Qness 60 EVO

THE REVOLUTION IN QUALITY ASSURANCE

HARDNESS TESTING + MICROSCOPY SEAMLESSLY COMBINED AND HIGHLY AUTOMATED

part of **VERDER** scientific

HARDNESS TESTING

SUPPORTED TEST METHODS

◇ VICKERS
DIN EN ISO 6507, ASTM E-92, ASTM E-384
(* not acc. to Standard)

HV0.00025*	HV0.0005*	HV0.001	HV0.002
HV0.003	HV0.005	HV0.01	HV0.015
HV0.02	HV0.025	HV0.05	HV0.1
HV0.2	HV0.3	HV0.5	HV1
HV2	HV2.5*	HV3	HV5
HV10	HV20	HV30	HV50
HV60*			

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

HK0.001	HK0.002	HK0.005	HK0.01
HK0.015	HK0.02	HK0.025	HK0.05
HK0.1	HK0.2	HK0.3	HK0.5
HK1	HK2		

◎ BRINELL
DIN EN ISO 6506, ASTM E-10

HBW1/1	HBW1/2.5	HBW1/5	HBW1/10
HBW1/30	HBW2.5/6.25	HBW2.5/15.625	HBW2.5/31.25
HBW2.5/62.5	HBW5/25	HBW5/62.5	

⇄ CONVERSION
DIN EN ISO 18265, DIN EN ISO 50150, ASTM E140
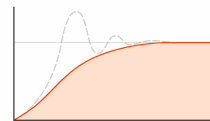
FULLY AUTOMATED TEST CYCLE
Electronic force application and closed-loop control

UNLIMITED OPTIONS

I Hardness testing module with a test force range of 0.25 g to 62.5 kg as standard – including ASTM & DAkkS-certified Vickers test diamond
I 2 versions - from semi-automatic application (M) to full automation (A+)
I Solidly-built machine – 'Made in Austria'
I Variably-structured, vibration-reducing cast body with frame in anodized aluminum.

VERTICAL CONCEPT WITH 2 Z-AXES

There are decisive benefits in distributing vertical movement across 2 axes. Via the first Z-axis there is dynamic motion control, allowing the indenter to be positioned towards the test surface quickly and conveniently at up to 30mm/s. The additional second Z-axis in the QATM system offers a high-resolution positioning system for greater precision in force application and focusing.
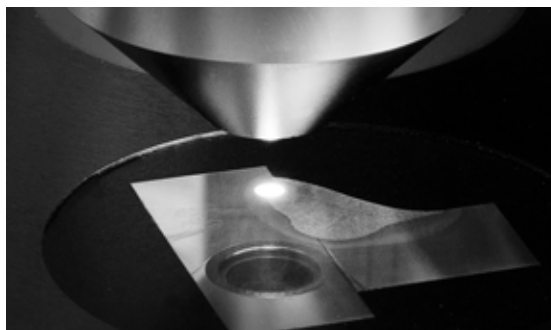
MICRO-SCOPY

HARDNESS TESTER OR MICROSCOPE?

BOTH.

REVOLUTIONARY OPTIC SYSTEM

The QATM-developed, in-house manufactured lens system sets new standards. As well as providing crystal clear image quality for hardness testing, Koehler illumination uses white LED light and motor-operated aperture shuttering to produce ideal contrast, even for high magnification images. The color-corrected high-quality lens series is used for structural analysis. There are also two camera systems to choose from. Experienced metallurgists agree the image quality provided by the Qness 60 EVO is comparable in all aspects with that of established sophisticated microscopes. The up-to-date concept and new lenses in the optic system enable the device to completely meet even the strictest physical 'test system definition' requirements in compliance with DIN EN ISO6507-1/2:2018.

INTERACTIVE TEST SOFTWARE FOR ALL VERSIONS

Qpix Control2 is pioneering the ultra-modern software operation of hardness testing equipment and has been expanded to include intelligent measurement tools for lengths and angles. It's ideal for establishing templates, and now also for the testing of welds (A+ models). In addition, the optional INSPECT software modules can be seamlessly integrated into the overall operating infrastructure:

l   Phase analysis
l   Layer thickness measurement
l   Grain size evaluation

8-POSITION TOOL CHANGER

Up to 8 different test diamonds or lenses can be mounted to the ultra-modern test turret. The compact structure is angled at 20° to guarantee excellent test room visibility. **Highlight:** The newly-developed hardness testing modules serve as modular indenter holders enabling plug-and-play retrofitting of Brinell and Knoop test equipment at any time after delivery.

