Struers
Ensuring Certainty

Struers hardness testing equipment

MAXIMIZE SPEED AND ACCURACY

Next-generation solutions that give you even higher throughput and dependable repeatability

FASTER AND MORE ACCURATE TESTING RESULTS

Hardness testing, or verification, is a crucial part of the materialographic process. No matter your material, sample size or standard, with Struers you can be sure your lab has the right setup to meet demands on throughput and accuracy, even for less skilled operators.

The right solution for your setup

Whatever the material you work with or standards you need to meet, you need a hardness testing solution you can rely on to deliver reproducible results with consistent quality and full process documentation.

Struers' hardness testers are proven to deliver dependable results, covering all applications within industrial research and production quality control using Vickers, Knoop, Brinell, and Rockwell test methods. However, the right equipment is only part of the solution, which is why we recommend you consult a materialographic specialist who understands your challenges and objectives.

Ensure certainty with a trusted partner

With Struers, you will never need to spend time and money managing multiple suppliers. We provide complete materialographic solutions, including all necessary calibration and servicing requirements, and a full range of accessories designed specifically to work flawlessly with your hardness testing equipment. This means you get the right preparation result from day one and the best value from your investment far into the future.

We also support you by sharing our extensive expertise and know-how through tailored services, helping you to create a faster, safer, and more cost-effective sample preparation process. We call this ensuring certainty, and it is the reason we are the partner of choice for thousands of materialographic professionals worldwide.

"Before we used a micro and macro hardness tester, followed by a microscope. Now, in most cases, we only need to use Duramin-40. This has significantly reduced time and increased efficiency in our testing process."

- Jesper Vejlø Carstensen, Senior Research Engineer, M.Sc., Ph.D., MAN Energy Solutions

WE UNDERSTAND YOUR CHALLENGES

Verifying your material using the right hardness testing process is essential to ensure consistent product quality and stay within regulatory values. That is why you need to be sure of a perfect result, every time, with a solution that meets your needs for speed and accuracy.

Throughput and speed

Labs can struggle to meet throughput demands, requiring better ways to test more samples in a shorter timeframe. Our latest generation of hardness testing machines are designed to streamline your process with greater accuracy, faster autofocus, wider load ranges, higher levels of automation, easier reporting, and more.

Verification is the final step of the sample preparation process to ensure your material meets the required values.

Cutting

Mounting

Grinding/polishing

Verification

Verification can be obtained by testing the resistance of a material to permanent deformation by a harder material.

The process uses one of four methods – Vickers, Knoop, Brinell, or Rockwell – depending on the type of material.

Reproducibility

It is crucial to be able to reproduce your hardness testing process, so you always get the same accurate results even if your operators are not highly trained. To achieve this, not only do you need the right equipment, but it must be set up and calibrated correctly to give you the data you require, such as for light, contrast, focus, method, and other crucial factors.

Accurate measurements

To comply with ISO and ASTM, your hardness testing process must deliver reliable results. Errors can have serious consequences, such as production stops and product recalls, and could even damage your brand name. This means you need to be sure your process meets your specific needs and uses the correct testing method.

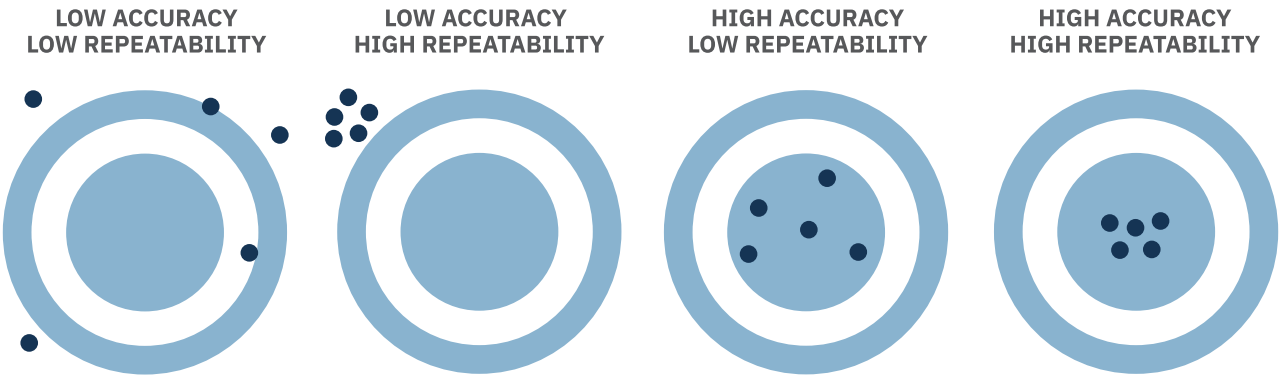
Documentation

Not only is it important to have detailed documentation of your results for your and your customers' internal audits and quality control, but it is a legal requirement in order to obtain ISO and ASTM certifications. The right testing solution will enable you to create, record, and share documentation in common formats and in any language.

