DuraVision G5

Precision hardness testing for the highest demands

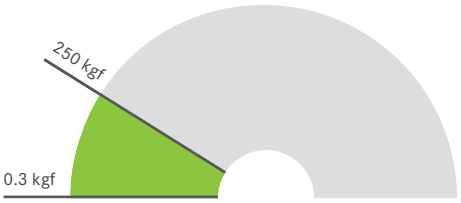
0.3–3,000 kgf
Brinell
Vickers
Rockwell
Knoop
Plastic testing
Carbon testing
HBT, HVT

emcotest.com

Hardness testing for every application.

Test load range from 0.3 kgf to 3,000 kgf.

LOAD RANGE



HARDNESS TESTING MACHINES

DuraVision 20 G5

HANDWHEEL

DuraVision 200 G5

MOTORISED NOSE CONE INFEED

TEST METHODS

Brinell compliant with ISO 6506, ASTM E10

1/1	1/2.5	1/5	1/10
1/30	2.5/6.25	2.5/15.6	2.5/31.25
2.5/62.5	2.5/187.5	5/25	5/62.5
5/125	5/250	10/100	10/250
HBT (not standardised)			

Vickers compliant with ISO 6507, ASTM E384, E92

HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5
HV 3	HV 5	HV 10	HV 20	HV 30
HV 50	HV 60	HV 100	HV 120	HV 125
HV 150	HVT (not standardised)			

Rockwell compliant with ISO 6508, ASTM E18

HRA – HRZ	HR15-N/T/W/X/Y
HR30-N/T/W/X/Y	HR45-N/T/W/X/Y

Knoop compliant with ISO 4545, ASTM E384, E92

HK 0.3	HK 0.5	HK 1	HK 2

Carbon testing compliant with DIN 51917

2.5/7	5/7	5/15	5/20	5/40
5/60	5/100	5/150	10/20	10/40
10/60	10/100	10/150		

Plastic testing compliant with EN ISO 2039

49.03 N	132.9 N	357.9 N	961 N

LOAD RANGE

HARDNESS TESTING MACHINES

DuraVision 30 G5

HANDWHEEL

DuraVision 300 G5

MOTORISED NOSE CONE INFEED

TEST METHODS

Brinell compliant with ISO 6506, ASTM E10

1/5	1/10	1/30	2.5/6.25
2.5/15.6	2.5/31.25	2.5/62.5	2.5/187.5
5/25	5/62.5	5/125	5/250
5/750	10/100	10/250	10/500
10/1000	10/1500	10/3000	
HBT (not standardised)			

Vickers compliant with ISO 6507, ASTM E384

HV 3	HV 5	HV 10	HV 20	HV 30
HV 50	HV 60	HV 100	HV 120	HV 125
HV 150	HVT (not standardised)			

Rockwell compliant with ISO 6508, ASTM E18

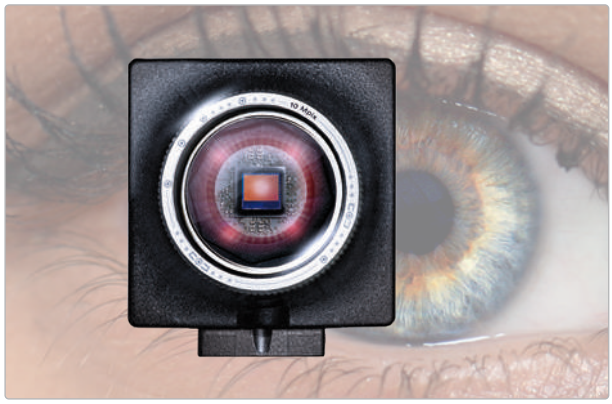
HRA – HRZ	HR15-N/T/W/X/Y
HR30-N/T/W/X/Y	HR45-N/T/W/X/Y

Carbon testing compliant with DIN 51917

2.5/7	5/7	5/15	5/20	5/40
5/60	5/100	5/150	10/20	10/40
10/60	10/100	10/150		

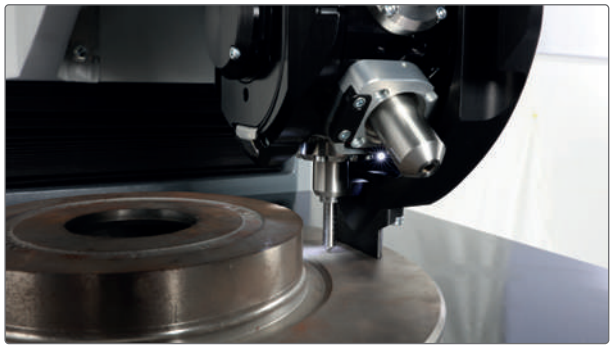
The DuraVision G5 Series.

Sturdy and precise hardness testing for production.



Broad spectrum of applications

The DuraVision G5 Series offers a uniquely broad standard load range from 0.3 kgf to 3,000 kgf. The force is continuously and precisely applied by means of a large number of electronic force measuring sensors. Intelligent utilisation of the 12-megapixel camera enables a 4x zoom, enabling the entire application range to be covered with just a few lenses. The combination with 7 turret positions also saves tool changing. Automatic evaluation of the test indents by fully automated brightness control and fast autofocus in combination with the star turret shortens the cycle times as far as technically possible and minimises the operator influence.



Easy testing of complex specimens

The large test area, the long reach despite the very compact overall design and the slim nose cone offer great flexibility for a very wide range of specimens. The variety of specimens that can be tested is further expanded by the possibility of testing both clamped and unclamped - You have the choice. In addition, the clamping force can be individually set. Complex specimens can be reliably clamped, while marks on soft materials can be avoided by selecting a correspondingly lower clamping force. All in all, ideal preconditions for every application in production.

