

# NEMESIS 5100

Universal Hardness Tester | Rockwell, Vickers, Knoop, Brinell

**AUTOMATIC / FULLY AUTOMATED**




# NEMESIS 5100

## Truly Universal...





The NEMESIS 5100 Series Universal Hardness testing systems provide exceptional performance and are designed with enhancements that deliver unparalleled accuracy and reliability, improved ergonomics and an overall enhanced and pleasant experience for the operator. The IMPRESSIONS® tester control and work flow software, forms an integral component of the testing system. Decreasing set up time and increasing testing efficiency through the use of programmable test patterns and specific designed software applications, developed upon the request of demanding users.

NEMESIS 5100 hardness testing instruments are routinely used for testing metals and plastics, in the aerospace and automotive industry, laboratories for sample evaluation, or to conduct common but versatile testing tasks.





### HARDNESS SCALES

- 
**VICKERS** 10gf - 150kgf  
also HVD (HVT)
- 
**KNOOP** 10gf - 5kgf
- 
**BRINELL** 1kgf - 3000kgf  
also HBD (HBT)
- 
**ROCKWELL** 3kgf - 150kgf

\* For more details on the scales see page 28



#### TECHNOLOGY OF TODAY



Load cell, closed loop, force feedback system

### A FORCE RANGE, WHERE NO ONE HAS GONE BEFORE!

1gf	10gf	<b>NEMESIS 5101</b>	250kgf	3000kgf
1gf	100gf	<b>NEMESIS 5102</b>	250kgf	3000kgf
1gf	10gf	<b>NEMESIS 5103</b>		3000kgf

*\*Also see Nemesis 9100*

## HIGHLIGHTS

- 1 Multi Load Cell, Closed Loop force application system, error <0,25%
- 2 Descending test head, with fixed work piece position
- 3 8-position turret with standard built-in laser positioning system
- 4 3 indenter positions, 3 LWD objectives installed (included)
- 5 18 Mega pixels, 4K+, full color, integrated camera system
- 6 Quick change anvil post
- 7 CNC motorized XY-stages, variable stage dimensions and travel ways
- 8 Full XY-stage overview camera, optical zoom system, with variable field of view
- 9 TTL power LED, Dual source power LED bank, stage illumination
- 10 Z-axis with ball bearing spindle
- 11 Integrated high performance system controller, i7 processor, 120GB mSSD storage
- 12 Industrial 15" touch screen, option for second screen 15" to 55" or projector
- 13 Top-class replaceable body parts, shock proof ABS covers

## Crossing all boundaries...

### 1 8 POSITION PRECISION TURRET & LASER POSITIONING

The 8 position turret is supplied as a standard feature on all 5100 models and allows to install indenters for Rockwell, Vickers, Knoop and Brinell (balls 1mm, 2.5mm, 5mm & 10mm) testing. Factory installed, the NEMESIS 5100 has 3 objectives 0.7x, 5x, 10x, 20x and a standard built-in Laser Positioning system.

### 2 STAGE OVERVIEW CAMERA (OPTIONAL)

Create magnified sample overview with the optional integrated auto focus optical & digital zoom, overview camera. The field of view of this sophisticated full color camera system does not limit you to one field of view, but gives a ZOOM range of 50 x 35 mm up to 200 x 180 mm without the need to use time-consuming scan and stitch functions.

Once the viewing area needs to be larger than the zoom range, scanning and stitching can be selected to create full stage overview. Click and go is one of the standard testing features of the overview camera. Just click randomly on designated area's and push "start". All tests run automatically. The pattern video overlay function eases positioning of multiple test rows or patterns across the specimen. The pattern video overlay scales automatically with every magnification, stepless, while the zoom camera decreases or enlarges the overview.

### 3 DYNAMIC Z-AXIS CONTROL & COLLISION DETECTION

A high end ball bearing Z-axis spindle is one of the very unique functions. Z-axis displacement at an accuracy of micron's supports ultra-fast auto focus. Z-axis controls are nearly limitless; CNC as a result from a test program, by touch screen indicators, from the built in joy stick, by the scroll wheel of the mouse, by fast up and down buttons or from a scroll wheel on the front of the machine. Positioning has never been this easy. Speed control related to your own movement; (0.01 up to 20 mm/s). To avoid any collision between the work piece and the turret, the Z-axis is controlled by a flawless collision detection and Z-axis retraction system. So neither the tester nor the workpiece are exposed to any damage.

### 4 HIGH SPEED CNC MOTORIZED XY-STAGE (OPTIONAL)

Save time and improve efficiency with one of the high speed, highly accurate motorized XY-stages. Available in variable sizes from standard, to large and extra-large. Enable automated sequencing of multiple samples. The ultra-high accuracy and repeatability guarantee precise positioning of indents and allow re-evaluation of any measurement points in batch or single view. Repeatability within 3 micron.



### CONNECTIVITY, CONTROL & QUALITY ASSURANCE

The system has bi-directional in and output channels. Tester control can be conducted remotely and supports for instance, but not limited to robotic systems. Test values can be exported as single values or as string of data to be handled by 3rd party quality evaluation software.

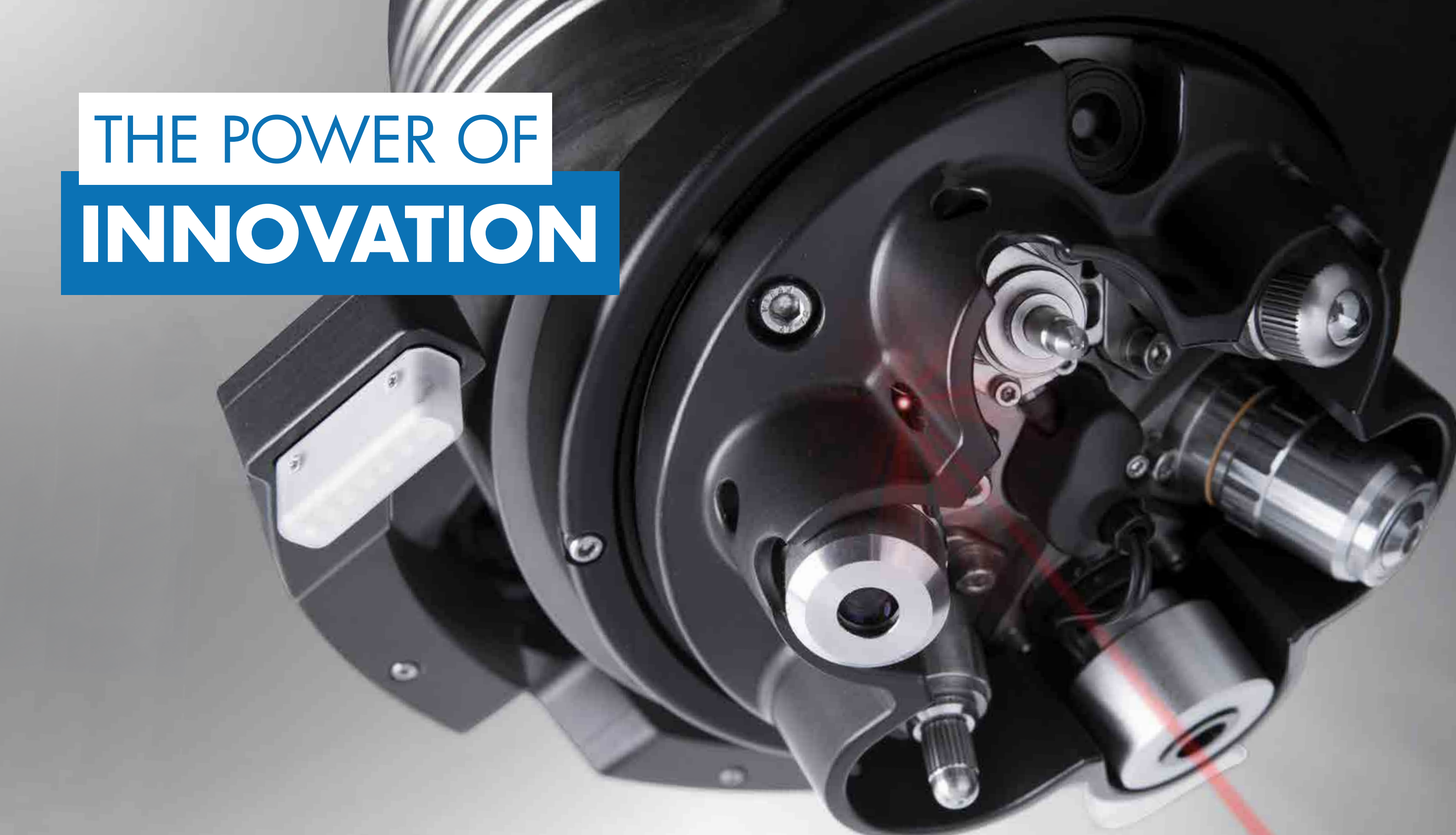
Q-DAS certified. (Optional)