Complex samples

Not every sample will be conveniently straight, small, and flat; often, you will need to work with irregular shapes, new materials or samples that require a specific hardness testing process. This can make your process slow or your results inconsistent, which is why it is best to consult a specialist who can guide your choices and help you adapt your process to new or complex materials.

Optimize your quality control



It is essential that your hardness testing solution meets your specific requirements to ensure consistent quality control across your materials and products.
Our next-generation equipment gives you exceptional accuracy and repeatability, every time, so you always get results you can rely on.

A SOLUTION FOR EVERY METHOD

Hardness Testing Methods

Struers provides a broad range of hardness testing equipment suitable for every material and method.

As materialographic specialists, we know that your equipment will only deliver the right result if it is calibrated for your lab and your requirements.

That's why with Struers you get far more than class-leading equipment – you get a complete package of services to ensure everything is set up correctly from day one, with ongoing support to guarantee optimal performance and results far into the future.

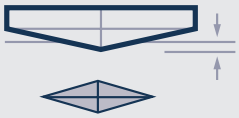
4 standard methods

The hardness of a material is the resistance it exhibits to permanent deformation by penetration of a harder material. Four different hardness testing methods have become standard to cover all different types of material.

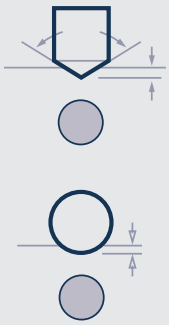
Our hardness tester solutions can support you with all testing methods:

Vickers is a hardness test for all solid materials. It is calculated by measuring the diagonal lengths of an indent in the sample material left by a diamond pyramid indenter with a given load. The diagonals of the indent are measured optically to determine the hardness, using a table or formula.

Brinell is used for hardness testing larger samples with a coarse or inhomogeneous grain structure. The indentation leaves a relatively large impression, using a tungsten carbide ball. The size of the indent is read optically.



Knoop is an alternative to Vickers in the micro hardness testing range. It is mainly used for brittle materials and to facilitate the hardness testing of thin layers. The indenter is an asymmetrical pyramidal diamond, and the indent is measured by optically measuring the long diagonal.

