ZwickRoell

Product Information

ZHV30-S Vickers Hardness Tester

Applications

The ZHV30 Vickers hardness tester is suitable for the following test methods:

- Vickers according to ISO 6507 and ASTM E92
- Knoop according to ISO 4545 and ASTM E384
- Brinell according to ISO 6506 and ASTM E10

Advantages and features

- Load levels with motorized load change: 0.2, 0.5, 1, 3, 5, 10, 30 (in kgf).
- Motorized turret for changing between indenter and lenses enables automatic test sequence.
- Turret for four lenses and one indenter eliminates risk of confusion.
- Load application via dead-weights guarantees test-force repeatability and long-term stability.
- Freely adjustable dwell times from 5 to 60 seconds.
- Individual lighting setting for each lens.

Operational control of the hardness tester is handled by **Diamond** hardness testing software:

- The intuitive and workflow-based test procedure is adapted to the ZwickRoell testing software. Operators can move seamlessly from one testing machine to another - thus training is reduced to a minimum.
- Diamond features a deep learning algorithm which mimics human behavior. It is especially suited for samples whose surface is not ideally suited to automatic indentation measurement. This improves the reproducibility of measurements between operators and sample preparation time is minimized.
- All data associated with the test is stored automatically, for example, the test method, hardness value, tolerances, and an image of the indentation with measuring lines. This allows the operator to reassess an automatic measurement even after the test has been completed and the sample removed from the hardness tester.

Product Information
ZHV30-S Vickers Hardness Tester

Diamond Hardness Testing Software
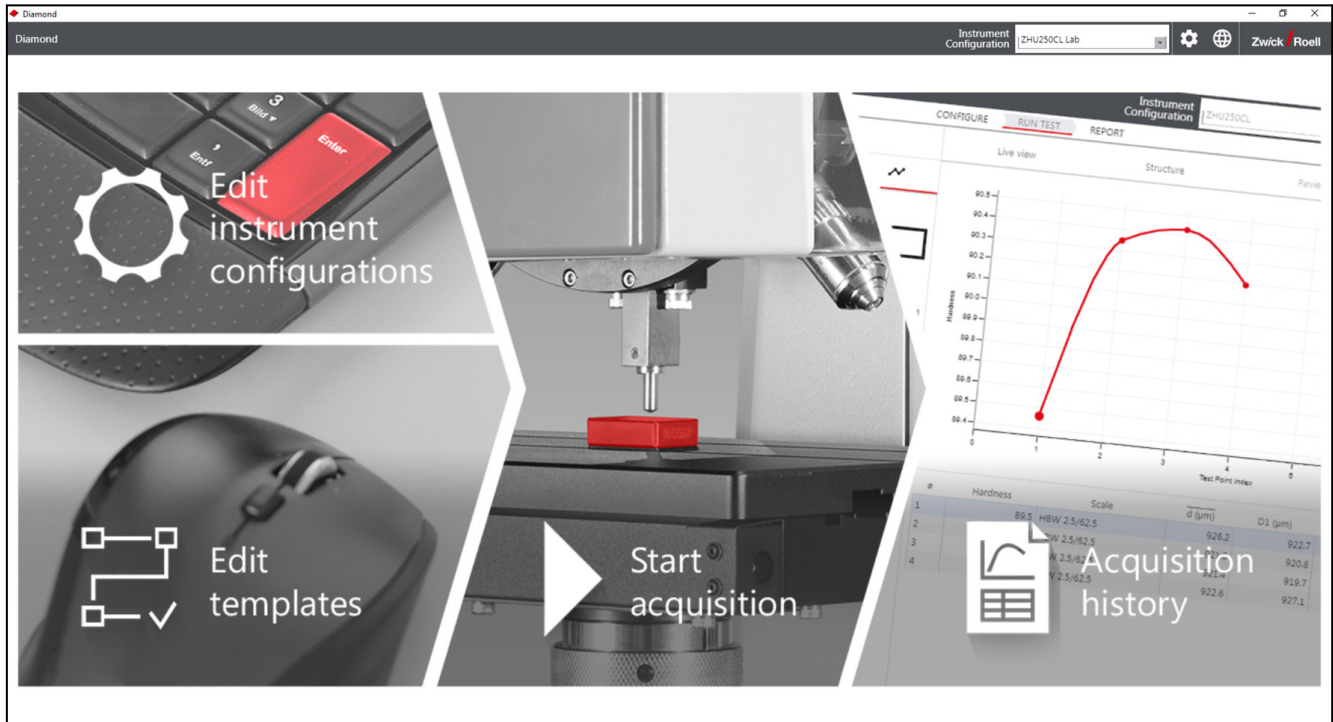
Start screen for Diamond hardness testing software

Getting started is easy!

