

# Precise hardness testing for the toughest requirements



## DuraVision G5

0.3-3000 kgf

Brinell

Vickers

Rockwell

Knoop

Plastic testing

Carbon testing

HBD, HVD

powered by  
**ecos** Workflow™  
WITH CALIBRATION INFORMATION SYSTEM

# Hardness testing for every application.

Test load range from 0.3 kgf to 3000 kgf.

## LOAD RANGE



## HARDNESS TESTING MACHINES



DuraVision 20 G5

HANDWHEEL



DuraVision 200 G5

MOTORISED TEST HEAD POSITIONING

## TEST METHODS



### Brinell according to 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
HBD (not standardised)			



### Vickers according to 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	HVD (not standardised)			



### Rockwell according to ISO 6508, ASTM E18

HRA - HRV	HR15-N/T/W/X/Y
HR30-N/T/W/X/Y	HR45-N/T/W/X/Y



### Knoop according to ISO 4545, ASTM E384, E92

HK 0.3	HK 0.5	HK 1	HK 2
--------	--------	------	------



### Carbon testing according to 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 according to 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 TEST HEAD POSITIONING

## TEST METHODS



### Brinell according to 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	
HBD (not standardised)			



### Vickers according to 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	HVD (not standardised)			



### Rockwell according to ISO 6508, ASTM E18

HRA - HRV	HR15-N/T/W/X/Y
HR30-N/T/W/X/Y	HR45-N/T/W/X/Y

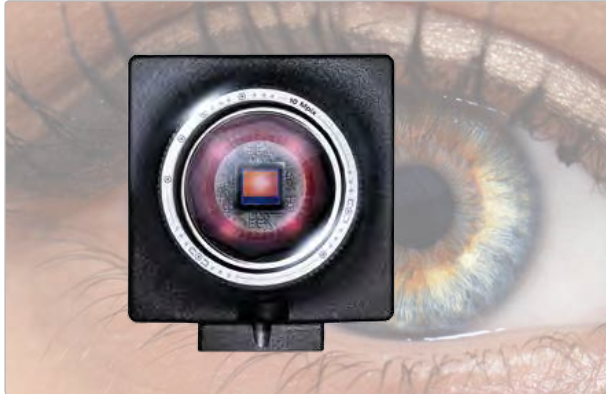


### Carbon testing according to DIN 51917

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 wide standard load range from 0.3 kgf to 3000 kgf. The force is continuously and precisely applied by means of a large number of electronic force measuring sensors. Intelligent utilisation of the 10-megapixel camera enables a 3x 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-shaped turret shortens the cycle times as far as technically possible and minimises the operator influence.



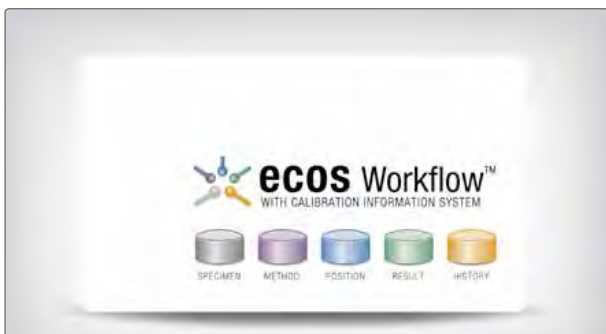
### Easy testing of complex specimens

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 with Calibration Information System (CIS) 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 CIS 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 surface 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



Modern 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.

Simple operation combined with fully automated test cycle.



## Motorised test unit with rapid traverse

Time saving during adjustment to different specimen heights thanks to the stepless 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

High flexibility for testing even complex specimen geometries



Modern display

10" touchscreen display developed for industrial applications



Bright LED surface lighting

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



# The pioneering hardness testing software.

## ecos Workflow CIS Touch



### The workflow in five steps

Specimen, method, position, result and history are the five steps provided by the intuitive **ecos** Workflow CIS operating software (with Calibration Information System). 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.



