

Hardness Testing with ZwickRoell



Zwick / Roell

Intelligent Testing



About ZwickRoell

Expertise in hardness testing.

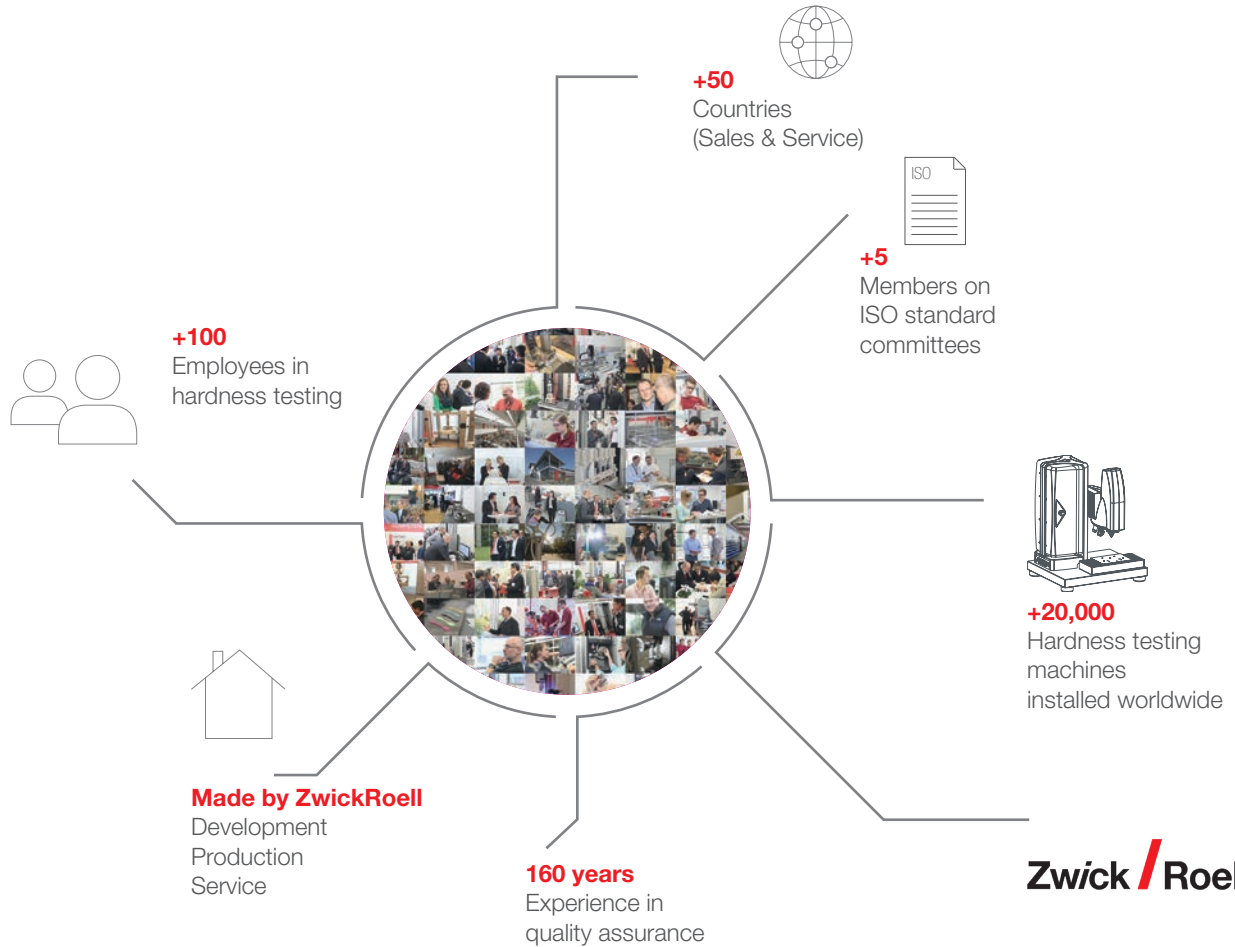
True to the motto of building hardness testing machines that „do everything simply, rather than simply everything“, we have been developing hardness testing machines for many decades that support the user in performing comprehensive testing tasks. For more than 160 years, ZwickRoell has stood for extraordinary technical performance, innovation, quality and reliability in materials and components testing. With over 70 years of experience in hardness testing and three production facilities in Ulm (Germany), Kuchl (Austria), and Birmingham (United Kingdom), we are your reliable partner for all your hardness testing applications.