### 5 15" HD TOUCH SCREEN OPERATOR INTERFACE

All machine control and workflow process can easily be operated from the 15" industrial capacitive touch screen. At choice a second 15" or larger screen can be connected.

### 6 SHOCK RESISTANT ABS MACHINE COVERS

The tester is fitted with a high-end external shell structure. All in a unique design with high-end aluminium panels. The shock proof and damage resistant ABS machine covers can withstand the harshest environment.



# THE POWER OF INNOVATION

**It's not about idea's, it's about making ideas happen...**

Sophisticated and unique, 100% linear, vertical force actuator. Cutting edge technology, high speed turret with integrated multi load cell signal handling, stage overview camera at indenter position, power LED TTL illumination, positioning laser and an advanced collision detection and test head retraction system.

# TURRET TECHNOLOGY

The high speed 8 position turret or revolver is the main center of performance of the NEMESIS 5100 series.

Designed for test forces up to 3000kgf in the NEMESIS 5100 configuration, this masterpiece of mechanics and optics also incorporates load cells and electronics to handle all force application and force system feedback.

It's also the home base of the high definition overview camera equipped with optical zoom system and autofocus, at indenter position. The technology of this camera provides a variable field of view of the overview, not seen in the industry before. Time consuming image stitching is therefore not required for most common samples.



## 1 POWER LED BANKS

On the side of the turret, mounted at a distance, two power LED banks provide cross surface illumination, assuring that the overview system has excellent viewing performance under all circumstances and on all materials.

## 2 4 OBJECTIVES

The four long working distance objectives mounted on the turret as a standard accessory, channel images to the built in 18 Megapixels, full color, 4k+ camera system. The result is a bright, sparkling image of your indent, the start of a successful precise automatic measurement function.

## 3 LASER POSITIONING SYSTEM

Another feature, not seen before in this class of instruments, is the standard, Class 3A laser positioning system. Position parts with great precision at the exact indent position. Provides operator comfort without limitations.



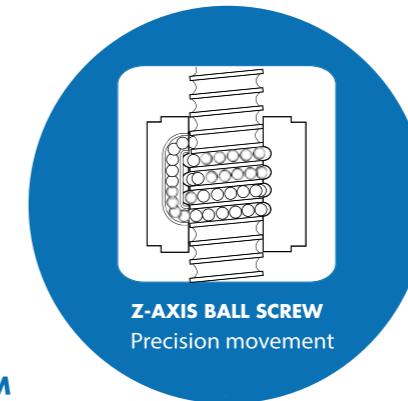
## 4 PROTECTION SYSTEM

Protecting the turret, load cells, optics and other parts, but also the workpiece against collisions caused by operator failure or program failure, the turret has a highly sensitive collision detection and retraction system. Broken indenters or damaged optics are simply history.

The system also recognizes unintended resistance that could be caused from hands or fingers and will retract the test head in any suspect situation instantly.

The turret also has a ridged protection parts for possible hits caused by positioning of the to be tested. The skirt mounted on the rotating center of the turret protects each individual turret position against accidental damage.

Vertical force actuator with position reading system



Z-AXIS BALL SCREW  
Precision movement

## MULTI LOAD CELL SYSTEM

To cover the wide range of test forces the low force models have three load cells installed. Each with its specific force range. Only in this way, high force accuracy and repeatability are always guaranteed.

## POSITION READING SYSTEM

The force actuator with a stroke of 150 mm has a linear reading system (glass scale) manufactured by HEIDENHAIN Germany. This top quality system with ABS position reading, provides a constant loop of information on the position of the test head and communicates details of the position that are used for rapid autofocus. This system enables you to conduct comprehensive depth measurement methods such as HVD (HVT) and HBD (HVT) normally not available on Micro Vickers / Vickers hardness testing machines.

## SERVO DRIVE SYSTEM

The actuator is driven by a high quality servo drive system. The system provides constant feedback on load, speed, resistance and other parameters that influence the operating process and tester integrity. At a central position in the force actuator, a ball bearing spindle translates the servo rotation to the operator desired direction or test cycle. Tester control and performance at the highest level.

The advantage of the descending test head over traditional spindle machines is the ease of handling larger parts and the fixed height of the workpiece position. Traditional spindle machines usually have a trapezoid spindle, that offers little accuracy on position, a wobbly image and a slower autofocus function.