## THE PROFESSIONAL INTRODUCTION TO HARDNESS TESTING AND MICROSCOPY

VERSION M

I Semi-automatic hardness testing with automatic image evaluation, autofocus and brightness regulation
I Manual XY table can be retooled for simple progression inspections
I Desktop PC with monitor and Qpix Control2 M for full interconnectivity

THE BEST
OF TWO WORLDS

IN A
SINGLE DEVICE
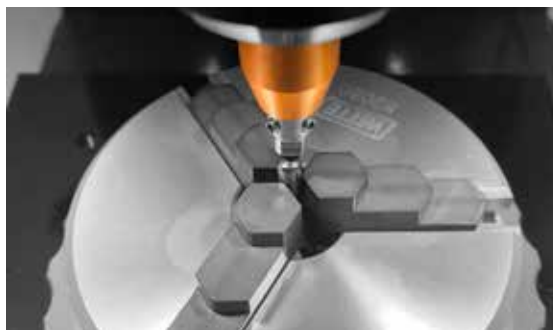
MAXIMUM VERSATILITY

Unsurpassed in single-piece testing and limited series tests on items of all sizes: Simple operability and optional additions for microscopy make QATM Qness 60 M EVO a unique, high-quality, all-round package.

DIGITAL CROSS SLIDE WITH DATA FEEDBACK

Enables serial predefinition of test programs with fixed numbers of test points. If required, also with a manual slide, digital micrometer spindle and positional return – as used for manual CHD progressions.

COMPREHENSIVE RANGE OF BASIC FUNCTIONS

Several labor-saving features are already included in the QATM base model:

l Optimized autofocus system
l Automatic brightness regulation
l Automatic image evaluation for hardness testing with multiple evaluation modes
l Built-in protocol generator

TEST SPACE LIGHTING

All devices are equipped with the new LED work space lighting: Simplified positioning of samples for single-piece tests.

QPIX CONTROL2 M SOFTWARE

The Qpix Control2 M-Version of the intuitively-operated software is included with the Qness 60 M EVO to provide sophisticated functionality tailored to the requirements of semi-automatic hardness testing devices. Clearly organized batch management and the effective use of templates from a broad span of testing projects, test result structuring and a complete range of background project information. The easily-generated templates include all the required information on test patterns, test methods, item names and user field details.
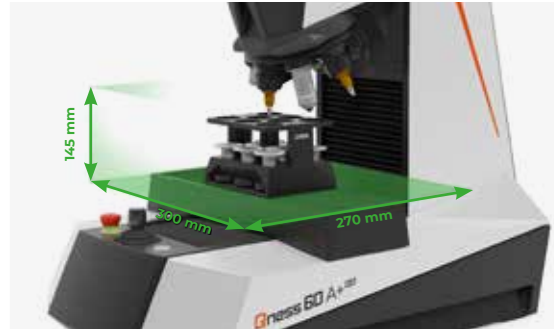
AUTOMATED AND PERFECTED

VERSION A+

I Ultra-precise, fully-automated XY slide
I Fully automatic 3D control functions
I Built-in sample image camera for unbeatable operating convenience

PIONEERING TECHNOLOGY

UNIQUE IMPLEMENTATION

EXACT POSITIONING AND A LARGE TEST SPACE

All 3 axes are equipped with the direct, optical path measuring system as standard. The axes and turret can be positioned to an accuracy of 1.5 µm, so even thin layers, or special testing or analytical coordinates, can be repeatedly and accurately approached.

### DIFFERENT TEST HEIGHTS

The unique construction of the highly-dynamic tool changer turret allows the positioning of test pieces at various heights within the test area. Innovative CAS technology protects the unit from collisions.
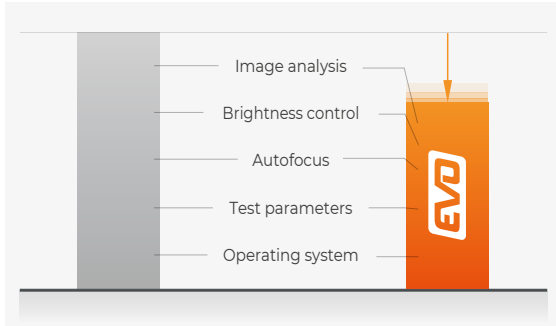
OPTIMIZED PERFORMANCE AND SILENCED DESIGN

Optimized testing parameters and shorter intervals for serial autofocus, brightness regulation and image analysis, facilitate unbeatable cycle times during everyday operation involving hardness testing devices of the new EVO product line; and it's even faster than the previous model. A further benefit of the new machine concept is the emphasis on reduced noise emissions in operation and motion, making it **particularly suitable for laboratory work.**
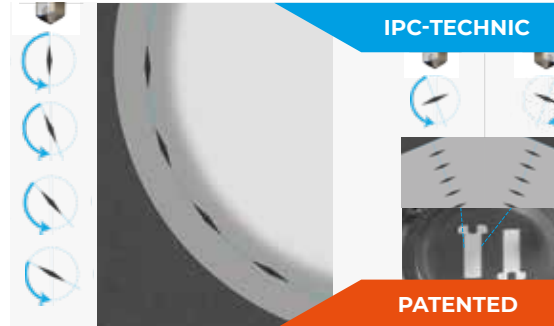
IPC TECHNOLOGY / ROTATABLE INDENTER

IPC – 'Indenter Parallel to Contour' (optional)
The operator can select the route and points for the Knoop indenter along each contour, either manually, via the software setting, or fully automatically. The compact indenter unit with a built-in rotation drive facilitates fully automated hardness testing in layers or along the edge of the workpiece.


