



powered by  ecos Workflow™

DuraScan

**Micro
Hardness tester**

EMO TEST
YOUR FACTOR OF SAFETY.

The DuraScan Series.

For basic operators up to pro-users



DuraScan 10

- Touchscreen controls
- 3-fold measurement turret - manual



MANUALLY SEMIAUTOMATIC

DuraScan 20

- Touchscreen controls
- 3-fold measurement turret - manual
- Manual cross slide



DuraScan 50

- PC controlled
- 6-fold measurement turret - automatic
- Linear table



DuraScan 70

- PC controlled
- 6-fold measurement turret - automatic
- Linear table
- Overview camera



FULLY AUTOMATIC

DuraScan 80

- PC controlled
- 6-fold measurement turret - automatic
- Large linear table
- Overview camera



Vickers

According to EN ISO 6507, ASTM E-92, ASTM E-384

HV 0.01	HV 0.025	HV 0.05	HV 0.1
HV 0.2	HV 0.3	HV 0.5	HV 1
HV 2	HV 2.5	HV 3	HV 5
HV 10			



Knoop

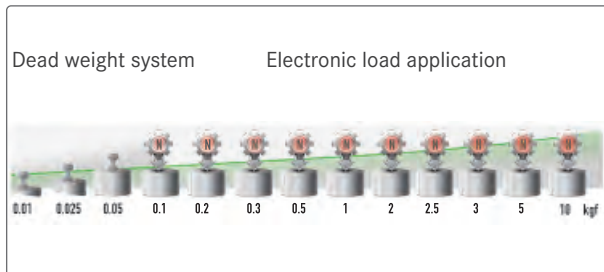
According to EN ISO 4545, ASTM E-384

HK 0.01	HK 0.025	HK 0.05	HK 0.1
HK 0.2	HK 0.3	HK 0.5	HK 1
HK 2			

Conversion according to DIN EN 50150, EN ISO 18265, ASTM E140-05

The best of two load systems.

Test load range from 10gf to 10kgf.



Shortened cycle times

The patented combination of a dead weight system and an electronic control loop utilises a load cell to achieve precise load application across the entire load range and guarantee shortened cycle times. So for the first time you are able to cover the complete micro, low load and macro ranges - from 0.01 to 10 kgf (0.098 N-98 N) with a single device. These are benefits also provided by the basic model.

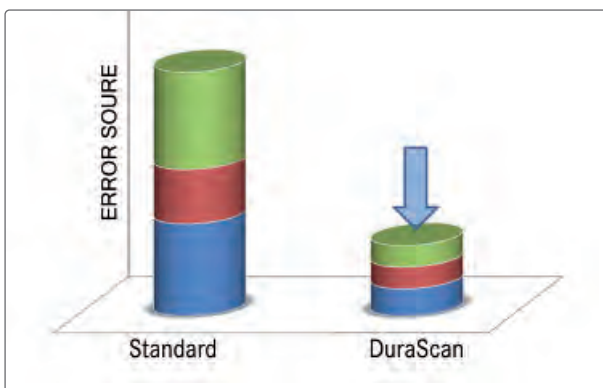


3-fold measurement turret - manual (DuraScan 10, 20) 6-fold measurement turret-automatic (DuraScan 50, 70, 80) (DuraScan 10, 20 optional)

Test method switch in under a second

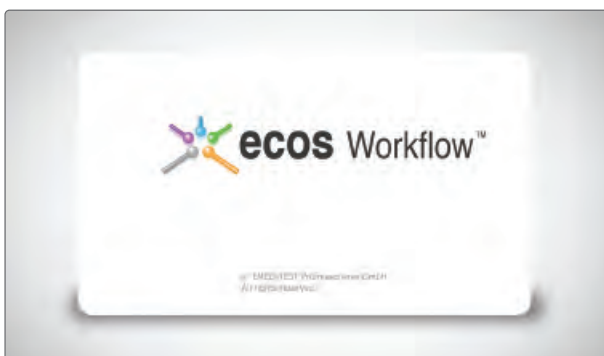
All standardised hardness testing methods have been saved in the software and can be called up at any time.

The correct indenter is automatically swivelled into position in combination with the 6-fold measurement turret. Subsequently, the test indentation can be measured correctly with a suitable lens. It is no longer necessary to change the indenter and lens. This saves on the complicated and time-consuming process of calibration and cuts out the possibility of human error by the user.



Absolute accuracy

Load application, measurement of test indentations and the properties of the indenter all factors which can have a great deal of influence on hardness testing results. In order to guarantee the highest possible degree of accuracy particular attention was paid to reducing influences and measuring errors occurring due to various operators being used, right from the conception of the DuraScan product line. All DuraScan series models feature the innovative load system, automatic image evaluation with automatic focus, a superior quality optical system with LED technology and are only equipped with certified indenters.



Tomorrow's software today: ecos Workflow

Ultra modern software technology is coupled with proven solutions for common hardness testing tasks! This tool helps save time, optimise expenditure and provides top quality service! The Workflow principle:

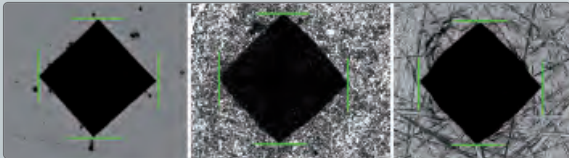
From simple, single to series measurement and long-term data storage and reporting, with **ecos Workflow** everything is possible. **ecos Workflow** software is guaranteed to lead you through every step with a minimum of time and effort!

The new DuraScan 10 and 20.

Complete PC control from the basic model up.