#### 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.



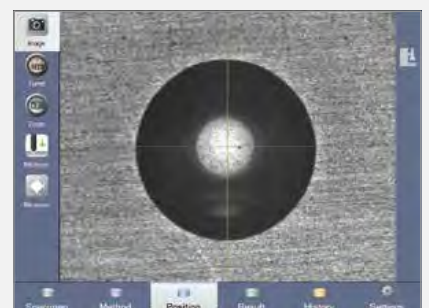
#### 2 Method

Select a measurement type, lens, test method, zoom level and, if applicable, conversion, hardness limits and geometric correction according to standard as well.



#### 3 Position

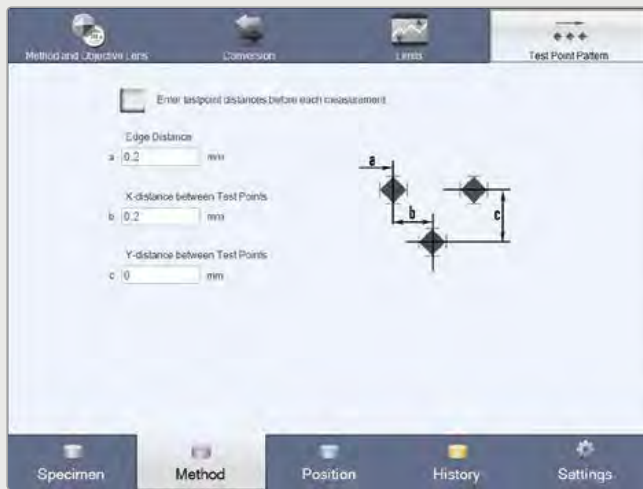
Position your test point on the workpiece. With the integrated tools, such as the surface lighting, this is quickly accomplished. Then simply start the test.





## 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 patterns when carrying out standardised serial tests (ISO 2639, 10328, 50190).



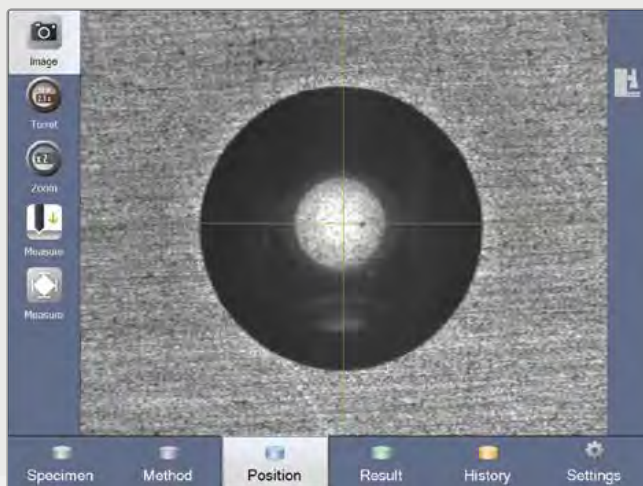
## Intuitive control

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.



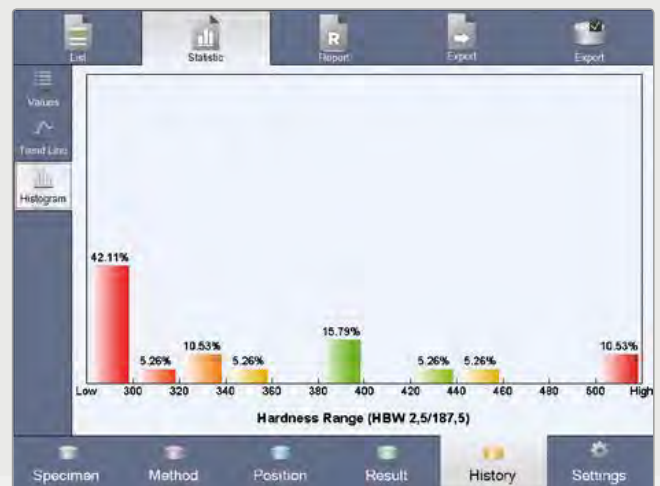
## Autofocus

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



## Figures and diagrams

The measured values are displayed visually in the form of figures, statistics or diagrams.