SAMPLE IMAGE CAMERA

It's no coincidence that most QATM customers choose the 'A+' version with a built-in sample image camera. In a few seconds the image of the sample is shot with the additional camera (field of view 49 x 37 mm). The image provides excellent navigational support within the software, particularly in combination with DOUBLE-VIEW TECHNOLOGY, and aids enhanced documentation in the automatically compiled test report.

PRACTICAL

APPLICATIONS
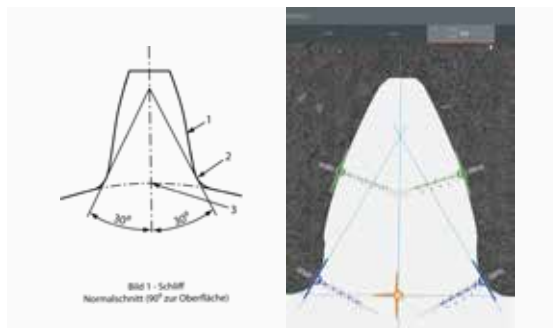
TOOTH FLANK TESTING

The time-consuming creation of test points, especially with tooth flank testing, is minimized by means of pre-defined test templates. The Qness 60 A+ enables the entire normed procedure between HV30 and HV1 to be done by one single device.


IDENTICAL SAMPLE TESTS

An entire range of relevant data, such as test patterns, test methods and user fields can be activated via pre-defined sample magazines. QATM can provide the most suitable clamping set-up, matrices and cassette systems for every requirement.
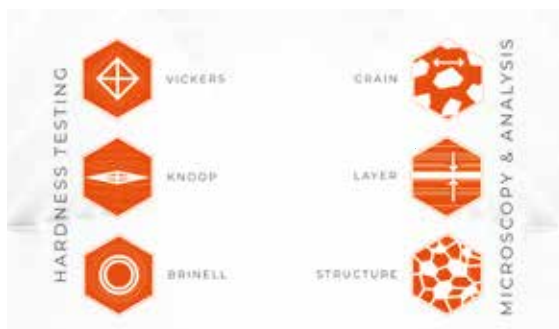

AUTOMATED HARDNESS TESTING AND MICROSCOPY

It is now possible to execute all required quality assurance tasks with a previously unattained degree of convenience and time efficiency. The QATM Qness 60 A+ EVO devices can work through hundreds – even thousands – of test and analytical points in a fully automated, unmanned setting. The analytical functions have also been integrated in order to enable the operator working in a manual mode to analyze sample properties with maximum efficiency, and to deliver the requested results smoothly and simply.
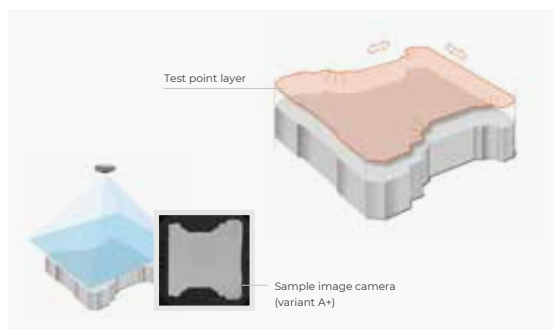
TEMPLATE FUNCTION

l Ideal for repeated tests / components
l Alignment of 'test point mappings' directly on the work piece with reference lines and bench marks
l Test point and analysis patterns without 'fixed stop' or sample holder
l The sample image can be used in a clearly-structured test report
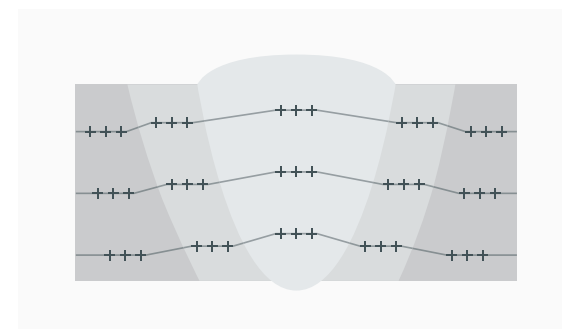
WELD SAMPLE TESTING AND ANALYSIS

Serial provision of 'Advanced Welding' functions facilitates the simple, norm-compliant (e.g. EN ISO 9015 & EN ISO 22826) integration of test mapping for hardness testing. Pre-defined patterns can be simply adapted to each respective test piece via interactive functions. If required, Qpix INSPECT modules can also provide a simultaneous material-graphics analysis of the weld seam.

ILLUMINATED STATUS DISPLAY

BRINGS LIGHT INTO THE DARK

The illuminated QATM logo displays the current device status at a glance. The range of flash intervals indicates whether the device is operating automatically or is free to be used for new tasks for staff all around the lab. Furthermore, not only does the LED test space lighting, installed as standard, allow samples and sample holders to be set up correctly, in the A+ version it guarantees uniform light intensity for sample imaging.

