

# CRASSE

MEASURING INSTRUMENTS



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# HARDNESS TESTERS



YOUR FACTOR OF SAFETY

# DURAJET G5



*Rockwell hardness tester with touch screen  
9.8 - 2450 N (1 - 250 kgf)  
Rockwell EN ISO 6508, ASTM E-18  
Plastic testing EN ISO 2039  
Carbon testing DIN 51917  
HBT and HVT methods*

Thanks to the electronically controlled load application and the load range of 9.8 N to 2450 N (1 kgf to 250 kgf), semi-automatic **DuraJet G5** fully covers the entire Rockwell range by a single device. In addition, plastic testings, carbon testings as well as Vickers and Brinell tests in-depth can be performed. This flexibility, combined with ease of operation, makes DuraJet G5 the device of choice where many different devices were previously used in various configurations.

- Hardness test compliant with Rockwell and carbon standards (Brinell and Vickers conversion)
- Clamping system of the nose cone with automatic test's start
- Specially suitable for small workpieces
- Adaptable to your requirements thanks to many optionals and accessories



## Electronic load application

Flexibility and compliance with standards through permanent electronic monitoring of the test loads plus precise, fully automatic control of the whole test cycle.



## Working space lighting

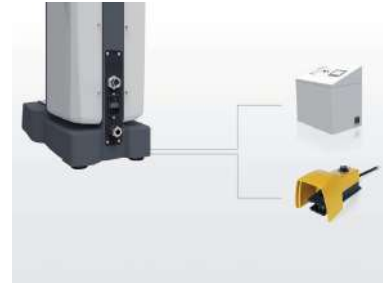
A LED integrated with the nose cone illuminates the working area around the measuring point so that precise positioning of the test points presents no problems, even in difficult light conditions. The LED is positioned absolutely glare-free and can be progressively dimmed.

# DURAJET G5



## ecos Workflow DuraJet Edition

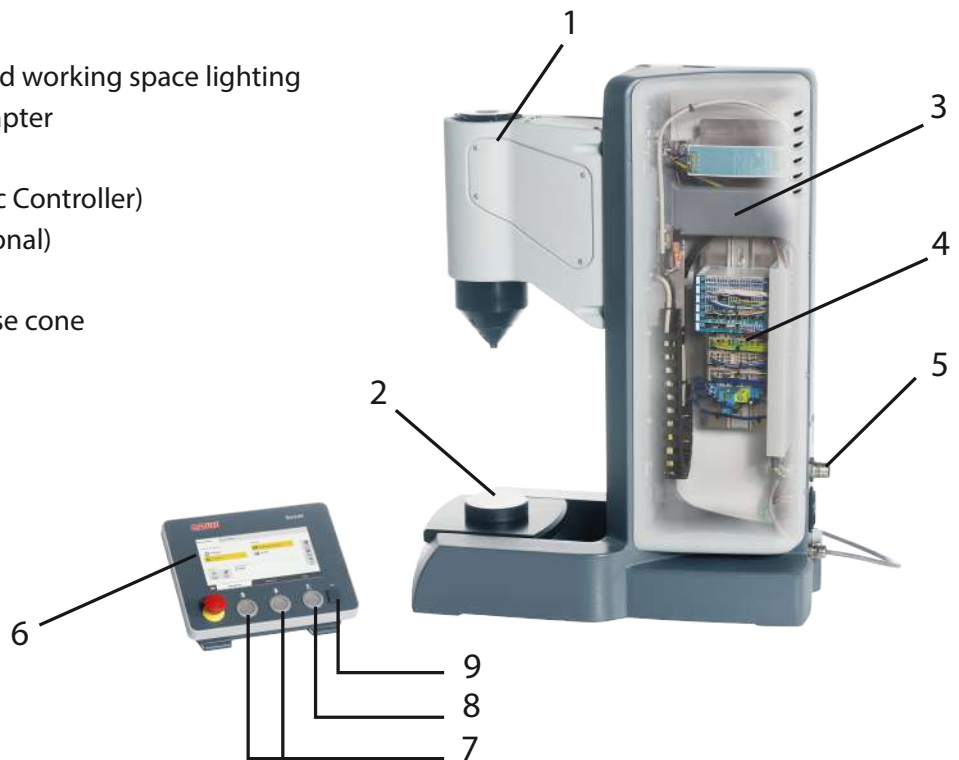
Intuitive user guidance coupled with many sophisticated functions, implemented on a pure PLC platform. Reports can also be prepared and printed. Furthermore, all test results can be stored on a network drive or USB flash drive.



## Integration into production plants

Thanks to an optionally available interface, it is possible to integrate the DuraJet G5 into an automated system and hence also carry out 100% testing without removing test specimens from the production process. Another possibility is to connect the available foot pedal to the interface, in order to control the clamping and testing cycle.

1. Nose cone with integrated working space lighting
2. Test anvil with device adapter
3. Highest safety standards
4. PLC (Programmable Logic Controller)
5. Hardware interface (optional)
6. 7" touch display
7. Height adjustment of nose cone
8. Start test
9. USB interface



# DURAJET G5



## ROCKWELL (compliant with ISO 6508, ASTM E18)

- HRA HRBW HRC HRD HREW HRFW HRGW HRHW HRKW HRLW HRMW HRPW HRRW
- HRSW HRVW HR15N HR30N HR45N HR15TW HR30TW HR45TW HR15WW HR30WW
- HR45WW HR15XW HR30XW HR45XW HR15YW HR30YW HR45YW



## BRINELL (non-standard depth measurement)

- HBT 1/5 HBT 1/10 HBT 1/30 HBT 2.5/31.25 HBT 2.5/62.5 HBT 2.5/187.5 HBT 5/125 HBT 5/250



## VICKERS (non-standard depth measurement)

- HVT 5 HVT 10 HVT 20 HVT 30 HVT 50 HVT 60 HVT 100

## PLASTIC TESTING (compliant with EN ISO 2039)

- 49.03 N 132.9 N 357.9 N 961 N

## CARBON TESTING (compliant with DIN 51917)

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

# DURAJET G5

## TECHNICAL FEATURES

Overview of functions		
	STANDARD	OPTIONAL
7"capacitive colour display (can be used with gloves)	●	
Load range 9.8 - 2450 N (1 kgf -250 kgf) - electronically controlled	●	
Machine control with integrated PLC	●	
Motor-driven height control of test unit	●	
Working space lighting (integrated in nose cone, dimmable)	●	
Template function	●	
Network interface RJ45	●	
Export data via serial port (USB-RS232 adapter required)	●	
USB interface	2x	
Test report in PDF format	●	
Fast Mode	●	
Test data management	●	
Rockwell, Super Rockwell (EN ISO 6508, ASTM E-18)	●	
Plastic testing (EN ISO 2039)	●	
Carbon testing (DIN 51917)	●	
HVD, HBD (not standardised)	●	
Testing clamped / unclamped	●	
Large test anvil 600 x 390 mm		●
Jominy module		●
Hardware interface (for activation by foot switch or system controller)		●
Functional dimensions		
Nose cone support diameter (standard)		Ø 15 mm
Nose cone bore (standard)		Ø 8 mm
Test anvil support		Ø 25
Maximum test height		260 mm
Throat depth		175 mm
Maximum workpiece weight		100 kg
Resolution of load measurement		24 bit
Resolution of depth measurement		0.02 µm
Machine features		
Dimensions (W x H x L)		300 x 740 x 565 mm
Weight of base unit		110 kg
Protection category EN60529		IP20
Power consumption (max. / standby)		120 W / 35 W
Main fuse rating (110 / 230V)		T 6.3 A
Ambient temperature		5 - 40 °C
Humidity		up to 90 % (without condensation)



# DURAJET G5

## ACCESSORIES



### C-Adapter

The C-Adapter can access even difficult-to-reach test points. The test is always performed without clamping, i.e. the specimen must be fixed. Retooling is quick and easy (test height is reduced by 170 mm).



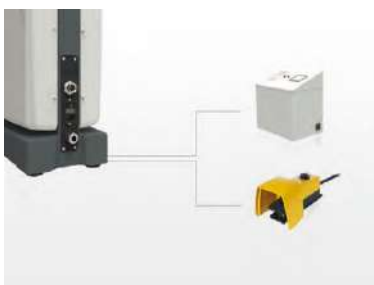
### Nose cone extension

The nose cone extension improves the access to difficult test positions. Various test anvils are available for tests in grooves, close to offsets or even on crankshafts (working space lighting not possible, test height reduced to 86 mm).



### Large test anvil

The DuraJet can also be ordered with a large test anvil for large specimens. It offers the same interface for accessories as the standard test anvil. The maximum test height with the large test anvil is 240mm.



### External machine control via hardware interface

It allows the integration of the DuraJet in an automated system and therefore 100% inspections without removing single test pieces from the production process. Another possibility is to connect the optional foot switch.



### Foot switch

It can be used to control the clamping process of bulky specimens. The function "Auto start after clamping" can be optionally used to perform the entire test cycle without manual control. It is supplied with a 2.5 m long cable and an emergency stop function.



### More accessories

All accessories for DuraJet G5 are available, including: various indenters (also certified in compliance with international standards EN ISO or ASTM), special nose cones, plane and V-tables, data cables, test blocks and many more.

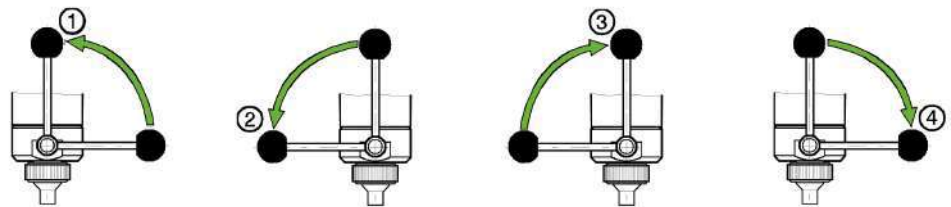
# N3A



*Rockwell hardness tester with dial gauge  
147 - 1840 N (15 - 187.5 kgf)  
Rockwell EN ISO 6508, ASTM E-18  
Plastic testing EN ISO 2039  
HBT and HVT methods*

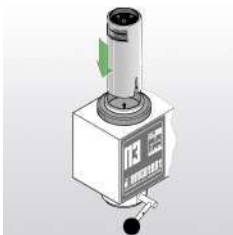
The **N3A hardness tester** is easy to use and then it is ideal for receipt of goods testing. The changeable *spring-sleeve* system is suitable for variable test loads. The reading of the hardness value occurs through an analog dial gauge.

Compliant with standard EN ISO 6508, ASTM E-18 for Rockwell testing.



## Easy operation

Load application by means of 180° lever:  
application of pre-load, application of main load, application of second pre-load, back to initial position.



## Changeable spring sleeve system

The N1A test unit with exchangeable spring sleeves is used for different loads. (Spring sleeves with different loads).

# N3A



## ROCKWELL (compliant with ISO 6508, ASTM E18)

- HRA HRBW HRC HRD HREW HRFW HRGW HRHW HRKW HRLW HRMW HRPW
- HRRW HRSW HRVW HR15N HR30N HR45N HR15TW HR30TW HR45TW HR15WW
- HR30WW HR45WW HR15XW HR30XW HR45XW HR15YW HR30YW HR45YW



## BRINELL (non-standard depth measurement)

- HBT 2.5/62.5 HBT 2.5/187.5



## VICKERS (non-standard depth measurement)

- HVT 30 HVT 100

## PLASTIC TESTING (compliant with EN ISO 2039)

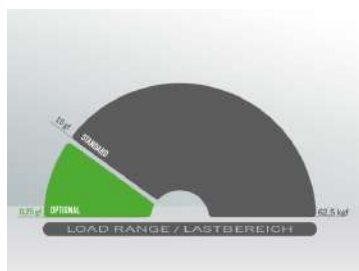
- 49.03 N 132.9 N 357.9 N 961 N

Technical features	
Measurement readings	Analog dial gauge
Height adjustment	Hand wheel
Test height (N1A unit and spring sleeves)	285 mm
Test height (with load adjustable test unit)	230 mm
Throat depth	170 mm
Maximum workpiece weight	20 kg
Dimensions (W x H x L)	205 x 830 x 470 mm
Basic machine weight	35 kg
Room temperature	5 - 40 °C

# DURASCAN G5



With the **DuraScan G5 series**, all Vickers, Knoop and Brinell test tasks in the load range between 0.25 gf and 62.5 kgf can be performed efficiently, flexibly and reliably. All model versions excel with the innovative user guidance system of the ecos Workflow operating software. The test cycle from setting the indent through to displaying the hardness value is always performed fully automatically, thereby eliminating operator effects to the greatest possible extent.



## A broad spectrum of applications

The wide load range (10 gf - 62.5 kgf) expands the application range of the hardness tester enormously. This can be extended optionally to the range 0.25 gf - 62.5 kgf at any time! The force is thereby continuously and precisely monitored electronically using a series of electronic force measuring sensors.



## Innovation in image evaluation

The 12 Mpix camera used in all the DuraScan G5 series sets new standards in image quality. It allows a 4x zoom without having any loss in quality. This innovative solution allows a broad range of applications to be covered with a small number of lenses. The fully automatic evaluation regulates the brightness and automatically evaluates the indentation.

# DURASCAN G5



## Accelerate your processes

Thanks to the new and patented rapid traverse for the height adjustment, the height of the test head can be adjusted at 10x speed. Different specimen holders can be stored with the exact height. For even greater precision, the working heights within a specimen holder can be defined individually.



## Modern display

DuraScan 10 and 20 are operated via a modern capacitive 10" touchscreen with brilliant image reproduction. The surface made from mineral glass is significantly more resistant to scratches than plastic surfaces.