Production facility in Kuchl



Production facility in Birmingham



Zwick / Roell

The right machine for your application

	0.05 mN	0.25gf	10gf	20gf	50gf	0.1kgf	0.2kgf	0.3kgf	0.5kgf	1kgf	2kgf	20N (2039gf)	3kgf
DURASCAN		Vickers ISO 6507, ASTM E384, ASTM E92, Knoop ISO 4545, ASTM E84, ASTM E92; Brinell SO 68											
ZHV μ		HV 0.01 to HV 2											
ZHV30		Vickers ISO 6507 / ASTM E384, Knoop ISO 4545											
DURAVISION 20/200/250		Vickers, Knoop, Brinell, Rockwell											
DURAVISION 30/300/350		Vickers, Knoop, Brinell, Rockwell											
DURAJET		Rockwell, Plastics 49.03 N; 13N											
ZHR8150CLK		Rockwell, Plastics, ISO6508											
ZHR		Rockwell											
ZHU/ZWICKILINE+		HV0.2-HV30/50, HK0.1-1, HB											
ZHN	Nano/Micro testers, Scratch testers, Wear testers for hardness and modulus measurement, Scratch, Profilometer, Fatigue, Dynamic up to 300 Hz												
Portables	Rockwell, Shore, IRHD												

Our product portfolio includes a full range of hardness testing machines for use on metals, plastics, rubber and special materials according to all the principal and globally accepted standards. ZwickRoell's hardness testing solutions range from manual standard applications to fully automatic testing systems.

You can find the complete product portfolio on www.zwickroell.com/hardness

15kgf	30kgf	62.5kgf	100kgf	150kgf	187.5kgf	250kgf	3000kgf
506, ASTM E10							
D 4545							
Rockwell, Carbon testing, Plastics testing							
Vickers, Knoop, Brinell, Rockwell, Carbon testing, Plastics testing							
2.9 N; 357.9 N; 961 N, Carbon testing, HVT, HBT							
8, ASTM E18, ISO 2039, ASTM D785							
Rockwell, Super Rockwell ISO 6508, ASTM E18							
W 1/1 - 1/30, 2.5/6.25-31.25							





Low load and micro hardness testing machines

With our low load and micro hardness testing machines Vickers, Knoop and Brinell test tasks can be carried out in a load range between 0.25 gf and 62.5 kgf features a high level of efficiency, flexibility and process reliability. We offer a market leading assortment from entry-level instruments for simple test tasks to fully automated hardness testing machines for complex test tasks.



DuraScanG5

The groundbreaking standard load range from 10 g to 62.5 kgf significantly expands the application range of the hardness tester and is applied via closed loop control. It can optionally be extended to a range from 0.25 gf to 62.5 kgf.

The 10 Mpix camera in combination with the 3-step zoom enables a wide range of applications with a small number of lenses.

DuraScan G5's 6-position turret enables quick and convenient changing of different indenters and lenses (DuraScan 10 G5/20G5 are equipped with a manual 3-position turret; the automatic 6-position turret is optionally available).



ZHVμ

The ZHVμ Micro Vickers hardness tester covers Vickers and Knoop hardness tests to ISO 6507, ISO 4545 and ASTM E384 in the test-load range from HV0.01 to HV2.

For more sophisticated or for automated applications, a fully automated PC controlled version of the ZHVμ micro Vickers hardness tester with HD software is available.



ZHV30

The ZHV30 low-load Vickers hardness tester covers Vickers and Knoop hardness tests to ISO 6507, ISO 4545 and ASTM E 384 in the load range from HV0.2 to HV30.



- Fully automatic brightness control and quick autofocus via 10 Mpix camera with 4x zoom. Electronically controlled test cycle (PLC) and automatic evaluation
- Evaluation of test indentations without requiring the operator to configure additional settings
- Large test area and wide reach with a compact design
- Optional hardware interface for integration into automatic systems or connection to a foot switch for external machine control
- Star-shaped turret with up to seven turret positions for placing indenters and lenses – enables a wide range of test methods on a single machine, without the need for frequent tool changes.

Universal hardness testing machine for production and labs

DuraVision G5

The DuraVision G5 series covers a uniquely wide standard load range of 0.3 to 250 kgf or 3 to 3000 kgf, which supports a large selection of test methods: Brinell, Vickers, Rockwell, Knoop to EN ISO and ASTM, as well as carbon testing and plastics testing. Thanks to its sturdy construction, the DuraVision G5 Automatic is particularly suitable for use not only in the vicinity of the production environment, but also in the laboratory for quality assurance purposes. The semi-automatic DuraVision G5 hardness testing machines are ideally suited for use in a in harsh production environments. The fully automatic version is designed for complex test tasks.