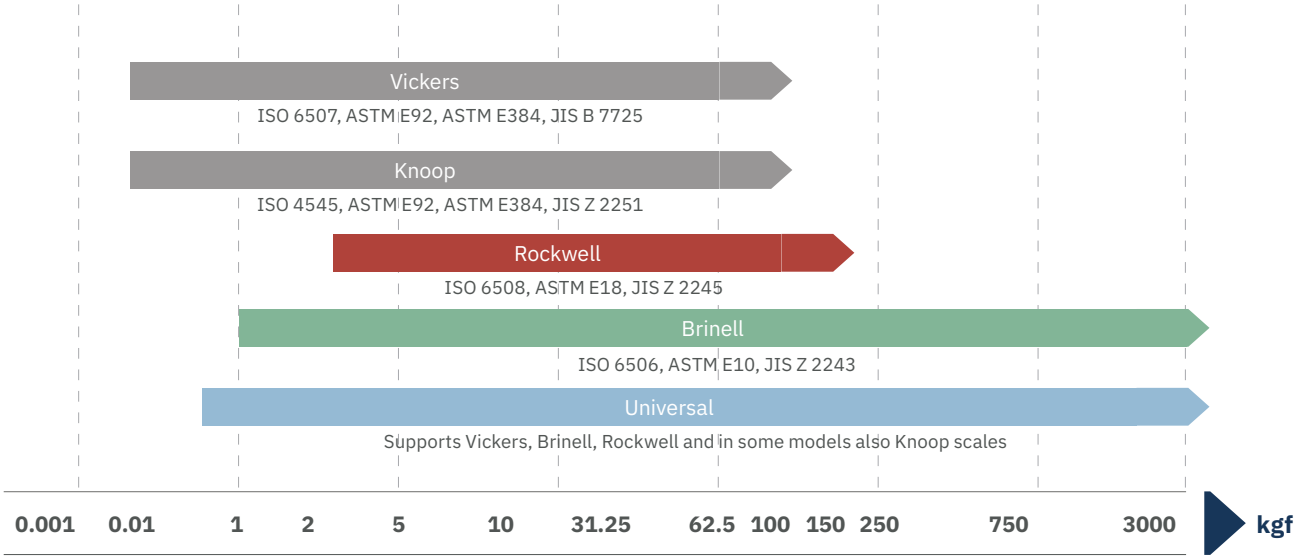


Rockwell is a fast test method developed for production control and is mainly used for metallic materials. The hardness is calculated by measuring the depth of an indent after an indenter has been forced into the specimen material at a given load.

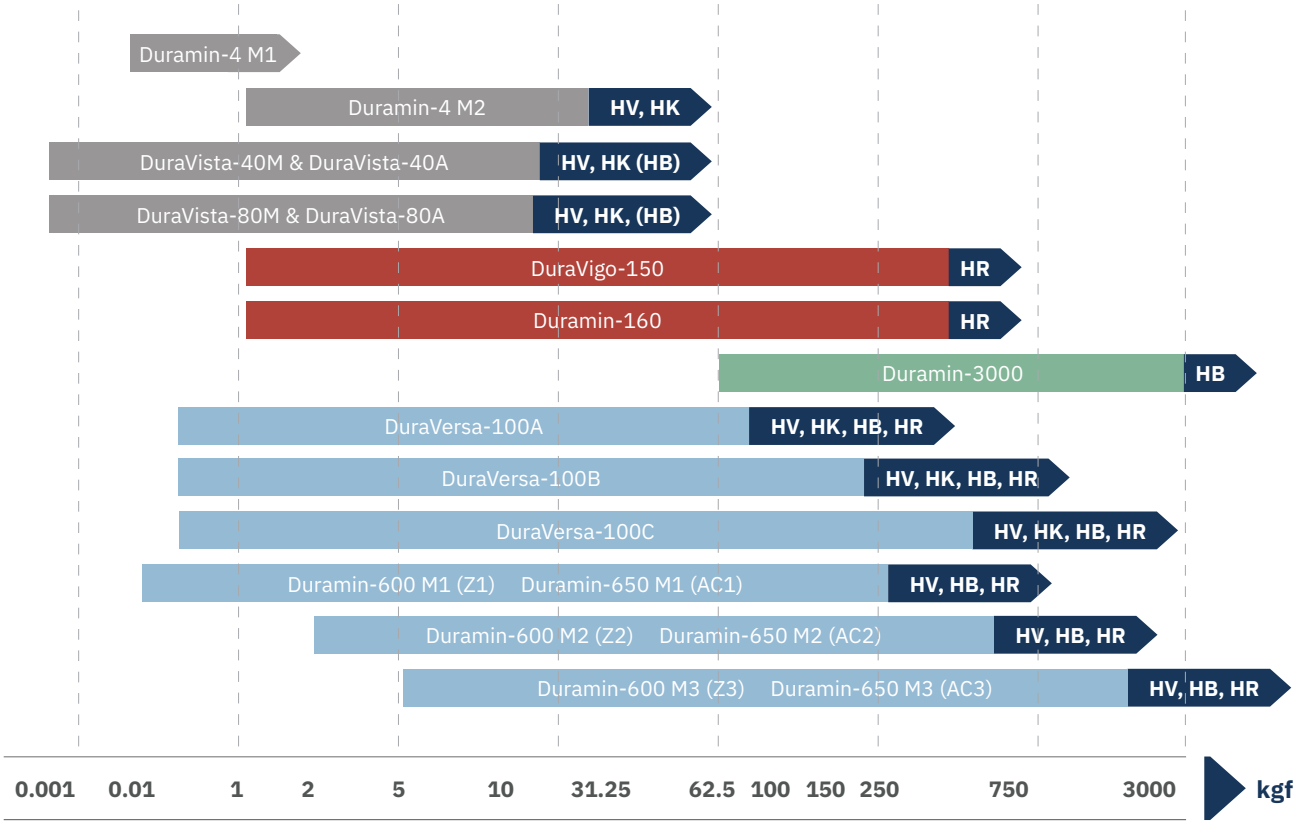
Whatever the hardness test method, we have a solution

Given your materials and the ISO or ASTM standard you need to meet, it is important to understand which Struers equipment is best for you.