Investment in the future

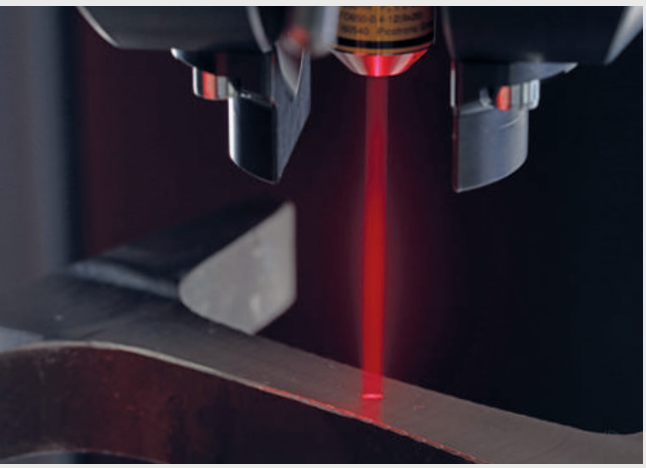
You are on the safe side with the DuraVision G5 Series. The sturdy machine design and modular configuration provide a durable product. With regular software updates, simple servicing and long spare part availability, EMCO-TEST offers a sustainable package to ensure a quick pay-back on your investment. The electronically controlled test cycle, based on the latest generation of PLC components, guarantees high test repeatability, irrespective of the operator, and high machine availability.

Intuitive software with calibration assistant

The **ecos** Workflow software package from EMCO-TEST provides an efficient, intelligent solution for all conventional hardness testing tasks. The user is guided step-by-step through the measuring process all the way to data backup. The intuitive user interface shortens the familiarisation time and reduces operating errors. A special feature of **ecos** Workflow is the integrated calibration assistant that monitors all calibrated methods and greatly simplifies the inspection of the hardness tester required by standards. The assistant indicates when periodic and indirect verifications in compliance with ISO and ASTM standards are due, it guides the user through the inspection process and supports documentation compliant with standards.

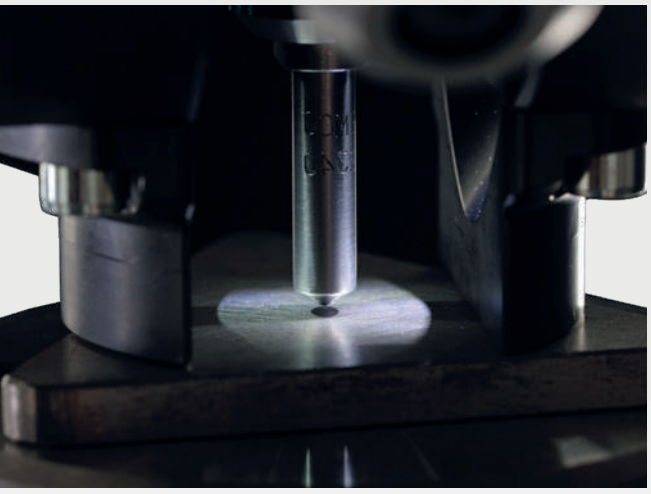
DuraVision 20 G5 and 30 G5.

Rapid measurement results thanks to simple operation.



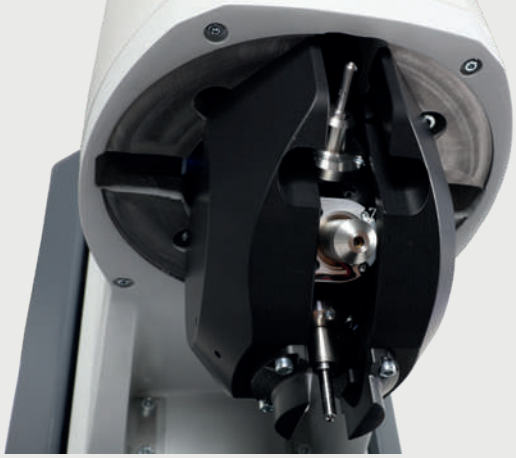
Modern laser technology

Precision focusing with laser light for simple test point positioning



Bright LED test area lighting

Precise positioning of the test points even under difficult lighting conditions thanks to dimmable LEDs



Slim nose cone

High flexibility for testing even complex specimen geometries

Sturdy display

10” touchscreen display developed for industrial applications

Large handwheel

Better grip for simpler clamping of the specimen

The new DuraVision 200 G5 and 300 G5.

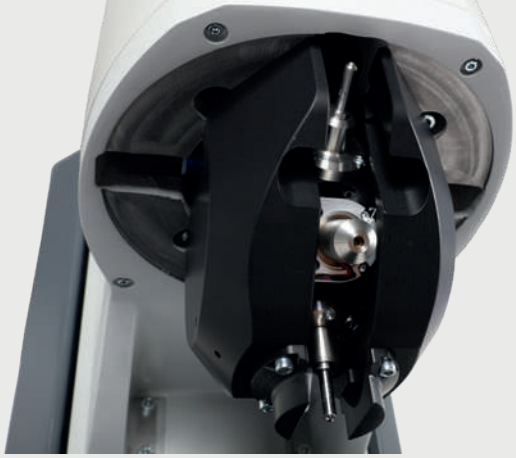
Very simple operation combined with fully automatic test cycle.