Hardness testing software: Results in four simple steps

ecos Workflow operating software

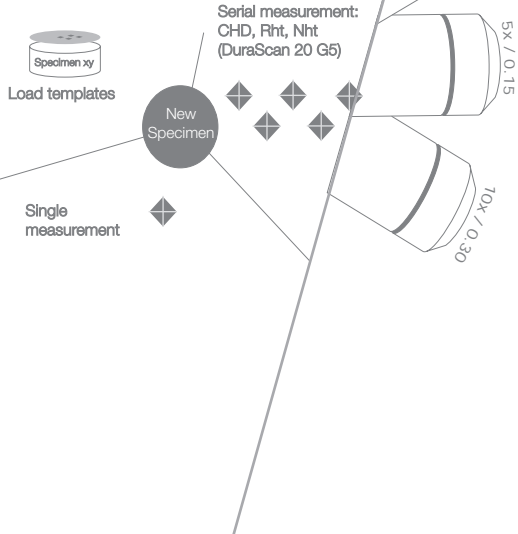
Optimal user-friendliness of a software is vital for efficient and error-free work. That is why EMCO TEST developed the unique, trend-setting operating software ecos Workflow. The software assumes control of the increasingly diverse test tasks and guarantees easy specimen management with sustainable data backup for later evaluation and analysis. We offer the hardness software ecos Workflow Touch for operation directly on the instrument via touchscreen, as well as ecos Workflow Pro for operation via an external PC.



1

Specimen

Start with a new specimen.
Select the desired test type or load a template.



2

Method

Select test methods,
test methods, conversions,
limit values, objectives or
device corrections.



3

Position

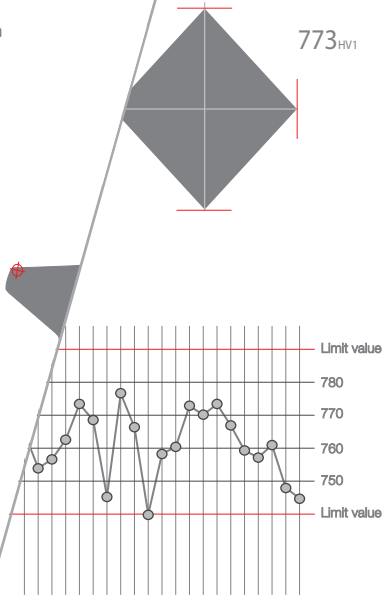
Position your test points on
the work piece and start the
measurement.



4

Result

Results are displayed automa-
tically and can be corrected by
hand. Export accurate
measurement reports.





ZHR

- Nose-mounted indenter enables hardness testing at difficult-to-access measurement points
- Separate indenter, for extended range of application. Fully automatic test sequence (including automatic evaluation) eliminates operator influence on test results
- High test-result reproducibility
- Robust construction with zero-backlash, ball-bearing-mounted lead-screw
- Test area up to 250 mm enables testing of larger workpieces
- Visual and audible signal outside of the tolerance specification and during pre-load setting/adjustment



DuraJet G5

- Wide range of application in the production environment due to large standard load range (1 - 250 kgf), robust machine design, and 7" touch display
- Electronically controlled test cycle (PLC) and automatic evaluation of test indentations without additional adjustments by the operator
- Continuous and precise force application through electronic force sensor
- Hardware interface for integration into automated systems or for connection of a foot switch for external machine control

Rockwell hardness testing machines – flexibility combined with ease of operation

ZHR – Rockwell Specialtesting equipment to customers individual requirements

The various hardness testers of the ZHR-family perform classical Rockwell methods (load: 60 - 150 kgf), superficial Rockwell methods (load: 15 - 45 kgf) and combinations of Rockwell and superficial Rockwell methods (load: 15 - 150 kgf) on Metals, Plastic, Laminate flooring and ceramics.

DuraJet G5 – The hardness testing multi-talent

Robust and versatile – the key characteristics of the DuraJet G5. Through electronic load application and a load range of 9.8 N to 2,450 N (1 kg to 250 kgf), this hardness testing machine covers the complete Rockwell range. But this hardness tester can do even more: Plastics and carbon testing as well as Vickers and Brinell tests can be performed in depth.