8-FOLD SAMPLE HOLDER

PERFECTION IN FULL AUTOMATION

QATM sample holders are designed to ensure maximum sample throughput. 'A' and 'A+'-device test tables include enough space for an 8-fold sample holder as standard; up to two sample holders can be used in parallel with the optional 300 mm slide.

OPTIMIZED
SAMPLE CLAMPING

GUARANTEED

EMBEDDED SAMPLES

The secure clamping of samples thanks to a redesigned sample holder with a built-in clamping force limiter, simplifies sample centering and positioning. A sample plate with a ball-joint even clamps samples that cannot be held flat to prevent them tilting or sliding during testing. Available with 1, 4 or 8 sample-holding positions and adapter rings for a large range of metric and imperial sample diameters.
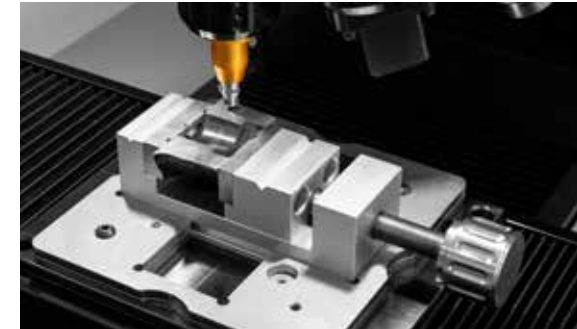
VICES

The clearly-organized, large and robust test room facilitates universality. Additionally, clamping samples straight into conventional vices reduces the effort required to prepare the sample, and expands the range of possible future test applications. QATM vices are also available with extra templates, enabling samples to be repeatedly clamped in precisely the same position.

NON-EMBEDDED SAMPLES

Components of almost all geometrical shapes can be fitted into the universal sample holder. Four clamping bolts can be set variably in various T-slots.
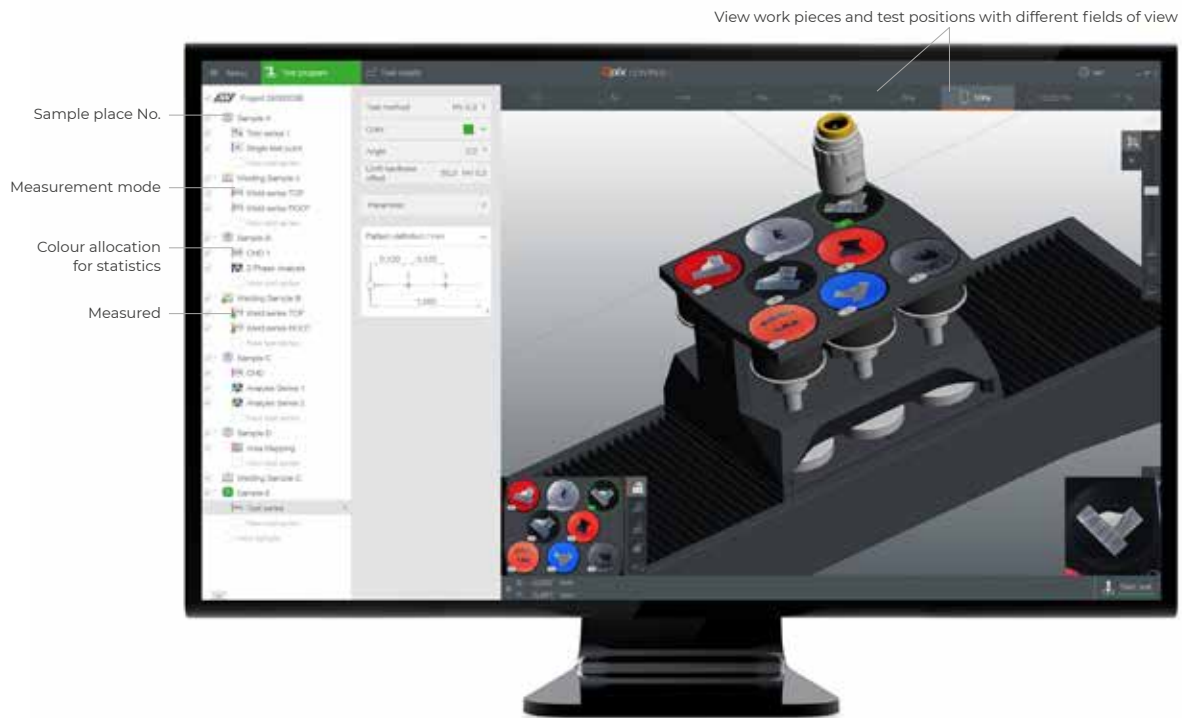

PRISMS

QATM prisms also enable round components to be tested with our devices. Benefit: Integration of the 3D model in the software automatically determines the center of the component and the highest point of each piece.

SPECIAL CLAMPING DEVICES

QATM is the right stop for advice on complex requirements and clamping devices! It would be our pleasure to advise, devise, customize and implement a solution for you. Only the right component clamping solution can guarantee reliable results.

View work pieces and test positions with different fields of view

Sample place No.