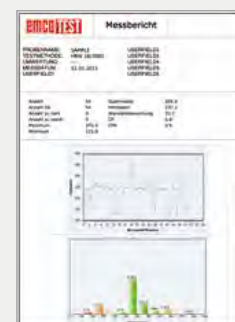
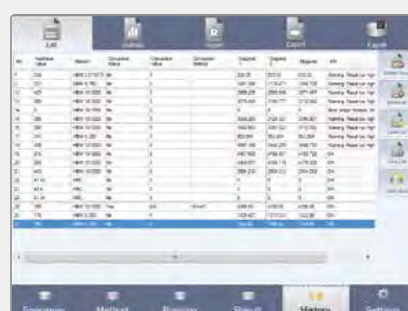
## 4 Result

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 CIS

### The calibration assistant of **ecos** Workflow CIS

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](http://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

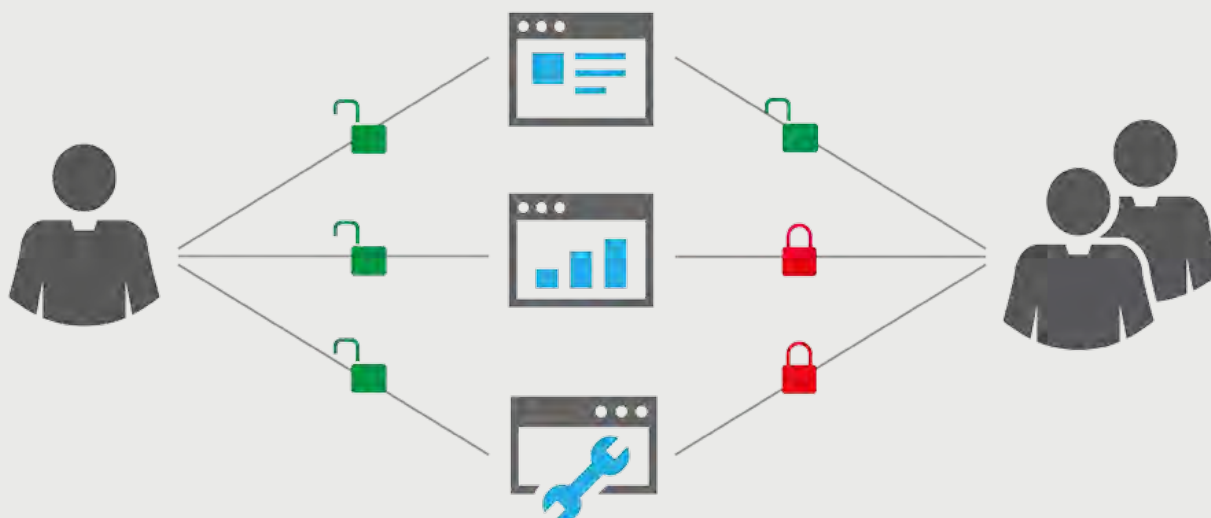


**ecos Workflow™**  
WITH CALIBRATION INFORMATION SYSTEM



### Template function

Create simple and efficient templates for frequently required test parameters. This significantly reduces the work for the operator and the possibilities of an operator error. Selecting the template automatically generates all the relevant settings for the specimen to be tested (method, measurement data group, conversion, geometric correction, etc.).