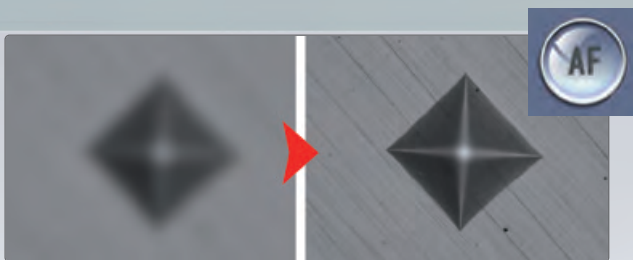
Fully automatic image evaluation

An important factor in the accuracy of test results is the measurement of the test indentation. Exact results can only be ensured with clearly recognisable test impressions with optimised contrast and ideal brightness. Camera electronics control picture quality independent of the operator to optimise clarity. Especially when testing unpolished surfaces such as corroded welding tests, this function is a prerequisite for automatic, operator-independent indentation recognition.



Autofocus as standard

The basic version is already equipped via camera electronics to focus sharply on the test indentation. The Autofocus function is a quick and reliable means of optimising the focal position. The lens is positioned via the motoric Z-axis with an accuracy of $< 0.1 \mu\text{m}$.



Easy contact: The interfaces

The most basic version also features all the standard PC interfaces providing an ideal basis for important network operation and data exportation.



Pic.
DuraScan 20

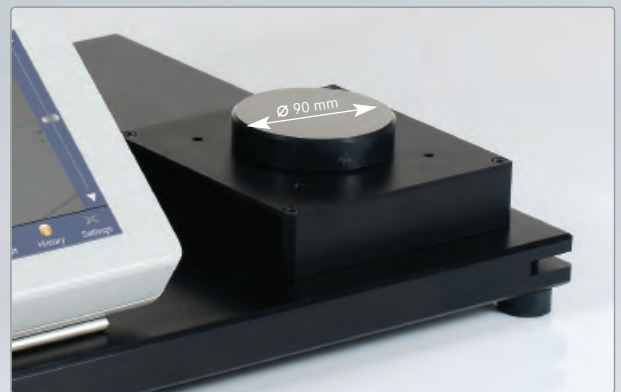


V concept

The patented V concept provides a large test area with a compact structure at a stable working height. The resultant operator ergonomics are a significant leap in terms of working conditions.

XY table or test anvil

The basic version provides a plane anvil with all the requirements for quick and easy individual tests. The DuraScan 20 sees the series expanded to include a manual XY-cross slide enabling reliable series measurement. Optional digital spindles are also available.



DuraScan 10 test anvil

The most progressive workflow software for 8.4"

The basic version also offers all the PC functions on the 8.4" TouchScreen. Intuitive software operation and logically structured workflow simplify the task enormously and help you save valuable time.



The future of hardness testing software.

 **ecos** Workflow™ for DuraScan 10 and 20.

Workflow in five steps

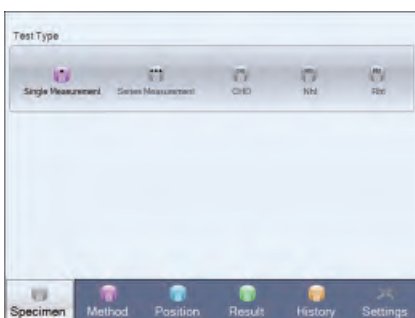
Test, method, position, result and record are the five steps in Workflow.

Logic, transparency and simplicity of operation are the main pillars of our many years of commitment to developing our proven **ecos** software solutions for comfortable, high performance hardness testing. Available in 5 standard languages (DE/EN/IT/FR/SP).



1 Specimen

Select a type of test. On top of single measurement, from the DuraScan 20 up to It is also possible to conduct series measurement, CHD, Rht or Nht runs.



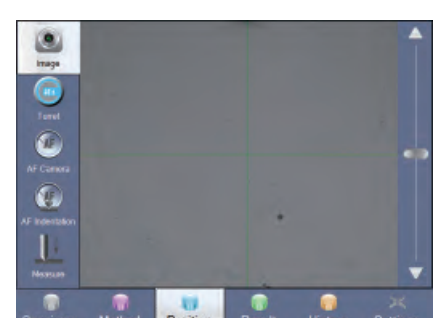
2 Method

Select a measurement type, lens, test method and zoom level; and if required conversions, hardness limits and standardised device corrections.



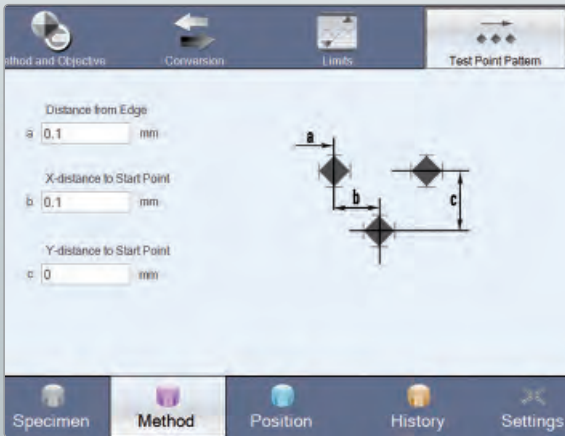
3 Position

Establish test point on the work piece. The tools provided make this child's play. Then begin the test.



Series measurement

There is a test point wizard for serial testing and CHD, Nht, Rht tests to support you with standardised serial measurement (EN ISO 2639,10328, 50190).



Intuitive control

Intuitive control provides an overview of which lens and indenter are currently in position. The 6-fold turret option allows selection to be made via display and mouse click.