Measurement mode

Colour allocation for statistics

Measured

Qpix CONTROL2

LIVEVISION-TECHNIC

CUSTOMER-SPECIFIC SAMPLE HOLDER

Identical samples can be set up in the software in scale as a 3D model.

OPERATION VIA EXTERNAL PC SYSTEM

REVOLUTIONARY 3D OPERATING CONCEPT

Intuitive, clearly organized and professional: Qpix Control2 next-generation hardness testing software, developed based on customer feedback and input for maximum user-friendliness. The controlled test head benefits from automatic height adjustment and contactless exploration, complete integration of the Qness sample holder, CAD compatibility with 3D imaging and a whole range of easily understood 3D control elements and views included in the software. It sets new standards in hardness testing.
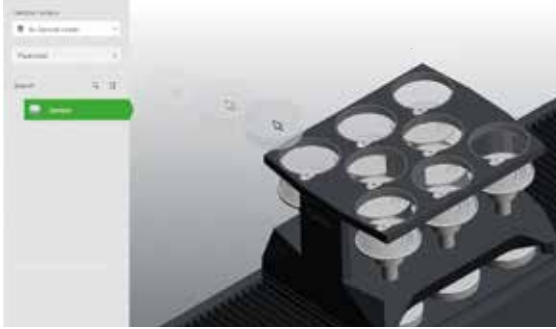
CAS-TECHNIC

CAS TECHNOLOGY

Innovative Collision Avoiding System (CAS) technology protects the mechanical parts in the device using predictive 3D motion calculations to visualize the effects of collisions and operation errors.
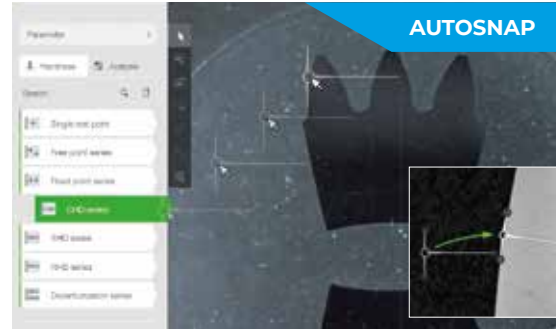
3 STEPS TO THE RESULT

AUTOSNAP

1. LOAD SAMPLES

The machine moves automatically to the height of the sample holder. An image of the sample is taken automatically.
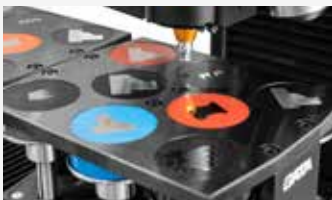
2. LOAD ROW

AutoSnap - Speedy row set-up: Drag the row of test points to the desired position. The serial Auto-Snap function corrects the starting point of the test row automatically.
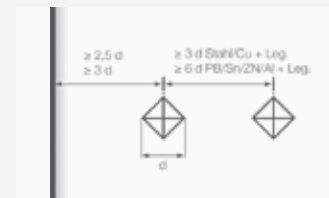
3. START TEST SEQUENCE

The test sequence is executed according to the applicable hardness testing standards.
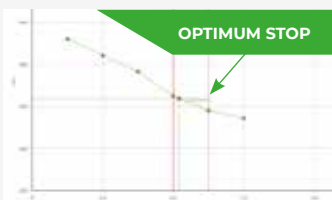
MORE ACCURATE RESULTS RAPIDLY

FULLY AUTOMATIC HARDNESS TESTING

Several progressions and samples are created and completed 'unmanned' (e.g. 60 progressions on 8 different samples in one test run)
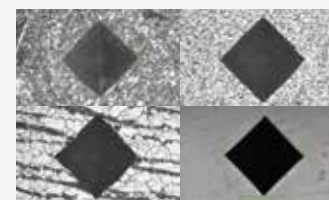

OPTIMUM STOP

### SAVE TIME WITH OPTIMUM STOP

Time-saving test mode 'Complete all indentations – then evaluate' and 'Optimum stop' to complete test series as soon as the lower hardness limit has been undercut.

AUTOMATIC MINIMUM DISTANCE

The distances of test points are automatically set to the minimum norm distance for more accurate test results.


SURFACE INDENTATION RECOGNITION

The adjustable surface indentation recognition function reduces the required effort of sample preparation for testing the hardness of non-optimum surfaces. Hence, automatic indentation recognition is also possible on critical surfaces (etching, grinding...).
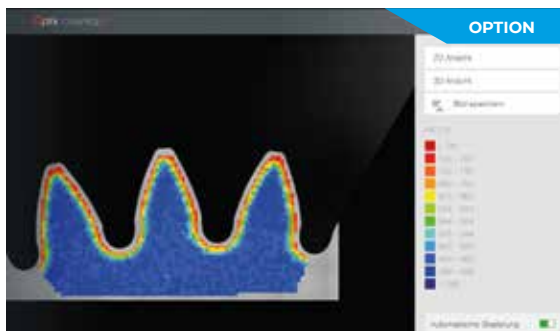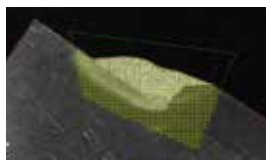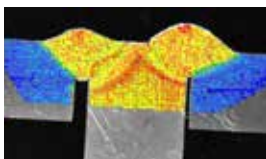
2D/3D AREA MAPPING

