

Product Information

ZHV30/zwicki-Line Hardness Testing Machine



Range of application

Can be used for all optical hardness test methods in the low-force range for individual, series and multiple hardness traverse tests to the following standards:

- Vickers hardness acc. to EN ISO 6507
- Knoop hardness acc. to EN ISO 4545
- Brinell hardness acc. to EN ISO 6506

This hardness tester is ideal for automated hardness testing to determine values for the following methods:

- Case hardening depth (CHD) to EN ISO 2639
- Effective hardening depth after surface heating (DS) to DIN EN 10328
- Nitriding depth (Nht) to DIN 50190-3 and
- Weld seam tests on steel pipes to DIN EN 10208

The ZHV30/zwicki-Line hardness testing machine covers the metals (steel producers, steel suppliers, hardening shops), automotive and aerospace industries, together with Academia, official bodies and authorities and medical technology (ceramics and dental materials).

Advantages/features

- The fully automatic ZHV30/zwicki-Line features closed-loop technology. It offers reduced testing costs and minimal operator influence, guaranteeing effective and cost-efficient low load hardness testing.
- The hardness tester has been designed as a 'top loader' so that the measuring unit is automatically lowered to the specimen. The test area height can be varied as required.
- The Xforce HP load cell and Zwick *testControl*[®] measurement and control electronics guarantee fast, precise test load application in the range from HV0.1 to HV30 and from HBW1/1 to HBW2.5/31.25.
- The innovative mounting device for the indenter guarantees shock-free application of all test loads.
- The measuring microscope features CCD camera technology and has a motorized turret for the indenter and up to 4 lenses, allowing a wide range of applications to be covered.
- Control of the hardness tester and evaluation of test data is via *testXpert*[®] software. Test reports (with test parameters and test results) are generated automatically.

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Additional features

The modular design of hardware and software ensures this flexible testing system is able to cater equally well for present and future customer requirements:

- Guaranteed retrofit and upgrade capability
- Software update with innovations
- Easily licensed software options
- Variable test area height
- Accessories and x-y tables

zwicki-Line hardness testing machines allow test area heights of up to 670 mm, enabling large components to be tested also.



Various x-y tables and numerous accessories are available:

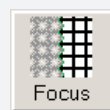
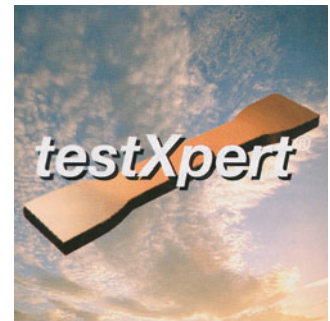
- With manual micrometer screws
- With digital micrometer screws for position transmission
- Motorized control, with travel up to 150 x 50 mm
- Alternative LED microscope illumination
- Specimen holders

The fully automated system includes automatic positioning of lens or indenter. The lens to be used is defined in the software via a mouse click and automatically rotated into position to measure the indentations. For hardness traverse tests a scanning lens can be defined for preliminary checks of the indentation positions and a measuring lens for indentation measurements.

The ZHV30/zwicki hardness testing machine is tailored to automated series and traverse tests and offers an economical solution for hardness testing. Automatic focusing and indentation measurement combined with four motorized axes provide a high level of automation with minimal operator involvement and influence, for accurate results at very low costs.

Intelligent testing with *testXpert*[®]

testXpert[®] intelligent testing software underpins this innovative testing system in standard testing situations (such as quality assurance) and provides demanding research and development specialists with a remarkable range of options.



Automatic focusing on the test indentation whenever required via the push of a button or zooming on to the specimen surface via a scroll bar



Fully automatic indentation measurement of single tests and multiple traverse tests, with auto focus if required



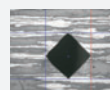
Virtual joystick for x-y table control or positioning via mouse-click on the video image



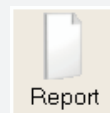
Easy definition of hardness traverse tests (including multiple traverse tests) and storage of user's own templates



Existing indentations can be re-approached and data evaluation repeated whenever required



Scanning and measuring lenses for hardness traverse tests



Automatic report generation and data export



Saving user's own templates: customizing user interface and test parameters, results tables and statistics tables, report creation and data export



User management with different access rights for administrators and user groups

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zwicki-Line Z2.5 testing machines with higher resolution

Type	Z2.5 TS	Z2.5 TN
Item number	375727	375729
Max. test load F_N (tensile/compression)	2.5 kN	2.5 kN
Crosshead speed	0.1 ... 50 mm/min	0.1 ... 50 mm/min
Positioning, repetition accuracy	$\pm 2 \mu\text{m}$	$\pm 2 \mu\text{m}$
Dimensions (height x width x depth) ⁽¹⁾	779 x 688 x 765 mm	1279 x 688 x 765 mm
Weight	approx. 90 kg	approx. 100 kg
Test area (height x depth)	170 x 99.5 mm	670 x 99.5 mm
Electrical connections (adjustable)	100 ... 250 V (PH,N,PE)	100 ... 250 V (PH,N,PE)
Mains frequency	50/60 Hz	50/60 Hz
Power rating	0.44 kVA	0.44 kVA

⁽¹⁾ Inclusive optical hardness testing unit and x-y table. The dimensions of the x-y table control unit are not considered.