From the very start, users can easily and intuitively navigate through Diamond testing software.
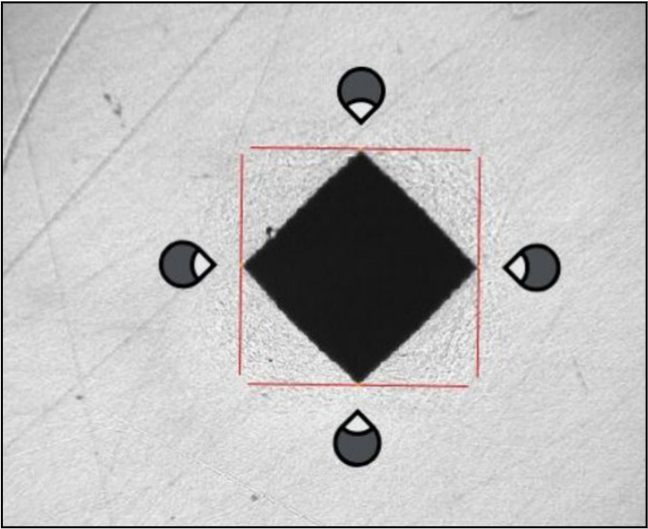
- The simple and straightforward structure of the intuitive interface mirrors laboratory work processes.
- Test definition and task execution, result analysis and general system settings are logically grouped together, allowing users to easily find what they are looking for and to navigate through the software with confidence. This also prevents user input errors.
  - Edit instrument configurations (set up the testing system): defines which machine components and settings will be used
  - Edit templates (configure test): create at least one program template, which defines the overall structure and parameters of the hardness test
  - Start acquisition (run test): enter the specimen attributes, set the indentations, obtain the hardness values
  - Acquisition history (view results): displays the test data acquisition history; open a test that has already been completed for further analysis

## Measurement using artificial intelligence

Image analysis is carried out using a unique deep learning algorithm which recognizes indentations even on low-contrast surfaces - in short, effortless repeatability and reproducibility for a wide range of operators.

- To date, more than 300,000 indentations on different surfaces and materials have been manually measured and fed into the deep learning algorithm.
- When performing an optical measurement, the algorithm mimics human behavior as if manually measured. This allows "difficult-to-detect indentations", which would not be detected by conventional image analysis, to be measured automatically.
- Specimen preparation for Vickers, Knoop and Brinell testing can be reduced to a minimum, also eliminating the need for additional manual remeasurement.

All data at ambient temperature.

We reserve the right to make technical changes in the course of ongoing development.

Product Information
ZHV30-S Vickers Hardness Tester

Automatic measurement of a Vickers indentation
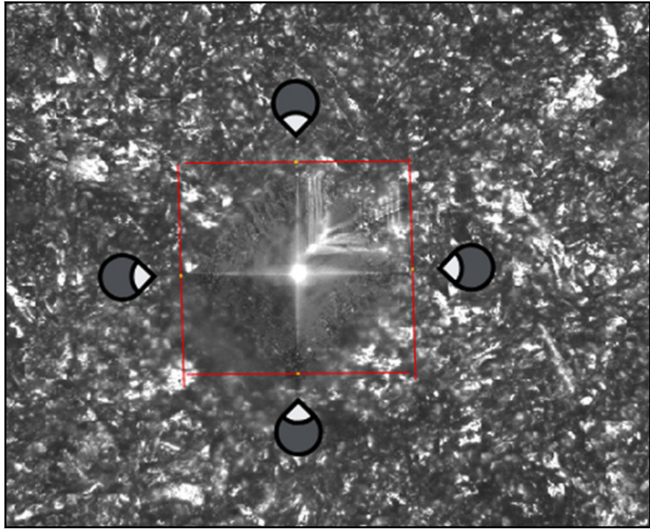
Measurement lines on a Vickers indentation in an etched weld sample

Traceability down to the last pixel

For each test, all of the test data is saved in the acquisition history. After completion or cancellation of the test, this can be recalled either for further analysis or to continue adding results to the test series.