## Versions in comparison



**DURASCAN 10 G5**



**DURASCAN 20 G5**



**DURASCAN 50 G5**



**DURASCAN 70 G5**



**DURASCAN 80 G5**

	DURASCAN 10 G5	DURASCAN 20 G5	DURASCAN 50 G5	DURASCAN 70 G5	DURASCAN 80 G5
<b>Load range</b>	0.00025-62.5 kgf	0.00025-62.5 kgf	0.00025-62.5 kgf	0.00025-62.5 kgf	0.00025-62.5 kgf
<b>Turret</b>	manually	manually	motor-driven	motor-driven	motor-driven
<b>Display</b>	display	display	PC	PC	PC
<b>Automation level</b>	semi-automatic	semi-automatic	fully-automatic	fully-automatic	fully-automatic
<b>Software</b>	ecos Workflow CIS Touch	ecos Workflow CIS Touch	ecos Workflow CIS Pro	ecos Workflow CIS Pro	ecos Workflow CIS Pro
<b>Sample positioning</b>	none	manual cross slide	linear table	linear table	large linear table
<b>Overview camera</b>	-	-	-	yes	yes

# DURASCAN 10-20 G5



DURASCAN 10 G5

- Automatic test cycle
- Control via touchscreen
- 3-tool measuring turret, manual
- 6-tool measuring turret, optional
- Suitable for single measurements



DURASCAN 20 G5

- Automatic test cycle
- Control via touchscreen
- 3-tool measuring turret, manual
- 6-tool measuring turret, optional
- Manual cross slide
- Suitable for simple curve measurements



## BRINELL (compliant with ISO 6506, ASTM E10)

HBW 1/1

HBW 1/2.5

HBW 1/5

HBW 1/10

HBW 1/30

HBW 2.5/6.25

HBW 2.5/15.625

HBW 2.5/31.25



## VICKERS (compliant with ISO 6507, ASTM E384, E92)

HV 0.00025

HV 0.0005

HV 0.001

HV 0.002

HV 0.003

HV 0.005

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

HV 20

HV 30

HV 50



## KNOOP (compliant with ISO 4545, ASTM E384, E92)

HK 0.00025

HK 0.0005

HK 0.001

HK 0.002

HK 0.003

HK 0.005

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

# DURASCAN 10-20 G5

## TECHNICAL FEATURES

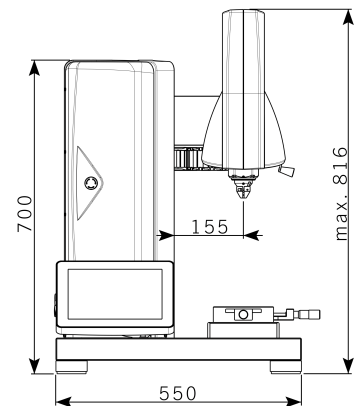
DURASCAN 10 G5    DURASCAN 20 G5

<b>Methods and load range</b>		
Load range 0.098 - 612.9 N (0.01 - 62.5 kgf) - electronically controlled	●	●
Load range 0.002452 - 612.9 N (0.00025 - 62.5 kg) - electronically controlled	optional (per indenter)	optional (per indenter)
Vickers (ISO 6507, ASTM E384, E92)	●	●
Knoop (ISO 4545, ASTM E384, E92)	●	●
Brinell (ISO 6506, ASTM E10)	●	●
<b>Configuration</b>		
10" capacity colour display (800x600 pixels), tiltable	●	●
ecos Workflow operating software touch	●	●
Automatic test cycle with brightness control and evaluation	●	●
Zoom 3x	●	●
10 Mpix evaluation camera with CMOS sensor	●	●
Baseplate of polished granite	●	●
Legs with integrated damping elements	●	●
Machine control via integrated PLC	●	●
Motorised height adjustment of the test unit with rapid traverse	●	●
Manual 3x measuring turret	●	●
Automatic 6x measuring turret	optional	optional
Ring light	optional	optional
Test table	Ø 90 mm	135 x 135 mm
Manual cross table with 25 mm travel distance and analogue micrometer spindles	optional	●
Manual cross table with 50mm travel distance and analogue micrometer spindles	optional	optional
Digital micrometer spindles	optional	optional
Operating system Windows 7 / 64 bit	●	●
Operating system Windows 7 / 32 bit	optional	optional
<b>Software functions</b>		
Module for serial measurements	optional	●
Template function	●	●
QR code function	●	●
Extended export functions via Export Editor	●	●
Calibration information system with Calibration Assistant	●	●
ecos Workflow xCHANGE (XML-based interface for data links)	●	●
Integrated TeamViewer client	●	●

# DURASCAN 10-20 G5

DURASCAN 10 G5    DURASCAN 20 G5

<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
<b>Functional dimensions</b>		
Space requirement (WxD)	700 x 600 mm	
Maximum workpiece weight	50 kg	
Positioning accuracy with manual spindles	0.1 mm	
Test force application resolution	24 bit	
Maximum test height DuraScan 10 G5	260 mm	
Maximum test height DuraScan 20 G5	245 mm	
Z-axis resolution	2.6 nm	
Maximum speed on Z-axis	1.2 mm/sec. bis 25 mm/sec.	
<b>Machine features</b>		
Weight of basic unit	85 kg	
Dimensions (WxHxD)	550 x 700 x 450 mm	
Protection class to EN 60529	IP20	
Power consumption (max. / standby)	120 W / 50 W	
Maximum voltage fluctuations	± 10%	
Main fuse (110 / 230V)	T 6.3 A	
Room temperature (to ISO/ASTM)	23 (± 5) °C	
Humidity	max. 70% (non-condensing)	





# DURASCAN 50-70-80 G5



DURASCAN 50 - 70 G5

- Fully automatic hardness tester
- Control via PC
- 6-tool measuring turret, automatic
- Automatic linear table
- Overview camera (DS 70)



DURASCAN 80 G5

- Fully automatic hardness tester
- Control via PC
- 6-tool measuring turret, automatic
- Large automatic linear table
- Overview camera



## BRINELL (compliant with ISO 6506, ASTM E10)

HBW 1/1 HBW 1/2.5 HBW 1/5 HBW 1/10 HBW 1/30 HBW 2.5/6.25 HBW 2.5/15.625 HBW 2.5/31.25  
HBW 2.5/62.5 HBW 5/25 HBW 5/62.5



## VICKERS (compliant with ISO 6507, ASTM E384, E92)

HV 0.00025 HV 0.0005 HV 0.001 HV 0.002 HV 0.003 HV 0.005 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 HV 20 HV 30 HV 50



## KNOOP (compliant with ISO 4545, ASTM E384, E92)

HK 0.00025 HK 0.0005 HK 0.001 HK 0.002 HK 0.003 HK 0.005 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

# DURASCAN 50-70-80 G5

## TECHNICAL FEATURES

DS 50 G5

DS 70 G5

DS 80 G5

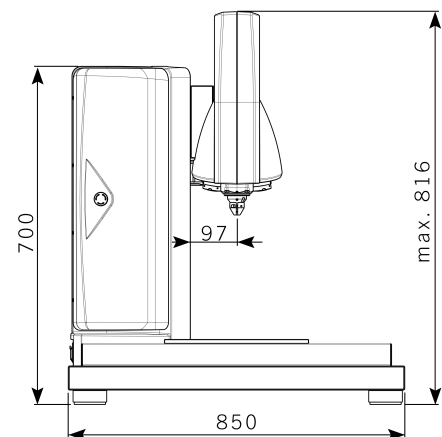
<b>Methods and load range</b>			
Load range 0.098 - 612.9 N (0.01 - 62.5 kgf) - electronically controlled	•	•	•
Load range 0.002452 - 612.9 N (0.00025 - 62.5 kgf) - electronically controlled	optional (per indenter)	optional (per indenter)	optional (per indenter)
Vickers (ISO 6507, ASTM E384, E92)	•	•	•
Knoop (ISO 4545, ASTM E384, E92)	•	•	•
Brinell (ISO 6506, ASTM E10)	•	•	•
<b>Configuration</b>			
Fully automated linear tables for positioning of the specimens	•	•	•
ecos Workflow operating software (for Windows 7, Windows 8, Windows 10)	•	•	•
Control via interfaced PC system	•	•	•
Automatic test cycle with brightness control and evaluation	•	•	•
3x zoom	•	•	•
10 Mpix evaluation camera with CMOS sensor	•	•	•
Baseplate of polished granite	•	•	•
Legs with integrated damping elements	•	•	•
Machine control via integrated PLC	•	•	•
Motorised height adjustment of the test unit with rapid traverse	•	•	•
Automatic 6x measuring turret	•	•	•
Overview camera for panorama function in real-time	•	•	•
Ring light	optional	optional	optional
Test table (WxL)	150 x 200 mm	150 x 200 mm	150 x 300 mm
Travel distances of the axes (X / Y)	150 x 150 mm	150 x 150 mm	300 x 150 mm
Glass scales for X-Y axes to increase the absolute positioning accuracy to < 1 µm	optional	optional	optional
<b>Software functions</b>			
Template mode	•	•	•
CHD, NHD, SHD and serial measurements	•	•	•
Extended export functions via Export Editor	•	•	•
Calibration information system with Calibration Assistant	•	•	•
ecos Workflow xCHANGE (XML-based interface for data links)	•	•	•
Multiple specimen module for testing several specimens in one work cycle	•	•	•
areaMASTER software module for generation of hardness maps	optional	optional	optional
Integrated TeamViewer client	•	•	•
<b>Interfaces</b>			
Interfaces for PC connection	1xUSB 2.0 1xRJ45	2xUSB 2.0 1xRJ45	2xUSB 2.0 1xRJ45

# DURASCAN 50-70-80 G5

<b>Functional dimensions</b>	
Space requirement (WxD) DuraScan 50 - 70 G5	700 x 600 mm
Space requirement (WxD) DuraScan 80 G5	850 x 600 mm
Maximum workpiece weight	50 kg
Positioning accuracy	0.0035 mm
Positioning accuracy with glass scale	< 0.001 mm
Test force application resolution	24 bit
Maximum test height	260 mm
Z-axis resolution	2.6 nm
Maximum speed on Z-axis	1.2 mm/sec. bis 25 mm/sec.
<b>Machine features</b>	
Weight of basic unit DuraScan 50 - 70 G5	87 kg
Weight of basic unit DuraScan 80 G5	98 kg
Dimensions (WxHxD) DuraScan 50 - 70 G5	550 x 700 x 450 mm
Dimensions (WxHxD) DuraScan 80 G5	700 x 700 x 450 mm
Protection class to EN 60529	IP20
Power consumption (max. / standby)	120 W / 50 W
Maximum voltage fluctuations	± 10%
Main fuse (110 / 230V)	T 6.3 A
Room temperature (to ISO/ASTM)	23 (± 5) °C

Overview camera  
(DS 70 - 80 G5)

Intuitive operation



# DURASCAN G5

## ACCESSORIES



Indenters



Lenses



Set-up assistant



Digital micrometer spindle



Machine vice



Manual chuck



1-fold specimen holder



6-fold specimen holder



Test blocks

# DURAVISION G5



DuraVision 20-30



DuraVision 200-300



DuraVision 250-350

## DURAVISION 20-200 G5 / 30-300 G5

The **DuraVision G5** hardness testers cover a unique wide standard load range of 0.3–250 kgf and 3–3000 kgf. The electronically controlled test cycle provides for a large selection of test methods. The Brinell, Vickers, and Rockwell test methods can be measured in compliance with EN ISO and ASTM standards, and carbon testing is also possible. Knoop and plastic tests can also be conducted with the lower standard load range models. Thanks to its sturdy construction, in combination with the simple and swift operation plus precise and repeatable measurement results, the DuraVision G5 hardness tester is also particularly suitable for use in harsh, demanding production environments.



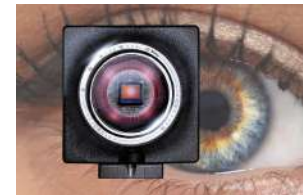
### Lens with Brinell SmartLight

In Brinell hardness test, particularly with soft materials, the edges are not always perfectly recognisable due to considerable deformation 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.



### Star-shaped turret – seven at a stroke

The star turret included in the normal scope of every machine can be expanded up to seven positions, for fitting any combination of indenters and lenses. A wide spectrum of test methods can thus be covered with a single machine. In addition, the turret rotates at a very high speed and automatically finds the shortest turning direction to the selected position.



### Broad spectrum of applications

The DuraVision G5 series offers a wide standard load range (0.3-3000 kg). The force is precisely applied by means of electronic force measuring sensors. The 10-megapixel camera enables a 3x zoom. Automatic evaluation of the test indents by automated brightness control and autofocus, together with the star-shaped turret, minimises the cycle times and operator influence.

# DURAVISION G5



## Easy testing of complex specimens

The large test area, the long reach (despite the very compact design) and the slim nose cone offer great flexibility for a very wide range of specimens, expanded by the possibility of testing both clamped and unclamped. 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.



## Intuitive software with calibration assistant

The ecos Workflow with Calibration Information System (CIS) software package provides an efficient solution for all conventional hardness testing tasks. The user is guided step-by-step through the measuring process, the intuitive interface shortens the familiarisation time and reduces operating errors. The integrated calibration assistant monitors all calibrated methods, simplifies the inspection of the hardness tester required by standards, and indicates periodic and indirect verifications.

## Versions in comparison



DURAVISION 20 G5



DURAVISION 30 G5



DURAVISION 200 G5



DURAVISION 300 G5

	DURAVISION 20 G5	DURAVISION 30 G5	DURAVISION 200 G5	DURAVISION 300 G5
<b>Load range</b>	0.3-250 kgf	3-3000 kgf	0.3-250 kgf	3-3000 kgf
<b>Turret</b>	motor-driven	motor-driven	motor-driven	motor-driven
<b>Display</b>	display	display	display	display
<b>Automation level</b>	semi-automatic	semi-automatic	semi-automatic	semi-automatic
<b>Software</b>	ecos Workflow CIS Touch	ecos Workflow CIS Touch	ecos Workflow CIS Touch	ecos Workflow CIS Touch
<b>Test positioning</b>	hand wheel	hand wheel	motor-driven test unit	motor-driven test unit

# DURAVISION 20-200 G5



DURAVISION 20 G5

- Brinell, Rockwell, Vickers, Knoop, plastic and carbon hardness testing
- Quick and simple specimen infeed by large handwheel
- Bright LED surface lighting for difficult lighting conditions
- Particularly suitable for small specimens
- Adaptable to your need thanks to optionals and accessories



DURAVISION 200 G5

- Brinell, Rockwell, Vickers, Knoop, plastic and carbon hardness testing
- Large test area with constant test height thanks to motorised test head positioning
- Stepless rapid traverse speeds of up to 25 mm/s
- Individual clamping force
- Bright LED surface lighting for difficult lighting conditions
- Ideal for integration into fully automated production systems



## BRINELL (compliant with ISO 6506, ASTM E10)

HBW 1/1	HBW 1/2.5	HBW 1/5	HBW 1/10	HBW 1/30	HBW 2.5/6.25	HBW 2.5/15.625	HBW 2.5/31.25
HBW 2.5/62.5	HBW 2.5/187.5	HBW 5/25	HBW 5/62.5	HBW 5/125	HBW 5/250	HBW 10/100	HBT 1/5
HBW 10/250	HBT 1/10	HBT 1/30	HBT 2.5/6.25	HBT 2.5/15.625	HBT 2.5/31.25	HBT 2.5/62.5	
HBT 2.5/187.5	HBT 5/125	HBT 5/250					



## 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 5	HVT 10	HVT 20	HVT 30	HVT 50	HVT 60	HVT 100			

## CARBON TESTING (compliant with DIN 51917)

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

# DURAVISION 20-200 G5



**ROCKWELL** (compliant with ISO 6508, ASTM E18)

HRA	HRBW	HRC	HRD	HREW	HRFW	HRGW	HRHW	HRKW	HRLW	HRMW	HRPW
HRRW	HRSW	HRVW	HR15N	HR30N	HR45N	HR15TW	HR30TW	HR45TW	HR15WW		
HR30WW	HR45WW	HR15XW	HR30XW	HR45XW	HR15YW	HR30YW	HR45YW	HR 62.5			



**KNOOP** (compliant with ISO 4545, ASTM E384, E92)

HK 0.3	HK 0.5	HK 1	HK 2
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**PLASTIC TEST** (compliant with EN ISO 2039)