Servo Drive System for low force models



3-AXIS joystick with fine adjustment

## Science fiction?... No, just reality ahead of schedule

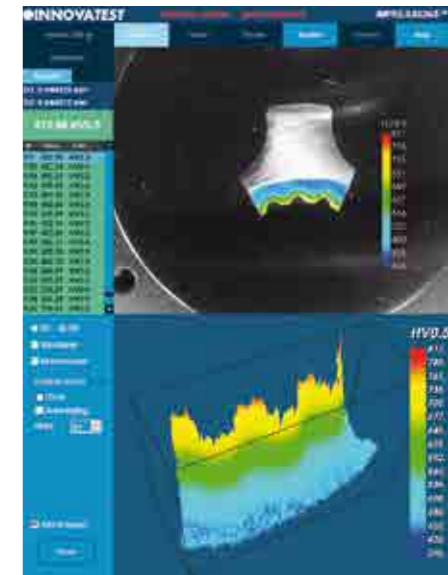
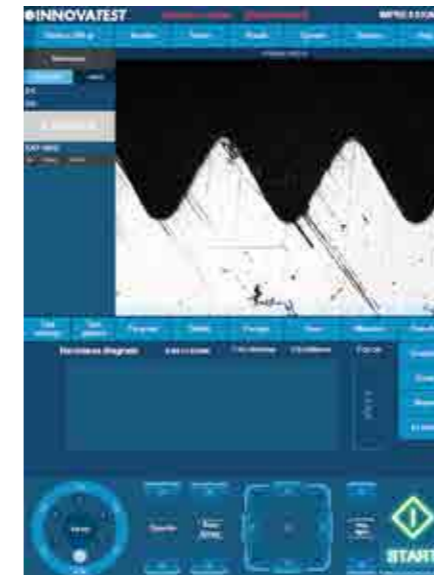
The Graphical User interface (GUI), contains industry preferred applications, and offers easy to learn, advanced workflow control. A simple test can be set up and conducted in about 3 seconds... IMPRESSIONS layout & functions will match not only your particular application requirements, but also meet the needs and preferences of your operators. A user level management system maximizes their comfort and efficiency.

The unique in the industry, 15" portrait mode, capacitive touch screen, gives room to all possible applications. Dual screen: For demanding users, a second vertical 15" or 24" landscape screen can be connected. For educational purposes, schools, universities, a full HD projector can be connected to the HDMI supported outlet. With this many options in Hardware and Software configuration, yearly updates and on demand upgrades, IMPRESSIONS® is truly the leading software in the industry.



# FEATURED BY IMPRESSIONS v2

ADVANCED SOFTWARE APPLICATIONS



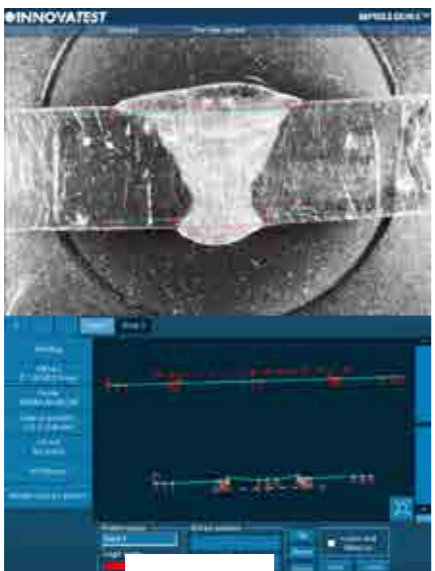
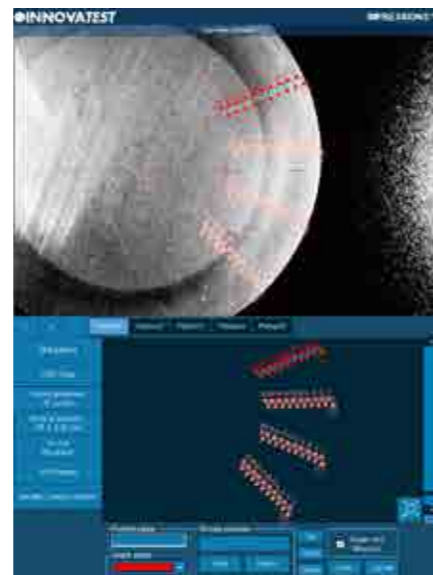


### 1 VIDEO OVERLAY GRAPHIC PATTERN EDITOR

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 print out. An important function for later sample analyses.

### 2 CHD, SHD, NHD

For the performance of test series for CHD/SHD/NHD data of specimens according to standard. The test 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.



### 3 WELD INSPECTION (ISO 9015)

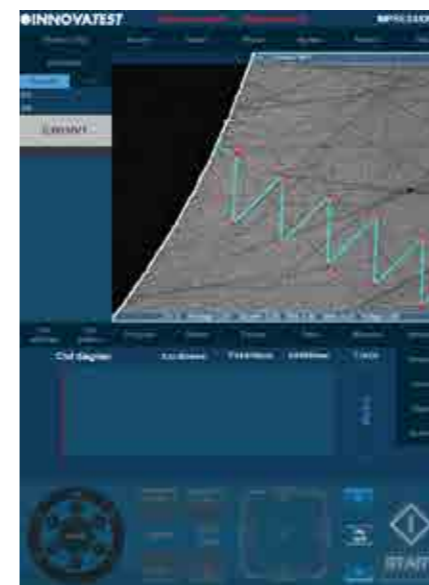
This especially developed tool enables you to conduct hardness testing on welded parts or segments according to ISO standard. Setting up the pattern according to the requirements becomes "easy-to-do", due to pre-set test points in the different zones of the weld and automatic correlation between test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

## Easy to operate, time reducing solutions...



### 4 HARDNESS OF SCREW THREAD DECARBONIZED ZONE (ISO-898-1)

A specialized software tool of IMPRESSIONS® allows you to set up and conduct fully automatic testing as per ISO 898-1 for screw thread measurement of (de)-carbonized part.



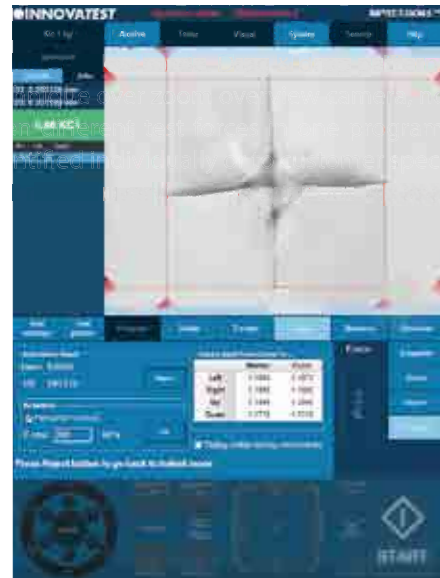
### 5 AUTOMATIC EDGE DETECTION

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.



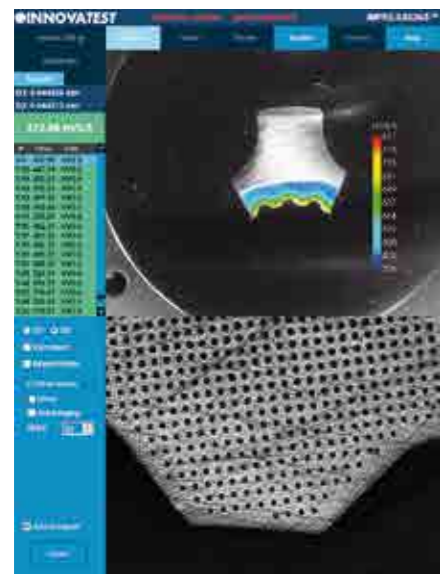
### 6 AUTOMATIC CONTOUR SCANNING

This application scans the entire outline (or partial) area of a sample. The function can be used with an objective or, ultra fast, by using the overview zoom camera. The system scans the entire outline defined and stores all relevant data in the test program. Subsequently, a chosen number of test points can be programmed into the particular program, or be conducted at selected distances, relative to the edge. This advanced feature enables the hardness testing procedure to be performed completely automatic. An excellent feature to combine with 2D or 3D hardness mapping, also known as "plane hardness chart".