ZHV30 Hardness testing unit

Type	with motorized revolver / with manual revolver
Item number	008294 / 035905
Load cell	Accuracy grade 0.5 according to DIN EN ISO 7500-1
Measuring microscope (quintuple revolver)	with CCD Camera (1/2" Chip) / 752x582 Pixel for 1 indenter and up to 4 objective lenses
Testing methods	
Vickers (acc. to DIN EN ISO 6507-1)	HV 0.1; HV 0.2; HV 0.3; HV 0.5; HV 1; HV 2; HV 3; HV 5; HV 10; HV 20; HV 30
Knoop (acc. to DIN EN ISO 4545)	HK 0,1; HK 0.2; HK 0.3; HK 0.5; HK 1
Brinell (acc. to DIN EN ISO 6506-1)	HBW 1/1; HBW 1/2.5; HBW 1/5; HBW 1/10; HBW 1/30; HBW 2.5/6.25; HBW 2.5/15.625; HBW 2.5/31.25
Also required:	Testing machine zwicki-Line Z2.5 (see above) Objective lenses and indenter (with mounting device, see below) Electrical connections 230 V (Item number 312130) / 115 V (Item number 312132) Motorized x-y table (in combination with motorized revolver)

Indenters and objective lens mounting device

Description	Item number
Indenter Vickers pyramid 136° for hardness tests to Vickers	318061
Indenter diamond pyramid to Knoop for hardness tests to Knoop	318845
Indenter hard metal ball dia. 1 mm for hardness tests to Brinell	320900
Indenter hard metal ball dia. 2.5 mm for hardness tests to Brinell	320896
Objective lens mounting device for indenters	035906

Objective lenses for hardness testing unit

Item number	311954	311956	311958	311960	311962
Inherent magnification	5:1	10:1	20:1	40:1	60:1
Standard equipment					
Field of view ⁽²⁾ horizontal	1760 μm	880 μm	440 μm	220 μm	147 μm
vertical	1320 μm	660 μm	330 μm	165 μm	110 μm
Picture resolution	2.3 $\mu\text{m}/\text{Pixel}$	1.2 $\mu\text{m}/\text{Pixel}$	0.6 $\mu\text{m}/\text{Pixel}$	0.3 $\mu\text{m}/\text{Pixel}$	0.2 $\mu\text{m}/\text{Pixel}$

⁽²⁾ A Vickers indentation should be at least 1/3 of the vertical field of view to be able to achieve a resolution of 0.2 μm ($d < 40 \mu\text{m}$) or 0.5% of d ($d \geq 40 \mu\text{m}$).

The degree of loading to DIN EN ISO 6506-1/2 is to be selected so that it is $0.24 \cdot D < \text{indentation dia.} < 0.6 \cdot D$.

The measurement device should have a scale graduation of 0.5% of d .

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LED Illumination source

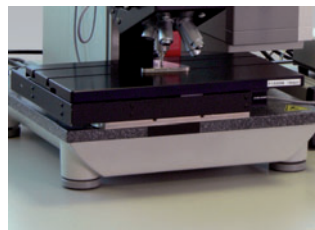
The frontlight coaxial lamp with LEDs can be used as an alternative source of illumination as opposed to normal light bulbs. The main advantages are the longer life span and considerably low heating up of the measuring microscope. The LEDs are operated by a current controlled mains unit.



Description	Item number
LED Illumination source	375920
Power supply unit, current controlled	375922

X-y tables

Description	Item number
Manual x-y table, Fmax 500 N, table size 135 x 135 mm	
- travel 50 x 50 mm, manual micrometer screws	353448
- travel 25 x 25 mm, digital micrometer screws, digital display and transmission of the position	353449
Motorized x-y table, Fmax 500 N, controlled by PC via RS232 interface	
- travel 100 x 50 mm, table size 350 x 192 mm	018130
- travel 150 x 50 mm, table size 400 x 192 mm	018134
Adapter plate for x-y tables for hardness testers (zwicki-Line, ZHV10)	375675



⁽¹⁾ Further table sizes respectively travel dimensions on request

Accessories

Description	Item number
Specimen clamp for 3 round specimen (Ø 40 mm) or for 6 round specimen (Ø 30 mm) incl. centering stop for x-y tables, Fmax 20 N	029548/029547
Parallel vice, also requested:	312086
Pair of clamping jaws for vice, Ø 4...14 mm / 14...40 mm / 40...70 mm	312090/312092/312094
Quick-action vice	312096
Various prisms for specimens diameter 1...20 mm / 5...70 mm / 30...150 mm	312106/312108/312110

Software *testXpert*® and options

Description	Item number:	German	English
<i>testXpert</i> ® Master test programm for optical testing methods		353451	353472
<i>testXpert</i> ® Option Traverse testing		353453	353475
<i>testXpert</i> ® Option Auto measurement		353455	353473
<i>testXpert</i> ® Option Auto focussing		353454	353474
<i>testXpert</i> ® Option Connection of x-y tables		353456	318788