ISO and ASTM standards overview



Struers equipment overview



Archive
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Report
Settings
Pattern
Program
Delete
Tools
HARDNESS DIAGRAM
Measure
Save
Escape
JOBS
FORCE
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NEW DURAVISTA-80 – WITH EFFECTIVE REPEATABILITY

Welcome to the new DuraVista-80 for Vickers and Knoop

No matter your material, with Struers hardness testing solutions you can be sure your lab has the right setup to meet the standards you need, with optimal reproducibility and repeatability of results.

- **Accurate measurements** with reliable results – every time
- **Limitless patterning possibilities** with the various optional integrated motorized stages
- **Reveal the smallest details** with high quality optics and white LED Köhler illumination and (optional) polarizer
- **Ensure certainty** with a complete preparation partner

MICRO/MACRO TESTERS

Duramin-4: Optimal repeatability and Easy Operation

Duramin-4 is an entry-level range of micro hardness testers that primarily uses the Vickers method, but it can also be used for Knoop and Brinell testing. The Duramin-4 testers are equipped with a combination of manual and automatic features to ensure easy operation and maximize efficiency through optimal uptime, delivery time, and footprint.

- Suitable for Vickers, Knoop, and Brinell hardness testing
- Manual indent measurement via eyepiece
- Two load ranges: 10 gf–2 kgf, 1 kgf–62.5 kgf (0.09 N–19 N and 9.8 N–612 N)

DuraVista-40: Microtester with Automated Accuracy

DuraVista-40 is an automated micro-hardness tester that supports the Vickers, Knoop, and Brinell scales up to 62.5 kg. It is software controlled with a built-in high-resolution camera and motorized Z-axis with autofocus that are coupled with its closed-loop loadcell technology to ensure repeatable and effortless results. The models with automated stage unleash limitless automation possibilities.

- Suitable for Vickers, Knoop, and Brinell hardness testing
- 18 MP camera with autofocus & auto-measure
- Software modules for CHD, gear tooth, welds and many more
- DuraSoft-Met Metallography software pack
- Configurable load range 0.1 gf–62.5 kgf (0.00098 N–612.9 N)

DuraVista-80: Precision and Efficiency

The DuraVista-80 automated micro-hardness tester is designed to deliver unmatched accuracy and ease of use. Supporting Vickers, Knoop, and Brinell scales up to 62.5 kg, it features a movable test head with independent load motor, offering both ergonomic excellence and precision.
Powered by advanced DuraSoft control software, the DuraVista-80 integrates a high-resolution camera, a motorized Z-axis with autofocus, and cutting-edge closed-loop loadcell technology. This ensures repeatable, effortless results every time. For enhanced productivity, models with automated stages unlock boundless automation capabilities, making the DuraVista-80 the ideal solution for demanding testing applications.

- Suitable for Vickers, Knoop, and Brinell hardness testing
- Motorized test head with touch focus18 MP camera with autofocus & auto-measure
- Software modules for CHD, gear tooth, welds and many more
- Configurable load range 0.1 gf–62.5 kgf (0.00098 N–612.9 N)

UNIVERSAL TESTERS

Duramin-600: Accuracy and Durability

Duramin-600 is designed for the toughest production environments. It feature a six-position turret to allow fast localization of desired test points and quick access to standard test patterns. Duramin-600 is suitable for high-volume testing and is equipped with a clamping device to secure oversized specimens. It's standard Anti-collision system keeps maintenance costs low.

- Suitable for Vickers, Brinell and Rockwell hardness testing
- Optional with motorized Z-table
- Three load ranges: 1 kgf–250 kgf, 3 kgf–750 kgf, 5 kgf–3000 kgf (9.8 N–2450 N, 29 N–7357 N and 49 N–29400 N)

Duramin-650: Exceptional Repeatability

Duramin-650 is a perfect universal testing solution for labs, and high-volume production environments. Featuring a six-position turret, with laser positioning allows for fast localization of desired test points. The user-friendly software gives quick access to standard test patterns and reports. Duramin-650 is suitable for high-volume testing and can be upgraded with a motorized XY-stage and an overview camera for automated hardness testing.