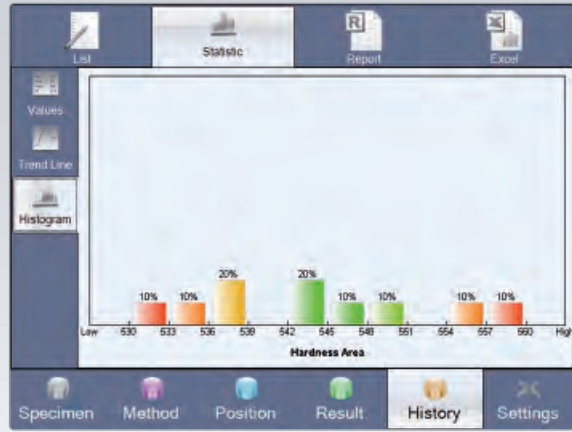
Autofocus

Automatic test specimen height recognition triggers automatic focussing.



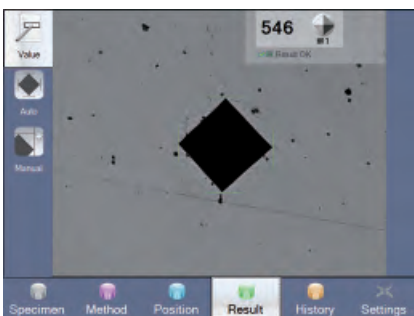
Figures and diagrams

Test values are converted to visuals in the form of figures or diagrams.



4 Result

The result is displayed clearly and is available for further uses. If necessary there is also the option of re-measuring either automatically or manually.



5 History

All results are stored long term in a clear structure. Users are able to archive data in other systems or to generate a report via the linked up printer.

No.	Method	Object no.	Indenter	Hardness value	Classification	Diameter	Diameter
1	HR1	Boh_4h	Niken	543	Measured	005	0.05
2	HR1	Boh_4h	Niken	543	Measured	005	0.05
3	HR1	Boh_4h	Niken	536	Measured	005	0.05
4	HR1	Boh_4h	Niken	535	Measured	005	0.05
5	HR1	Boh_4h	Niken	538	Measured	005	0.05
6	HR1	Boh_4h	Niken	530	Measured	005	0.05
7	HR1	Boh_4h	Niken	538	Pathological	005	0.05
8	HR1	Boh_4h	Niken	540	Measured	005	0.05
9	HR1	Boh_4h	Niken	546	Measured	005	0.05



DuraScan 50, 70 and 80.

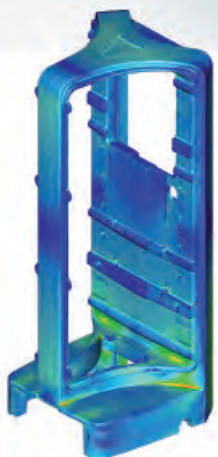
Automatic functions - ultimate precision

Asymmetric design

Asymmetric design with traverse path line distances provide plenty of test space despite its compact dimensions.



Pic.
DuraScan 80

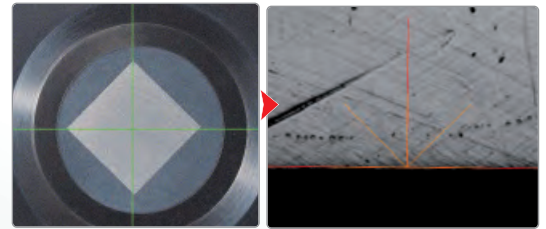


Materials and technology

The solid granite base lays the foundations of a precise system. The mechanical advantages such as temperature durability, vibration damping and plan parallelity are of particular importance for large linear slides as they guarantee the best possible degree of accuracy. Exact requirements for the stand cast based on FEM calculations ensure the structure remains stiff and stable.

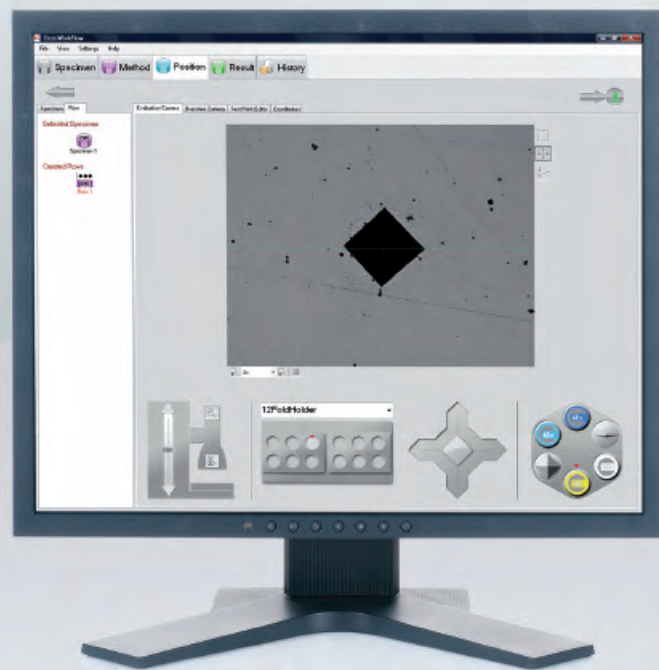
Overview camera (DuraScan 70, 80)

The tried and trusted overview camera ensures the perfect overview, regardless of how complicated the test procedure or the number test points and test rows. The combination of a macro lens and a superior quality lens facilitates view ranges of 60 μm to 52 mm. This unique technology allows an overall picture of the test subject (40 x 52 mm) and clearly displays every test run. A significant simplification of the task is provided by the addition of grid, support and reference lines including a display of the possibilities for moving edges. Furthermore, the picture can also be saved in the report.



overview camera

evaluation camera

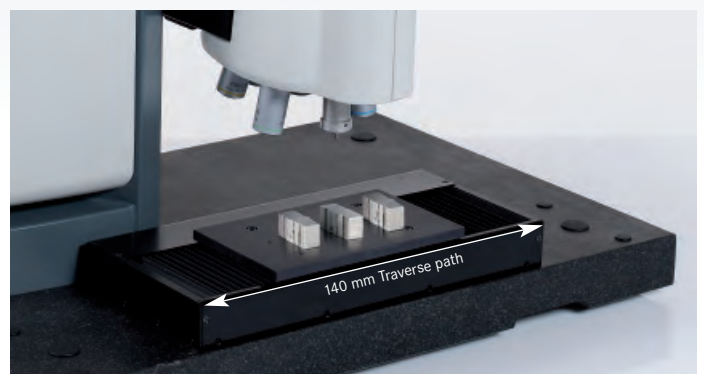


Control via external PC.