49.03 N	132.9 N	357.9 N	961 N
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## TECHNICAL FEATURES

DURAVISION 20 G5

DURAVISION 200 G5

Methods and load range		
Load range 2.942 - 2452 N (0.3 - 250 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 CIS Touch operating software	•	•
Automatic test cycle with brightness control, autofocus and image evaluation	•	•
Zoom 3x	•	•
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 + 447 x 370 mm
Operating system Windows 7 / 64 bit	•	•
Operating system Windows 7 / 32 bit	optional	optional



# DURAVISION 20-200 G5

DURAVISION 20 G5

DURAVISION 200 G5

<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	RJ 45	RJ 45
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)	-	optional
<b>Functional dimensions</b>		
Maximum workpiece weight	200 kg	500 kg
Z-axis resolution	-	0.18 µm
Maximum speed on Z-axis	-	up to 25 mm/sec
Maximum test height	400 mm	500 mm
Weight of basic unit	420 kg	450 kg
Power consumption (max. / standby)	120 W / 50 W	600 W / 100 W
<b>Machine features</b>		
Dimensions (W x H x D)	380 x 1400 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 x 42 mm	
Width	320 mm	
Protection class to EN 60529	IP20	
Voltage supply (V)	230 V ~ 1/N/PE 110 V ~ 1/N/PE	
Maximum voltage fluctuations	± 10%	
Frequency	50 / 60 Hz	
Main fuse (110 / 230V)	T 6.3 A	
Room temperature (to ISO/ASTM)	from 5 to 40°C	
Humidity	max. 70% (non-condensing)	

# DURAVISION 30-300 G5



DURAVISION 30 G5

- Brinell, Rockwell, Vickers and carbon hardness testing in the specified load range
- Quick and simple specimen infeed by large handwheel
- Bright LED surface lighting for difficult lighting conditions
- Particularly suitable for small specimens
- Adaptable to your needs thanks to optionals and accessories



DURAVISION 300 G5

- Brinell, Rockwell, Vickers and carbon hardness testing
- Large test area with constant test height thanks to motorised test head positioning
- Stepless rapid traverse speeds of up to 25 mm/s
- Individual clamping force
- Bright LED surface lighting for difficult lighting conditions
- Ideal for integration into fully automated production systems

## **BRINELL** (compliant with ISO 6506, ASTM E10)

HBW 1/5	HBW 1/10	HBW 1/30	HBW 2.5/6.25	HBW 2.5/15.625	HBW 2.5/31.25	HBW 2.5/62.5
HBW 2.5/187.5	HBW 5/25	HBW 5/62.5	HBW 5/125	HBW 5/250	HBW 5/750	HBW 10/100
HBW 10/250	HBW 10/500	HBW 10/1000	HBW 10/3000	HBT 1/5	HBT 1/10	HBT 1/30
HBT 2.5/15.625	HBT 2.5/31.25	HBT 2.5/62.5	HBT 2.5/187.5	HBT 5/125	HBT 5/250	HBT 5/750
HBT 10/500	HBT 10/1000	HBT 10/1500	HBT 10/3000			

## **ROCKWELL** (compliant with ISO 6508, ASTM E18)

HRA	HRBW	HRC	HRD	HREW	HRFW	HRGW	HRHW	HRKW	HRLW	HRMW	HRPW
HRRW	HRSW	HRVW	HR15N	HR30N	HR45N	HR15TW	HR30TW	HR45TW	HR15WW		
HR30WW	HR45WW	HR15XW	HR30XW	HR45XW	HR15YW	HR30YW	HR45YW	HR 62.5			

# DURAVISION 30-300 G5



**VICKERS** (compliant with ISO 6507, ASTM E384, E92)

- HV 3
- HV 5
- HV 10
- HV 20
- HV 30
- HV 50
- HV 60
- HV 100
- HV 120
- HV 125
- HV 150
- HVT 5
- HVT 10
- HVT 20
- HVT 30
- HVT 50
- HVT 60
- HVT 100

## CARBON TESTING (compliant with DIN 51917)

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

## TECHNICAL FEATURES

DURAVISION 30 G5

DURAVISION 300 G5

<b>Methods and load range</b>		
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 + 447 x 370 mm
Operating system Windows 7 / 64 bit	●	●
Operating system Windows 7 / 32 bit	optional	optional

# DURAVISION 30-300 G5

DURAVISION 30 G5

DURAVISION 300 G5

<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	RJ 45	RJ 45
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)	-	optional
<b>Functional dimensions</b>		
Maximum workpiece weight	200 kg	500 kg
Z-axis resolution	-	0.18 µm
Maximum speed on Z-axis	-	up to 25 mm/sec
Maximum test height	400 mm	500 mm
Weight of basic unit	420 kg	450 kg
Power consumption (max. / standby)	120 W / 50 W	600 W / 100 W
<b>Machine features</b>		
Dimensions (W x H x D)	380 x 1400 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 x 42 mm	
Width	320 mm	
Protection class to EN 60529	IP20	
Voltage supply (V)	230 V ~ 1/N/PE 110 V ~ 1/N/PE	
Maximum voltage fluctuations	± 10%	
Frequency	50 / 60 Hz	
Main fuse (110 / 230V)	T 6,3 A	
Room temperature (to ISO/ASTM)	from 5 to 40°C	
Humidity	max. 70% (non-condensing)	

# DURAVISION 250-350 G5



- Hardness testing compliant with Brinell, Rockwell, Vickers, Knoop, plastic and carbon standards in the specified load range
- Time savings thanks to quick, fully automatic test cycles
- Particularly suitable for hardness tests on large numbers of specimens with different heights
- Ideal for testing of CHD, NHD, SHD, Jominy curves and hardness maps

The fully automated **DuraVision G5** hardness testers cover a peerlessly broad standard load range of 0.3–250 kgf and 3–3000 kgf. The electronically controlled test cycle provides for a large selection of test methods. The Brinell, Vickers, and Rockwell test methods can be measured in compliance with EN ISO and ASTM standards, and carbon testing is also possible. Knoop and plastic tests can also be conducted with the lower standard load range models. Thanks to its sturdy construction, the DuraVision G5 Automatic is particularly suitable for use not only in the vicinity of the production environment, but also in the laboratory for quality assurance purposes.

## Versions in comparison



**DURAVISION 250 G5**



**DURAVISION 350 G5**

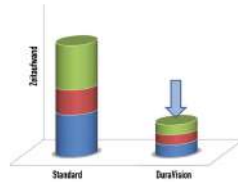
<b>Load range</b>	0.3 - 250 kgf	3 - 3000 kgf
<b>Turret</b>	motor-driven	motor-driven
<b>Display</b>	PC	PC
<b>Automation level</b>	fully-automatic	fully-automatic
<b>Software</b>	ecos Workflow CIS Pro	ecos Workflow CIS Pro
<b>Overview camera</b>	optional	optional

# DURAVISION 250-350 G5



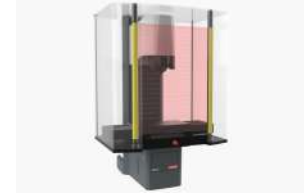
## Reliably to the correct test result

Evaluation of the test indents with fully automatic brightness control and fast autofocus. The test load is applied using the closed-loop control; the force is monitored by electronic sensors. The test points are accurately positioned without any operator influence.



## Time savings thanks to fast test cycles

Thanks to the new, patented rapid traverse, the height of the nose cone can be adjusted at up to 25 mm/s. Combined with use of the template function, this enables quick configuration. The high degree of automation reduces the operating time involved in serial testing many times over.



## CE protective housing

It meets international CE requirements thanks to maximum protection and high levels of user-friendliness, together with the CE protective housing. The light barrier system means that no safety door needs to be opened in future in order to access the machine's testing area.



## Serial measurement

Even simultaneous serial testing of multiple specimens with different heights presents no problem at all for the DuraVision G5, whether with or without nose cone.



## Overview camera (optional)

It generates a large live image of the specimen. Single test points and complex test series can be placed on work pieces in just few seconds. The image can also be saved and printed in test reports.



## Efficient preparation

Carry out complex test tasks in a few simple steps using the template function: all the settings of a specimen that has already been measured are saved and can then be loaded for testing a new specimen.



## Lens with Brinell SmartLight *(see page 34)*



## Star-shaped turret *(see page 34)*



## Intuitive software *(see page 22)*

# DURAVISION 250-350 G5



## BRINELL (compliant with ISO 6506, ASTM E10 - HBT non-standardised)

HBW 1/1	HBW 1/2.5	HBW 1/5	HBW 1/10	HBW 1/30	HBW 2.5/6.25	HBW 2.5/15.625	HBW 2.5/31.25
HBW 2.5/62.5	HBW 2.5/187.5	HBW 5/25	HBW 5/62.5	HBW 5/125	HBW 5/250	HBW 5/750	
HBW 10/100	HBW 10/250	HBW 10/500	HBW 10/1000	HBW 10/3000	HBT 1/5	HBT 1/10	HBT 1/30
HBT 2.5/6.25	HBT 2.5/15.625	HBT 2.5/31.25	HBT 2.5/62.5	HBT 2.5/187.5	HBT 5/125	HBT 5/250	
HBT 5/750	HBT 10/500	HBT 10/1000	HBT 10/3000				



## VICKERS (compliant with ISO 6507, ASTM E384, E92 - HVT non-standardised)

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 5	HVT 10	HVT 20	HVT 30	HVT 50	HVT 60	HVT 100			



## ROCKWELL (compliant with ISO 6508, ASTM E18)

HRA	HRBW	HRC	HRD	HREW	HRFW	HRGW	HRHW	HRKW	HRLW	HRMW	HRPW
HRRW	HRSW	HRVW	HR15N	HR30N	HR45N	HR15TW	HR30TW	HR45TW	HR15WW		
HR30WW	HR45WW	HR15XW	HR30XW	HR45XW	HR15YW	HR30YW	HR45YW				

## CARBON TESTING (compliant with DIN 51917)

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



## KNOOP (compliant with ISO 4545, ASTM E384, E92)

HK 0.3	HK 0.5	HK 1	HK 2
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## PLASTIC TESTING (compliant with EN ISO 2039)

49.03 N	132.9 N	357.9 N	961 N
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 DV 250

 DV 350

# DURAVISION 250-350 G5

## TECHNICAL FEATURES

DURAVISION 250 G5

DURAVISION 350 G5

<b>Methods and load range</b>		
Load range 2.942 - 2452 N (0.3 - 250 kgf) - electronically controlled	●	-
Load range 29.42 - 29420 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)	●	-
<b>Configuration</b>		
ecos Workflow CIS Pro 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-shaped turret	●	●
Automatic 7x star-shaped turret	optional	optional
Surface lighting (integrated into nose cone, dimmable)	●	●
Testing clamped/unclamped	●	●
Motorised cross table (WxD)	400 x 250 mm	400 x 250 mm
<b>Software functions</b>		
Template function	●	●
CHD, NHD, SHD and serial measurements	optional	optional
Extended export functions via Export Editor	●	●
Calibration Information System with calibration assistant	●	●
ecos Workflow xCHANGE (XML-based interface for data connection)	●	●
Multiple specimen module for testing several specimens in one work cycle	optional	optional
areaMASTER software module for generating hardness maps	optional	optional
Jominy software module	optional	optional
Integrated TeamViewer client	●	●
Adjustable User Rights	●	●
<b>Interfaces</b>		
Interfaces for PC connection	2xUSB 2.0, 1xRJ45	2xUSB 2.0, 1xRJ45



# DURAVISION 250-350 G5

DURAVISION 250 G5

DURAVISION 350 G5

<b>Functional dimensions</b>		
Maximum specimen weight	50 kg	50 kg
Weight of basic unit	500 kg	500 kg
Z-axis resolution	0.18 µm	0.18 µm
Maximum speed on Z-axis	up to 25 mm/s	up to 25 mm/s
Maximum test height	420 mm	420 mm
Maximum throat depth	320 mm	320 mm
Nose cone support	53 x 42 mm	53 x 42 mm
<b>Machine features</b>		
Dimensions (W x H x D)	900 x 1370 x 1050 mm	
Space requirements (W x D)	900 x 1050 mm	
Test force application resolution	0.45 nm	
Length measuring probe resolution	0.05 µm	
Protection class to EN 60529	IP20	
Voltage supply (V)	230 V 1/N/PE	
110 V 1/N/PE	IP20	
Maximum voltage fluctuations	± 10%	
Frequency	50 / 60 Hz	
Main fuse (110 / 230 V)	T 6.3 A	
Room temperature (to ISO/ASTM)	from 5 to 40°C	
Humidity	max. 70%	
Power consumption (max./standby)	600 W / 100 W	



# DURAVISION G5

## ACCESSORIES



### DUST PROTECTION SYSTEM

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 base is the ideal foundation for offering operators optimum working conditions and an optimum height for ergonomic working. Furthermore, the vibration-damping elements provide the ideal conditions for precise measurement results.

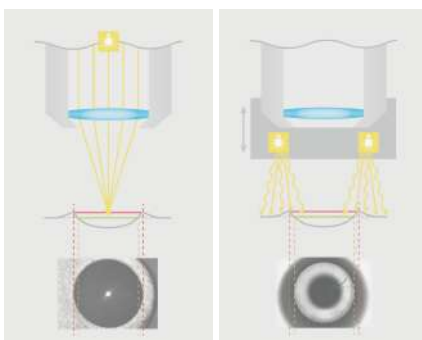


### STAR-SHAPED TURRET

The star turret can be expanded up to seven positions. It provides seven positions for fitting any combination of indenters and lenses, so that wide spectrum of test methods can be covered with a single machine. The turret rotates at a very high speed and automatically finds the shortest turning direction to the selected position.

### LENS WITH BRINELL SMARTLIGHT

*In use for Brinell testing until now:*

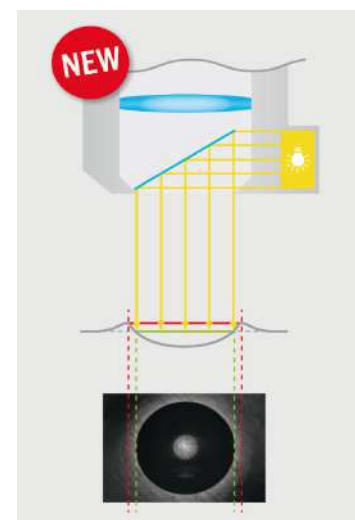


COAXIAL LIGHTING

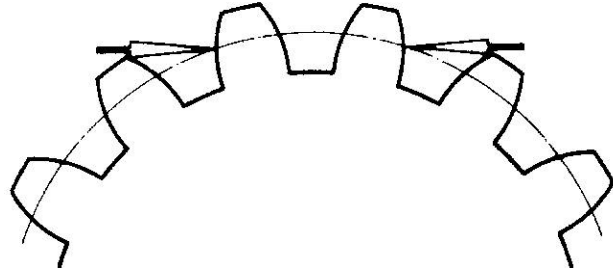
CIRCULAR LIGHT

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.

*Innovation in DuraVision G5*



# PORTABLE HARDNESS TESTERS



The **portable** Rockwell **hardness testers** are the result of more than 60 years of experience. They have proven themselves in many branches of industry for decades. The heart of every tester is the reliable spring sleeve unit for load application. The hardness value is indicated on an analogue dial gauge.