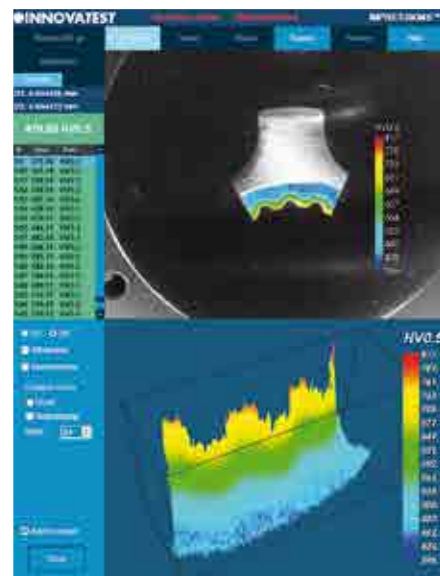
**7 Kic CRACK MEASUREMENT**

For those requiring more in depth knowledge on materials behavior, and wish to study on fracture and fatigue, crack growth can be predicted (and measured) by using the Kic application. The software supports Kic crack detection under load. At choice, one of both methods, Palmqvist or Median / Radial fracture toughness can be selected.



**8 2D HARDNESS CHART**

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



**9 3D HARDNESS CHART**

Besides the option to display a 2D graphic diagram, the system can generate a 3D visual. 2D and 3D hardness chart are one application.

**10 SNAPSHOT FUNCTION**

This handy function in IMPRESSIONS® allows you to make screen captures of the viewing area. It gives the opportunity to store such images with comments or to paste them into the report generator for further processing.



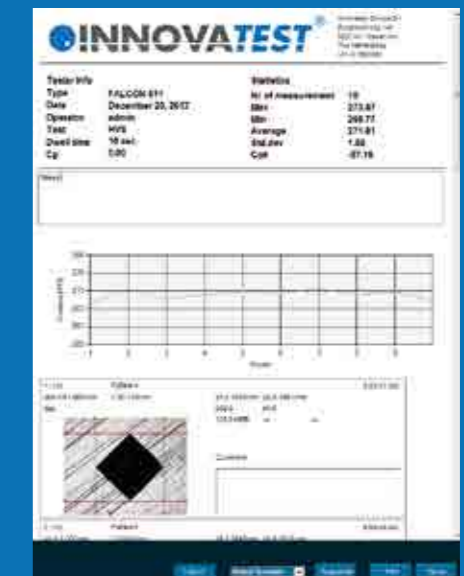
**11 USER DEFINED PROGRAMS**

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, like hardness scale, force, dwell-time, pattern, conversion and the report template are stored in the same program.



**12 REPORT GENERATOR**

The report generator offers to design customized testing reports, including your company’s details and logo and include testing results, graphics and pictures of indentations in an easy to edit environment. The file can be printed straight to a connected laser printer for further distribution. Alternatively the file can be exported as a CSV file, to be used in MS Office applications or 3rd party quality assurance software.





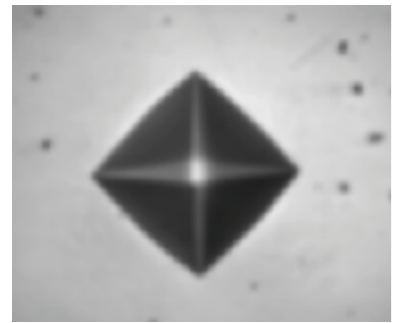
# AUTOMATIC IMAGE EVALUATION



1

## 1 AUTO FOCUS

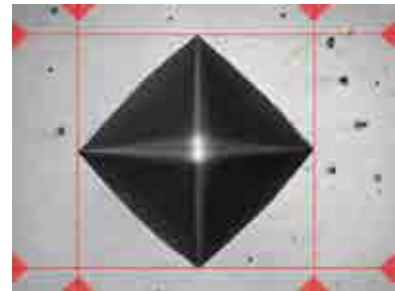
Fast & precise, observe how IMPRESSIONS® finds focus from a large distance, as far as the travel of the Z-axis allows. Algorithms used for close distance autofocusing set new standards in AF speed.



2

## 2 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.

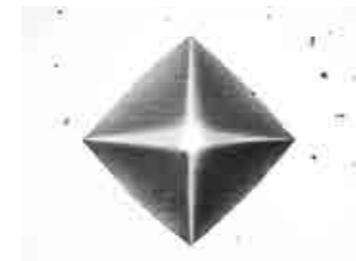


One accurate measurement is worth more, than 1000 expert opinions...

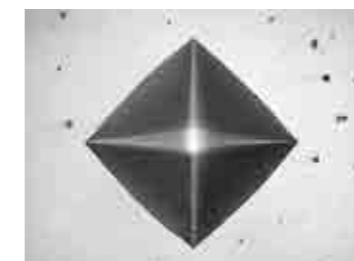
## 3 ILLUMINATION SETTINGS

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

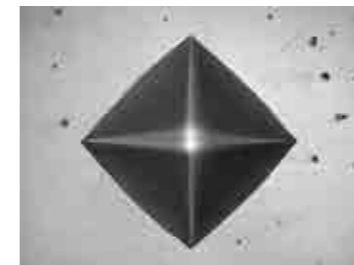


3

Irregular surface



Regular surface



Poor surface



4

## 4 REFINED IMAGE DETECTION

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



# INCOMPREHENSIBLE POSSIBILITIES

**INNOVATEST**  
 1100 W TEST RD BOSTON  
 BOSTON MASS 02128  
 Phone: 617 432 2200  
 info@innovatest.com

Tester info:		Statistics:	
Type	NEMESIS 5100	Nr of measurement	40
Date	24-1-2018	Max	166.78
Operator	Admin	Min	110.85
Dwelltime	10 sec.	Average	133.12
Test	HV5	Standard Deviation	13.01
Program	4 Luis Op67 12.7x99 courbes FN14 Range		45.93