260 mm Test height

Linear table versions

The large traverse path distances of the linear tables facilitate optimum, fully automatic hardness testing. High resolution and almost no need for reverse rotation of spindles ensure a large degree of repetitive accuracy.



Linear table 140 x 70 mm for DuraScan 50 and 70

As simple as possible.

ecos Workflow™ for DuraScan 50, 70, 80.

The software of the future.

ecos Workflow technology is your key to the future. Simple operation and comprehensive automation is becoming increasingly important in hardness testing. The software takes control of the increasingly diverse range of testing tasks and guarantees simple specimen administration and lasting data security. The high proportion of software in our hardness testing equipment means **ecos Workflow** makes a decisive contribution to the performance and quality of the overall product.

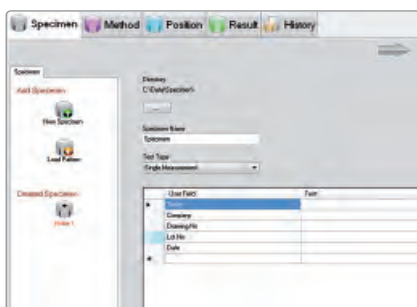


Z-axis control
with Autofocus

A clear overview of test magazines can be seen on the test and
One click on the graphic display sends the device to the correct position

1 Specimen

Positioning the specimen and determining the type of test.



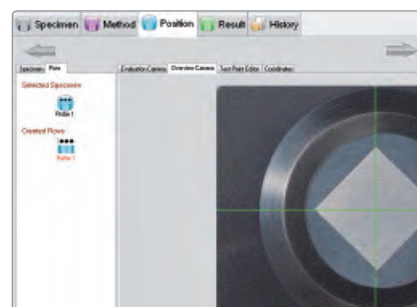
2 Method

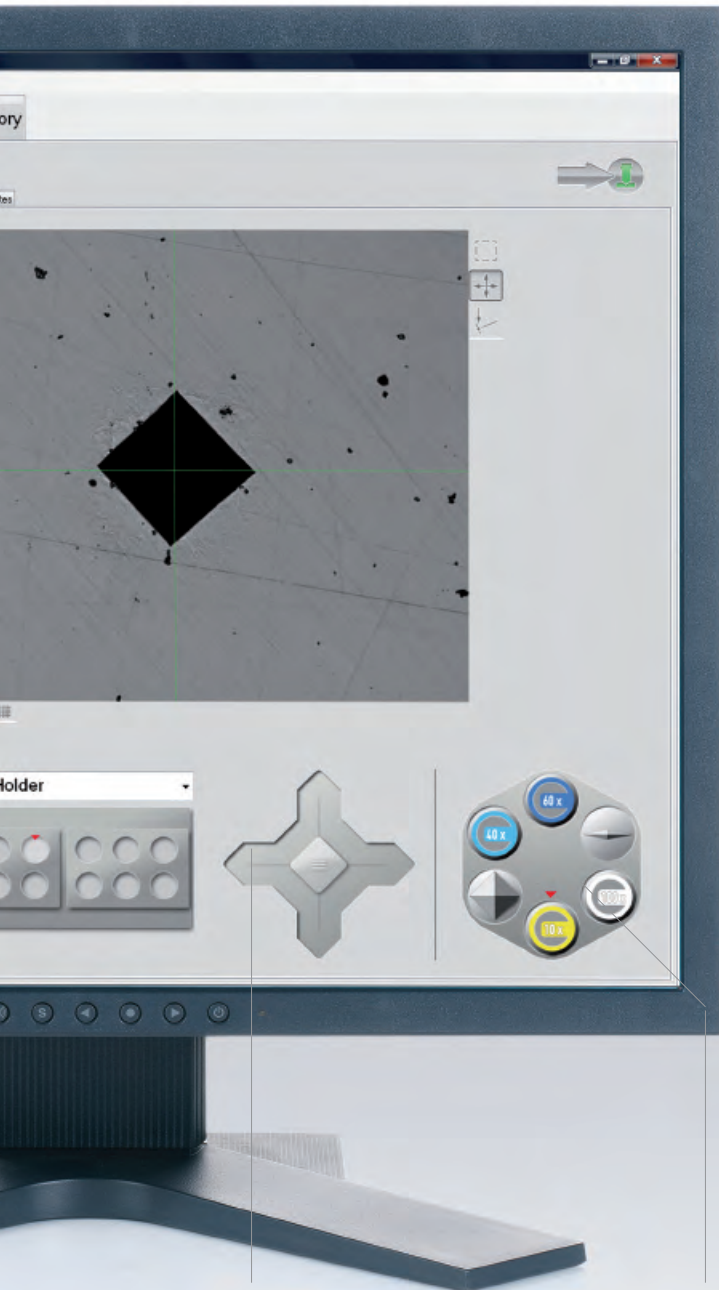
Determination of test method and other parameters for non-standard hardness testing.



3 Position

Determination of test pattern and positioning of run gauging.





XY axis control
for positioning

6-fold measurement turret
with placement info



Single measurement

This function allows individual test points to be set at will. Measurement can be started directly from the surface view or from the overview camera.