Patented Z-axis with rapid traverse

Time saving during adjustment to different specimen heights thanks to the rapid traverse speeds of up to 25 mm/s

External machine control via hardware interface

Additional interface allows integration of the DuraVision G5 into automated systems or the connection of the optional foot switch



Slim nose cone

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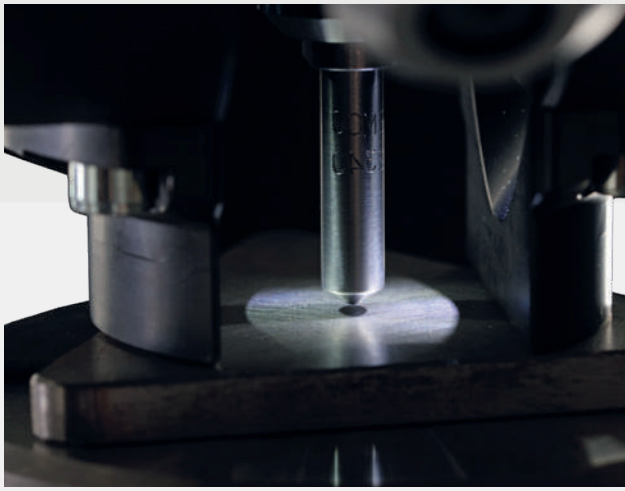
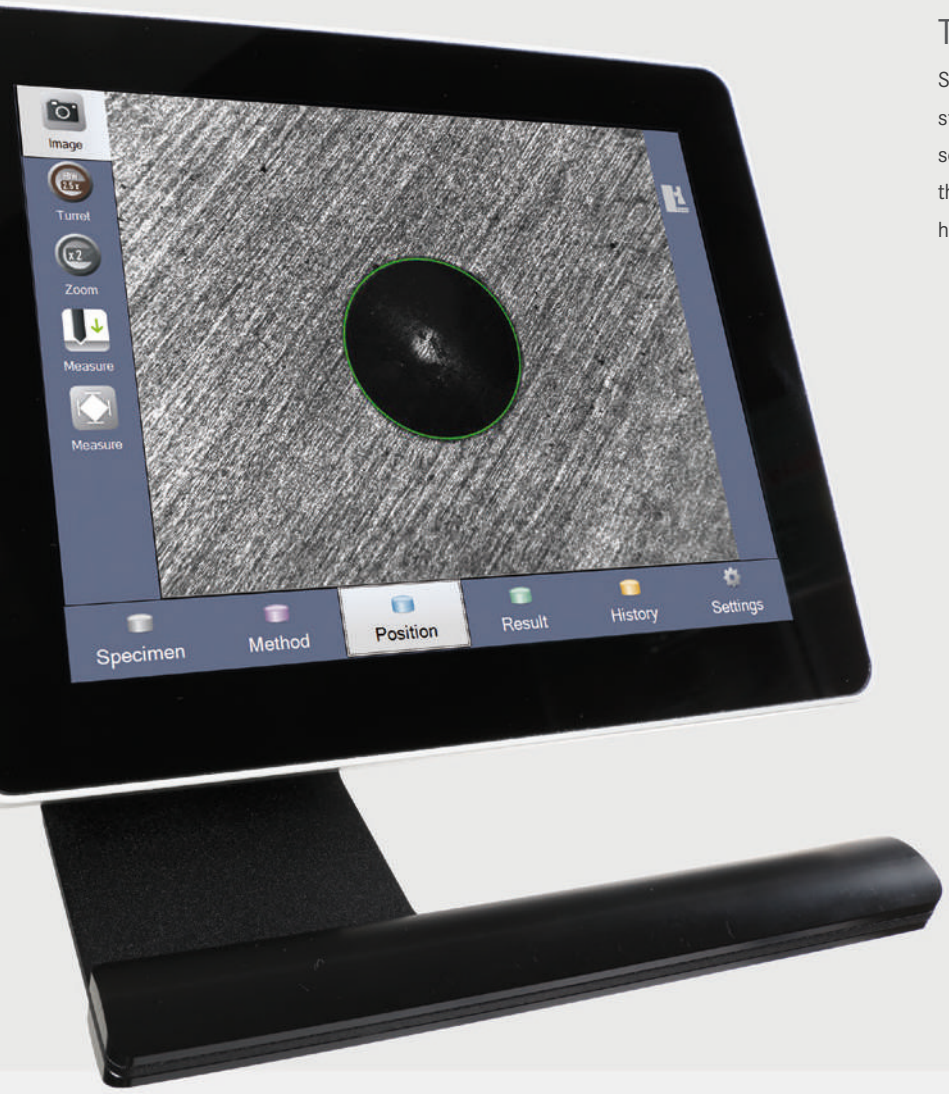


Bright LED test area lighting

Precise positioning of the test points even under difficult lighting conditions thanks to dimmable LEDs

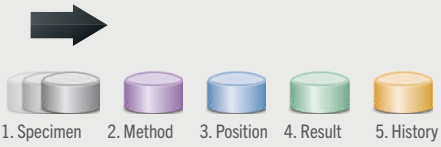
The pioneering hardness testing software.

ecos Workflow Touch



The workflow in five steps

Specimen, method, position, result and history are the five steps provided by the intuitive **ecos** Workflow operating software. Logic, transparency and very simple operation are the key factors in the workflow for efficient and convenient hardness testing. Available as standard in 13 languages.



TeamViewer

Windows 10

1 Specimen

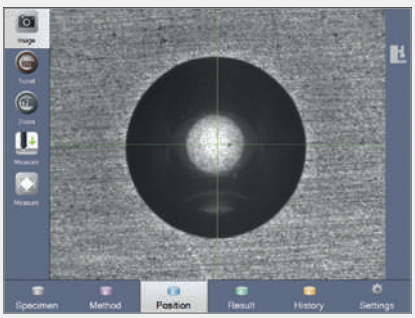
Select the required test type from a choice of single measurement, serial measurement, CHD, SHD and NHD progression, load a template or scan a QR code.