## Versions in comparison



N4 A-B-C



N6



N7 F



N7 P

<b>Load range</b>	15-182.5 kgf (A) 15-187.5 kgf (B-C)	62.5 kgf	62.5 kgf	62.5 kgf
<b>Display</b>	manually	manually	manually	manually
<b>Automation level</b>	manually	-	-	-
<b>Device type</b>	testing clamp	hardness tester in bores	tooth flank tester	tooth flank tester
<b>Testing room</b>	throat depth: 85/130/180 mm clamping width: 0-145/ 235/335 mm	drilling diam.: 36-110 mm, insertion depth up to 400 mm	external teeth mod. 2-10, tooth measuring range 140 mm	external teeth mod. 3-35, tooth measuring range 700 mm

# HARDNESS TESTER N4



## USABLE TEST METHODS

All Rockwell test methods compliant with EN ISO 6508, ASTM E-18. Test methods according not to standards in Brinell HBD are possible in test load range 294 - 1839 N (30 - 187.5 kgf)

## OPERATION

The part to be tested is clamped between the anvil and the test head, after which the load is applied to the indenter. Subsequently the reading is taken from the dial gauge.

## TYPE AND CONSTRUCTION

Type	Throat depth	Capacity	Type	Throat depth	Capacity
N4A 000	85 mm	0 - 145 mm	N4C 000	180 mm	0 - 335 mm
N4B 000	130 mm	0 - 235 mm	N4E 000	110 mm	0 - 20 mm

The hardness tester possesses a clamping device consisting of clamp in light-alloy with quickly adjustable threaded spindle and clamping toggle. According to customer's request, test unit N1A 001 with spring sleeve or one of the load adjustable test units can be selected.

## LOAD-ADJUSTABLE TEST UNITS

(capacity reduces to 55mm)

N1P 000 – for plastic testing in compliance with EN ISO 2039-1

N1R 000 – for Rockwell testing in compliance with EN ISO 6508 – 60, 100, 150

N1S 000 – for Super Rockwell testing in compliance with EN ISO 6508 – 15, 30, 45



**ROCKWELL** (compliant with ISO 6508, ASTM E18)

HRA	HRBW	HRC	HRD	HREW	HRFW	HRGW	HRHW	HRKW	HRLW	HRMW	HRPW
HRRW	HRSW	HRVW	HR15N	HR30N	HR45N	HR15TW	HR30TW	HR45TW	HR15WW		
HR30WW	HR45WW	HR15XW	HR30XW	HR45XW	HR15YW	HR30YW	HR45YW				

# HARDNESS TESTER N6 - N7

## OPERATION

The testing machine is positioned in the bore and fixed by clamping action. The test load is applied via hand lever. Subsequently the reading is taken from the dial gauge in HRC values.

## TYPE AND CONSTRUCTION

All devices consist of test unit N1E 000 (complete with dial gauge, dial gauge cover and spring sleeve) with load lever and Intest sensor with tensioning nut, clamping clip and spring link, including test sample. The standard design consists of load level 62.5, HRC hardness value indicator, device case, hardness comparison table and instruction manual.

## APPLICATION

For bore diameters from 36–110 mm.



N6

## OPERATION

The testing machine is positioned on the work piece and clamped to the requested test point. The test load is applied via hand lever. Subsequently the reading is taken from the dial gauge.

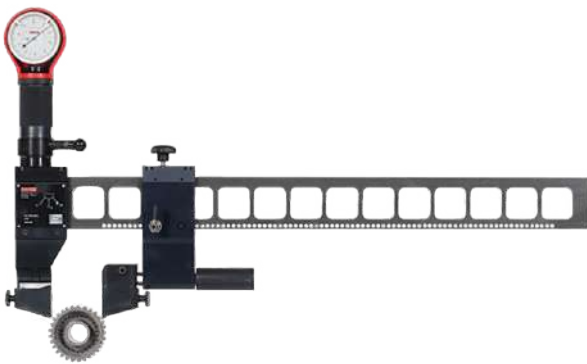
## TYPE AND CONSTRUCTION

All devices consist of test unit N1E 000 (complete with dial gauge, dial gauge cover and spring sleeve) with load lever, the measurement head with built-in spring link, including hardness testing diamond and the clamping device. The standard design consists of a load level 62.5, HRC hardness value indicator, tool kit, hardness comparison table, device case and instruction manual.

## APPLICATION

External teeth module 2–10, maximum tooth measurement width 140 mm (N7F).

External teeth module 3–35, maximum tooth measurement width 700 mm (N7P).



N7



**ROCKWELL** (compliant with ISO 6508, ASTM E18)

HR 62.5

# PORTABLE HARDNESS TESTERS



**NOVOTEST**

# COMBINED HARDNESS TESTER T-UD2

The device works with both UCI (*Ultrasonic Contact Impedance*) and dynamic (*Leeb*) probes. User gets the benefits of two methods of measurement.

The **Leeb probe** is used for measuring the hardness of non-ferrous metals, cast iron, coarse-grained materials, massive products etc.

The **UCI probe** is used for measuring the hardness of small items, objects with a thin wall, complex form, and to measure the hardness of surface hardened layers.

Available with Bluetooth



UCI probe

Leeb probe

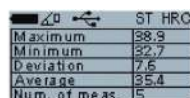
## THE ADVANTAGES OF T-UD2

- Hardness measurement of any mass products with a thickness of 1 mm – inaccessible to the dynamic (Leeb) hardness testers (small parts, thin-walled structures, pipes, tanks, steel sheets, articles of complex shape, hardness control of metal coatings, etc.)
- Small imprint after measuring
- Measuring the hardness of surface hardened layer
- Wide range of hardness
- Only basic function, nothing extra
- Possibility to use in field conditions with high humidity and dust
- Convenience and ease of measurement
- Optimized number of buttons
- Contrast display with bright back-lighting
- Automatic recognition of probe
- Indication of the type of connected probe
- Calibrations stored in memory of probe
- Very easy in operation and calibration
- Internal memory and communication with PC
- New, intuitive menu with tips on the buttons
- Temperature range down to - 40°C
- Water resistant case
- Rubber bumper protected case

## MANY MODES OF MEASUREMENT



Normal mode



Statistics mode



Smart mode



Signal mode

# COMBINED HARDNESS TESTER T-UD2

## OPTIONAL BLUETOOTH MODULE

Thanks to the special NOVOTEST app for Android, it is possible to do hardness measurements, calibrate the device, set up a convenient display of values, save the results of hardness measurements, synchronize the archive with your other devices and a PC, transfer measurement results to your colleagues with your smartphone.

Using a Bluetooth connection, your smartphone connects to the hardness tester and you have a completely new device. The intuitive interface, ample opportunities for documenting results, Internet access, touch screen, camera, microphone and GPS receiver of a smartphone turn the hardness tester T-UD2 into something completely unique and previously inaccessible.

## WITH NOVOTEST APP IS POSSIBLE TO:

- Set and calibrate the hardness tester.
- Display measurement results in real time in numerical form with the construction of a graph, histogram or statistics.
- Take a picture of the test object with the putting of hardness marks.
- Create a video of the measured product.
- Recording audio notes about the tested object.
- Automatically save measurement's geolocation on Google maps.
- Display a Google map with markers of places of measurements made on it and the ability to view these measurements.
- Create the final comprehensive report on the measurement.
- Send a finished report to e-mail, messenger (or in any convenient way) directly from the application.
- Create folders and files with any names thanks to the flexible structure of the archive of measurements.
- Synchronize with PC and other smartphones.
- Access a cloud service for storing the archive of measurements.
- Automatically and manually synchronize the cloud measurement archives between devices.
- Use the Google navigation mode, building a route and accompanying to the point at which the measurements were made.
- Store archives of other devices with Bluetooth in one application.



# COMBINED HARDNESS TESTER T-UD2

## THREE TYPES OF UCI PROBES

Load	Advantages or benefits	Typical applications
98 N (10 kgf)	Leaves relatively large dent. Suitable for low finished surfaces.	Small forged products, cast materials, heat-treated materials, etc., turbine blades, inside tubes with $\varnothing > 90$ mm.
50 N (5 kgf)	Considered to be the universal type for most general applications. 50 N of downward hand pressure is required to activate the probe. Surface finish equivalent to 80 grind or better.	Induction or carburized machined parts, e.g. camshafts, turbines, weld inspection, HAZ. Measurement in grooves, gear tooth flanks and roots, turbine blades, inside tubes with $\varnothing > 90$ mm.
10 N (1 kgf)	Load is easy to apply; provides control to test on a sharp radius. Only 10 N of downward hand pressure is required to activate the probe. Surface finish equivalent to 150 grind or better.	Ion-nitrided stamping dies and molds, forms, presses, thin-walled parts. Bearings, tooth flanks, turbine blades, inside tubes with $\varnothing > 90$ mm.

## TECHNICAL FEATURES

UCI probe types	1 kgf (10 N) - 5 kgf (50 N) - 10 kgf (98 N)
Leeb probe types	D, DC, DL, C, D+15, E, G
Indenter	Diamond indenter (UCI), hardened ball (Leeb)
Measuring direction	Any direction 360°
Data storage	Limited only by the memory card
Measurement hardness range:	
- Rockwell, HRC	20 - 70
- Brinell, HB	90 - 450
- Vickers, HV	230 - 940
- Tensile strength, MPa	370 - 1740
Measuring accuracy	HV $\pm$ 3%; HRC $\pm$ 1.5%; HB $\pm$ 3%
Hardness scale	HRC, HB, HV, MPa
Materials	- UCI probe: pre-calibrated for steel - Leeb probe: pre-calibrated for steel, alloy steel, cast iron, stainless steel, aluminum, bronze, brass, copper - Additional custom materials for calibration
Operating temperature range	-20 to +50° C
Power supply	2 AA batteries
Instrument dimensions	120 x 60 x 25 mm
Weight of electronic unit with batteries	0.2 kg (without probes)
Battery life	Not less than 20 hours

# COMBINED HARDNESS TESTER T-UD3

The device works with both UCI (*Ultrasonic Contact Impedance*) and dynamic (*Leeb*) probes. User gets the benefits of two methods of measurement.

The **Leeb probe** is used for measuring the hardness of non-ferrous metals, cast iron, coarse-grained materials, massive products etc.

The **UCI probe** is used for measuring the hardness of small items, objects with a thin wall, complex form, and to measure the hardness of surface hardened layers.

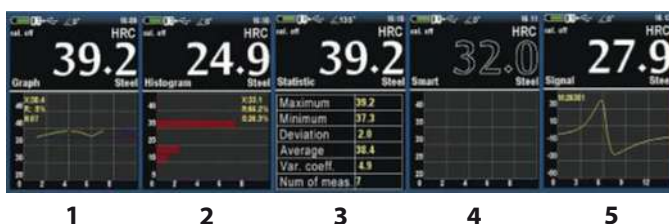
Available with  
Bluetooth



## THE ADVANTAGES OF T-UD3

- Hardness measurement of any mass products with a thickness of 1 mm – inaccessible to the dynamic (Leeb) hardness testers (small parts, thinwalled structures, pipes, tanks, steel sheets, articles of complex shape, hardness control of metal coatings, etc.)
- Small imprint after measuring
- Measuring hardness of the surface hardened layer
- Wide range of hardness
- Various measurement modes
- Calibration of any scale in any range
- Convenience and ease of measurement
- Large full color graphic display with bright back-lighting
- Automatic recognition of probe
- Indication of the type of connected probe
- Calibrations stored in memory of probe
- Extended temperature range down to - 40°C
- Internal memory and communication with PC
- New, intuitive menu with tips on the buttons
- Optional wireless mini-printer
- Water resistant case
- Rubber bumper protected case

## MANY MODES OF MEASUREMENT



1. GRAPH - the mode of building the graph
2. HISTOGRAM - the mode of building the histogram
3. STATISTIC - the mode of statistics
4. SMART - the mode of filtering incorrect measurements
5. SIGNAL - the mode of displaying the signal (only for Leeb probe)

# COMBINED HARDNESS TESTER T-UD3

## OPTIONAL BLUETOOTH MODULE

Thanks to the special NOVOTEST app for Android, it is possible to do hardness measurements, calibrate the device, set up a convenient display of values, save the results of hardness measurements, synchronize the archive with your other devices and a PC, transfer measurement results to your colleagues with your smartphone.

Using a Bluetooth connection, your smartphone connects to the hardness tester and you have a completely new device. The intuitive interface, ample opportunities for documenting results, Internet access, touch screen, camera, microphone and GPS receiver of a smartphone turn the hardness tester T-UD3 into something completely unique and previously inaccessible.

## WITH NOVOTEST APP IS POSSIBLE TO:

- Set and calibrate the hardness tester.
- Display measurement results in real time in numerical form with the construction of a graph, histogram or statistics.
- Take a picture of the test object with the putting of hardness marks.
- Create a video of the measured product.
- Recording audio notes about the tested object.
- Automatically save measurement's geolocation on Google maps.
- Visualizzare una mappa di Google con le indicazioni dei luoghi delle misurazioni fatte e la possibilità di visionarle.
- Display a Google map with markers of places of measurements made on it and the ability to view these measurements.
- Create the final comprehensive report on the measurement.
- Send a finished report to e-mail, messenger (or in any convenient way) directly from the application.
- Create folders and files with any names thanks to the flexible structure of the archive of measurements.
- Synchronize with PC and other smartphones.
- Access a cloud service for storing the archive of measurements.
- Automatically and manually synchronize the cloud measurement archives between devices.
- Use the Google navigation mode, building a route and accompanying to the point at which the measurements were made.
- Store archives of other devices with Bluetooth in one application.

# COMBINED HARDNESS TESTER T-UD3

## THREE TYPES OF UCI PROBES

Load	Advantages and benefits	Typical applications
98 N (10 kgf)	Leaves relatively large dent. Suitable for low finished surfaces. Surface finish equivalent to 30 grind or better.	Small forged products, cast materials, heat-treated materials, etc., turbine blades, inside tubes with $\phi > 90$ mm.
50 N (5 kgf)	Considered to be the universal type for most general applications. 50 N of downward hand pressure is required to activate the probe. Surface finish equivalent to 80 grind or better.	Induction or carburized machined parts, e.g. camshafts, turbines, weld inspection, HAZ. Measurement in grooves, gear tooth flanks and roots, turbine blades, inside tubes with $\phi > 90$ mm.
10 N (1 kgf)	Load is easy to apply; provides control to test on a sharp radius. Only 10 N of downward hand pressure is required to activate the probe. Surface finish equivalent to 150 grind or better.	Ion-nitrided stamping dies and molds, forms, presses, thin-walled parts bearings, tooth flanks, turbine blades, inside tubes with $\phi > 90$ mm.