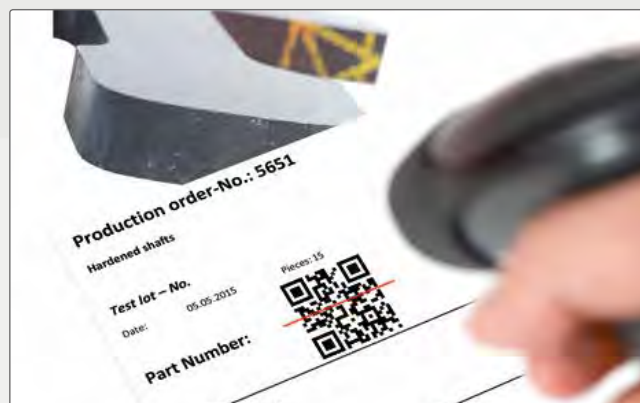


## Simple management of user rights

The **ecos** Workflow CIS 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.

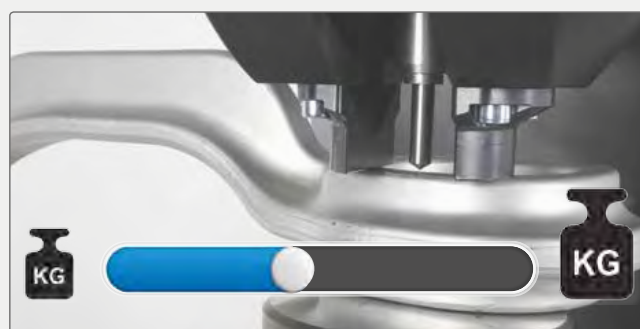
## QR code function

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

Thanks to the patented construction of the Z-axis 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 CIS.

## 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, .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 significantly simplifying the automatic further processing.



### ecos Workflow xCHANGE

The xChange interface is standard on all hardness testers of the DuraVisionG5 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

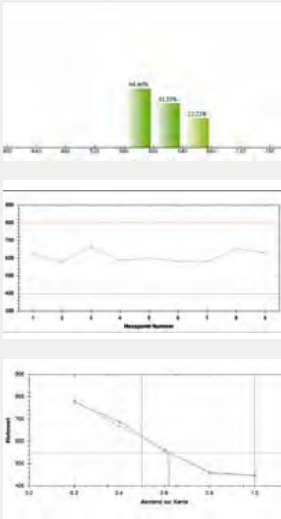
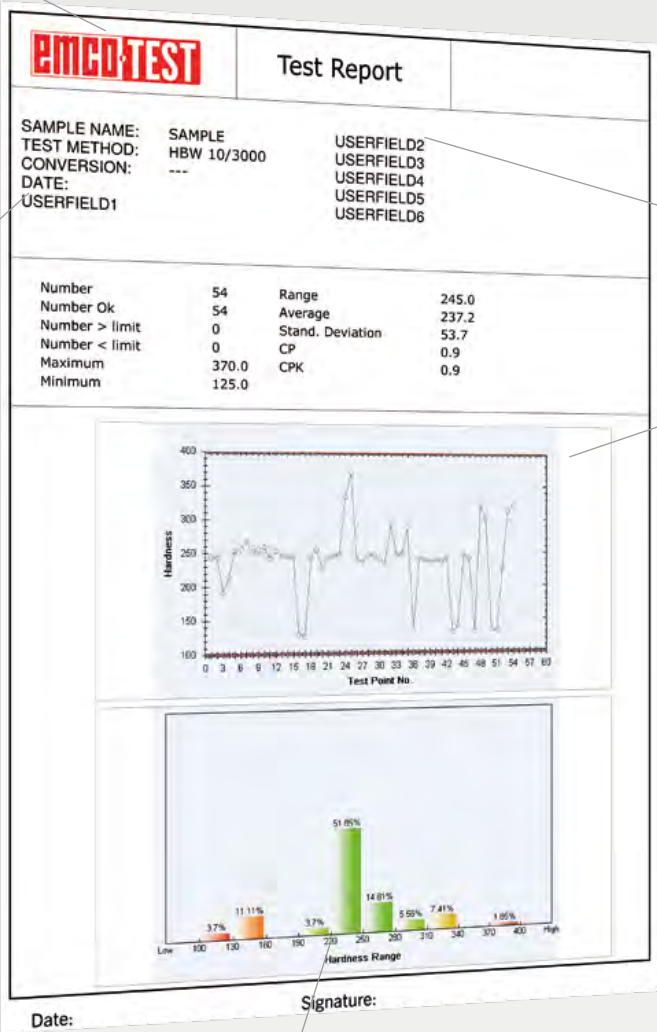
All models offer as standard the possibility of direct printing. This function allows a test report to be created using an interfaced printer. Furthermore, the report generator enables individual reports to be designed for documentation of the test results.

