3kgf - 750kgf
		NEMESIS 9600G2/C 5kgf - 3000kgf
	Optional force ranges	OPTION 1 200gf - 500gf
		OPTION 2 200gf - 3kgf
		OPTION 3 1kgf - 5kgf
		OPTION 4 200gf - 5kgf
	Test force tolerance	< 0.25% for test force 100gf to 3000kgf
		< 0.5% for test force below 100gf

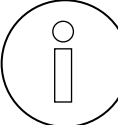
MOTORIZED TOOL CHANGER

	Dwell time settings	Default 10 seconds, user defined. Up to 999 seconds
	Motorized tool changer (turret)	Ultra-fast, 9 position, 8 free to configure, 1 fixed
	Free tool positions	8 for indenters, 8 for objectives (8 max total)
	Fixed tool positions	1 for cross laser & touch probe
	Objectives	Long working distance 0.7x, 2.5x, 5x, 10x, 20x, 40x, 60x, 100x
	Indenters	Certified indenters (ISO/ASTM) available at choice
	Camera 1 (objective)	20 Mpx, HD, 4K+, Machine vision system
	Camera 2 (overview)	18 Mpx Full HD, Full Color, Optical zoom system, variable FOV 40 x 30mm - 140 x 110mm

SYSTEM

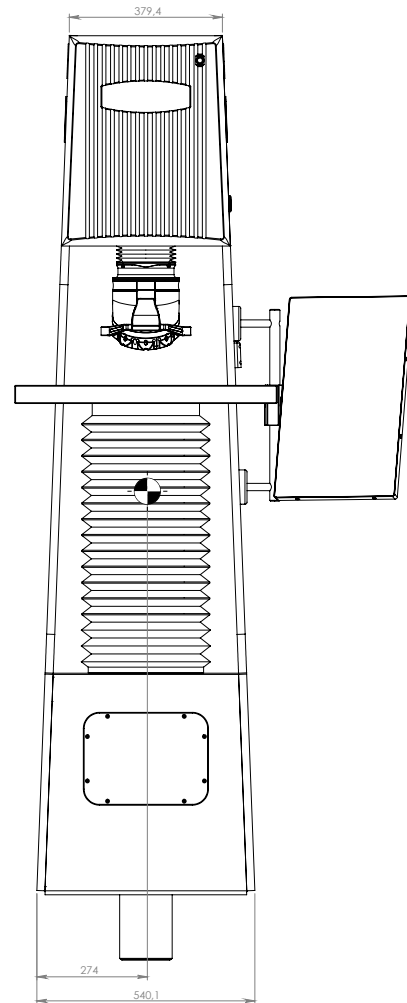
	Electronic system Standard (Recommended)	High performance embedded controller, i7 mSSD, 512 GB MS Windows® 11 operated , up to 8 years* INNOVATEST warranty
	Electronic system (Optional)	High performance external controller, i7 or i9 SSD, 1TB MS Windows® 11 operated, 1 year factory warranty
	Screen(s)	22” capacitive touchscreen (portrait mode)
	Display resolution	0.01 HV, HK, HB
	Statistics	Total test, max, min, average, range, standard deviation, All in real time after each test
	Hardness conversion	Rockwell, Rockwell Superficial, Vickers, Brinell, Knoop, Leeb & Tensile
	Software	IMPRESSIONS™ V4, work flow system & tester control
	Data storage capacity	Internal and external mSSD, SSD or HDD
	Data output	XML, CSV, Certified for Q-DAS (optional)
	Data input	Keyboard, touchscreen, barcode scanner, database
	Connectivity	5 USB ports, RJ45 Ethernet LAN, W-LAN, RS-232, Blue Tooth, 5 Axis CNC & motorized XY-stage connector, Dual HDMI screen connectors
	Printer	A4, A3 full color laser printer (optional)

GENERAL

	Machine dimension	600mm x 1200 x 3000
	Machine weight	1100 kg
	Workpiece accommodation	650mm (H) x 395mm (D)
	Power supply	100VAC to 240VAC, 50/60Hz, single phase
	Operating temperature	10°C to 35°C
	Power consumption	426W
	Humidity	10% to 90%, non-condensing
	Noise	< 70 db(A)