## TECHNICAL FEATURES

UCI probe types	1 kgf (10 N) - 5 kgf (50 N) - 10 kgf (98 N)
Leeb probe types	D, DC, DL, C, D+15, E, G
Measuring range	HV: 230 ~ 940; HRC: 20 ~ 70; HB: 90 ~ 650 Tensile strength, MPa: 370 ~ 1740
Measuring accuracy	HV $\pm$ 3%; HRC $\pm$ 1.5%; HB $\pm$ 3%
Indenter	Diamond indenter (UCI), hardened ball (Leeb)
Data storage	Limited only by the memory card
Communication	Upload data to PC and export as a spreadsheet (USB cable and software included)
Hardness scale	HRC, HB, HV, HRB, HS, HL, MPa
Materials	- UCI probe: pre-calibrated for steel - Leeb probe: pre-calibrated for steel, alloy steel, cast iron, stainless steel, aluminum, bronze, brass, copper - Additional custom materials for calibration
Data display	Load applied/contact (UCI), angle (Leeb), single test result. Max., min., average of tests, number of tests, deviation, var. coeff, histogram, signal and smart mode
Indication	Color LCD display (320 x 240)
Operating environment	Temperature: -20 to +40° C; Humidity: 30 to 80% RH
Power supply	DC 4.5 V (3 AA batteries)
Instrument dimensions	160 x 75 x 30 mm
Net weight	Approx. 0.3 kg (without probe)
Battery life	Approx. 10 hours

# COMBINED HARDNESS TESTERS T-UD2/3

## STANDARD SET T-UD2

- Electronic unit
- UCI probe
- Leeb probe
- 2 AA batteries
- Charger
- USB cable
- Operating manual
- Software for PC
- Case

## AVAILABLE OPTIONS T-UD2

- UCI probe
- Leeb probe
- Batteries
- Charger
- USB cable
- Set of hardness measures
- Case



## STANDARD SET T-UD3

- Electronic unit
- UCI probe
- Leeb probe
- 3 AA batteries
- Charger
- USB cable
- Operating manual
- Software for PC
- Case

## AVAILABLE OPTIONS T-UD3

- UCI probe
- Leeb probe
- Rubber bumper protected case
- Wireless printer
- Portable grinding machine
- Set of hardness measures
- Three types of UCI probes (10 - 50 - 98 N)
- Batteries
- Charger
- USB cable
- Case



# WIRELESS HARDNESS TESTER LAB UCI



Wireless portable hardness tester which implements the UCI (*Ultrasonic Contact Impedance*) method.

## FEATURES

- Ultra-portable device for quick hardness testing anywhere – in laboratories or in field conditions, with autonomous continuous operation up to 20 hours.
- UCI hardness test method has almost no boundaries in relation to the test object, so this method is the most versatile of the existing ones.
- Multifunctional application with a user-friendly interface and cloud archive.

### The NOVOTEST Lab application allows users to:

- Set up and calibrate the device;
- Get illustrations of measurements as graphs, histograms, and statistics;
- Save measurements with text-, audio-, photo- and even videos protocols;
- Transfer the protocol in one click by any convenient messenger or e-mail;
- Synchronize archive with cloud storage.

# WIRELESS HARDNESS TESTER LAB UCI



## ULTRAPORTABLE

Wireless connection allows user to get rid of wires, blocks, and it makes the device as portable as possible. It fits in any bag or even just a pocket.



## HIGH AUTONOMY

The device charges from any USB 5V port, be it a PC, car, or a power bank. From one full charge, the device can work for more than 20 hours in a row.



## SPECIAL NOZZLE

The special nozzle for products helps test radius surfaces and get accurate measurements on the flat products, included in the standard set. The device can also be used without a nozzle for narrow and hard-to-reach places.



## CALIBRATION FOR ANY METAL

The device has preset calibrations for steel, aluminum and brass. If necessary, users can calibrate the device for any metal-scale combination if samples are available.

## CROSS-PLATFORM ARCHIVE MANAGEMENT INTERFACE

Create comprehensive protocols and synchronize your archive with cloud storage managed in the Google Chrome browser.

# WIRELESS HARDNESS TESTER LAB UCI



## ADVANTAGES OF LAB UCI

- Wireless
- Ultraportable
- Autonomous
- Universal
- Accurate
- Widely applicable
- Multifunctional
- Easy to use

The device connects with your smartphone through the NOVOTEST application!



## TECHNICAL FEATURES

Measuring range	HRC: 20~70, HB: 90~650, HV: 230~940, Tensile strength, MPa: 370~1740, User calibrations for any range (e.g.: HV20-2000)
Scales	HRC, HB, HV, HRA, HRB, MPa, and can be calibrated for any other
Materials	Steel, aluminum, brass and can be calibrated for any other
Weight	170 g
Dimensions	160 x 26 (36 with nozzle) mm
Battery life	20 hours
Power supply / Charging	Built-in battery / USB 5V
Operating environment	Temperature: -30°C ~ 60°C – Humidity: 30% ~ 80% R.H.



# WIRELESS HARDNESS TESTER LAB UCI

## STANDARD SET LAB UCI

- Hardness tester
- Special nozzle
- Software
- USB cable
- Case
- Operating manual

## AVAILABLE OPTIONS LAB UCI

- Hardness test blocks
- UCI probe test stand for thin sheets
- Portable grinding machine

## APPLICATIONS



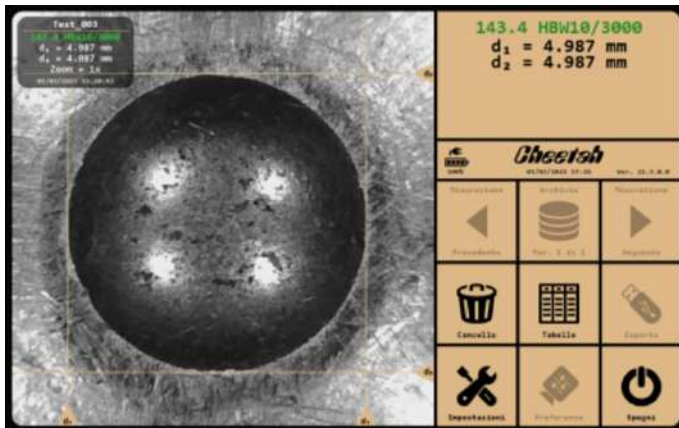
**OTHER PORTABLE HARDNESS TESTERS**



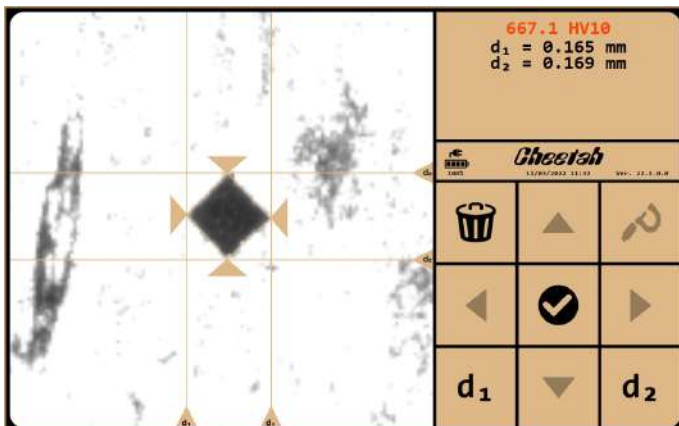
# CHEETAH MEASURING SYSTEM

## Brinell and Vickers indentation's digital reader

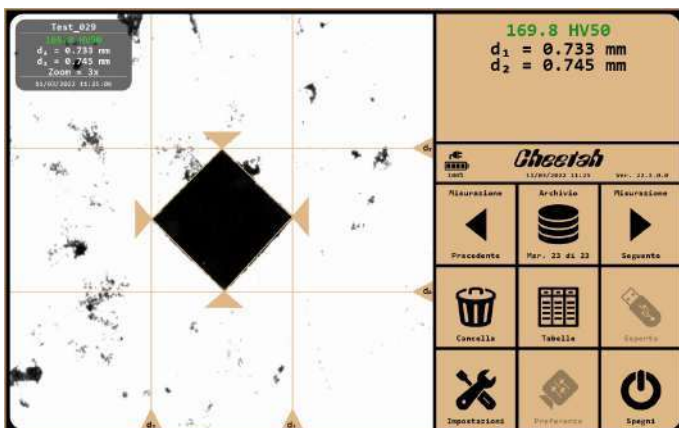
The software allows the user to measure Vickers and Brinell indentation in compliance with ISO and ASTM.



1/1 HB	2.5/6.25 HB	5/25 HB	10/100 HB
1/2.5 HB	2.5/15.6 HB	5/62.5 HB	10/250 HB
1/5 HB	2.5/31.5 HB	5/125 HB	10/500 HB
1/10 HB	2.5/62.5 HB	5/250 HB	10/1000 HB
1/30 HB	2.5/187.5 HB	5/750 HB	10/3000 HB



10 HV	20 HV	30 HV	50 HV
60 HV	100 HV		



10 HV	20 HV	30 HV	50 HV
60 HV	100 HV		

# CHEETAH MEASURING SYSTEM

## INSTRUMENT COMPOSITION:

- PC Tablet
- Measuring probe with built-in LED light and USB3 cable
- Measuring software on Windows operating system for automatic and manual reading of Brinell / Vickers indentation
- High-definition camera for optical evaluation of Brinell / Vickers indentation with digital zoom
- Connection cable
- Operating manual



## TECHNICAL FEATURES

Typical parameters of a file are:

- File name, with creation of a tests storage
- Measuring mode Archive/Live
- Digital zoom 1x - 1.5x - 2x - 3x - 5x
- HRC conversion
- Tolerance with insert of min/max limits
- Instrument calibration
- Printing of the report with customisation of company details and own logo
- Indentation images memorisation
- Data export to PDF and EXCEL format
- Images export

- Dimensions: h 140 mm - Ø 50 mm
- Weight: 0.600 kg
- Camera resolution: 1440 x 1080 Pixel
- Brinell diameters range: 0.3 - 6.0 mm
- Vickers diameters range: from diagonals 100 micron

# MECHANICAL PORTABLE HARDNESS TESTERS

## BRINELL HARDNESS TESTER HBX 0,5



### TECHNICAL FEATURES

**Brinell** hardness tester designed to measure steel and cast iron hardness up to 350 - 400 Brinell; the measurements can be carried out anywhere and in any testing direction.

With this instrument the classic consumables can be saved; it is lightweight, small and portable.

When **HBX 0,5** is pushed down, a pre-loaded spring sets free and releases the load on the underlying workpiece; the force of the spring is guided directly on the indenter. This creates the indentation.

After that, the indentation diameter will be measured thanks to the supplied micrometrical microscope or through digital measuring systems.

## ROCKWELL HARDNESS TESTER PHT

### TECHNICAL FEATURES

The mechanical **Rockwell** hardness tester, even if smaller than a bench one, does not lose in accuracy.

The smallest model weights only 0.7 kg and its use is similar to a classic micrometer. **PHT** directly measures 15 Rockwell scales: A, B, C, D, E, F, G, H, K, L, M, P, R and S (depending on the model).

Its accuracy is compliant with ISO 6508 and ASTM E-18 standards.

The measuring process is fast and easy, it leaves only a small test indentation on the piece's surface.



**METALLOGRAPHIC  
MACHINES**

***Chennai Metco***

# CUTTING MACHINES

**Sectioning**, the removal of a conveniently sized and representative specimen from a larger piece is the first major operation in the preparation of **metallographic specimen**. Incorrect preparation techniques can cause micro-structural changes that lead to erroneous interpretation.

The selection of the right cutter is the first crucial step of specimen preparation. Abrasive cutting, with copious supply of coolant to ensure that no thermal damage takes place, is the most widely used method of sectioning materials for microscopic examination. CRASE provides a wide range of cutting machines by Chennai Metco; very large cutters to section bigger and long sized components, such as crankshafts, are also available.

## BAINCUT LSS - Low Speed Saw

The precision section saw is designed for slicing all types of materials with ease.

The slow speed cutter is mostly used for accurate sectioning of very small, hard components for R&D.

### FEATURES

- Cutting capacity up to 20 mm
- Built-in coolant tray
- Down-feed facility with different weights up to 400 g
- Variable speed up to 600 rpm
- Micrometer for cross-feed adjustment up to 25 mm
- AC motor single phase, 220 V / 50Hz or 110 V / 60 Hz
- Diamond blade size: Ø 127 mm
- Touch screen with pre-set programs
- Automatic safety button
- Dimensions: 400 x 300 x 250 mm



# CUTTING MACHINES

## BAINCUT HSS PLUS - High Speed Saw



The precision saw for cutting all types of materials with variable spindle speed. Automated Y movement adds to the convenience.

A must for slicing surface engineered components, hard, sensitive applications. Preferred by research laboratories.

### FEATURES

- Cutting capacity up to 60 mm
- Variable speed 100-5000 rpm
- AC motor 3-phase (750 W), 220 V / 50 Hz or 110 V / 60 Hz
- Y axis automatic movement
- Z axis movement up to 40 mm
- Diamond or abrasive wheel up to Ø 200 mm
- Door safety interlock system
- Re-circulating coolant system
- Dimensions: 845 x 784 x 600 mm



## BAINCUT M - Medium

A popular general purpose cut-off machine with viewing window, internal illumination, re-circulation coolant system, washing jet, safety limit switch. Chop cutting by lowering the wheel with the handle (Z movement).

### FEATURES

- Cutting size up to 60 mm
- Spindle speed 2800 rpm
- Motor 3 HP, 3-phase, 415 V / 50 Hz or 220 V / 60 Hz
- Cutting wheel Ø 250 mm
- Z axis manual movement
- Built-in movable re-circulation coolant tank
- T-slot bed, 110 x 200 mm
- Dimensions: 850 x 750 x 1550 mm





# CUTTING MACHINES

## BAINCUT UM - Upper Medium

A sturdy floor model general purpose cutter. Large space in the cutting zone offers flexibility to use wide variety of fixtures. Cutting action is carried out by lowering the arm (Z movement) through cutting plane (Y axis); additional X axis movement. Suitable for many applications including small gears, medium sized auto components and shafts.

### FEATURES

- Cutting capacity up to 80 mm
- Spindle speed 2800 rpm
- Cutting wheel 300 mm
- Motor 5 HP, 3-phase. 415 V / 50 Hz or 220 V / 60 Hz
- Three axes movement X, Y and Z
- Built-in movable re-circulation coolant tank
- Table size: 260 x 260 mm with 8 mm T-Slot
- Dimensions: 1100 x 1000 x 1650 mm



## BAINCUT L - Large

Large heavy-duty cutting machine for sectioning large samples. Has similar features to UM model, but with higher capacity (Z, Y and X movements).

### FEATURES

- Cutting capacity up to 110 mm (L Plus: 130 mm)
- Spindle speed 1900 rpm
- Cutting wheel 350 mm (L Plus: 400 mm)
- Motor 7.5 HP, 3-phase, 415 V / 50 Hz or 220 V / 60 Hz
- Built-in movable re-circulation coolant tank
- Easy operator panel
- Side opening for longer components
- Table size: 254 X 355 mm with 12mm T-Slot
- Dimensions: 1040 x 1600 x 1800 mm



# CUTTING MACHINES

## BAINCUT XL Auto



Automatic extra large cutting machine with integral sliding door. Standard Y axis automatic movement, optional Z axis automatic movement. Pulse cutting, step cutting, etc., for burn-free cutting. Preset parameters for consistency and ease of use.