Series measurement

One or a number of test series with positional coordinates can be measured. Measurement can be started directly from the surface view or from the overview camera.



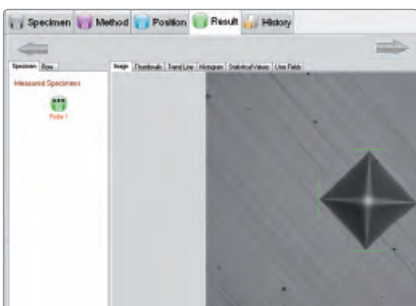
CHD/Nht/Rht measurement



One or a number of test series for according to standard CHD/Nht/Rht determination of test specimen. Measurement can be started directly from the surface view or from the overview. For Nht measurement additional core hard points can be defined separately.

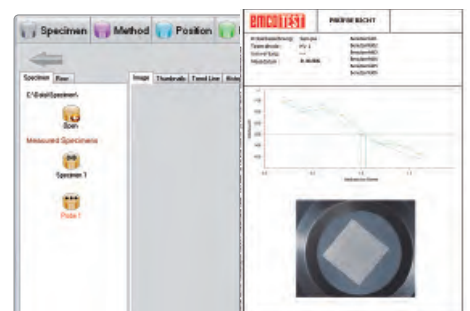
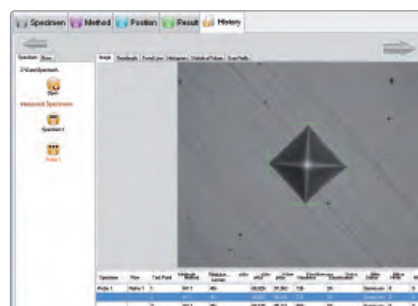
4 Result

Measurement result with tools for further processing.



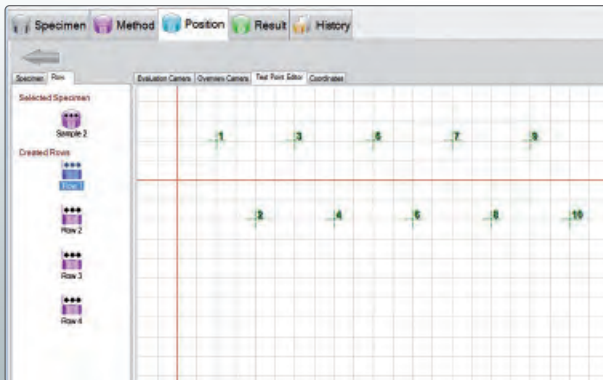
5 History

Archive for long term data storage. Facility for compilation and printing of reports.



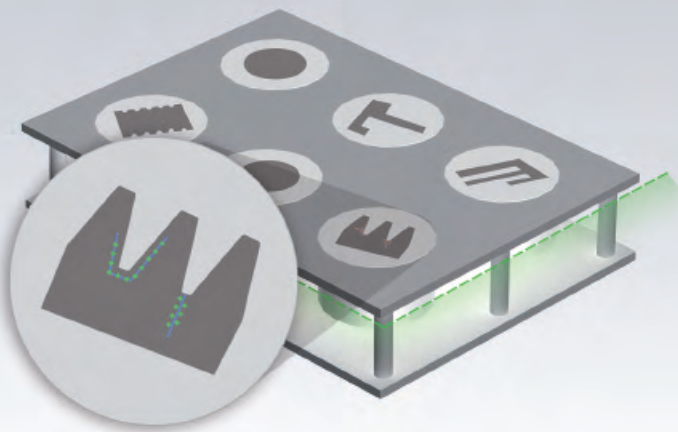
The Functions.

ecos Workflow™: The Highlights.



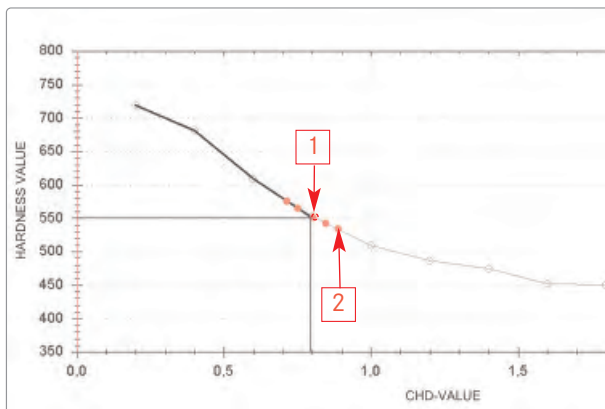
Easy generation of test series

The test point editor allows test points to be easily set up in a grid. It is also possible to set up each individual test point by entering coordinates. An even more elegant solution for series measurement is provided by line and polygon line tools. Test series can be automatically adapted to suit work piece contours. Adherence to standard defined test distances (i.e. point distance = 3 x diagonal) can also be done with the integrated tool.



Single and multiple test samples

The standard version allows the specimen to be set up for several test series and be measured automatically. The functions required for this are clearly visible in a tool list. An optionally available software module 'ecos Workflow multiple specimen' allows several specimen (i.e. 12 bedded specimen in two 6-fold-sample holders) each with several test series to be tested fully automatically.