The optional software module '2D/3D hardness chart' is the perfect aid for the detailed determination of hardness distribution over the total cross section, especially for heat-treated samples. This is extremely important in material exploration, and also for weld testing or in damage analysis.
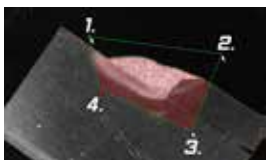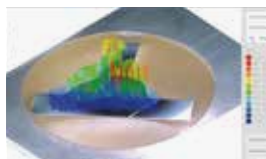

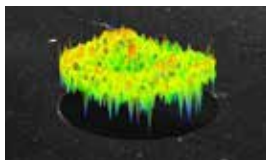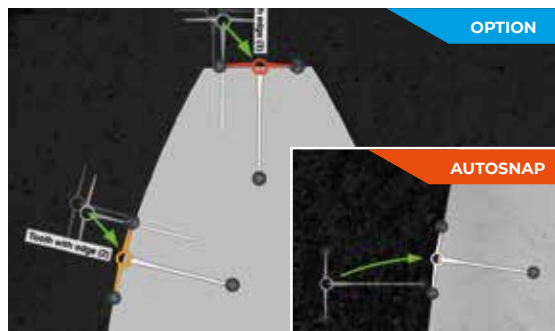
1. Create area

2. Define grid

3. Display in 2D...

...or 3D

Homogenous hardness distribution chart on wire cross section


Test point pattern on a non-bedded specimen

EDGE RECOGNITION

Edge recognition involves automatic adaption of test row starting points to the sample edge when using project and sample templates. The module significantly increases the degree of automation and is an ideal add-on to the serially provided AutoSnap function.

DIGITAL CALIPER

The digital caliper is compatible with the Qpix Control2 system and reads the dimensions, height and diameter of components wirelessly and at the push of a button, entering them into the software. The test head height control in A+ versions enables the test height to be reached completely automatically with no need for manual input.
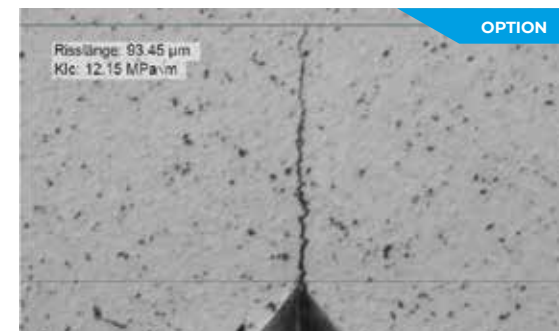
FRACTURE LENGTH MEASUREMENT

The K1C value is established via norm-compliant measurement of the 4 fracture lines. The MPa√m is subsequently calculated automatically.

INNOVATIVE
SOFTWARE ADD-ONS

FOR HARDNESS TESTING

STRUCTURAL ANALYSIS MADE EASY

QPIX INSPECT SOFTWARE MODULES

The intuitive and user-friendly Qpix INSPECT software functionality provides a comprehensive toolbox for microscopic evaluations and result documentation. The multifunctional software can be customized for customer-specific measuring tasks and complemented with add-on modules.

OPTION
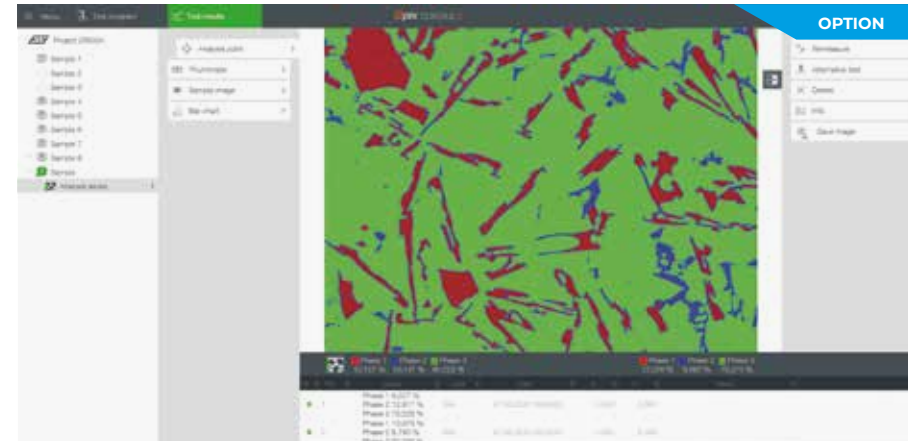
INSPECT PHASE ANALYSIS

I Automatic image object dimensioning

I Evaluation of phase fractions according to ISO 9042 and ASTM E562

I Provides analytics results as percentage proportions of a surface or as nominal surface values as tables or diagrams

OPTION

OPTION

INSPECT LAYER THICKNESS MEASUREMENT

I Determination of layer thickness according to DIN EN ISO 1463.