### FEATURES

- Cutting capacity up to 150 mm
- Automatic Z movement with Servo System
- Advanced PLC based graphical touch screen
- Variable cutting speed 1000 - 3000 rpm
- Cutting wheel Ø max. 500 mm
- Motor 15 HP, 3-phase, 415 V / 50 Hz or 480 V / 60 Hz
- Coolant tank with 150 L capacity
- Fume digester
- Table 500 x 500 mm with 12 mm T-Slot
- Dimensions: 1700 x 1700 x 1900 mm

## BAINCUT XXL Auto

Automatic bigger sized fully loaded cutting machine. Two side sliding door provides voluminous internal space to section big components and also easy access. Standard automatic movement Y and Z axes. Pulse cutting, step cutting, etc., for burn-free cutting. Variable spindle speed included.

### FEATURES

- Cutting capacity up to 200 mm
- Variable spindle speed 1000 - 3000 rpm
- Motor 30 HP, 3-phase, 415 V / 50 Hz or 480 V / 60 Hz
- Cutting wheel Ø max. 500 mm
- Advanced PLC based graphical touch screen
- Automatic Y and Z movement with Servo System
- Fume digester
- Table 500 X 500 mm with 12 mm T-Slot
- Dimensions: 2100 x 2150 x 2400 mm



# MOUNTING MACHINES

**Mounting** the specimen after sectioning is often necessary for subsequent handling and metallographic polishing.

Mounting has several benefits, especially in hand polishing when specimen flatness and edge retention are important.

Specimen mounting has other benefits such as:

- uniform flatness for either manual or automatic grinding and polishing machine;
- easier handling of specimens that are too small and fragile;
- Chennai Metco **mounting presses** are engineered with best in class techniques with international standards.

## BAINMOUNT H



### FEATURES

- Hydraulic mounting press
- Touch screen LCD parameter indicator
- Mould dimensions Ø 30 - 40 - 50 mm
- Heater 1600 Watt, single phase
- Water cooling re-circulation system (optional)
- Digital temperature indicator and digital timer
- Timer-buzzer for heating and cooling cycles
- Dimensions: 580 x 610 x 550 mm

## BAINMOUNT H AUTO

### FEATURES

- Hydraulic automatic system
- Auto-doser
- Mould dimensions Ø 30 - 40 - 50 mm
- Heater 1600 Watt, single phase
- Automatic water cooling system
- Ideal for transparent, EPO and bakelite moulds preparation
- Timer-buzzer for heating and cooling cycles
- Presets and data storage up to 25 programs
- Dimensions: 430 x 570 x 510 mm



# MOUNTING MACHINES

## BAINMOUNT TWIN H AUTO



### FEATURES

- Hydraulic automatic system
- Mould dimensions Ø 30 - 40 - 50 mm
- Heater 1600 Watt, single phase
- Automatic water cooling system
- User friendly advanced LCD touch screen
- Timer-buzzer for heating and cooling cycles
- Ideal for transparent, EPO and bakelite moulds preparation
- Presets and data storage up to 25 programs
- Simultaneous mounting in both cylinders
- Dimensions: 650 x 630 x 510 mm

# GRINDING/POLISHING MACHINES

**Grinding** involves process of coarse grinding prior to fine grinding to obtain flat surface, followed with steps of fine grindings.

**Polishing**, in one or more final steps, in specimen preparation is to get mirror finished surface. This process is necessary to get the clear view of the microstructure in the specimen.

It is done through a series of SiC sheets, diamond platens, cloths, and suspensions to obtain mirror like and planar surface in the specimen.

Chennai Metco offers a full range of table top, floor model, manual, semi-automatic and fully automatic polishing machines. Fully automatic polishers are ideal for laboratories looking for high quality consistent results for demanding applications.

## BAINLINE TWIN WET

### FEATURES

- Endless belt, 100 x 915 mm
- Motor 1 HP, 3-phase
- Simplified belt change mechanism
- Water cooling system
- Speed 1440 rpm
- For flat, coarse grinding prior to fine grinding
- Dimensions: 670 x 680 x 290 mm



## BAINLINE GP

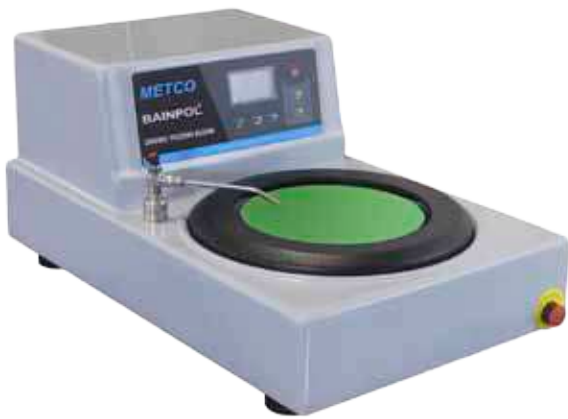
### FEATURES

- Endless belt 100 x 915 mm
- Motor 0.5 HP, single phase
- Simplified belt change mechanism
- For flat, coarse grinding prior to fine grinding
- Dimensions: 560 x 350 x 230 mm



# GRINDING/POLISHING MACHINES

## BAINPOL VT



### FEATURES

- Single disc, standard Ø 200 mm
- Optional discs Ø 250 - 300 mm
- Motor 0.5 HP, single-phase, high torque
- AC drive
- Variable speed 50 - 1000 rpm or 50 - 600 rpm
- Display LCD
- Corrosion resistant
- Flexible water jet with control valve
- Power supply: 220 V / 50 Hz or 110 V / 60 Hz
- Dimensions: 360 x 660 x 310 mm

## BAINPOL VTD

### FEATURES

- Double disc, standard Ø 200 mm
- Optional discs Ø 250 - 300 mm
- Motor 0,5 HP, single-phase, high torque
- AC drive
- Variable speed 50 - 1000 rpm or 50 - 600 rpm
- Display LCD
- Corrosion resistant
- Flexible water jet with control valve
- Power supply: 220 V / 50 Hz or 110 V / 60 Hz
- Dimensions: 710 x 660 x 310 mm



# GRINDING/POLISHING MACHINES

## BAINPOL SEMI-AUTOMATIC

### FEATURES

- AC motor 0.5 HP, single-phase
- LCD touch display
- Variable speed 50 - 600 rpm
- Head speed 100 rpm
- Digital timer
- Auto head to hold 3 samples: 30 - 40 - 50 mm
- Independent powered polish head
- Standard disc Ø 300 mm, optional Ø 250 mm
- Dimensions: 435 x 750 x 520 mm



*Also available with double disc*

## BAINPOL AUTO

### FEATURES

- AC motor 1 HP, single-phase, high torque
- LCD touch display, digital timer
- Variable speed 50 - 600 rpm
- Variable pressure 1 - 4 bar
- Water cooling system
- Automatic head, up to 6 moulds
- Independent powered polish head, variable speed 30 - 150 rpm
- Standard disc Ø 200 - 250 - 300 mm
- Dimensions: 850 x 500 x 600 mm



*Also available with double disc  
Dimensions: 950 x 850 x 750 mm*

# GRINDING/POLISHING MACHINES

## BAINPOL VFD



### FEATURES

- Heavy duty floor model with storage compartment
- Double disc, variable speed 50 - 600 rpm
- AC motor 0.5 HP, single-phase
- Standard disc Ø 300 mm
- Optional discs Ø 200 - 250 mm
- Corrosion resistant
- Drainage system
- Dimensions: 870 x 750 x 1020 mm

*Also available the semi-automatic version*

## BAINPOL VFF

### FEATURES

- Heavy duty floor model with storage compartment
- Four discs, variable speed 50 - 600 rpm
- AC motor 0.5 HP, single-phase
- Standard disc Ø 250 mm
- Optional discs Ø 200 - 300 mm
- Corrosion resistant
- Drainage system
- Dimensions: 1740 x 750 x 1020 mm





# MICROSCOPES

**Optical microscope** remains the most important tool for the study of microstructure. All examination of microstructure should begin with use of light microscope starting at low magnification followed by progressively higher magnification. Reflected light microscopes are commonly used for the study of metals and are classified as *upright* and *inverted*. These terms refer to the orientation of the light path to the plane-of-polish of the specimen during observation.

## METSCOPE - I

Trinocular inverted metallurgical microscope with plan optics and incident light illumination. Convenient model for quick micro analysis, with ergonomic design. Available options to add quality enhancing the optic. Objectives: 10x - 20x - 50x - 100x Magnification range: 100x - 1000x (standard) Illumination: 6 V, 20 Watt A third port available for camera.



## VERTIMET CP



Trinocular vertical metallurgical microscope with plan optics and incident light illumination. Best suited for situations demanding vertical viewing. Practical no-frill microscope with amazing clarity. Objectives: 10x - 20x - 50x - 100x Magnification range: 100x - 1000x (standard) Illumination: 6 V, 20 Watt A third port available for camera.

## MACSCOPE - Z (Stereo Zoom)

*Stereo zoom* microscope with camera port. Designed with excellent clarity and ergonomics. Modular design enables configuration to suit your applications. Standard magnification: 6.2x to 50x Magnification: 3.1x to 100x with suitable eye pieces and objectives Fiber optic illuminator (optional) Illumination: ring illuminator 10w bulb



# GEAR TESTING MACHINES



# GEAR TESTING MACHINES

**CRASE** has been in gear's market for more than 30 years; today is able to *sell, assist* and *retrofit* testing machines for spur and bevel gears' measurement.

We face problems about **gears' control** thanks to our knowledge developed during years of fieldwork and thanks to today's technology, presenting a wide range of offers.

## MANUAL GEAR MEASURING MACHINES



MAAG - KLINGELNBERG - MAHR - FRESCO - HOFLER

Manual machines, with or without base plate, are a worthy technical-economic option to measure gears. Once instruments have been retrofitted, they get efficient and updated. Our technicians are able to update your gear measuring machine of any brand and model, both CNC and manual. Beyond updating the measuring system, we can repair or inspect mechanical and electronical parts of your instrument.

The software is able to measure in compliance with DIN 3960 / 3962 AGMA, JIS, BS, ISO in order to meet any customer's requirement; measurement of the outside of spur gears and pinions.

### Measurement types in basic packet "Gear Soft":

- Straight profile and helix ( $0^\circ$ ).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

Applicable to completely manual gear measuring machines with production of the involute profile through base plate or mechanical sine-bar. Installation of a measuring probe LVDT and two optical lines interfaced to a PC with dedicated electronics. The instrument can be calibrated and controlled with any standard master gear.

Maag PH-60, Klingelberg-PFS-60,62,600, Hofler EFR 300, EFR 350, EFR 401, 401 MZ Golder Micron IL600, Karl Mahr 891T, David Brown 18T.

# GEAR TESTING MACHINES

## SEMI-AUTOMATIC GEAR MEASURING MACHINES

### Measurement types in basic packet "Gear Soft":

- Straight profile and helix ( $0^\circ$ ).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

Applicable to gear measuring machines with motorised movement of the measuring axes for testing helix and involute, the system allows to increase and digitalise manual basic helix and, potentially, of the tailstock.



Maag PH-40,100, SP-60,100, Klingelnberg-PFSU 640,1200,1600, Hofler EFRS 401, EFRS 631, HFR 630.

## CNC GEAR MEASURING MACHINES



Applicable to gear measuring machines with all motorised axes, interfaced to a programmable CNC movement controller. They perform a complete test of the gear with a totally automatic cycle for all the specified teeth. Gear Soft CNC offers the measurement of helix, profile and run-out charts and pitch measurement.

Klingelnberg PNC-33, PNC-40, PNC-60, Hofler EMZ 400,401,402,630,631,632, Hofler ZME 400, Hofler ZP 250,260,350,400, M&M.

Among CNC gear measuring machines we can find many instruments that range from 200 mm to 2000 mm diameter and completely automatic, which allows to measure in a fast and easy way. With only one measuring cycle, the machine provides a test report for the measure of helix, involute and division parameters.

### Measurement types in basic packet "Gear Soft":

- Straight profile and helix ( $0^\circ$ ).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

### Measurement types in CNC packet "Gear Soft":

- Error single pitch.
- Error adjacent pitch.
- Pitch variations.
- Error cumulative pitch.
- Division.
- Concentricity.

# GMM - Gear Measuring Machines

## Gear measuring machines GMM

The **GMM gear measuring machines** series, thanks to customizable software packets for different applications, is suitable for performing a wide range of measurements in a completely automatic way. It is a metrological multifunctional system which is able to recognise and carry out the most frequent measuring software processes in the industrial sector.

The structure is made of three linear coordinate axes with pneumostatic support on granite tracks, that totally delete any friction and wear.

The placement of two tailstocks is provided, one of that is integral with the rotary axis (W) and the other one is opposite and height adjustable, mounted on a specific granite column. The control of the tailstock is motorised. This four-axes coordinate system is fitted for the placement of an analog measuring head which, with the use of a tracer, physically touches the sample's surface and tests the theoretical trend, made by a suitable interpolation created by the test, on the basis of the mathematic formulation implemented in software.

GMM gear measuring machines are able to measure:

- straight, helical and parallel gears
- splined gears with inner and outer involute profile
- pitch errors and concentricity
- thickness on k teeth
- crown and worm gears with harmonic analysis of the profile
- shaving cutters
- gleason/hypoid pairs with calculation of machine's parameters
- hobs, reverse engineering and other solutions.



### SOFTWARE GEARSOFT

**GearSoft** is the basic software of GMM series and it is implemented by applications which allow to perform complete measuring cycles in compliance with standards ISO, DIN and AGMA.

The measure includes the detection of the distortion of involute and helix, with the possibility to insert K charts on maximum four teeth, and the test of pitch error and concentricity and the thickness of the tooth.

GearSoft also allows to:

- print reports for the issue of trial certificates
- export and save files as PDF
- send data aimed to statistic analysis
- share acquired data, using the interconnection system compliant with the new regulatory standards.

# GMM - Gear Measuring Machines

## Main features of GMM gear measuring machines

- **SUPPORT BASE:**

The structure lies on the floor through self-levelling pneumatic supports.

- **GRANITE SURFACE:**

It serves as sliding surface for the Y axis, as support base for the tailstock, and as a base for the rotary table.

- **Y AXIS CARRIAGE:**

It carries X and Z axes. It shifts on granite tracks with pneumostatic supports. The transduction system is made of high-resolution protected optical lines. The movement occurs through linear motor on a neutral axis..

- **X AXIS CARRIAGE:**

With pneumostatic supports on granite tracks.

- **Z AXIS CARRIAGE:**

With pneumostatic supports on granite tracks with pneumatic stabilizing system.

- **ROTARY TABLE:**

Pneumostatic support system, with a treated steel backing pad, with clamping grooves and interchangeable lower tailstock. The transduction system is composed by a high-resolution rotary encoder. The movement is performed by an electronic axis by means of a torque motor, with peripheral traction.



- **TAILSTOCK:**

Realised with a sliding track on a granite column, movement with automatic tailstock's preloading system. Device for thermal lengthening equalization with suitable anti-expansion joint.