Gamme	19007-194
four	4

**HARDNESS DIAGRAM**

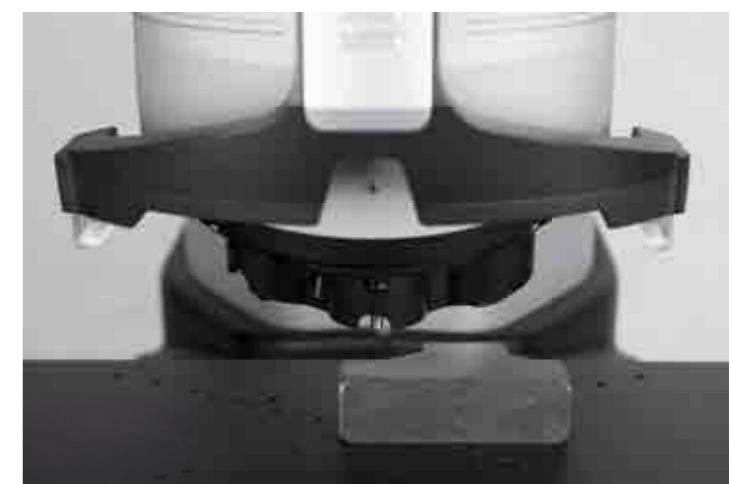
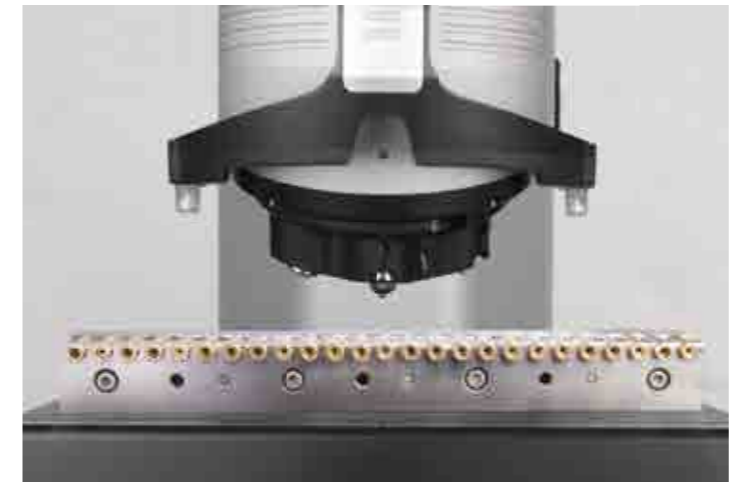
  

Pos	Hard	Max	Min	Plu	Point	Go/No	Go/No	Go/No	Go/No
1	110.85	110.85	110.85	110.85	1	A	110.85	110.85	110.85
2	112.25	112.25	112.25	112.25	2	A	112.25	112.25	112.25
3	118.4	118.4	118.4	118.4	3	A	118.4	118.4	118.4
4	117.97	117.97	117.97	117.97	4	A	117.97	117.97	117.97
5	125.05	125.05	125.05	125.05	5	A	125.05	125.05	125.05
6	129.09	129.09	129.09	129.09	6	A	129.09	129.09	129.09
7	148.94	148.94	148.94	148.94	7	A	148.94	148.94	148.94

## AMMUNITION TESTING PATTERN CONFIGURATOR & REPORTING

This application is developed in close cooperation with special manufacturers of ammunition shells and casings. It allows single and multiple shell/casing testing according to the requirements in the industry. The fully automatic test procedure generates a detailed report, providing single readings and statistics with Go/No indication. This further includes sophisticated settings for re-measurement. For particular details please contact our sales department.

The NEMESIS 5100 is specifically designed to use the large selection of fixtures and specimen holders can be used on any of the stages and anvils. The frame size allows a large workspace accomodation. Regardless of the shape of a particular workpiece, the accessories list and corresponding software applications enable to test almost any component and part.





# SUPPORT YOUR BEST TESTING RESULTS

## With our rigid designed Bench stands

- Rock solid bench stands
- 100% retractable drawer, bearing guidance, max 100kg load. Rubber anti slip bottom
- Lockable cabinet, 300mm high
- Adjustable feet, (+/- 50mm height adjustable to reach ergonomic working position)
- Made of corrosion resistant zinc plated steel with RAL powder coating
- Carrying capacity of 400kg
- Top surface made of 50mm Plywood with 1.5mm chemical resistant plastic plating, edges made of shock resistant 3mm ABS side liner
- Industrial quality, for workshop or laboratory

Designed for hardness testing instruments, painted in INNOVATEST® RAL colors matching our testers.



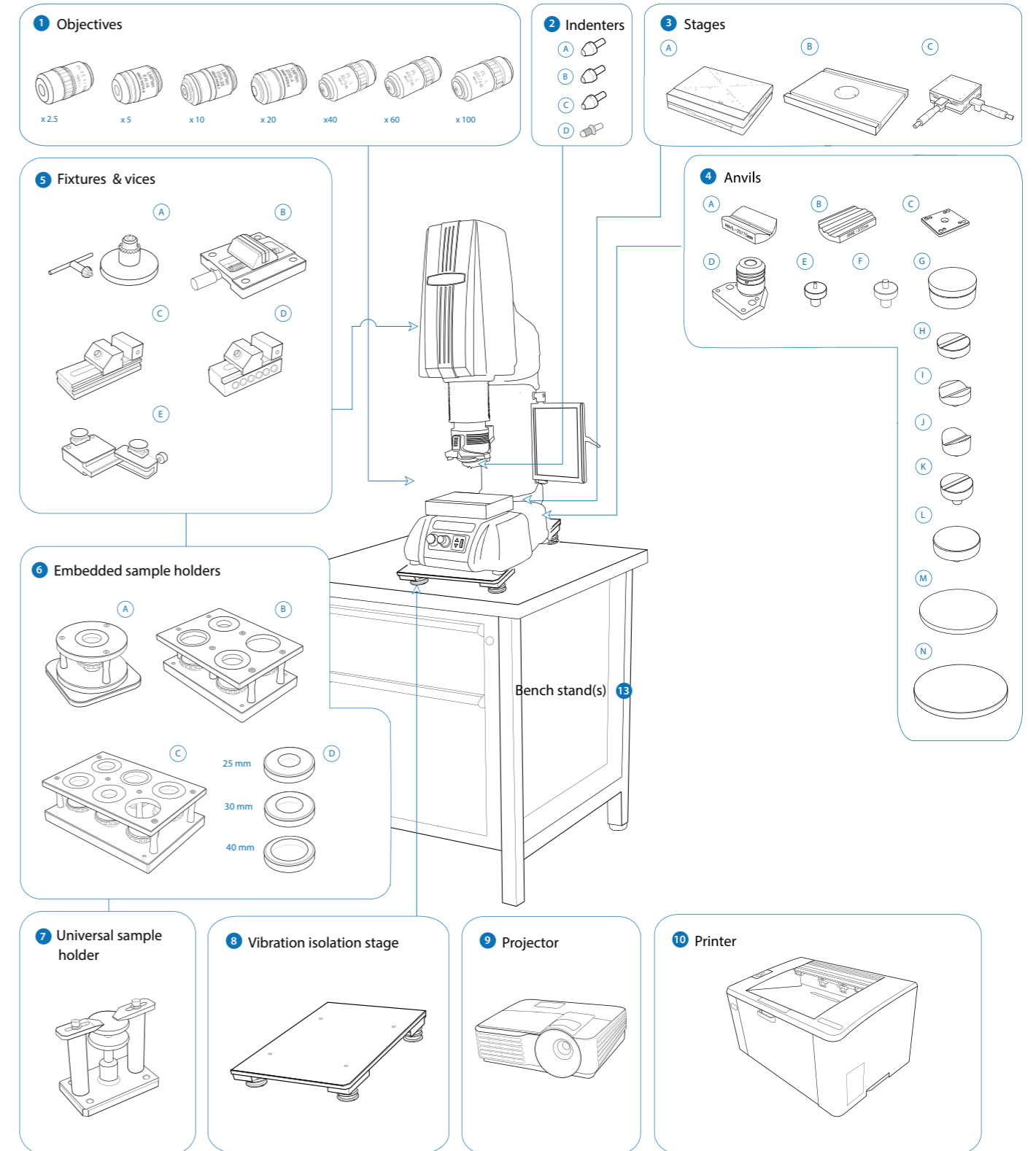
UN-STAND/960 71 x 75 x 80 cm



UN-STAND/965 150 x 75 x 80 cm

# ACCESSORIES NEMESIS 5100

Schematic overview of the configuration options, standard and optional accessories