Optimise CHD series testing

To ensure a maximum of accuracy with reduced testing time i.e. when determining hardness penetration depth (CHD, Nht, Rht), two features have been made standard for the software:

1. Automatic stop on reaching hardness limit

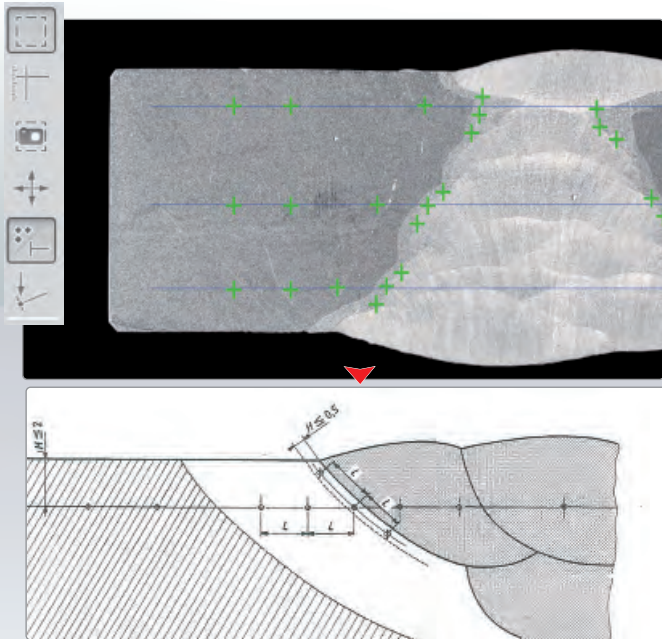
The limit is defined and the number of measuring is provided when the limit is reached. It is not necessary to know in advance how many indentations have to be made until the CHD is reached.

2. Subsequent addition of test points

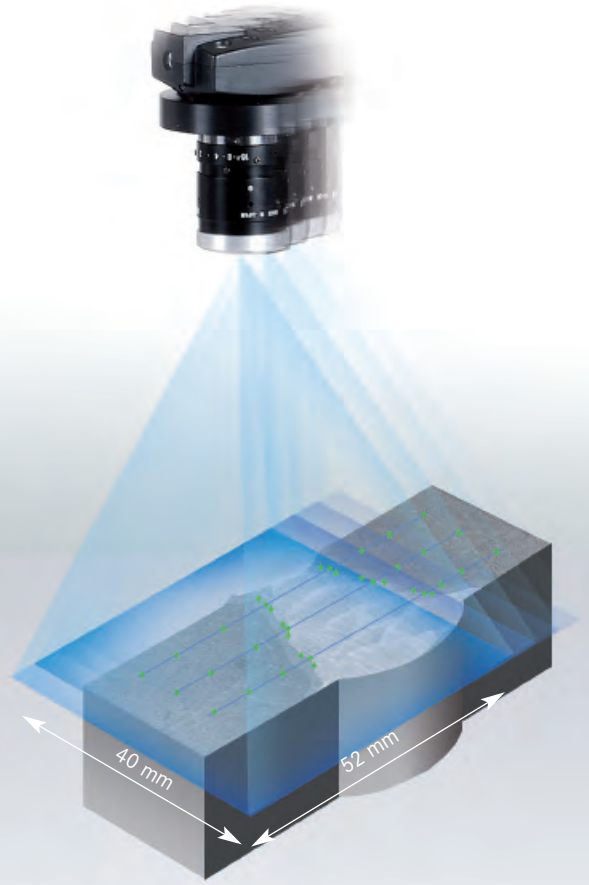
The CHD value determined by the hardness threshold can be determined more accurately the more test points have been set up in this range. Subsequent insertion of test points around the established CHD value allows the provision of a more accurate result within a shorter test time frame.

Positioning with panorama function

The macro lens is designed for 52 x 40 mm test specimen size. This allows for the simple and transparent positioning of the test points and test series in real time. Moreover, the panorama function also allows larger test specimen to be completely included in the setting of test points. Specimen size is only limited by the movement distance of the slide. Specimen pictures for archives and records are set up for a 52 x 40 mm format.



The overview camera provides a panoramic overview of the work piece (variations 70 and 80).

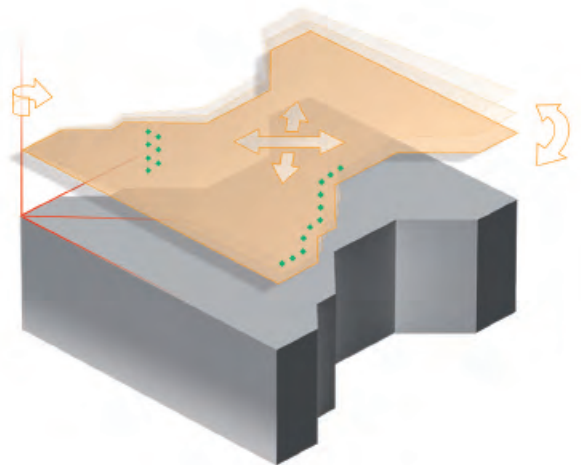


Time saving pattern mode

Specimen that have already been measured are used as a guideline containing certain elements and basic settings for new specimen. The settings from the basic guideline are automatically used for new specimen. Guidelines are automatically generated for each measurement and archived specimen. Operators are recommended to use guideline settings when testing a series of identical parts, or when frequently testing parts that always conform to certain parameters, tolerance levels, test methods etc., or continually exhibit the same pattern of test results, but have varying descriptions. Conduct complex testing tasks with very few clicks.



The rotation axle positions the test pattern on the work piece.



Safest possible data storage.

All test information is presented in a clear overview.



Customised data export function

ecos Workflow software allows the exportation as PDF documents and in two types of Excel documents. Use of XML format makes us Q-DAS enabled. Each measured specimen is stored as an individual file facilitating the guarantee of maximum security.

Efficient data administration

The multitude of test values generated during a process of comprehensive quality control requires immense precision and availability from computer supported QS systems. Complete documentation and the secure allocation of test results to the respective work piece are of particular relevance. The export-tool integrated into **ecos** Workflow Software provides the required interface. The danger of data errors in protocol generation is kept to a minimum.

Direct printing

All models in this line provide a direct opportunity to print out documents. This function allows you to produce a test report using any printer connected to the computer. Using the overview camera the DuraScan 70 and 80 models allow the integration of a specimen picture.