Universal hardness testing machines for instrumented indentation tests & nanoindenters

ZHU/zwickiLine+ universal hardness testing machine

The ZHU/zwickiLine+ universal hardness testing machine is based around the zwickiLine materials testing machine. It can be used both for classical hardness testing methods (Rockwell, Vickers, Brinell, ball-indentation) and for the innovative instrumented indentation method for determining hardness plus other material parameters of metallic materials (Martens hardness, ISO 14577). The ZHN nanoindenter is used for comprehensive, mechanical characterization of thin layers or small surface areas with the necessary force and travel resolution. This includes measuring indentation hardness, indentation modulus, and Martens hardness to ISO 14577 (instrumented indentation testing).



ZHU/zwickiLine+

- The zwickiLine+ combined with the hardness measurement head and the new hardness edition of testXpert testing software create an innovative testing system with a comprehensive range of application. Universal, material-dependent application for practically all hardness testing methods with fully automatic test sequences
- Method-independent, automatic representation of force-indentation depth curve for comprehensive material characterization during the instrumented indentation test to ISO 14577
- Versatile results display: individual and statistical values, graphs, screen display, and test reports can be changed freely.



ZHN Nanoindenter

- Determination of hardness and elastic modulus to DIN EN ISO 14577 Measurement is typically performed with a Berkovich indenter with force control.
- The ZHN uniquely features real force and displacement control. The measuring heads feature high lateral stiffness—changing indenters is extremely easy and calibration is not influenced.
- The ZHN has the highest signal-to-noise ratio for the entire nano and micro range (106) of all existing nanoindenters, both normal and lateral.
- The lateral force unit (LFU) is ideal for scratch, wear, and multi-axial tests—even for larger forces, lateral force displacement curves are measured in nm resolution.

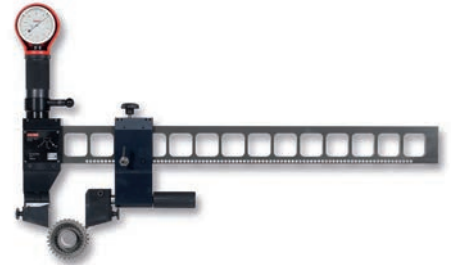
Portable hardness testers for metals



/ N4 - Hardness testing clamps



/ N6 - Hardness testing in drill holes



/ N7 - Tooth flank testers

Portable hardness testers for plastics and rubber



/ IRHD3103



/ Shore Digital



/ IRHD3105 combitest



/ Shore A

Portable hardness testing

Tests on metals

Our portable Rockwell hardness testers in a load range from 15 to 187.5 kgf are the result of over 65 years of experience. They have proven themselves in many branches of industry for decades. At the core of every testing instrument is the reliable spring sleeve unit for load application. The hardness value is indicated on an analog dial gauge. Applications for these portable hardness testers range from the simple measurement of sheet metal to the performance of hardness tests on tooth flanks and drill holes.

Tests on plastics and rubber

ZwickRoell offers various testing instruments for mobile hardness testing on plastics and elastomers in different versions (analog/digital or with/without support bracket/stand). Shore and IRHD (International Rubber Hardness Degree) hardness testers determine the indentation depth of the most diverse materials, from foams to rubber and rigid plastics.





Service is our passion

We support you on all things related to hardness testing.

We not only meet the widest range of test requirements, but we support you throughout the entire life cycle of the testing system with tailored support services—anywhere in the world. For our materials testing machines we guarantee the availability of spare parts for at least 10 years after a product has been discontinued. In short: when you choose us, you choose absolute investment security.



Consultation & Application Technology

We offer you one of the most comprehensive application expertise of the industry – with numerous experts in standards committees, and specialists who are passionate about supporting you online, in our demo centres or at your site.

Maintenance and Inspection

Our regular maintenance and inspection services protect your machine from downtime and unnecessary costs associated with repair work.

Calibration

We operate calibration laboratories around the world. Among other standards, we perform calibrations to DAkkS, COFRAC, UKAS, A2LA, INMETRO, TÜRKAK and NABL.



ZwickRoell Academy

ZwickRoell Academy offers a diverse and informative training program for beginners and advanced users as well as customized courses to suit your individual requirements.

Modernization & Pre-Owned Machines

We are ready to assist you with simple retrofit packages and also with specially tailored modernization concepts for hardness testing machines from more than 40 different manufacturers.

Repairs and Spare Parts

We think and act for the long term, which is why we guarantee the availability of spare parts for our machines for at least 10 years after a product has been discontinued.

Ready for the next generation

ZwickRoell provides individually tailored services and support through the entire life cycle of your testing machine - we are there for you.

Hotline and customer support

Do you have questions or need support? Our service engineers are always available to provide you with fast, expert assistance.

Together for your needs.



We offer you the right machine for your special requirement and an extensive range of accessories.