2 Method

Select the test procedure, lens, test method, zoom level and, if applicable, conversion, limits and geometric correction according to standard as well.

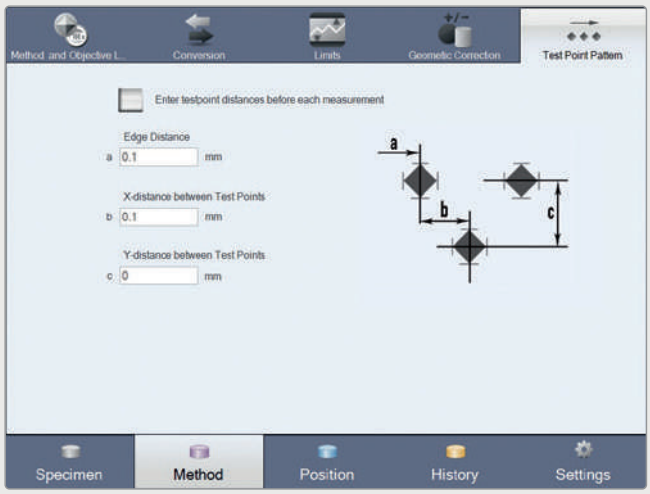
3 Position

Position your test point on the workpiece. With the integrated tools, such as the test area lighting, this is quickly accomplished. Then simply start the test.



Serial measurements

A test point wizard is available for serial measurements or CHD, NHD and SHD measurements. This assists you in creating a test point grid for standard-compliant serial measurements (ISO 2639, 10328, 50190).

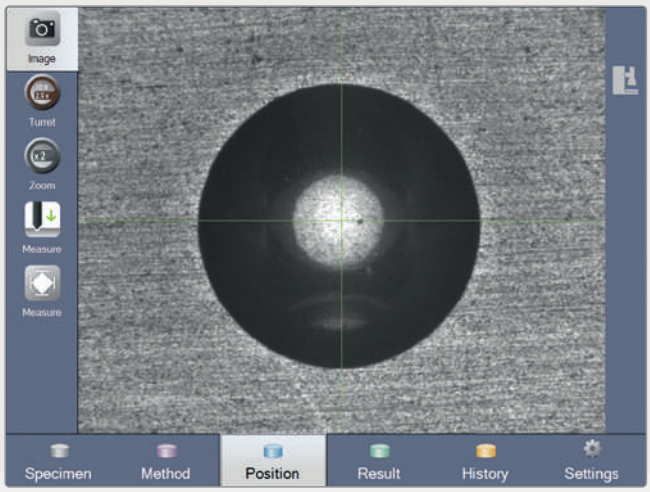


Very simple operation

The software shows you clearly which lens or which indenter is in use. Lenses and indenters are swivelled by simply clicking on the touch-screen display.

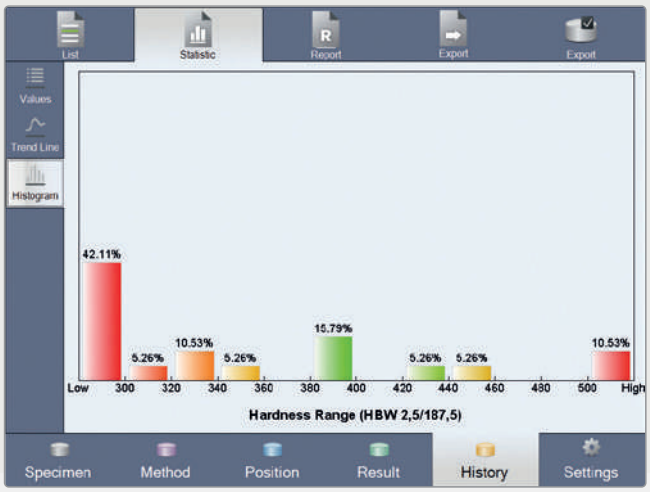
Autofocus

The automatic detection of the specimen height allows the tester to be focussed independently.



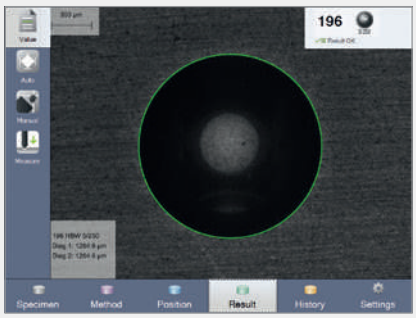
Statistics and diagrams

The measured values are displayed visually in statistics or diagrams.



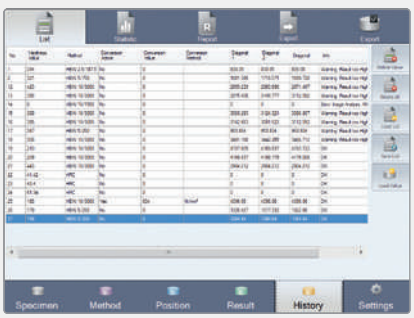
4 Result

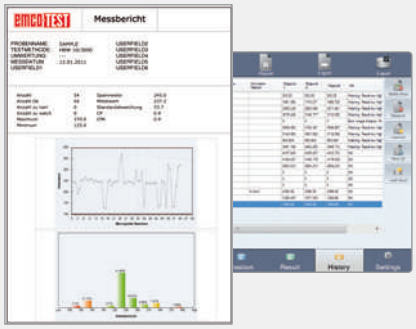
The result is shown clearly and is available for further use. The measurement can also be repeated automatically or manually if required.



5 History

All results are stored permanently with a clear structure. You have the option of archiving the data in other systems or of creating a report via the directly interfaced printer.