- The sidebar contains numerous filter options, which can narrow down the sequence quickly and display only the most relevant results.
- In addition to the test data, images of the indentations can be displayed which include the measuring lines. The lines are color coded to indicate if any have been manually adjusted.
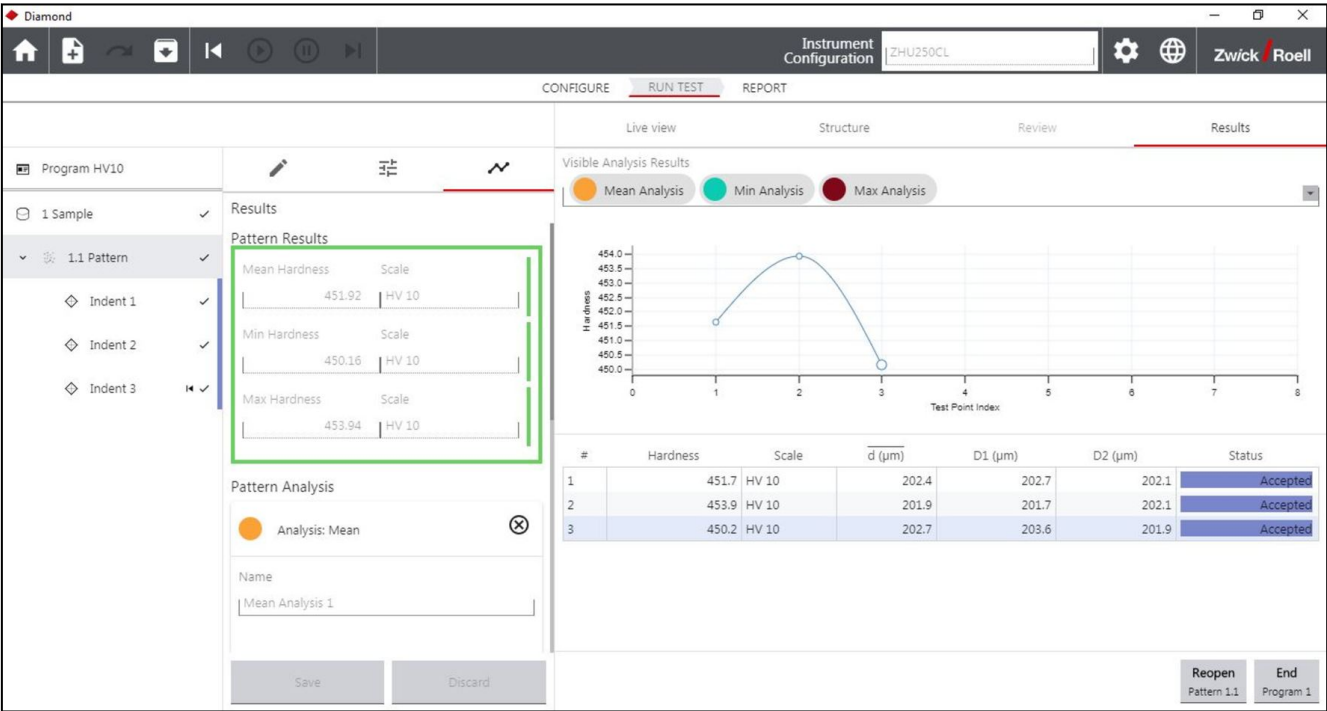
Overview of the hardness test results including limits

All data at ambient temperature.

We reserve the right to make technical changes in the course of ongoing development.

Zwick / Roell

Product Information

ZHV30-S Vickers Hardness Tester

Technical data

Description	Value	
Type	ZHV30-S	
Item No.	2112558	
Test loads	0.2 ... 30	kgf
Vickers HV	Standard load steps from HV 0.2	
Knoop HK	Standard load steps from HK 0.2	
Brinell HBW	Standard load steps with 1 mm ball indenter	
Focusing	manually via lead screw	
Optics	1.3 megapixel USB3 camera	
Data export	USB	
Test area (Height x Depth)	250 x 150	mm
Dimensions (H x W x D)	850 x 300 x 650	mm
Weight	50	kg
Electrical supply	3A single-phase, 240/120V, switchable, 50/60 Hz	

Includes UKAS certification, accessory case, user manual and dust cover

Testing software and hardware

Description	Item number
Diamond software–semi-automated version • For use with Windows 10 operating system • Automatic measurement of indentations (Vickers, Knoop and Brinell) eliminates operator influence	**2112532**
PC for using Diamond • Operating system Microsoft® Windows® 10 • Intel Core i7 or higher with 16 GB RAM • Incl. keyboard, mouse, and connection cable	**2112554**
Graphics card with Nvidia chip set enabled with CUDA technology • Minimum 4 GB graphics card memory • Minimum 1152 CUDA core • Operating system and program on SSD or M.2 or faster memory type installed	**2112555**
23" LCD monitor	**2112556**
15" touchscreen monitor	**2112547**
Telescopic/articulated arm for 15" touchscreen monitor	**2112548**

Indenter

All indenters are accredited to ISO and ASTM Standards.

Indenter	Included in scope of delivery	Item No.
Vickers, Diamond pyramid 136°	UKAS test certificate	2111265
Knoop, Diamond pyramid	UKAS test certificate	2111266
Brinell, with tungsten carbide ball 1 mm	UKAS test certificate	2111264

We reserve the right to make technical changes in the course of ongoing development.

Product Information

ZHV30-S Vickers Hardness Tester

Indenter holder

Required	Item No.
1 x per indenter	2112268

Lenses

Type	Individual magnifi-cation	Field of view (1.3 MP camera) [μm]	Resolution (1.3 MP camera) [μm/pixel]	Item No.
Objective lens	5 : 1	2000	0.92	2111211
Objective lens	10 : 1	1000	0.46	2111212
Objective lens	20 : 1	500	0.22	2111213
Objective lens	40 : 1	250	0.11	2111214
Objective lens	50 : 1	160	0.09	2111215
Objective lens	100 : 1	100	0.04	2111216

Lens holder

Required	Item No.
1 x per lens	2111209

Optional accessories

X-Y tables

Type	Dimensions [mm]	Adjustment	Travel [mm]	Item No.
Manual X-Y table	100 x 100	manual micrometers	50 x 50	2111222
Manual X-Y table	100 x 100	digital micrometers	50 x 50	2111221
Manual X-Y table	100 x 100	manual micrometers	25 x 25	2111224
Manual X-Y table	100 x 100	digital micrometers	25 x 25	2111223

Additional accessories are available on request.