- Suitable for Vickers, Brinell and Rockwell hardness
- Optionally available with a motorized XY-stage for fully automatic testing of test series
- Three load ranges: 1 kgf–250 kgf, 3 kgf–750 kgf, 5 kgf–3000 kgf (9.8 N–2450 N, 29 N–7357 N and 49 N–29400 N).

DuraVersa-100: Adaptability and Accuracy

DuraVersa-100 is an automated universal tester. It is offered in three load versions, from 200gf to 3000kg, with the option to include low forces down to 10gf for all versions. The nine-position turret provides flexibility to equip indenters and objectives. It has a high-resolution camera and motorized Z-axis with autofocus and auto-measure, thus ensuring repeatable and effortless results.

- Suitable for Vickers, Knoop, Brinell and Rockwell hardness testing
- 18 MP camera with autofocus & auto-measure
- Various manual and motorized stage options
- Software modules for CHD, gear tooth, welds and many more.
- DuraSoft-Met Metallography software pack
- Configurable load range 0.2 gf–250 kgf, 0.2 gf–750 kgf or 0.2 gf–3000 kgf (1.96 N–2452 N, 1.96 N–7357.5 N, 1.96 N–29430 N)

ROCKWELL TESTERS

DuraVigo-150: Ready for repeatable Rockwell results

DuraVigo-150 is a sturdy closed-loop Rockwell-hardness tester with electronic power control that offers high accuracy, efficiency, and flexibility and requires minimal maintenance.

- Regular and superficial Rockwell scales
- Automatic test cycle via closed-loop loadcell load system
- Clamping and protection cone
- USB data out
- Load range 3 kgf–250 kgf (29.4 N–2452.5 N)

Duramin-160/160Z: Automatic Rockwell tester for fast results

Duramin-160/160Z: Automatic high-precision Rockwell tester for fast results and suitable for multiple sample sizes. It is operated with an integrated touchscreen and is available with an optional motorized Z-axis. Duramin-160 helps to increase throughput through method dedication and improves process lead time with a built-in report manager.

- Regular and superficial Rockwell scales
- Automatic test cycle via closed-loop loadcell load system
- Clamping and protection cone
- USB data out
- Optional motorized Z-axis
- Load range 1 kgf–250 kgf (9.8 N–2452.5 N)

BRINELL TESTER

Duramin-3000: Brinell testing for any production environment

Duramin-3000 is a single-task Brinell tester. It is an entry-level model but robust enough to withstand any production environment. The machine is designed to handle different sample sizes and shapes, and the indent evaluation is carried out with a handheld camera.

- Handheld zoom camera for indent measurement
- Embedded PC, operated by mouse or touchscreen
- Load range: 62.5 kgf–3000 kgf (612 N–29400 N)

FIND YOUR IDEAL SOFTWARE MODULE

Custom-made for your process and with advanced workflow control and reporting features, our hardness testing software makes everything faster, easier, and more intuitive.

We provide a broad range of modules that can be added to the software of your Duramin hardness tester to help optimize your process. For example, a simple test can be set up in as little as three seconds, and a test that takes hours to map out on a sample can be accomplished in under 10 minutes for the first time, then under a minute each time thereafter.

Our software is based on a user level management system to facilitate multiple operator use, and is designed to enhance safety, maximize repeatability and reduce the risk of error.

How does hardness testing software help?

- Custom-made solutions
- Advanced workflow control
- Enhanced reporting
- Secure documentation
- Greater repeatability

Whatever your needs and verification goal, there is a Struers software module for you.

Our software modules will:

- Decrease errors
- Increase your efficiency
- Increase repeatability
- Secure documentation.

Find all software modules for your Struers hardness tester on www.struers.com or scan for more information

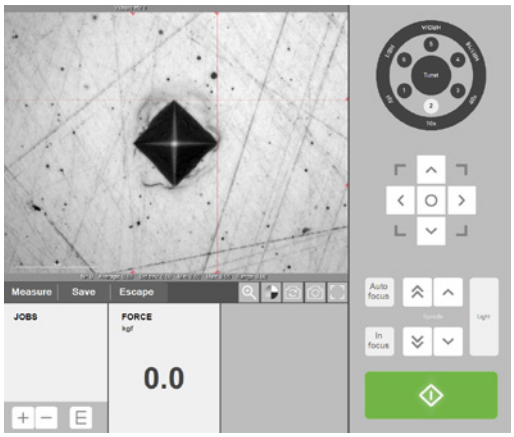
Struers
PATTERN EDITOR
Pattern1
CHD pattern
CHD Type
Points positions 10 points
Start at current position
Pattern properties
Modify pattern
All Patterns
Pattern name
Graph color
Stored patterns
Gear A
Save
Delete
Indent and Measure
Up
Home
Down
Save
Cancel
Ok
JOBS