- **OPERATOR WORKSPACE:**

In the lower part there is all the control electronics and in the upper part is placed the PC complete with all the accessories (monitor, keyboard, mouse and printer) to draw up the final test certificates.

# GMM - Gear Measuring Machines

## GMM 40 - Small Size



IT MEASURES GEARS WITH OUTER DIAMETER UP TO 400 mm

It is a machine with high-level dynamic features thanks to the use of linear motors with pneumostatic supported tracks, which allow movement without any friction.

The structure includes three linear axes (X, Y, Z), a rotary axis (W) and a tailstock column, everything based on high-accuracy granite tracks. This permits a better long-term stability and a low thermodynamic response, even in case of temperature variation.

### Technical features

Movement	
CNC on the four interpolated axes - joystick for manual movement	
Measuring effective strokes	
X axis	350 mm
Y axis	240 mm
Z axis	390 mm
Diabase levelling table	
Thickness	130 mm
Width	1160 mm
Length	1070 mm
Total size and weight	
Length *	2800 mm (*desk included)
Width	1350 mm
Height	2000 mm
Weight	2600 kg
Resolution	
Linear axes	0.0001 mm
Rotary axis	0.0001 °
Electricity supply and consumption	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Energy consumption	1.6 KWh
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01 µ; Available flow rate: 120 NI/min to 0.6 Mpa
Max measurable size and weight of spur gears	
Maximum diameter	425 mm
Maximum height	350 mm
Maximum height between tips	700 mm (on demand up to 1450 mm)
Maximum weight allowed	200 kg

# GMM - Gear Measuring Machines

## GMM 70 - Medium Size

IT MEASURES GEARS WITH OUTER DIAMETER UP TO 700 mm

Even though GMM 70 maintained the same construction principles, compared to the Small Size model, it has been created to allow to measure heavier and bigger samples with very high accuracy. The structure lies on the floor with pneumatic auto-levelling supports. This ensures that the whole measuring system is isolated from external stresses and that the kinetic energy of moving masses is absorbed. The rotary table is built in order to sustain a load of about 1500 kg thanks to the pneumostatic support on granite track.



### Technical features

<b>Measuring effective strokes</b>	
X axis	650 mm
Y axis	350 mm
Z axis	590 mm
<b>Diabase levelling table</b>	
Thickness	300 mm
Width	1395 mm
Length	1370 mm
<b>Total size and weight</b>	
Length *	3200 mm (*desk included)
Width	1700 mm
Height	2350 mm
Weight	3500 kg
<b>Resolution</b>	
Linear axes	0.0001 mm
Rotary axis	0.0001 °
<b>Electricity supply and consumption</b>	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01µ; Available flow rate: 120 NI/min to 0.6 Mpa
<b>Max measurable size and weight of spur gears</b>	
Maximum diameter	700 mm
Maximum height	550 mm
Maximum height between tips	1000 mm (on demand up to 2000 mm)
Maximum weight allowed	400 kg



# GMM - Gear Measuring Machines

## GMM 110 - Big Size



IT MEASURES GEARS WITH OUTER DIAMETER UP TO 1100 mm

GMM 110 is the larger model of the series and it has been sized and designed in order to be able to measure very big and heavy gears and other parts with high accuracy.

The structure is totally made of granite without any welded part. The sturdy rotary table, with a considerable diameter, lies on pneumostatic support tracks, and it is moved by an electronic axis and a next-generation encoder.

It can bear loads up to 2000 kg, maintaining a resolution of 0.36" of arc (3,600,000 counts per lap), thanks to a special torque motor with a big diameter and without using any type of mechanical reduction (electronic shaft).

### Technical features

Movement	
CNC on the four interpolated axes - joystick for manual movement	
Measuring effective strokes	
X axis	900 mm
Y axis	600 mm
Z axis	600 mm
Diabase levelling table	
Thickness	450 mm
Width	1940 mm
Length	1570 mm
Total size and weight	
Length *	3350 mm (*desk included)
Larghezza	2115 mm
Height	2855 mm
Weight	5000 kg
Resolution	
Lineari axes	0.0001 mm
Rotary axis	0.0001 °
Electricity supply and consumption	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01µ; Available flow rate: 120 NI/min to 0.6 Mpa
Max measurable size and weight of spur gears	
Maximum diameter	1100 mm
Maximum height	550 mm
Maximum height between tips	1200 mm (on demand up to 2000 mm)
Maximum weight allowed	2000 kg

# OTHER GEAR TESTING MACHINES

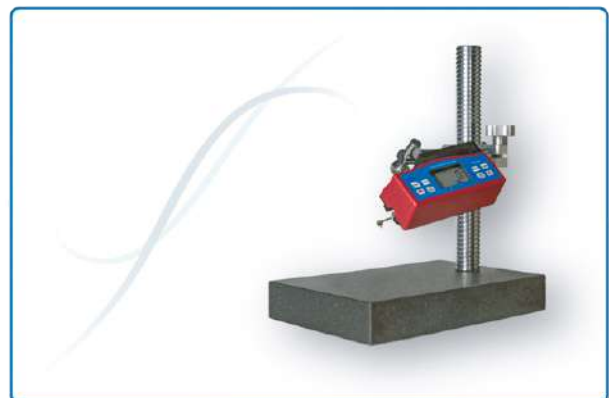
## GEAR TESTING MACHINES



**Gears engagement testing** is a functional control; we can offer both single-flank and double-flank gear testing machines. The double-flank ones are recommended for the test of spur gears; the single-flank instruments, instead, are recommended for the control of spur gears, bevel gears and worm gears. The test is performed with either a measuring master or a torque gear. The evaluation of results depends on the measuring system installed on the instrument.

## ROUGHNESS TESTERS

**Roughness** measurement can be very important on some parts; it can make piece's operating features change in a very significant way. Using the roughness tester models SA6210, SA6230 and SA6260 can make easier to measure these parameters. These instruments are recognised to be efficient in hard-to-reach points' measurement. They are specially recommended for roughness measurement on gear teeth, along both profile and helix's direction.



# **VIDEO MEASURING SYSTEMS**

# VMA Manual video measuring machine

## DESCRIPTION



- Powerful measuring software with auto tracing-edge function, multi-output report.
- Sub-pixel segmentation technology improves the ability of image boundary resolution.
- The surface cold light source can be used to measure the complex workpieces.
- With laser pointer, easy to find the specific location of the measured workpiece.
- Stable granite workbench with "00" Grade.
- German made high precision polish rod and bearing.
- High resolution video system.
- Renishaw measuring probe is optional for simple 3D purpose.

## Technical features

Product name	Manual video measuring system			
2.5D model	VMA-2010	VMA-3020	VMA-4030	VMA-5040
3D model	VMA-2010P	VMA-3020P	VMA-4030P	VMA-5040P
X - Y axes travel distance	200 x 100 mm	300 x 200 mm	400 x 300 mm	500 x 400 mm
Z axis travel distance	200 mm			
Dimensions	600 x 500 x 920 mm	750 x 520 x 980 mm	1000 x 620 x 990 mm	1100 x 950 x 1660 mm
Net weight	120 kg	150 kg	180 kg	360 kg
X - Y axes accuracy	2.5+L/100 $\mu$ m			
Loading weight of working stage	25 kg			
Image sensor	TEO 1/3" colorful CCD camera			
Objective lens	Manual position zoom lens			
Video total magnification	Optic zoom lens: 0.7 ~ 4.5x; Objective lens: 20 ~ 148x			
Resolution	0.5 $\mu$ m			
Working distance (standard)	92 mm			
Object view	8.1 mm ~ 1.3 mm			
Movement system	X - Y axes: polish rod; Z axis: T-type screw rod			
Data processor	RS-100			
Illumination	Surface: 8-division LED cold light; Contour: adjustable 256-grades LED cold illumination			
Measuring software	Mikrosize			
Working environment	Temperature: 20°C $\pm$ 2°C; Temperature variation < 2°C/hr; Humidity: 30 - 80%			
	Vibration < 0.002 g, 15 Hz			
Power source	AC 100 ~ 220 V, 50/60 Hz, 10 A			
Packing List				
Mainframe / Dell PC system	Zoom lens 0.7 - 4.5x		LED light source	
RS-100 data processor	1/3" CCD camera		Mikrosize measuring software	
Linear scale	Calibration block/Capture card		Instruction manual/Anti-dust cover	
Z axis high precision linear guide rail	100 mm length block (3D)		Renishaw probe (3D)	

# VMC CNC Video measuring machine

## DESCRIPTION

- CNC fully auto close loop control, auto measurement; integrative design, convenient for measuring.
- Stable and reliable marble base, ensuring high measure speed, accuracy and precision.
- Precision linear guide and grinding ball screw, AC servo motor ensures accuracy.
- High precision linear scale, resolution is 1  $\mu\text{m}$ , great stability.
- Manual zoom lens and 1/2" color high resolution CCD camera.
- Programmable 5 ring, 8-division LED surface illumination.
- Contour parallel LED illumination, can realize 256 grade brightness adjustment intelligently.
- Optional touch probe, realize 3D measurement.



Technical features			
Product name	CNC automatic video measuring system		
2.5D model	VMC-3020	VMC-4030	VMC-5040
3D model	VMC-3020P	VMC-4030P	VMC-5040P
X - Y axes travel distance	300 x 200 mm	400 x 300 mm	500 x 400 mm
Z axes travel distance	200 mm		
Dimensions	750 x 520 x 980 mm	1000 x 620 x 990 mm	1300 x 750 x 1000 mm
Maximum load capacity	25 kg	25 kg	25 kg
Net weight	240 kg	280 kg	360 kg
X - Y - Z 3-axes linear scale (2.5D)	Resolution: 0.5 $\mu\text{m}$		
Accuracy	$E1(x/y) = 2.5+L/100 \mu\text{m}$		
Repeatability	$\pm 2 \mu\text{m}$		
Movement system	X - Y - Z axes: screw rod		
Movement control	CNC auto servo movement control		
Video system	TEO 1/2" color CCD camera		
	Manual coaxial zoom lens		
	Optical magnification: 0.7 - 4.5x; Video magnification: 20 - 148x		
	Working distance (standard): 92 mm		
Object view (standard)	11.1 ~ 1.7 mm		
Speed	X - Y axes: 200 mm/s; Z axis: 50 mm/s		
Illumination	Contour	Adjustable 256-grade LED parallel illumination	
	Surface	Adjustable 256-grades 5-ring and 8-division LED cold illumination	
3D measurement	3D module and UK Renishaw touch probe		
Measuring software	Mikrosize		
Working environment	Temperature: 20°C $\pm$ 2°C; Temperature variation < 2°C/hr; Humidity: 30 - 80%		
Power source	AC 100 ~ 220 V, 50/60 Hz, 10 A		
Packing list			
Measuring software	CCD camera / Video capture card	Manual coaxial zoom lens	
Mainframe / Dell PC system	Scale transfer / Movement control card	48-division LED illumination	
Linear scale / Calibration block	100 mm length block (3D)	Renishaw probe MCP-K2 (3D)	

# VMU CNC Video measuring machine

## DESCRIPTION



- CNC fully auto close loop control, auto measurement; integrative design, convenient for measuring.
- Stable and reliable marble base and pillar, ensuring high measuring speed, accuracy and precision.
- Precision linear guide and grinding ball screw, AC servo motor ensures accuracy.
- High precision linear scale, resolution is 1  $\mu\text{m}$ , great stability.
- Manual zoom lens and 1/2" color high resolution CCD camera.
- Programmable 5-ring, 8-division LED surface illumination .
- Contour parallel LED illumination, can realize 256 grade brightness adjustment intelligently.
- Optional touch probe for 3D measurement.

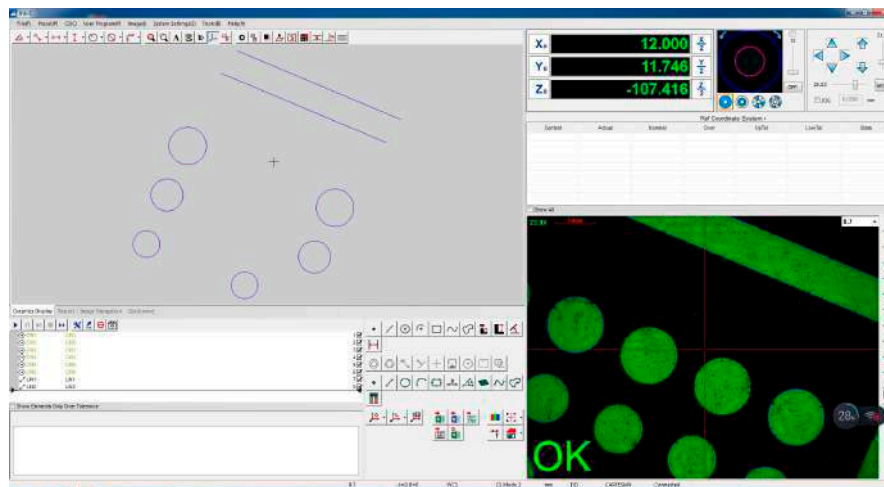
Technical features			
<b>Product name</b>		<b>Fully automatic video measuring system</b>	
2.5D model		VMU-3020	VMU-4030
3D model		VMU-3020P	VMU-4030P
X - Y axes travel distance		300 x 200 mm	400 x 300 mm
Z axis travel distance		200 mm	
Accuracy		$E1(x/y) = 2.5+L/100 \mu\text{m}$	
Video system		TEO 1/2" colorful CCD camera	
		6.5x auto coaxial zoom lens	
		Optical magnification: 0.7 - 4.5x; Video magnification: 20 - 148x	
		Working distance: 92 mm	
Object view (standard)		11.1 ~ 1.7 mm	
Linear scale resolution		0.5 $\mu\text{m}$	
Movement system		X - Y - Z axes screw rod	
Movement control		CNC auto servo movement control	
Speed		X - Y axes: 200 mm/s; Z axis: 50 mm/s	
Illumination	Contour	Adjustable 256-grade LED parallel illumination	
	Surface	Adjustable 256-grades 5-ring and 8-division LED cold illumination	
3D measurement		3D module and UK Renishaw MCP-K2 touch probe	
Measuring software		Mikrosize	
Maximum load capacity		25 kg	25 kg
Dimensions		750 x 520 x 980 mm	1000 x 620 x 990 mm
Net weight		240 kg	280 kg
Working environment		Temperature: 20°C $\pm$ 2°C; Temperature variation < 2°C/hr; Humidity: 30 - 80%	
Power source		AC 100 ~ 220 V, 50/60 Hz, 10 A	
Packing list			
Measuring software		CCD camera / Video capture card	6.5x auto coaxial zoom lens
Mainframe / Dell PC system		Scale transfer / Movement control card	8-division LED illumination
Linear scale / Calibration block		100 mm length block (3D)	Renishaw probe (3D)

# MIKROSIZE MEASURING SOFTWARE

Thanks to the Mikrosize 3D software with simple interface, intuitive operation, easy operation and powerful functions, users can complete the measuring task quickly and efficiently.