Important functions.

ecos Workflow

The calibration assistant of **ecos** Workflow

The calibration assistant integrated into the test software as standard supports you in the inspection of all the calibrated methods of your hardness tester required by the standards. The software notifies you of upcoming inspections, guides you through the test cycle and supports appropriate documentation.

Further details can be found at: www.emcotest.com/ecosworkflow

Information

Informs you of upcoming inspections

Guide

Guides you through the inspection procedure

Documentation

Supports you in the documentation of the tests

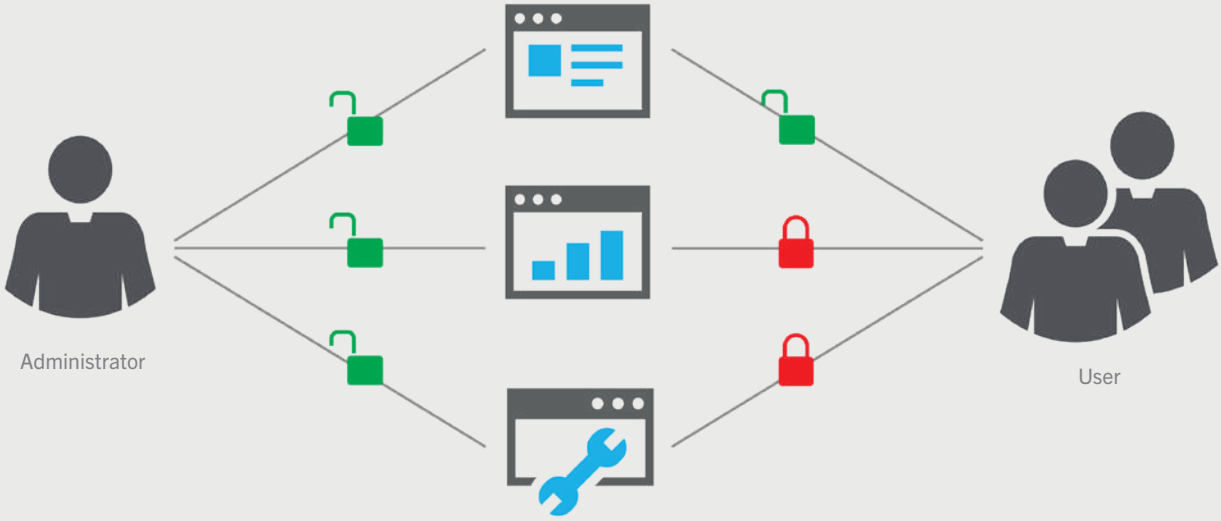
Status

Informs you of the current status of the calibrated methods

ecos Workflow™
WITH CALIBRATION INFORMATION SYSTEM

Data management / Template function

A measurement data group can be created and selected before the test. All test results are collected in separate lists, allowing them to be represented clearly, exported or saved as a report at any time. Use grouped measurement data management to assign test data to individual users or user groups, components, batches or departments. In addition, frequently used test parameters can be assigned to the measurement data group in the form of templates (method, conversion, geometric correction). This significantly reduces the amount of work for the operator and the possibility of incorrect operation.



Simple management of user rights

The **ecos** Workflow operating software offers the possibility of selectively and individually controlling user rights by means of user levels. Any number of user levels with different rights can be created and changed at any time. Working rights can be individually assigned to every single function and method. All available rights can be very easily assigned to the desired user level with the help of a rights editor. The users are then assigned to the user level that can, if necessary, be additionally protected by means of a password. This ensures that only authorised users can perform a measurement with the required test method or can change machine settings.

QR code function

This function allows the user to create QR codes with all the relevant data necessary for the hardness test, such as test method, lens, etc., and to also print these out, if necessary. In addition, any QR code or bar code of existing identification codes on specimens or dockets can be assigned to any stored template. This code can be read in using an interfaced bar code scanner. The assigned data are then automatically loaded and the test can be carried out immediately. The test procedure can thus be accelerated and operator errors reduced.

Individual clamping force

The optimum force for clamping can be set as required in the software, depending on the specimen size and material. Even complex specimens can thus be reliably clamped by selecting a correspondingly higher clamping force. Marks on soft materials can be avoided by selecting a correspondingly lower clamping force.

Modern data management with ecos Workflow.

Simple and safe handling of data.

Efficient data management

The vast number of measured values created during the course of comprehensive quality assurance demands highest levels of precision and availability from computerised QA systems. In order to guarantee continuous documentation and reliable allocation of measured data to the respective workpiece, all DuraVision G5 models offer extensive possibilities for data output and backup. In addition to storing of the test results directly at the hardness tester, all the data collected during the test can also be saved as files in .pdf, .csv, .xls (Excel) or .xml format. The output in .xml format allows simple interfacing to Q-DAS systems. The integrated Export Editor offers extensive adaptation possibilities. In addition to the scope and sequence of the exported measurement data, a new file can also be generated automatically after each measurement, thus signifi-cantly simplifying the automatic further processing.

ecos Workflow xCHANGE

The xChange interface is standard on all hardness testers of the DuraVision G5 and DuraScan G5 Series. It allows practically any customer-specific requirement for connecting the hardness tester to databases and data input devices to be satisfied,as well as enabling fully automatic or unmanned operation. Since **ecos** Workflow xChange is based on the established XML format, interaction with it is simple and structured.