SOFTWARE MODULES

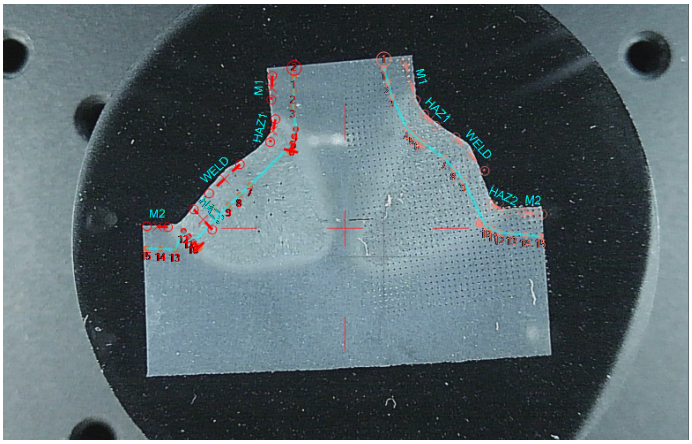
Standard in DuraSoft

DuraSoft-equipped machines come standard with a comprehensive suite of tools to enhance testing efficiency:

- Auto-focus
- Auto-illumination
- Auto-Measure; Provides accurate measurements for Brinell, Vickers, and Knoop indents.
- Report Generator; Includes a variety of preloaded templates for streamlined reporting.
- Data Export Function: Allows seamless data transfer for editing in external spreadsheet programs.

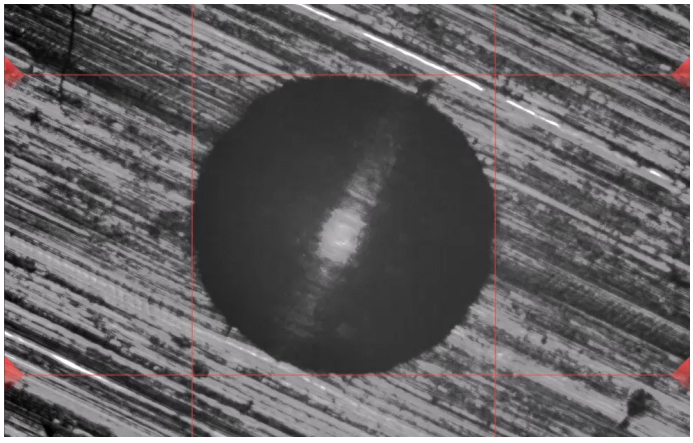


Weld measurement module



Dedicated Weld Hardness measurement module for defining patterns according to base material, HAZ and Weld zone.

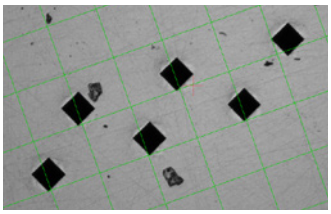
AI Module



Trained on thousands of images, the artificial Intelligence module can identify and measure even hard to read , low contrast indents

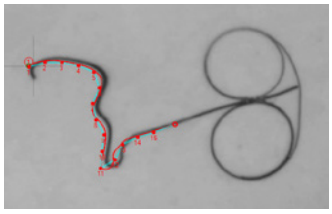
EXAMPLES OF SOFTWARE MODULES

CHD, SHD, NHD testing module



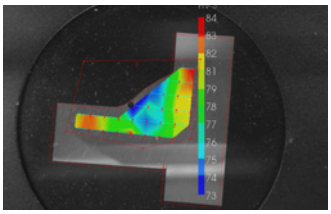
Quick setup for test, analysis and reporting of surface treated samples.