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

# ORDER DETAILS

## NEMESIS 5100



NEMESIS 5101 Universal hardness tester, 10gf - 250kgf	NEMESIS 5101	
NEMESIS 5102 Universal hardness tester, 100gf - 250kgf	NEMESIS 5102	
NEMESIS 5103 Universal hardness tester, 10gf - 3000kgf	NEMESIS 5103	

## ACCESSORIES

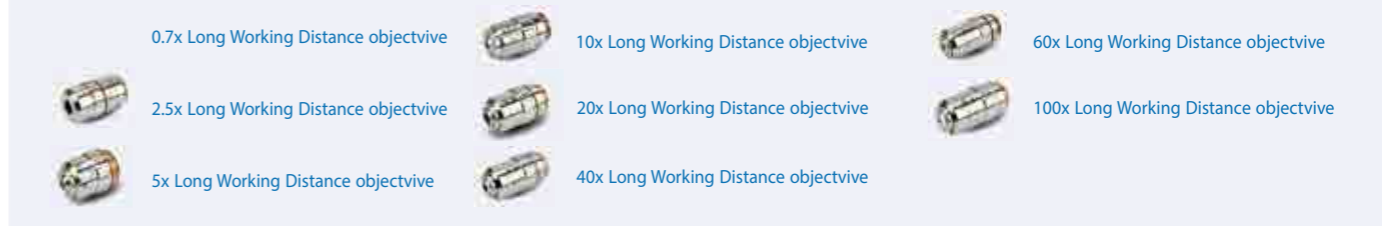
1	Objectives	0.7x Long Working Distance objective	AS900-0.7OBJ	STANDARD
		2.5x Long Working Distance objective	ASSUN-OBJ2.5X	
		5x Long Working Distance objective	ASSUN-OBJ5X	STANDARD
		10x Long Working Distance objective	ASSUN-OBJ10X	
		20x Long Working Distance objective	ASSUN-OBJ20X	STANDARD
		40x Long Working Distance objective	ASSUN-OBJ40X	
		60x Long Working Distance objective	ASSUN-OBJ60X	
		100x Long Working Distance objective	ASSUN-OBJ100X	
		Overview / Full view zoom camera + software functionality, field of view 50x35mm up to 200x180mm, including dual power LED bank	UN-OVCAM2D	
		Indenter actuator post (2nd & 3th indenter position) factory installed	FALCON/IP2/IP3	STANDARD
2	Indenters	High speed 8 position turret (revolver head), for 3 indenters, 3 objectives, Laser positioning guide	UN-8POSTUR	STANDARD
		Rockwell C Diamond Indenter ISO/ASTM certified	IN/6005	
		Rockwell Ball Indenter 1/16", includes 1 carbide ball, ISO/ASM certified	IN/7506	
		Rockwell Ball Indenter 1/8", includes 1 carbide ball, ISO/ASM certified	IN/7606	
		Rockwell Ball Indenter 1/4", includes 1 carbide ball, ISO/ASM certified	IN/7706	
		Rockwell Ball Indenter 1/2", includes 1 carbide ball, ISO/ASM certified	IN/7806	
		Carbide balls 1/16", ISO/ASTM certified	IN/2507	
		Carbide balls 1/8", ISO/ASTM certified	IN/2509	
		Carbide balls 1/4", ISO/ASTM certified	IN/2514	
		Carbide balls 1/2", ISO/ASTM certified	IN/2519	
		A Vickers Indenter ISO/ASTM certified	IN/8105	
		B Knoop Indenter ISO/ASTM certified	IN/8205	
		C Brinell Indenter 1 mm, includes 1 carbide ball, ISO/ASTM certified (3mm shaft)	IN/7001	
		Brinell Indenter 1 mm, includes 1 carbide ball, ISO/ASTM certified (6.35mm shaft)	IN/7000	
		Brinell Indenter 2.5 mm, includes 1 carbide ball, ISO/ASTM certified	IN/7005	
		Brinell Indenter 5 mm, includes 1 carbide ball, ISO/ASTM certified	IN/7010	
		Brinell Indenter 10mm, includes 1 carbide ball, ISO/ASTM certified	IN/7015	
		Carbide balls 1mm ISO/ASTM certified	IN/2005	
Carbide balls 2.5 mm ISO/ASTM certified	IN/2010			
Carbide balls 5mm ISO/ASTM certified	IN/2015			
Carbide balls 10mm ISO/ASTM certified	IN/2020			

3	Stages	A Motorized CNC XY-stage, 337x187mm Displacement: 200x100mm, 450kgf Motorized CNC XY-stage, 437x238mm, Displacement: 300x150mm, 450kgf Motorized CNC XY-stage, 630x238mm, Displacement: 400x150mm, 450kgf Repeatability +/-0.003mm requires: cable set CE-99-0003 1x and AS5000-200-15 Clamping mounting plate 1x	UN-XY572010 UN-XY903015 UN-XY904015	
		Motorized CNC XY-stage, 410x280mm Displacement: 200x100mm, 4000kgf Motorized CNC XY-stage, 510x280mm, Displacement: 300x150mm, 4000kgf Motorized CNC XY-stage, 610x280mm, Displacement: 400x150mm, 4000kgf Repeatability +/-0.005mm requires: cable set CE-99-0003 1x and AS5000-200-15 Clamping mounting plate 1x	UN-XY932015 UN-XY933015 UN-XY934015	
		Cable connecting to CNC stage to embedded driver (XY- set)	CE-99-0002	
		B Large flat surface testing table, with 2 T-slots, 350x250mm, for large components, requires AS5000-450 1x and AS9000-21-01 Locking ring 1x	UN-TESTTABLE/015	
		Large flat surface testing table, with 2 T-slots, 450x350mm, for large components, requires AS5000-450 1x and AS9000-21-01 Locking ring 1x	UN-TESTTABLE/016	
		Large flat surface testing table, with 2 T-slots, 600x300mm, thickness 25mm, for large <u>light</u> components, requires AS5000-450 1x and AS9000-21-01 Locking ring 1x	UN-TESTTABLE/019	
		C Manual XY- stage with analogue metric micrometers, 100x100mm, Displacement: 25x25mm, scale 0.01mm, max load 100kg, Requires: AS500XL-450-02 Mounting plate	UN-XYSTAGE/120	
		Clamping mounting plate	AS5000-200-15	
		Locking ring	AS9000-21-01	
		4	Anvils	A Small V-Anvil 3-20mm requires base plate
B Large V-Anvil 20-75mm requires base plate	UN-ANVILLV/106			
C Base plate for V-anvils un-anvilsv/105 & 106	UN-VANVILBASEPL			
D Quick change anvil base (required for mounting testing tables, except round	AS5000-450			
E Spot anvil 5mm, requires AS5000-450	UN-ANVIL/010			
F Spot anvil 10mm, requires AS5000-450	UN-ANVIL/011			
G Irregular part table support, ø150mm, requires AS5000-450	UN-ANVIL/020			
H V-Anvil 80mm, 3,3-20mm, requires AS5000-450	UN-ANVIL/040			
I V-Anvil 80mm, 12-80mm, requires AS5000-450	UN-ANVIL/045			
J V-Anvil 80mm, 20-140mm, requires AS5000-450	UN-ANVIL/050			
K "V"Testing cradle, max. test force 62.5kgf	UN-CRADLE/105			
Flat anvil 80mm, requires AS5000-450	UN-TESTTABLE/002			
Testing table flat 200mm, screwfix, requires AS5000-450	UN-TESTTABLE/010			
Testing table flat 235mm, screwfix, requires AS5000-450	UN-TESTTABLE/012			
5	Fixtures and vices	A Axle chuck, max. test force 62.5kgf	UN-AXLECHUCK	
		B Small parts vice jaw width 55mm, open 50mm, self centering max. test force 62.5kgf	UN-VICE/115	
		C Polished precision vice with lock down system ; jaw width 25mm, open's 20mm	UN-VICE/210	
		D Polished precision vice lock down system ; jaw 36 mm, depth 42 mm	UN-VICE/215	
		Polished precision vice lock down system ; jaw 48 mm, depth 75 mm	UN-VICE/220	
		Polished precision vice lock down system ; jaw 75 mm, depth 100 mm	UN-VICE/230	
		E Wire Testing Fixture, max. test force 62.5kgf	UN-WIRE/105	