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.

Probe	Reihe	Prüfpunkt	Härte	Methode	Objektiv	X-Abstand zum Startpunkt
Probe 1	Reihe 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.



## Base – for stability and ergonomics

The DuraVision G5 base is the ideal foundation for offering the operator 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 is very stable, meaning that workpieces with high weights can also be safely tested.



## Star-shaped turret – seven at a stroke

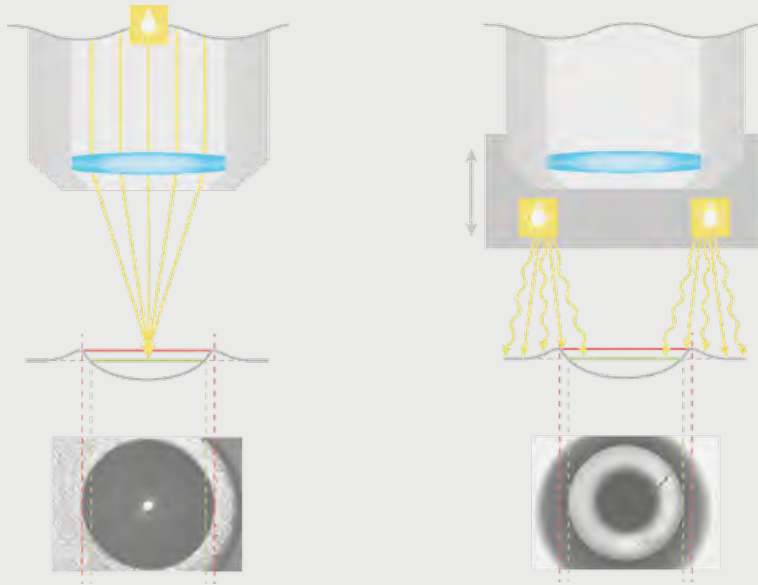
The star turret included in the normal scope of every machine can be expanded from the standard two positions to up to seven positions – at any time and with little effort. The star-shaped design allows not only a slim construction of the turret, but also provides seven positions for fitting any combination 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.



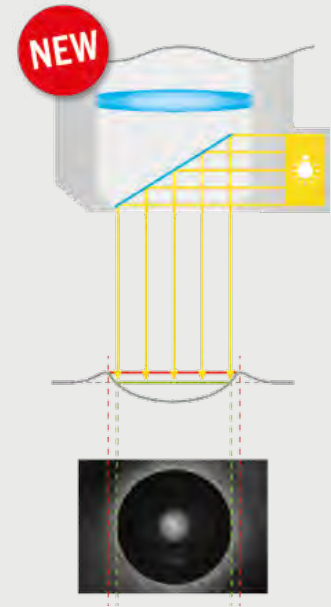
## Lens with Brinell SmartLight

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.

### Ring 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 ring 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 EM-CO-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](http://www.emcotest.com)

At [www.emcotest.com](http://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.



# 360° FULL SERVICE COMPETENCE

Competence and experience — hand-in-hand.



## Our strategy

With the vision of “building machines that don't simply do everything, but do everything simply”, Ernst Alexander Maier developed EMCO-TEST from the inheritance of his father and company founder into the world technology leader in the field of hardness testing. Today we are the largest manufacturer of hardness testing machines with the most modern and most efficient technologies in Eu-

rope. In line with our mission of making everything concerning hardness testing simpler, we offer comprehensive solutions for all these applications from a single source: Development, production, calibration, consultation and supplementary services – complete coverage of all important issues. This means competence in all aspects of hardness testing: 360° FULL SERVICE COMPETENCE.