Contour scanning module



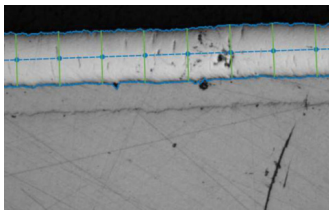
Automatically scans the full contour of the samples using edge detection to allow automatic pattern placement

Hardness mapping module



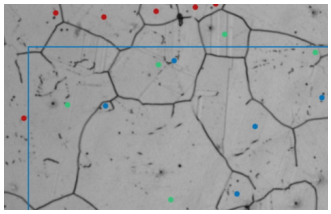
Module for 2D or 3D hardness mapping over areas or scanned contours.

Coating thickness module



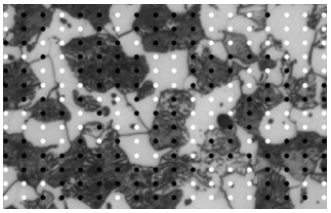
To determine layer thickness according to ISO standards. Automatic measurement of single and multiple layers and coatings. Part of DuraSoft-Met.

Phase analyses module



Analytics module for calculating Volume Fraction or Phase Analysis. Grid counter presents the Black Fraction and White Fraction. Part of DuraSoft-Met.

Grain size measurement module



Module to determine Grain sizes according to DIN EN ISO 643 and ASTM E112 via linear, square or hexagon section method. Part of DuraSoft-Met.

Q-DAS connection module

To export results in Q-Das format- Excel, PDF and personal templates included in standard delivery

See all software modules on our website

Scan QR code for more information

CALIBRATED TO PERFECTION

To assure the best possible reproducible and reliable results against strict ISO and ASTM values, you need to be sure your equipment is properly calibrated for your work environment and materials.

Our calibration services ensure that your hardness testing equipment is ready to give you reliable and accurate results from day one. This includes indirect or direct verification of a chosen number of methods (hardness measure type and load area, e.g., HV 1 or HRC), and can be done to multiple hardness scales.

We will also come to your premises on an ongoing basis, according to your preference, to ensure your equipment's settings have not changed over time. Each time your equipment is calibrated by us, you will receive documentation in an official Struers certificate.

Why is calibration essential?

- Certainty of results according to specifications
- Documented method for audits
- Repeatable results

ACCESSORIES FOR DEPENDABLE RESULTS

Struers provides all the accessories you will need for hardness testing. This includes specimen holders, vices, and jaws to ensure workpiece integrity and stability. A variety of indenters provides flexibility in your method choice, and our anvils and clamping devices enable broader sample geometries and applications. We also offer a range of objective lenses to obtain optimally sized indents on the screen. Other accessories include nose cones, carbide and steel balls.

Indenters

We provide certified and uncertified indenters for all hardness testing methods, giving you more options for your process needs. Some of our indenters are even available with exchangeable balls so you can use them for both Brinell and Rockwell testing.

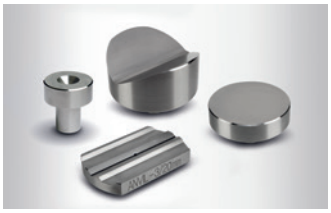
Test blocks

Calibrated test blocks are essential to ensure accuracy, integrity, and traceability of your hardness testing process. Struers' hardness test blocks are all certified in accordance with ASTM E384 (Vickers and Knoop), E18 (Rockwell), or E10 (Brinell). All the blocks are calibrated and accredited to ISO guide 25 in an ISO 17025 compliant facility.

Vices and jaws

Correct mounting of the specimen is crucial to perform a proper hardness test. When you are working with complex specimen shapes, our vices and jaws will secure them in your hardness tester to ensure optimal – and repeatable – results.

Anvils



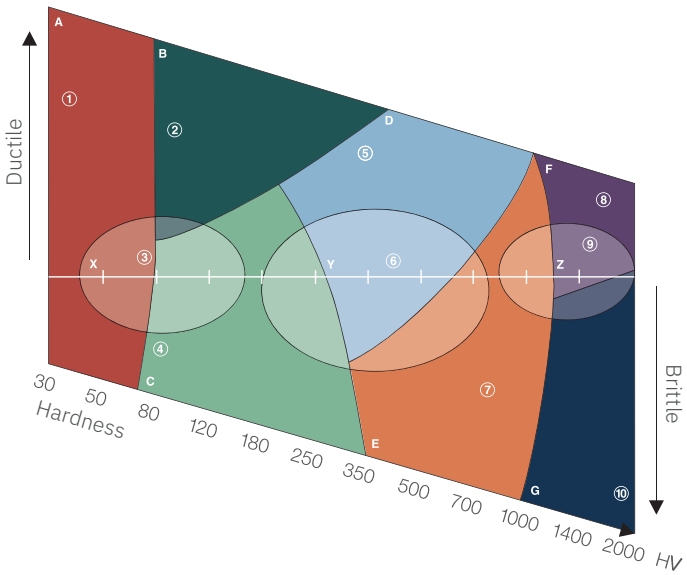
To achieve consistent and reliable results, your specimen must be properly clamped, whether it is flat, round or cylindrical. We supply a range of support anvils and clamping devices to suit a wide variety of specimen sizes and geometries.