I Semi-automated gauging of horizontal, vertical and radial layers.

I Provision of layer thickness as statistical values for lengths as tables or diagrams.
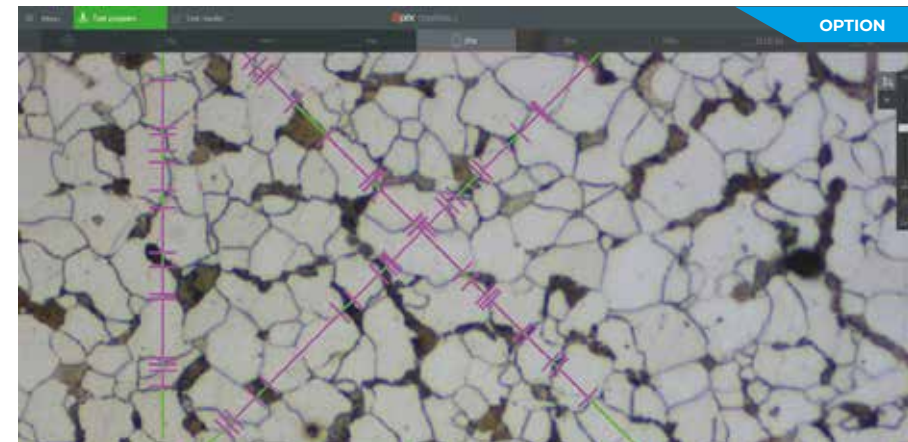
INSPECT GRAIN SIZE DETERMINATION

I Grain size determined according to DIN EN ISO 643 and ASTM E112 via linear or circular section method.

I Results of the analysis provided as tables or diagrams.

I Documentation of statistical characteristics of grain size and segment lengths cutting through the grains.

VISIONARY IDEAS

FOR INDUSTRY 4.0

#QNESSCONNECTEDFUTURE

Linking up production machinery, intelligent controls for production plants and automated data-sharing for work process planning, have become essential aspects of manufacturing operations over the past few years. Visionary ideas for the Internet of Things and Industry 4.0 now ensure we also offer interconnected test and result monitoring for quality assurance.

QATM HAS A CLEARLY-DEFINED GOAL

We aim to develop all the requisite technologies, processes and resources, and ensure that customers get 100% of the benefits from all the interconnected devices installed by QATM and to profit from optimized data management. All the steps, tools and developments this requires, are integral to our project: **#QnessConnectedFuture** We can already meet many of these requirements today!

BENEFITS

Efficient documentation

Reduced operation influence

Minimization of error sources

Faster and improved process monitoring

Real-time results

Reduced costs

INTELLIGENT DATA EXCHANGE SOLUTIONS TODAY

FOR CONNECTED TOMORROWS

STANDARD

QCONNECT

Qconnect is the interface in Qness Qpix Control2 software, providing customers with a full portfolio of inter-device connectivity - from serial production, open XML interfaces (bi-directional) and pre-specified plug-in solutions, such as the QDAS Plug-In+, through to customer-specific connectivity solutions implemented completely by Qness. We have a professional solution for every applicational requirement.
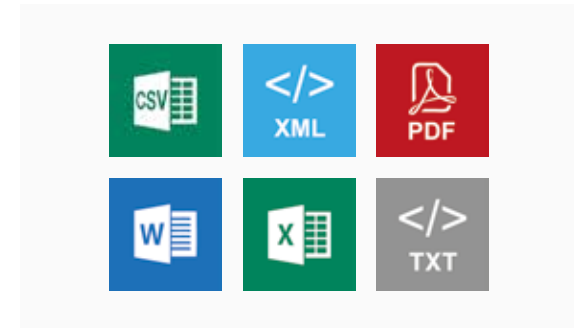
AUTOMATIC EXPORT FUNCTIONS

Many pro-level export functions are built into Qness solutions as standard. Raw data is exported into CSV/TXT and XML, report exports into MS Word, Excel, PowerPoint and PDF – as part-specific issues or as individual exports. All export configurations can be stored individually for templates.

STANDARD

CALIBRATION MANAGER

This is a leap forward for calibration result management. The QATM Calibration Manager reminds operators of the necessary tests at freely definable intervals. Test results are added to the ongoing statistical record at the push of a button.

BARCODE/QR CODE/DMC READER

Qpix software platforms support barcode and QR code readers. Whether simply inserting header files (serial), managing the complete integration of reading devices for the automatic selection of templates, or calling up data from superordinate systems (optional) – barcode/QR code readers simplify work procedures for the tester, while also preventing operating errors.