## Accredited calibration laboratory to ISO 17025

In order to comply with international standards, for reproducibility of measurement results and for comprehensive documentation of the test cycles, EMCO-TEST offers accredited calibration in accordance with EN ISO / IEC 17025. Our accredited calibration laboratory ensures that the services offered always represent the state-of-the-art of the standards and technology.

## 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.

## Service app

With the EMCO-TEST Service app, you can quickly and easily send a service message around the clock and from anywhere in the world. The app guides you step-by-step in easily creating your service message. This ensures that our service technicians receive all the relevant data on the machine and can quickly provide assistance in an emergency. These and many other functions await you in our EMCO-TEST Service app.

## Remote support

The TeamViewer Client integrated as standard can be started directly from ecos Workflow CIS 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.





# Technical data



	DuraVision 20 G5	DuraVision 30 G5
<b>Methods and load range</b>		
Load range 2.942 - 2452 N (0.3 - 250 kgf) - electronically controlled	•	-
Load range 29.42 - 24920 N (3 - 3000 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)	•	•
<b>Configuration</b>		
10" capacitive colour display (1024 x 768 pixels), tiltable	•	•
ecos Workflow CIS Touch operating software	•	•
Automatic test cycle with brightness control, autofocus and image evaluation	•	•
3x zoom	•	•
10 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 - 19614 N(200 - 2000 kgf) ± 10%	-	-
Automatic 2x star turret	•	•
Automatic 7x star turret	optional	optional
Surface lighting (integrated into nose cone, dimmable)	•	•
Testing clamped/unclamped	•	•
Test anvil (W x D)	Ø 90 mm	Ø 90 mm
Operating system Windows 7 / 64 bit	•	•
Operating system Windows 7 / 32 bit	optional	optional
<b>Software functions</b>		
Module for serial measurements	optional	optional
Template function	•	•
QR code function	•	•
Extended export functions via Export Editor	•	•
ecos Workflow xCHANGE (XML-based interface for data links)	•	•
Integrated TeamViewer client	•	•
<b>Interfaces</b>		
Network interface	RJ45	RJ45
USB interface	2x	2x
RS 232 interface	1x	1x
VGA interface	•	•
Integrated memory (SSD)	32 GB	32 GB
Hardware interface (for control with foot switch or line controller)	-	-
<b>Functional dimensions</b>		
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
Z-axis resolution	-	-



## DuraVision 300 G5

•	-
-	•
•	•
•	•
•	•
•	-
•	-
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
optional	optional
•	•
•	•
Ø 90 mm + 447 x 370 mm	
•	•
optional	optional
optional	optional
•	•
•	•
•	•
•	•
•	•
RJ45	RJ45
2x	2x
1x	1x
•	•
32 GB	32 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
450 kg	450 kg
600 W / 100 W	600 W / 100 W
0.18 µm	0.18 µm

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
Width	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)



DuraVision G5 product brochure

# Benefit from our worldwide sales and service network!

Our qualified sales and service partners are at your disposal in over 40 countries. We can therefore guarantee the best support for you and your machine. You can find a dealer near you on our website [www.emcotest.com](http://www.emcotest.com).



- Headquarters Austria
- Sales and service partners

## EMCO-TEST

YOUR FACTOR OF SAFETY

**EMCO-TEST (Deutschland) GmbH**

Frühlingstraße 6

83278 Traunstein, Germany

office@emcotest.de Tel. +800 20 438 000

[www.emcotest.de](http://www.emcotest.de)

**EMCO-TEST Prüfmaschinen GmbH**

Kellau 174

5431 Kuchl-Salzburg/Austria

office@emcotest.com Tel. +43 6244 204 38

[www.emcotest.com](http://www.emcotest.com) Fax +43 6244 204 38-8