A METHOD FOR ANY MATERIAL

Optimize your process – minimize your waste

Are you looking for perfect results from your true structure? Or perhaps a few artifacts are acceptable as long as they do not disturb your analysis? No matter your preparation goal, we will help you optimize your sample preparation process. This means increasing the quality of your specimen to meet your goal, while minimizing process waste with fewer, shorter steps.

Find the optimal process for your material



Find the hardness of your material on the X-axis, then move up or down the Y-axis, depending on its ductility. Learn more and see optimized methods for your material at **Struers.com**.

Take a systematic approach

Based on extensive academic training and hands-on experience, our materialographic experts have developed optimized methods for any material. Simply tell us your preparation goal, and we will customize our standard method to your equipment, requirements and operator capabilities, whether your focus is on quality, safety, speed, or efficiency.

A systematic approach is key to achieving accurate, repeatable results and makes troubleshooting easier. High-quality consumables will also maximize your reproducibility. Our stringent in-house quality control ensures our consumables deliver the same performance every time to absorb sensitivity to changes in conditions.

500+

predefined and proven methods for your polishing process

CHOOSE A PARTNER, NOT JUST A SUPPLIER

Maximize uptime with consumables on delivery

We'll help you to reduce your risk and keep inventory costs down with our robust global supply chain. For fast, reliable delivery, we have distribution centers across the U.S., Japan, China, Germany, and Denmark.

Our ISO 9001-certified LEAN production and strict quality control ensure all consumables perform as promised and contribute to a safer workplace. You can also minimize your environmental impact thanks to our ISO 14001 certification for environmental management and commitment to low-carbon shipping.

Get total support – whenever you need it

Hardness testing is just one part of the story. There are Struers consumables and equipment for every stage in the process. These are designed to work together so you get the most out of your investment. Furthermore, our materialographic experts will help you optimize your end-to-end process through Value Stream Mapping.

In fact, we are here to help you with every aspect of materialography. Whether you need to boost your skills with onsite and online training or maximize your uptime with service and support, we offer a complete solution for ensuring certainty.

98% of consumables are shipped within

48 hrs

GET NON-STOP PEACE OF MIND WITH SERVICEGUARD

We are here to support you in ways that add value far beyond simply class-leading products and equipment. Struers ServiceGuard gives you a complete solution for ensuring certainty at every stage, including a comprehensive annual service review and access to spare parts for ten years even after the equipment has been discontinued.

ServiceGuard is your best way of maintaining productivity and high-quality results through service plans, start-up packages, installation, training, and knowledge sharing. It also ensures you get the best out of your investment through a global support network and expertise that delivers greater availability, predictability, and uptime for the lifetime of your Struers equipment.

“I have always had great support from the Struers service team – they keep our equipment in the best condition and always give great advice.”

- Bill Taylor, Materials and Forensics Engineer, John Crane

DEDICATED TO UPTIME AND EFFICIENCY

Our service commitment is built around your needs, giving you complete confidence in the performance of your Struers equipment and the efficiency of your preparation process.

ENSURING CERTAINTY

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Ensuring certainty

Materialographic preparation and testing demands consistent, reproducible results. These come not only from your laboratory process, operators and equipment, but from your supply chain and your partner. As a Struers customer you benefit from high quality design and engineering of equipment and consumables, but just as much from our unique knowledge base, robust global supply chain, and expert service and applications support – where and when you need it. We call all this ensuring certainty.

Struers remains dedicated to making the world a better place through the pursuit of deep scientific insights and ground-breaking technology. Today, we're your trusted partner in a fast-changing world, sharing our expertise and practical experience on a global scale. This gives you innovative solutions that help you face the future with confidence. We continue to lead the way in materialographic products and services, and to shape future developments towards a better society.

www.struers.com

Struers
Ensuring Certainty