6	Sample holders	A	Sample holder for 1 sample	UN-ESH1	
		B	Sample holder for 4 samples	UN-ESH4	
		C	Sample holder for 6 samples	UN-ESH6	
		D	Insert 25 mm, for sample holders	UN-ESHI25	
			Insert 30 mm, for sample holders	UN-ESHI30	
		Insert 40 mm, for sample holders	UN-ESHI40		
7	Sample holder		Universal clamp and levelling device	UN-CLAMP/105	
8	Vibration isolation stage		Passive vibration isolation stage, broad spectrum, designed for NEMESIS 5100	UN-AVS-300	
9	Projector		On request, any brand of your choice	UN-PROJECTOR	
10	Printer		Laser printer	UN-PRINT	
11	LCD screen		Portrait mode 15" capacitive touch screen	UN-SCREEN1	<b>STANDARD</b>
12	Keyboard and mouse		Logitech keyboard and mouse	UN-SKBSET	<b>STANDARD</b>
13	Bench stands		Cabinet test table with drawer 150x75x80cm	UN-STAND/965	
			Pre installation, calibration, handling and standard packing (for sea and airworthy transportation)	SEAPACK/060	
	3-Axis Joystick		3-axis joy stick, with fine adjustment and dynamic axis control	UN-JOYSTICK1	
	Bluetooth		Bluetooth connectivity	UN-BTADAPT	
	Machine cover		Anti Static machine cover	UN-TESTERCOVER04	

# ACCESSORIES

## OBJECTIVES



## INDENTERS



## STAGES



## ANVILS



# ORDER DETAILS

## FIXTURES & VICES



## EMBEDDED SAMPLE HOLDERS



## UNIVERSAL SAMPLE HOLDER



## VIBRATION ISOLATION STAGE



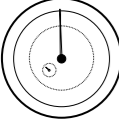
## SOFTWARE

Manual on-screen measurement	UN-MANM	STANDARD
Automatic measurement	UN-AUTOM	STANDARD
Automatic focussing	UN-AUTOFOC	STANDARD
Report configurator	UN-REPORTA	STANDARD
User level management	UN-LEVMAN	STANDARD
Overview / Full view zoom camera + software functionality, field of view 35x50mm up to 200x180mm	UN-OVCAM2D	
CHD, SHD, NHD configurator & graphic interface. Requires: indent pattern configurator (TESTPAT01)	UN-PATCHD	
Video overlay graphic pattern editor	UN-TESTPAT01	
Weld inspection (ISO 9015)	UN-WELDPAT	
Ammunition testing pattern configurator & reporting	UN-SHELLCONF	
Hardness of screw thread decarbonized zone (ISO 898-1)	UN-ISO898/1	
Automatic edge detection	UN-EDGEDTC	
Automatic contour scanning	UN-CSCAN	
Drawing & measuring application	UN-DRMEAS	
Snapshot function	UN-SNAPSH	STANDARD
Full stage view scanning	UN-STAGESC	
Kic crack measurement under load. Palmqvist & Median / Radial fracture toughness	UN-CRKPAP	
2D / 3D hardness chart (scanning/mapping, includes automatic contour scanning)	UN-CSCAN2D3D	
DualView Technology, 2 viewing screens software ; screen, cables, European and US power cables included	UN-DVTECHSET	
Virtual joystick, on-screen		STANDARD
Advanced 3-axis communication protocol for robotic systems	UN-REMC	
Q-DAS Certified connectivity protocol	UN-QDAS	

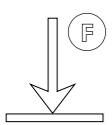


# SPECIFICATIONS

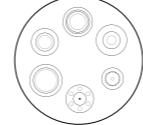
## HARDNESS SCALES

	<b>ROCKWELL</b> 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
	<b>VICKERS</b> ISO 6507 ASTM E384, E92 JIS B 7725	HV0.010, HV0.015, HV0.020, HV0.025, HV0.050, HV0.1, HVO.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV4, HV5, HV10, HV20, HV25, HV30, HV40, HV50, HV100, HV120, HV150; All test forces are also available for the HVT scales
<b>Kic Fracture toughness</b>	All Vickers forces & scales	
<b>KNOOP</b> ISO 4545 ASTM E92 JIS Z 2251	HK0.01, HK0.02, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1, HK2, HK5, HK10, HK20, HK30, HK50	
<b>BRINELL</b> ISO 6506, ASTM E10 JIS Z 2243	HBW1/1kgf, HBW1/2.5kgf, HBW1/5kgf, HBW1/10kgf, HBW1/30kgf; HBW2.5/6.25kgf, HBW2.5/15.625kgf, HBW2.5/31.25kgf, HBW2.5/62.5kgf, HBW2.5/187.5kgf; HBW5/25kgf, HBW5/62.5kgf, HBW5/125kgf, HBW5/187.5kgf, HBW5/250kgf; HBW10/100kgf, HBW10/250kgf, HBW10/750kgf, HBW10/1000kgf, HBW10/1500kgf, HBW10/3000kgf; All test forces are also available for the HBT scales	
<b>HVD (HVT)</b>	All Vickers test forces, as per above table.	
<b>HBD (HBT)</b>	All Brinell test forces, as per above table.	
<b>PLASTIC</b> ISO 2039	49,03 N, 132,9 N, 357,9 N, 961 N	
<b>CARBON</b>	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	
<b>CONVERSIONS</b>	Conversion to other hardness scales according to ASTM E140, ISO 18265, GB/T 1172	