* Check individual warranty conditions

TECHNICAL DRAWINGS

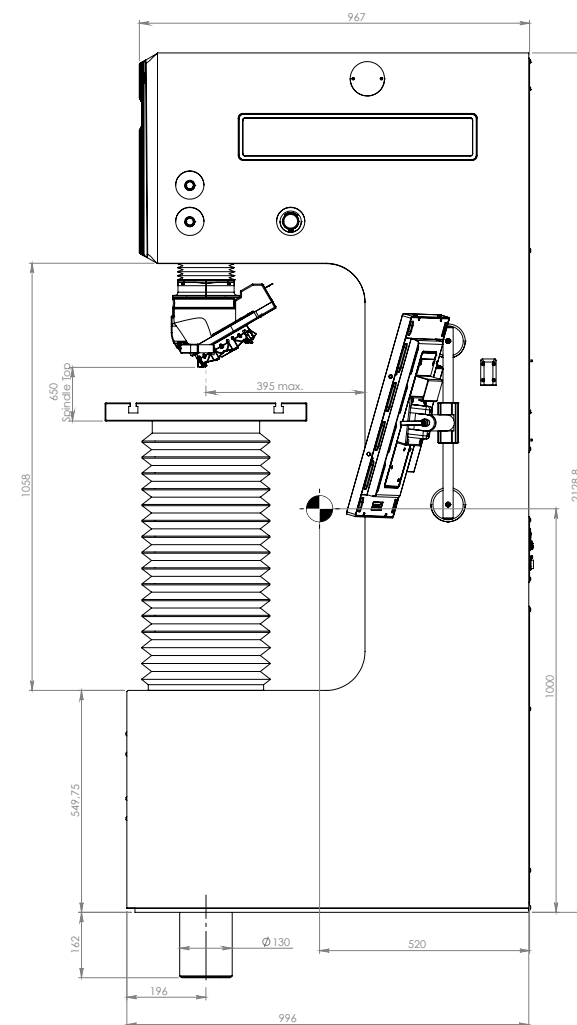


All dimensions in these drawings are in mm, approximate. Working heights and or workpiece accommodation varies depending on the stages and stage accessories used.

Please contact our sales department for more details.

All dimensions in these drawings are in mm, approximate. Working heights and or workpiece accommodation varies depending on the stages and stage accessories used.

Please contact our sales department for more details.



OTHER MODELS IN THE UNIVERSAL RANGE



FENIX 300U

Load Cell, Closed loop, force feedback, test force application system Universal hardness tester with I-TOUCH™ system.
See brochure B20F300/XX



VERZUS 750U

Fully automatic, load cell, Closed loop, force feedback universal hardness tester with electronic micrometer or analogue eyepiece. IMPRESSIONS™ 8.5" full color touchscreen.
See brochure B19V750U/XX



NEXUS 7700G2

Fully automatic, load cell, closed loop, force feedback universal hardness tester with full HD optical zoom stage overview camera, IMPRESSIONS™ 22" full color touchscreen.
See brochure B23N7700G2/XX



NEXUS 8100G2

Heavy duty fully automatic, load cell, Closed loop, force feedback universal hardness tester with full HD optical zoom stage overview camera, IMPRESSIONS™ 22" full color touchscreen.
See brochure B25N8100G2/XX



NEXUS 8100XLM G2

Heavy duty fully automatic, load cell, Closed loop, force feedback universal hardness tester with full HD optical zoom stage overview camera, IMPRESSIONS™ 22" full color touchscreen.
See brochure B25N8100G2/XX



NEMESIS 5100G2

Multi load cell, Closed loop Fully automatic, 8 position turret Rockwell, Superficial Rockwell, Micro/Macro Vickers, Knoop & Brinell Hardness testers Descending test head, 150 mm fixed work piece position.
See brochure B23N5100G2/XX



NEMESIS 9100G2

Multi load cell, Closed loop Fully automatic, 8 position turret Rockwell, Superficial Rockwell, Micro/Macro Vickers, Knoop & Brinell Hardness testers Descending test head, 300 mm fixed work piece position.
See brochure B23N9100G2/XX

Changes in products and/or product specifications can emerge due to new technologies and continuous development.

We reserve the right to change or modify specifications of the products without prior notice. We recommend you to contact our sales office for up-to-date information.

Brochure B25N9600G2/02/EN

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EUROPE

INNOVATEST Deutschland GmbH.
Sales & Service
Phone: +49 245 670 59 500
info@innovatest-deutschland.com
www.innovatest-deutschland.com

INNOVATEST France SARL
Sales & Service
Phone: +33 1 848 88038
commercial@innovatest-france.com
www.innovatest-france.com

INNOVATEST UK Ltd.
Sales & Service
Phone: +44 (0) 121 824 4775
info@innovatest-uk.com
www.innovatest-uk.com

INNOVATEST Polska sp. z o.o
Sales & Service
Phone: +48 697 099 826
info@innovatest-polska.pl
www.innovatest-poland.com

MIDDLE EAST

INNOVATEST Middle East LLC
Sales & Service
Phone: +971- 4- 880 0875
info@innovatest-mideast.com
www.innovatest-mideast.com

NORTH-AMERICA

INNOVATEST USA Inc.
Sales & Service
Phone: +1 267 317 4300
info@innovatest-usa.com
www.innovatest-usa.com

ASIA

INNOVATEST Shanghai Co., Ltd.
Sales & Service
Phone: +86 21 60906200
Fax: +86 21 60912595
info@innovatest-shanghai.com
www.innovatest-shanghai.com

INNOVATEST Japan K.K.
Sales & Service
Phone: +81 3 6667 0554
Fax: +81 3 6667 0556
info@innovatest-japan.com
www.innovatest-japan.com

INNOVATEST South East Asia
Sales & Service
Phone: +65 6451 1123
Fax: +65 6452 1011
info@innovatest-singapore.com
www.innovatest-singapore.com

Distributor :

CORPORATE HEAD OFFICE

INNOVATEST Europe BV
Manufacturing, Distribution & Service
Borgharenweg 140
6222 AA MAASTRICHT
The Netherlands

Phone: +31 43 3520060
Fax: +31 43 3631168
info@innovatest-europe.com
www.innovatest-europe.com