Create individual test reports

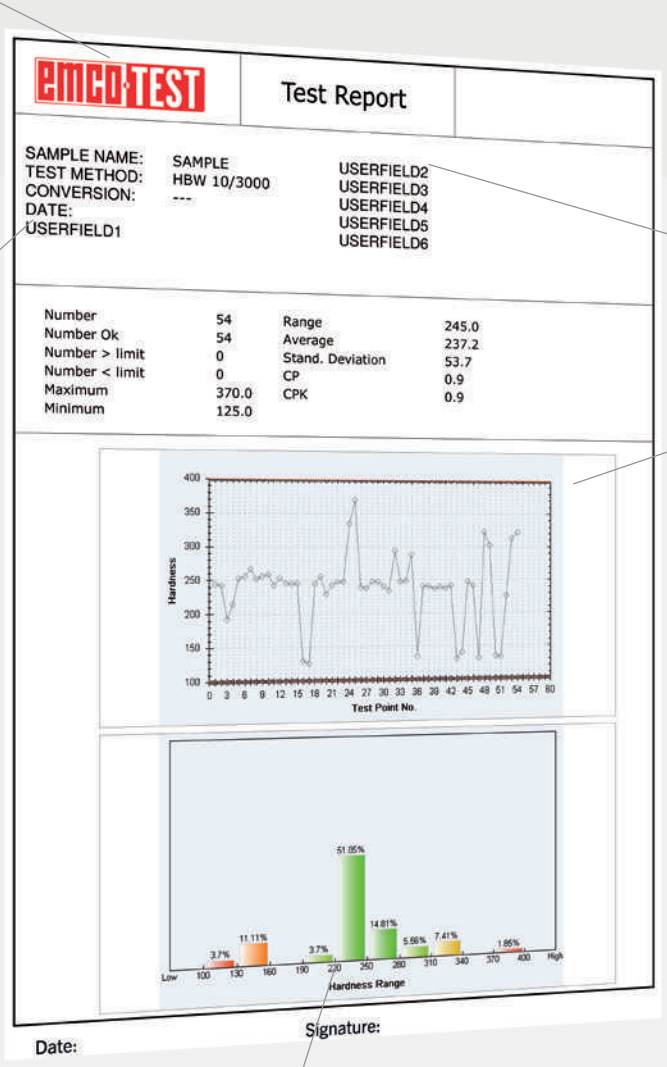
All models offer as standard the possibility of direct printing. This function allows a test report to be created using an interfaced printer. Furthermore, the flexible report generator enables individual reports to be designed for documentation of the test results.

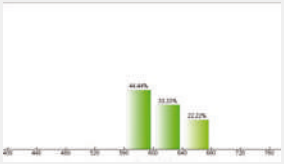
Integration of your company logo into the test report

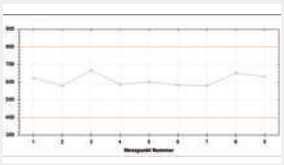
Individual fields for specimen designation and test parameters

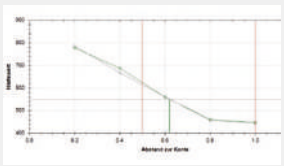
Further freely definable fields

Bar diagram, statistics, trend diagram, etc.







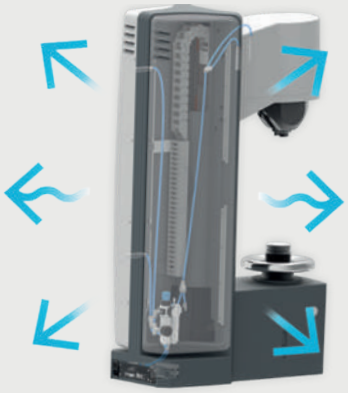


Measured value tables, statistical information, etc. can also be incorporated.

Specimen	Row	Testpoint	Hardness	Method	Lens	X-distance to start point
Specimen 1	Row 1	1	716	HV1	50x	0,200
		2	668	HV1	50x	0,400
		3	684	HV1	50x	0,600
		4	599	HV1	50x	0,800
		5	549	HV1	50x	1,000
		6	716	HV1	50x	1,200
		7	668	HV1	50x	1,400
		8	684	HV1	50x	1,600
		9	599	HV1	50x	1,800
		10	549	HV1	50x	2,000

Options & accessories.

Adapt the DuraVision G5 to your needs.



Dust protection system - for harsh environments

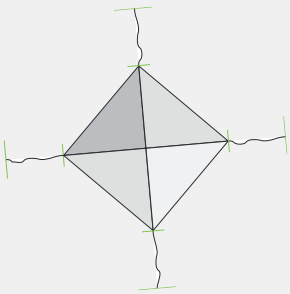
External influences, such as extreme dust development in production environments, make heavy demands on precision measuring systems. The pressurised system prevents dirt and dust entering the precision measuring and control electronics inside the machine.

Star-shaped turret – seven at a stroke

The star turret included in the normal scope of every machine can be expanded from the standard two positions to up to seven positions – at any time and with little effort. The star-shaped design allows not only a slim construction of the turret, but also provides seven positions for fitting any combination of indenters and lenses. A wide spectrum of test methods can thus be covered with a single machine, and frequent tool changing is not necessary. In combination with the new high-resolution camera, this reduces investment costs and set-up time. In addition, the turret rotates at a very high speed and automatically finds the shortest turning direction to the selected position.