Compile customised test reports.

Documentation of test results.

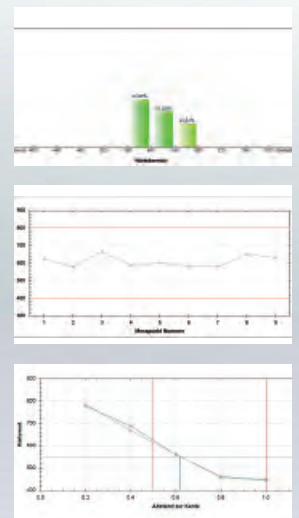
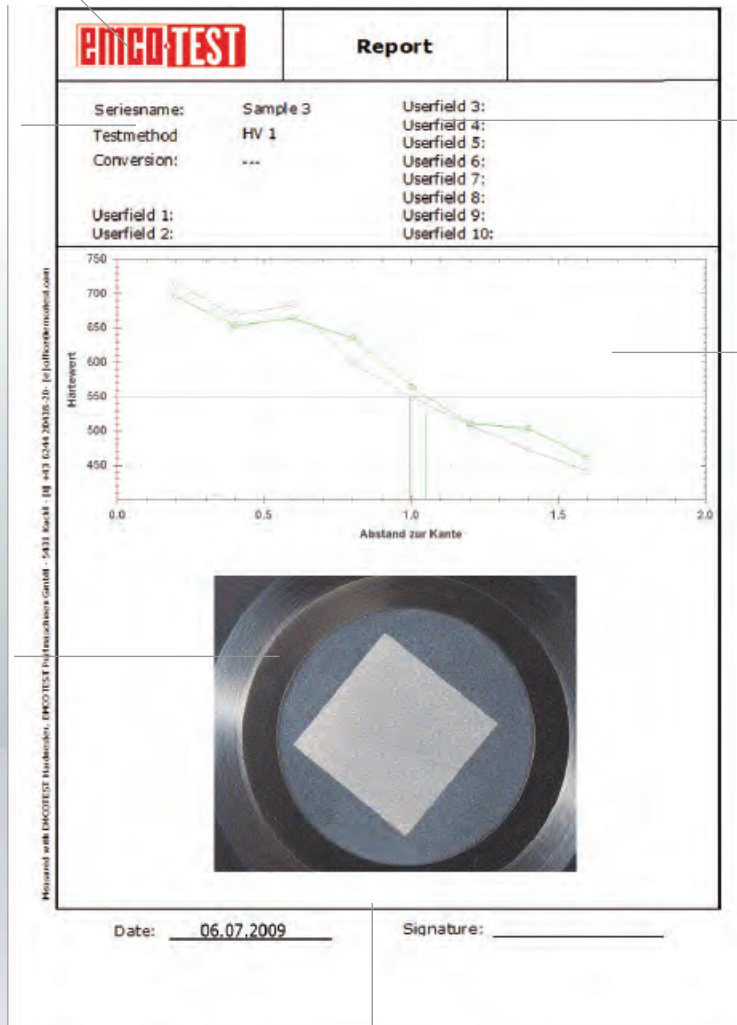
Inclusion of your corporate logo on the test report

Individual spaces for specimen description and test parameters

More freely definable fields

Progression curves

Macro-view of specimen picture with test point labelling (only possible with overview camera)



Space for results tables, statistics etc.

Probe	Werte	Prüfzeit	Werte	Abstand	Ergebnis	Skalierung mit Skizze
Probe1	1	174	1401	04	0,000	
	2	168	1411	05	0,000	
	3	168	1411	05	0,000	
	4	168	1411	05	0,000	
	5	168	1411	05	1,000	
	6	168	1411	05	1,000	
	7	172	1411	05	1,000	
	8	182	1411	05	1,000	
	9	182	1411	05	1,000	
	10	181	1411	05	2,000	

Various layout patterns

Whether using integrated and norm compliant standard forms or specific corporate reporting, the flexible and highly convenient form and report generator allows you to produce your own documents and reports.

Exemplary Service.

Expertise and design make the difference.



Service network

Your purchasing EMCO-TEST product is by no means the end of our service. Tried-and-trusted EMCO-TEST quality is also provided in the form of technical support. We already make our support services available in over 40 countries. Your local support providers can be found at www.emcotest.com.

Service friendly design

In order to provide immaculate quality every time the EMCO-TEST test machine is subjected to a complete function test before delivery. Ease of maintenance is integrated into the units right from the beginning of the design phase. This has resulted in the inclusion of a menu driven display, integrated self diagnosis and modular, replaceable electronics components, leading to the correction errors in the least possible time. The system also allows the automatic installation of software updates that can be imported via USB stick, CD-ROM or internet download. This secures the value of your investment for the future as you may wish to change procedures, steps or standards (i.e. conversion tables etc.).

Certified Maintenance Technicians

It is our goal to guarantee the best possible support for you and your device. To ensure these standards are achieved each maintenance technician is given regular training at EMCO-TEST headquarters and thus remains right up to date. This is the only way an excellent standard of service can be guaranteed!

What you need

Indenter and lens for your needs.

Indenters

EMCO-TEST provides a number of different indenters. All certified indenters are compliant with international standards. Select the correct indenter for your test.

Vickers	L 5 mm, Ø 6 mm
Knoop	L 5 mm, Ø 6 mm

Lenses

The basic rule is the lower the test force, the greater the optical magnification. The table shows the rough assignment of the five lenses.