#QNESSCONNECTEDFUTURE

FIND OUT MORE ABOUT THE INTERCONNECTIVITY OF QNESS-FAMILY HARDNESS TESTING DEVICES

ACCESSORIES AND

INDIVIDUAL CONFIGURATIONS

EVEN LARGER WORK ROOM

The optional large slide doubles the test table surface area to 300 x 120 mm. If required, the test height can also be extended from 145 mm to 260 mm.
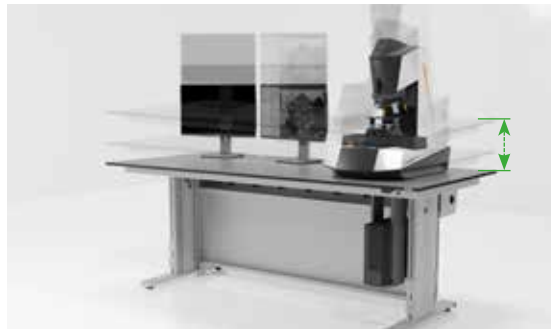

PREMIUM HARDNESS TEST BLOCKS

Premium quality in comprehensive variety. Independent DAkkS (ISO/IEC 17025) calibration according to DIN EN ISO and ASTM including software for periodic norm-compliant tests.

LAB TABLES

Configure and optimize your lab workplace with solutions from the comprehensive QATM lab furniture range.
Highlight: The extremely resilient QATM work table with electrically-driven height adjustment is ergonomically adapted to use with the Qness 60 EVO with up to 2 monitors and offers built-in cable management.

QNESS 60 A+ PORTAL VERSION

The Qness 60 EVO is a portal solution that offers unique movement flexibility, opening up new possibilities in micro and low load hardness testing.

Benefits:
- Test table dimensions/traverse path 500 x 500 x 300 mm
- Front-loading position – ideal for heavy test pieces loaded by cranes
- Accommodates up to 9 x 8-piece sample holders at once (72 pieces) and safety housing with a CE light grid
- Unrestricted operational convenience

M

A+
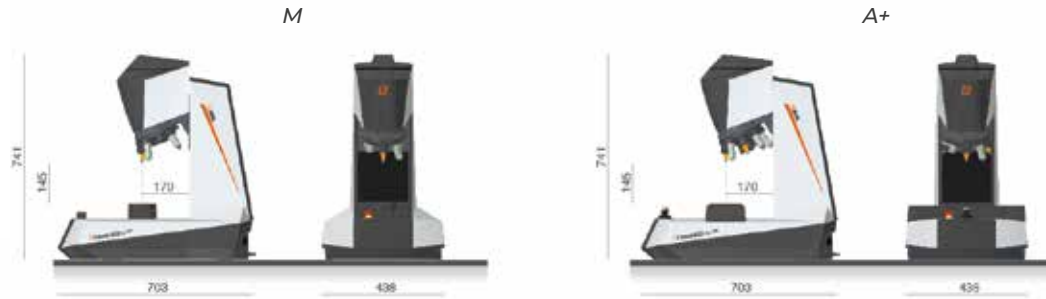
	Qness 60 M EVO	**Qness 60 A+ EVO**
Test force range	0.25 g – 62.5 kg (0.00245- 613.1 N)	
Test head control	Dynamic, Hand wheel	Dynamic, 3-Axis-Joystick automated (CAS Technic)
Tool positions	8 (motorized Tool Changer) max. 3 hardness testing modules, max. 6 lenses	
Measurement types	Single-, Row measurement	Multi-samples, CHD, NHD, SHD, Single-, Row measurement, Decarburization, Visual test patterns + Welds, Dimensioning tools
Measurement types (optional)	CHD, NHD, SHD (cross slide) Phase analysis, Layer thickness measurement, Grain size evaluation	Rings and tubes Phase analysis, Layer thickness measurement, Grain size evaluation
Sample image camera	-	5 MP
Test height / Throat depth	145 / 170 mm	
Test anvil / XY cross slide	- (Option: manual cross slide)	Motorized
Table size	Ø 100 mm (Cross slide: 135 x 135 mm)	150 x 120 mm
Traverse Path	Z 145 mm (X25 Y25 Z125 mm with cross slide)	X 150 mm Y 150 mm Z 145 mm
XY positioning repeatability	-	+/- 1.5 µm
Max. workpiece weight	50 kg	50 kg
Weight of basic device	55 kg	60 kg
Software	Qpix CONTROL2 M	Qpix CONTROL2
Power supply	100 – 240 V ~1/N/P, 45-65 Hz	

KEY DATA

Test sequence	Fully automated / electronic force application
Included basic equipment	1 Test module (0.25 g – 62.5 kg), Vickers indenter ASTM + DAkkS
Camera system / image transfer	5 MP
Interfaces	1 x USB 3.0
Lenses	2.5x, 5x, 10x, 20x, 50x, 100x
Lens types	Standard (LE Plan) for hardness testing High Quality (TU Plan Flour) for hardness testing and microscopy
Field of view (acc. to equipment)	0.070x0.053 mm (100x) to 2.80x2.10 mm (2.5x)

ONLINE PRODUCT CONFIGURATOR

Additional modules and accessories can be viewed using the online product configurator at **www.qatm.com**

Online Configurator ›

QATM
QUALITY ASSURED

ATM Qness GmbH

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