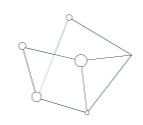
## TEST FORCE

	<b>Force application</b>	Multi-load cell, closed loop, force feedback system
	<b>Test forces</b>	0.010kgf – 3000kgf
	<b>Force range per model</b>	<b>NEMESIS 5101</b> 10gf – 250kgf <b>NEMESIS 5102</b> 100gf - 250kgf <b>NEMESIS 5103</b> 10gf - 3000kgf
	<b>Test force tolerance</b>	< 0.25% for test force 100gf to 250kgf < 0.5% for test force below 100gf

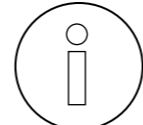
## TURRET

	<b>Dwell time settings</b>	Default 10 seconds, user defined. Up to 999 seconds
	<b>Motorized turret</b>	Ultra-fast, 8 position turret, 2 indenter positions, 4 objective positions
	<b>Objectives</b>	Long working distance 0.7x, 2.5x, 5x, 10x, 20x, 40x
	<b>Indenters</b>	Certified indenters (ISO/ASTM) available at choice
	<b>Camera 1 (objective)</b>	18 Mpx, HD, 4K+, Machine vision system
	<b>Camera 2 (overview)</b>	Full HD, Full Color, Optical zoom system, variable FOV 50 x 35mm - 200 x 180mm

## SYSTEM

	<b>Electronic system</b>	High performance embedded controller, i7, mSSD 120 GB, MS Windows® 10 operated
	<b>CNC support</b>	5 Axis CNC controller (for motorized stages) or stage accessories
	<b>Screen(s)</b>	15" portrait mode capacitive touch screen, second screen option
	<b>Display resolution</b>	0.01 HV, HK, HB
	<b>Statistics</b>	Total test, max, min, average, range, standard deviation, All in real time after each test
	<b>Hardness conversion</b>	Rockwell, Rockwell Superficial, Vickers, Brinell, Knoop, Leeb & Tensile
	<b>Software</b>	IMPRESSIONS™ V2, work flow system & tester control
	<b>Data storage capacity</b>	Internal and external mSSD, SSD or HDD
	<b>Data output</b>	XML, CSV, Certified for Q-DAS (Optional)
	<b>Connectivity</b>	5 USB ports, RJ45 Ethernet LAN, W-LAN, RS-232, Blue Tooth, 5 Axis CNC & motorized XY- stage connector, Dual HDMI screen connectors
	<b>Printer</b>	A4, A3 full color laser printer (optional)

## GENERAL

	<b>Machine dimension</b>	1100 mm x 425 mm x 695 mm
	<b>Machine weight</b>	210 kg
	<b>Power supply</b>	100VAC to 240VAC, 50/60Hz, single phase
	<b>Operating temperature</b>	10°C to 35°C, non-condensing
	<b>Power consumption</b>	100W
	<b>Humidity</b>	10% to 90%, non-condensing

# TECHNICAL DRAWINGS

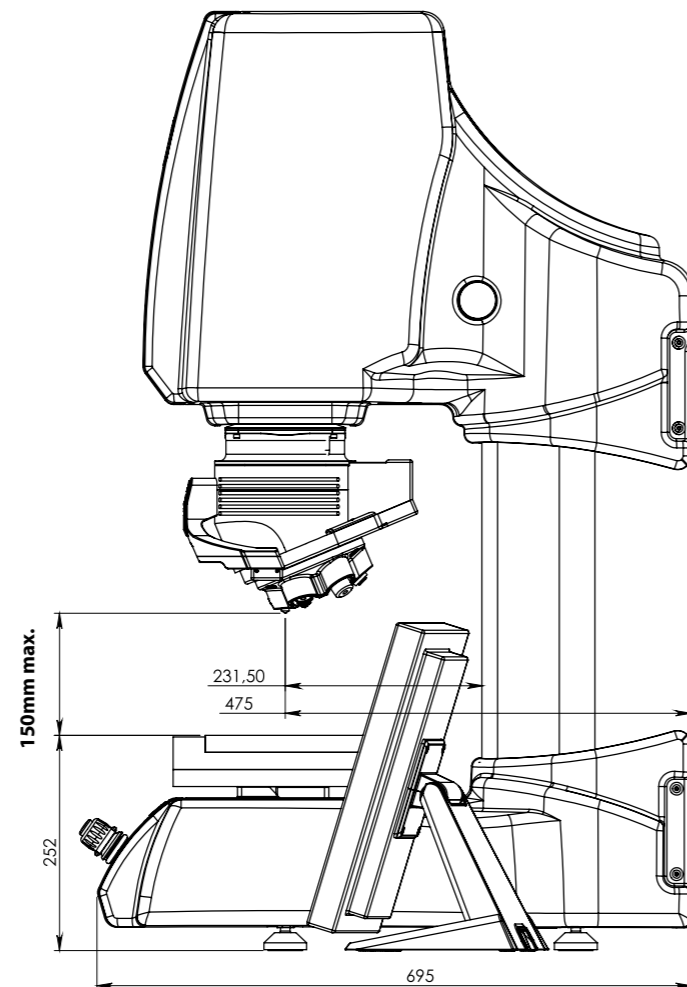
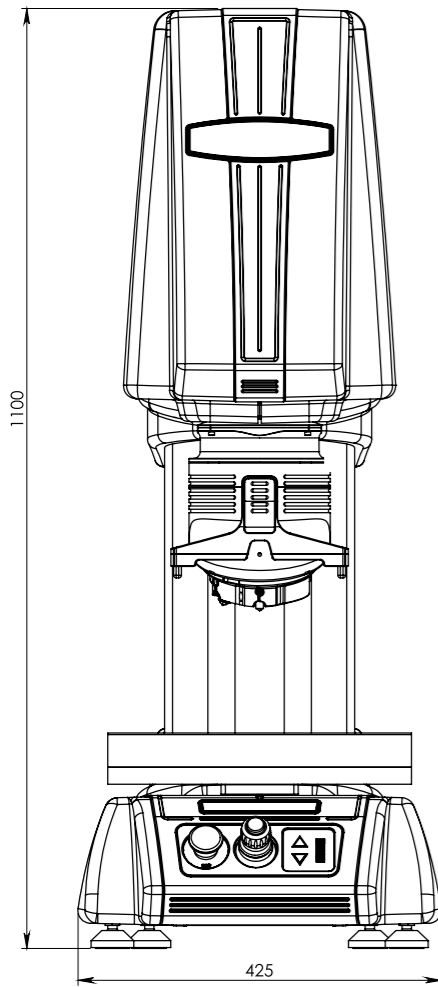
## OTHER MODELS IN THE NEMESIS RANGE



### NEMESIS 9100

Multi Load Cell, Closed loop  
Fully automatic, 8 position turret  
Rockwell, Superficial Rockwell,  
Micro/Macro Vickers, Knoop  
& Brinell Hardness testers  
Descending test head,  
fixed work piece position  
*See brochure B18N9100/XX*

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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.

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 B18N5100/01/EN



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