Base – for stability and ergonomics

The DuraVision G5 base is the ideal foundation for offering operators optimum working conditions. Irrespective of whether the operator works standing up or sitting down, the base provides an optimum height for ergonomic working. Furthermore, the base features vibration-damping elements that provide the ideal conditions for precise measurement results. The generously sized drawers provide space for storing accessories and tools.



ecos FRACTURE

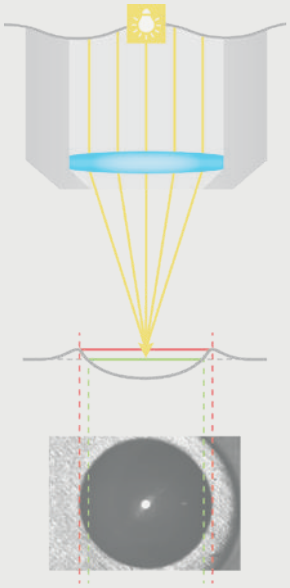
The optional module ecos FRACTURE enables a fast determination of the fracture toughness on carbide and ceramic material according the Palmqvist (ISO 28079) and Niihara method (ISO 28079). To determine the fracture toughness, all four single cracks must be measured in the evaluation camera. The Determination of the fracture toughness is done automatically.

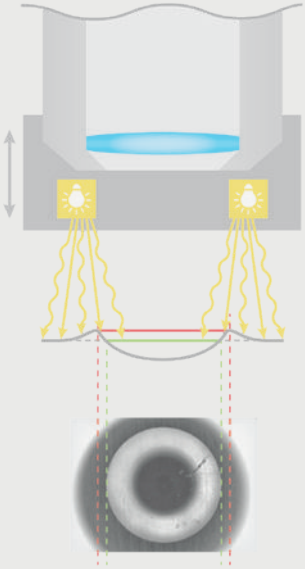
Lens with Brinell SmartLight

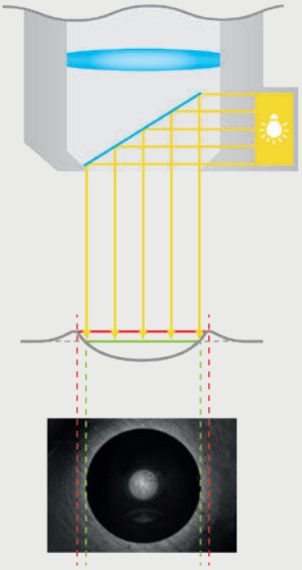
The Brinell hardness test has always represented a challenge with soft metals and difficult surfaces. Particularly with soft materials, the edges are not always perfectly recognisable due to considerable deformation (bulging) around the indentation. The new lenses with the innovative Brinell SmartLight now ensure ideal lighting and allow better recognisability of the test indentation during Brinell tests. The lenses with Brinell SmartLight are available as 2.5x and 5x lenses.

In use for Brinell testing until now

Innovation in DuraVision G5







Coaxial lighting

When using coaxial lighting, the light passing through the lens is scattered on the specimen surface. As the light beams are not reflected back to the lens due to the scatter, the test indentation appears dark. Furthermore, shadowing is caused by the oblique incident light in the area of the bulging around the test indentation. Due to these physical factors, the edges of the indentation are difficult to detect and evaluate.

Circular light

When using circular lighting, diffuse light falls in a ring pattern from the outside onto the indentation. The light beams are reflected in the test indentation back into the lens. This allows better recognition of the edges compared with coaxial lighting.

Depending on the hardness range, different height settings of the circular light are necessary in order to achieve optimum illumination of the test indentation. That these adjustments are performed manually by the operator can, however, have a negative influence on the evaluation result.

Brinell SmartLight

The SmartLight technology developed by EMCO-TEST combines a lens with “collimated light”. With this lighting, parallel light beams are directed by a mirror system onto the test indentation. The light therefore strikes the test indentation perpendicularly from above and prevents any shadowing in the area of the bulge. The contour is clearly recognisable and the indentation can be precisely evaluated. The SmartLight technology is permanently integrated into the lens and requires no further settings by the operator.

Complete accessories catalogue at www.emcotest.com

At www.emcotest.com you will find the whole range of accessories for the DuraVision G5 hardness testing machine, such as various indenters, special test tables, adapters for further indenters, lenses and much, much more.

LOOKING BACK ON OVER 65 YEARS OF COMPETENCE.

Competence and experience – hand-in-hand.

Our success is founded on the vision of Karl Maier to build hardness testing machines that «do everything simply, rather than simply everything». In the form of simple testing tools that implement the most complicated functions. This is why Salzburg businessman and mechanical engineer Maier decides to establish a hardness testing department in his company, Maier & Co Maschinenfabrik (later EMCO Maier GmbH), in 1954.

When Karl Maier dies in 1978, his innovative testing products have long since made a name for themselves. The founder´s son, Ernst Alexander Maier, takes over the company, which under his leadership becomes a technological leader in the field of hardness testing, not only in Austria, but far beyond its borders. 1989 marks a milestone with invention of a closed-loop control system for load application in hardness testers. For the first time worldwide, it enables testing with all test methods and many load levels in a single universal hardness testing machine. Patent applications are submitted for this revolutionary invention not only in Europe, but also in the USA and Japan, and it still represents the technological basis for all modern hardness testers. In 1996, the hardness testing department becomes a separate company and EMCO-TEST Prüfmaschinen GmbH is founded.

The death of Ernst Alexander Maier in the year 2001 is a grievous loss, because his extraordinarily visionary spirit has not only shaped the development of the company, but also its employees and milieu. His humanity and sense of responsibility with respect to the region and the environment are also sorely missed. The figures for themselves: Approximately 50 employees at the company headquarters in Kuchl subsidiary are responsible for our international commercial success. Together with our motivated and talented team, we have turned Karl Maier´s vision into a living reality – his idea has become our mission. Or to put it another way: «We don´t make simply everything for hardness testing, but we do make everything in hardness testing simple.»