	Test load range (kg)								
	0.01	0.025	0.2	0.5	1	2.5	3	5	10
10 x									■
20 x						■	■	■	
40 x				■	■				
60 x		■	■						
100 x	■	■							

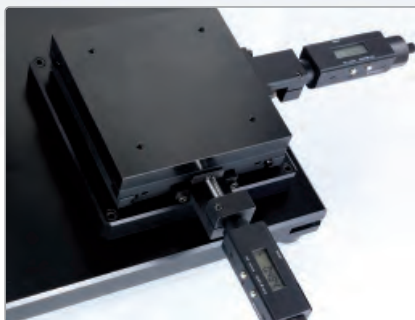
Set-up assistant

The serial set-up assistant helps to configure your hardness tester. It guides you through the most important settings such as upgrades, add-ons and exchange of lenses and indenters.



Complete accessories catalogue at www.emcotest.com

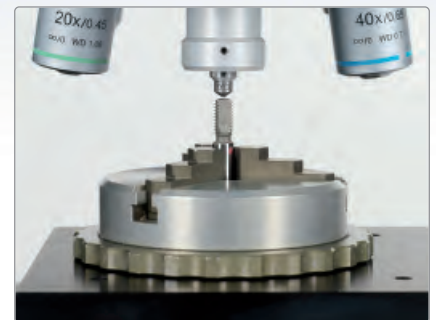
At www.emcotest.com you will find a complete range of accessories for the DuraScan hardness testing machine and a number of Indenters, special test tables, adapters for other indenters, lenses and more.



Digital micrometer spindle
(optional for DuraScan 20)



Machine vice



Manual chuck



1-fold specimen holder



6-fold specimen holder



Adapter for additional indenter

Find the right version for you!



MANUALLY/SEMI-AUTOMATIC

FULLY AUTOMATIC






	DuraScan 10	DuraScan 20	DuraScan 50
Test anvil / Cross slide	Standard load according to DIN Ø25H7 Ø 90 mm 	Manual micrometer spindle Tracking distance: 25 x 25 mm 135 mm  136 mm	Via software DC motor driven Tracking distance: 140 x 140 mm 200 mm  120 mm
Measurement turret	manual (optional DC-Motor)	manual (optional DC-Motor)	DC-Motor
max. work piece weight	50 kg	50 kg	10 kg
Dimensions (WxHxL)	505 x 670 x 420 (mm)	505 x 670 x 420 (mm)	680 x 680 x 450 (mm)
Space requirements (WxL)	650 x 500 (mm)	800 x 650 (mm)	1100 x 800 (mm)
Display	8.4"	8.4"	ext. monitor 19"
Weight of basic device	68 kg	68 kg	92 kg
Base plate	Aluminium	Aluminium	Aluminium
Projection (A/B)	50/150 (mm)	50/150 (mm)	170/86 (mm)
Tracking speed	_____	_____	80 mm/s (X/Y)
Positioning accuracy*	_____	0.01 mm	± 0.008 mm
Overview camera	_____	_____	_____
Included software	 	  	  
Optional software		_____	

*) resulting error total from the X, Y, Z axis and the turret axis


General technical facts:


Voltage supply (V)	110/230~1/N/PE, 50–60 Hz
max. voltage fluctuation	± 10%
max. power consumption	120 W
Main fuse (110/230V)	T6.3A
Type of protection EN 60529	IP20
Room temperature (according to ISO/ASTM)	23 (±5)°C
Air humidity	40–70% (no condensation)





DuraScan 70	DuraScan 80
Via software DC motor driven Tracking distance: 140 x 140 mm	Via software DC motor driven Tracking distance: 280 x 140 mm
200 mm  Cross slide 120 mm	280 mm  Cross slide 120 mm
DC-Motor	DC-Motor
10 kg	10 kg
680 x 690 x 450 (mm)	680 x 684 x 450 (mm)
1100 x 800 (mm)	1100 x 800 (mm)
ext. monitor 19"	ext. monitor 19"
92 kg	96 kg
Granite	Granite
170/86 (mm)	170/86 (mm)
80 mm/s (X/Y)	80 mm/s (X/Y)
± 0.008 mm	± 0.01 mm
40 x 52 mm	40 x 52 mm
	
	


ecOS Workflow Software Module:


 **ecOS Workflow** is the basic software for specimen management and setting test parameters with test series depiction, results database, statistics and an export tool.

 **ecOS Workflow IMAGE** facilitates fully automatic picture evaluation with integrated autofocus.

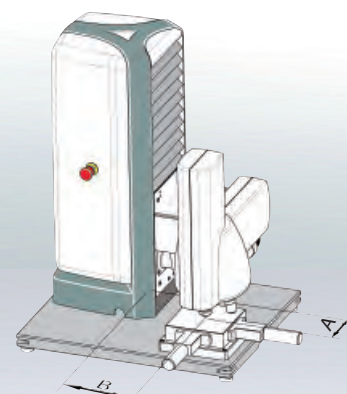
 **ecOS Workflow CHD-C** facilitates the generation of CHD, Nht and Rht series (DC-motor powered cross slides).

 **ecOS Workflow 2nd CAMERA** enables an overview picture featuring test point distribution, pattern, help lines and specimen picture in the test report.

 **ecOS Workflow MULTIPLE SPECIMENS** allow several specimen to be set up at one go. Specimens can be freely positioned in magazines or multiple specimen holders.

 **ecOS Workflow CHD MANUAL** enables the generation of CHD, Nht and Rht series (manual cross slides).

Test loads	0.098–98 N (0.01–10 kg)
Test space height	260 mm
Resolution test unit (Z axis)	5 nm
Test unit feed speed	0.03 - 2 mm/s
Resolution X/Y axis	0.5 µm
Interfaces	2 x USB, 1 x RS232, 1 x RJ45 (Ethernet)
Measuring and overview camera	CMOS 1.3 Mpix, USB 2.0



Basic diagram



A vision of things to come – www.emcotest.com

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