Premium quality with certified quality promise (ISO 9001)

In order to ensure that only perfect quality is supplied to you, every EMCO-TEST testing machine is thoroughly and stringently tested before delivery. The ease of service is taken into consideration right from the beginning in the design phase. The results are menu-driven fault detection, integrated self-diagnosis and modular exchange of electronic components that ensure the remedying of faults in a minimum of time. Software updates that take into consideration changes in standards or optimise future processes ensure high investment security for you.

Remote Support

The TeamViewer Client integrated as standard can be started directly from **ecos** Workflow and offers the optimum basis for perfect online support worldwide. This software allows remote maintenance as well as the sharing of the screen contents with other computers, e.g. for training purposes (internet connection required).

10 years spare parts availability

For EMCO-TEST hardness testing machines we guarantee spare parts availability of least 10 years after a product has been discontinued. To secure your investment in a EMCO-TEST testing machine, we extend this availability by several more years whenever possible, significantly exceeding standard industry requirements.

Technical data at a glance

Handwheel

	DuraVision 20 G5	DuraVision 30 G5
Methods and load range		
Load range 2.942 - 2,452 N (0.3 - 250 kgf) - electronically controlled	•	-
Load range 29.42 - 24,920 N (3 - 3,000 kgf) - electronically controlled	-	•
Brinell (ISO 6506, ASTM E10)	•	•
Vickers (ISO 6507, ASTM E384, E92)	•	•
Rockwell, Super Rockwell (ISO 6508, ASTM E18)	•	•
Knoop (ISO 4545, ASTM E384, E92)	•	-
Plastics testing (ISO 2039)	•	-
Carbon testing (DIN 51917)	•	•
Configuration		
10" capacitive colour display (1024 x 768 pixels), tiltable	•	•
ecos Workflow Touch operating software	•	•
Automatic test cycle with brightness control, autofocus and image evaluation	•	•
3 step zoom	•	•
12 Mpix evaluation camera with CMOS sensor	•	•
Machine control via integrated PLC	•	•
Motorised height adjustment of the test unit with rapid traverse	-	-
Clamping force setting 1961.4 - 19,614 N(200 - 2,000 kgf) ± 10%	-	-
Automatic 2x star turret	•	•
Automatic 7x star turret	optional	optional
Workspace lighting (integrated into nose cone, dimmable)	•	•
Testing clamped/unclamped	•	•
Test table (W x D)	Ø 90 mm	Ø 90 mm
Operating system Windows 10 / 64 bit	•	•
Software functions		
Module for serial measurements	optional	optional
Data Management / Template function	•	•
QR code function	•	•
Extended export functions via Export Editor	•	•
ecos Workflow xCHANGE (XML-based interface for data links)	•	•
Integrated TeamViewer client	•	•
Adjustable user rights	•	•
Interfaces		
Network interface	2xRJ45	2xRJ45
USB interface 3.0	4x	4x
HDMI	1x	1x
Displayport	1x	1x
Integrated memory (SSD)	128 GB	128 GB
Hardware interface (for control with foot switch or line controller)	-	-
Functional dimensions		
Max. workpiece weight	200 kg	200 kg
Z-axis resolution	-	-
Max. speed on Z-axis		
Max. test height	400 mm	400 mm
Weight of basic unit	420 kg	420 kg
Power consumption (max. / standby)	120 W / 50 W	120 W / 50 W

Motorised nose cone infeed

DuraVision 200 G5	DuraVision 300 G5
•	-
-	•
•	•
•	•
•	•
•	-
•	-
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
optional	optional
•	•
•	•
Ø 90 mm + 447 x 370 mm	
•	•
optional	optional
•	•
•	•
•	•
•	•
•	•
•	•
2xRJ45	2xRJ45
4x	4x
1x	1x
1x	1x
128 GB	128 GB
optional	optional
500 kg*	500 kg*
0.18 µm	0.18 µm
up to 25 mm/sec	up to 25 mm/sec
500 mm	500 mm
420 kg	420 kg
600 W / 100 W	600 W / 100 W

* When using EMCO-TEST base as substructure

Machine data:

Dimensions (W x H x D)	380 mm x 1400 mm x 830 mm
Space requirements (W x D)	1080 x 1580 mm
Test force application resolution	0.45 nm
Length measuring probe resolution	0.05 µm
Nose cone support	53 mm x 42 mm
Reach	320 mm
Protection class to EN 60529	IP20
Voltage supply (V)	230V ~ 1/N/PE 110V ~ 1/N/PE
Max. voltage fluctuations	± 10%
Frequency	50/60 Hz
Main fuse (110 / 230V)	T 6.3 A
Room temperature (to ISO/ASTM)	+5°C to +40°C
Humidity	max. 70% (non-condensing)

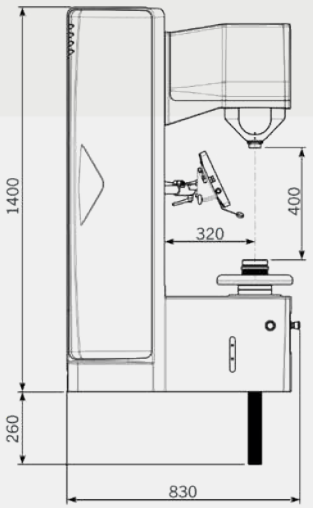


Fig.: DuraVision 20/30 G5

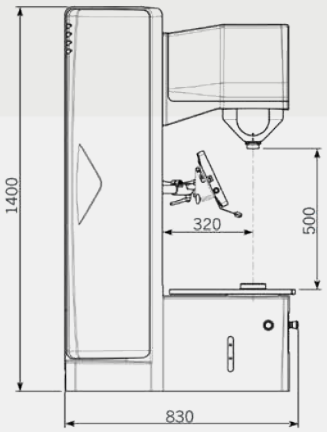


Fig.: DuraVision 200/300 G5

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