## Simple and friendly interface

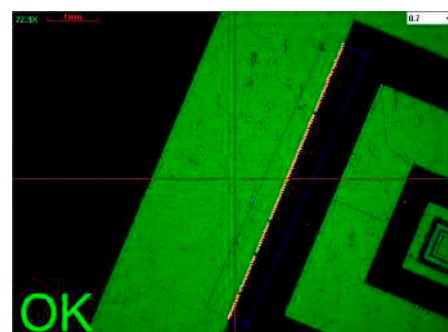
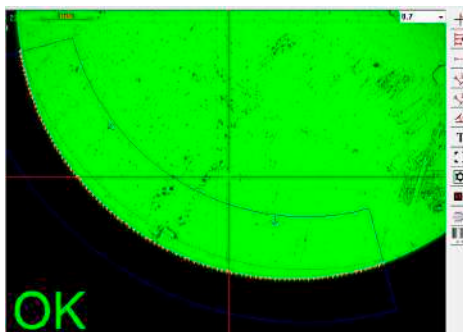
- The common functions are in the main interface, which is easy to get familiar with.
- Users can complete almost all measurement task by simply clicking and dragging the mouse.



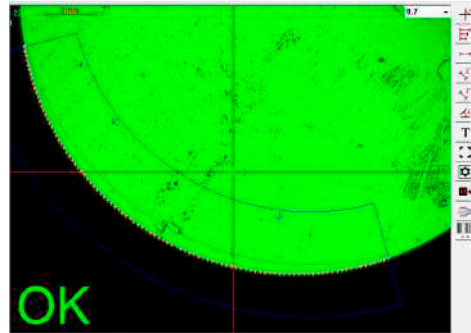
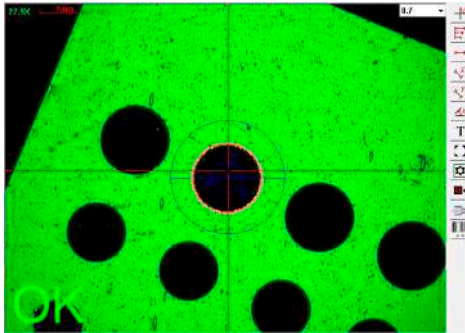
## POWERFUL GEOMETRIC MEASUREMENT FUNCTION

### Complete geometric measurement function

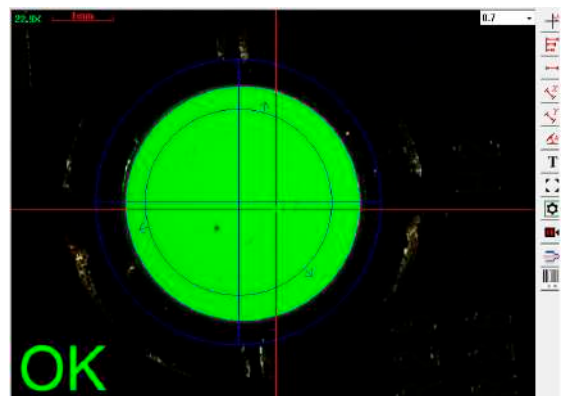
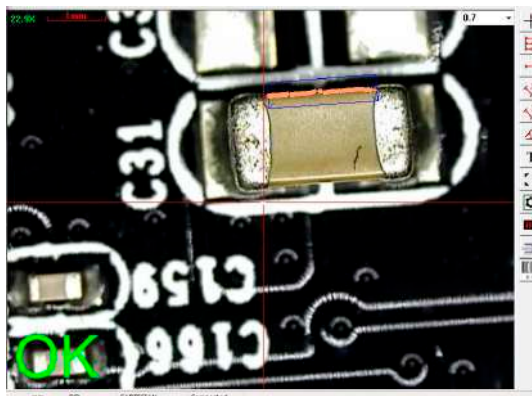
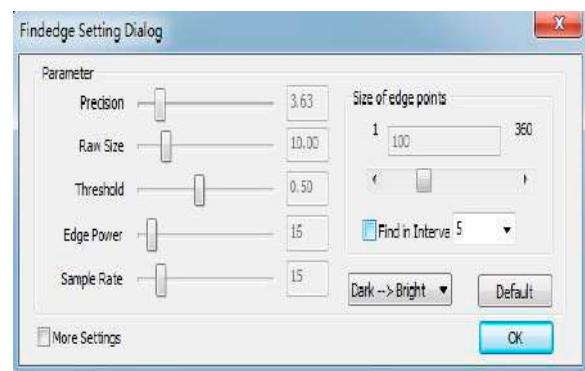
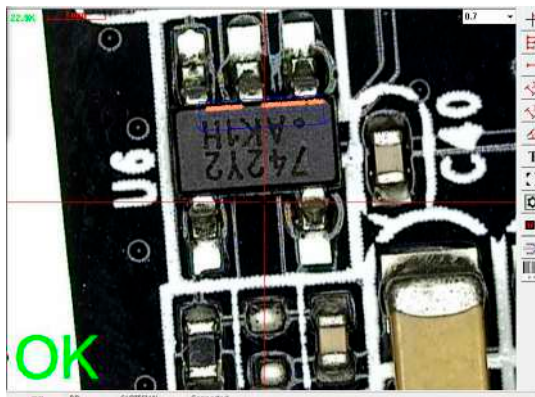
- Measurement of points, lines, arcs, circles, rectangles, ellipses, bond length (waist features), open curves, closed curves, planes, cylinders, cones, balls and other geometric elements.
- When a probe or laser displacement sensor is added to the z-axis, 3D graphic elements such as cylinder, cone, sphere and surface of 3D space can be measured. According to the actual characteristics of elements, each element can be measured by a variety of different methods.
- The coordinate value, length, area, volume and other data of the element can be obtained directly after edge searching.



# MIKROSIZE MEASURING SOFTWARE



- It can grasp the weak edge, set the edge searching direction arbitrarily, avoid the edge selection error, set the edge searching parameters flexibly, and remove the influence of the rough edge.

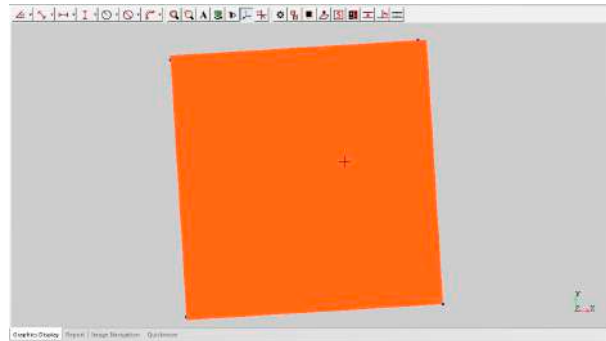
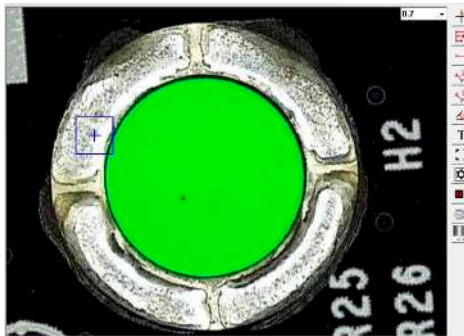




# MIKROSIZE MEASURING SOFTWARE

## AUTO FOCUS FUNCTION AND FOCUS MEASUREMENT FUNCTION

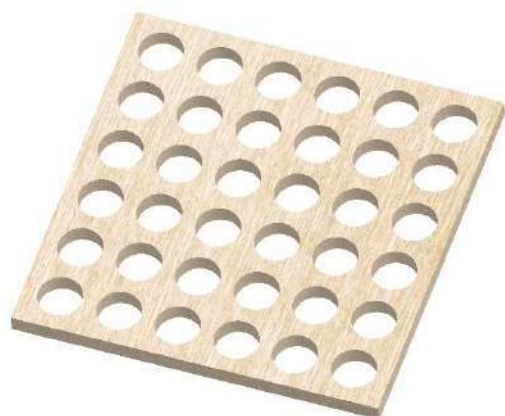
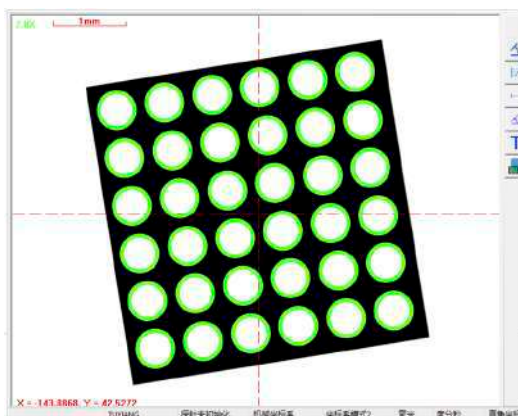
- The software can automatically determine whether the focus is the clearest or not. This function can also be used to measure height and flatness.



## FAST RESPONSE TO MEASUREMENT OF COMPLEX SHAPE WORKPIECE AND MASS WORKPIECE (SPECIAL FUNCTION OF AUTOMATIC MACHINE)

### Translational array measurement of elements

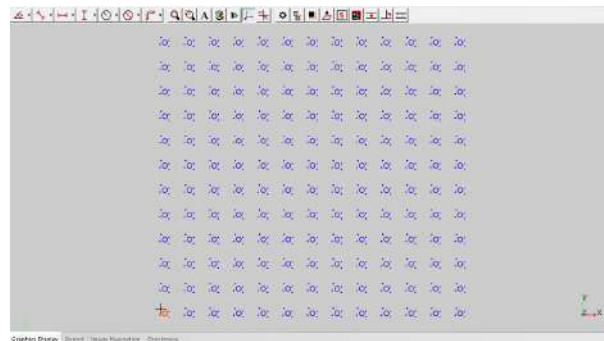
- For equidistant elements series, only one element needs to be measured manually, and then all elements can be measured automatically through the translation array function, which is very convenient to measure array features.



# MIKROSIZE MEASURING SOFTWARE

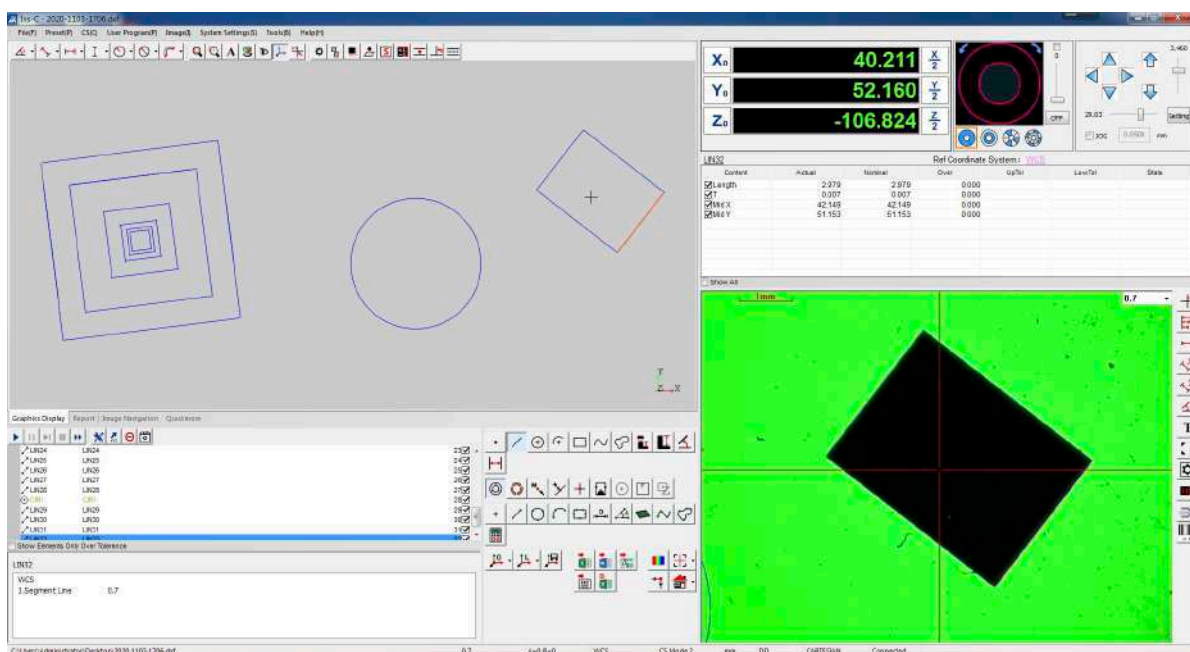
## Workpiece array and macro array measurement (special function of automatic machine)

- When a large number of workpieces are measured, only one workpiece can be measured manually, and all workpieces can be measured automatically through the workpiece array and macro array function.
- Both a single fixture and multiple fixtures can deal with it at the same time. It can save time and improve measurement efficiency.



## Import CAD drawing measurement function

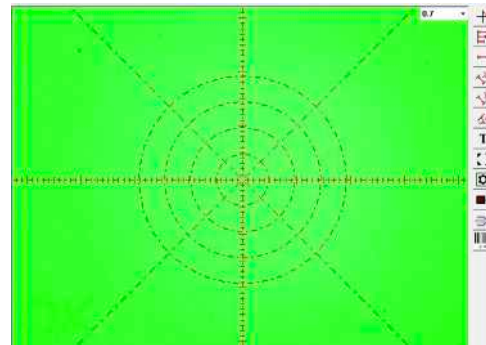
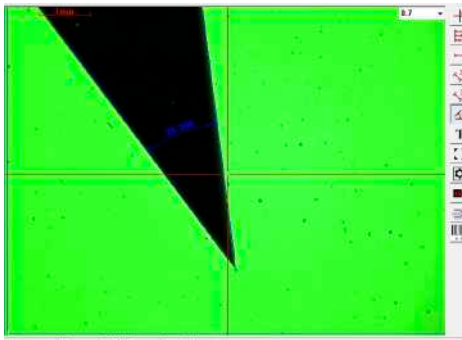
- The dimension drawing can be done directly by CAD software, and the automatic measurement can be realized after importing the software; there is no need to collect points for edge searching.
- It is very convenient for coordinate measurement and contour contrast measurement of complex or irregular shapes.



# MIKROSIZE MEASURING SOFTWARE

## Comparative measurement function

- The scale line, angle line and standard circle can be preset for comparative measurement of workpiece.
- The dimension line or angle line can also be drawn directly on the image outline, observe the length, angle, step height and diameter of the workpiece dynamically.



## FLEXIBLE USER PROGRAM

- The software automatically compiles the user program according to the sequence of user measurement steps, and control the program running and stop.
- The user program and each step can be edited, sorted, inserted, deleted, so that it can adapt to various complex and changeable measurement steps.
- When measuring a large number of workpieces, only one edge measurement is needed.



# MIKROSIZE MEASURING SOFTWARE

## AUTOMATIC CALCULATION OF GEOMETRIC TOLERANCE OF ELEMENTS

- The software provides complete tolerance setting and calculation functions, which can set and calculate geometric tolerances such as straightness, roundness, flatness, cylindricity, profile, position, parallelism, perpendicularity, concentricity, circle runout, etc.
- It can automatically judge whether the tolerance is OK or NG, and has NG warning and prompt function. The visualized tolerance chart enables users to know the specific out of tolerance position and find out the cause of out of tolerance conveniently.

CIR1		Ref Coordinate System : PCS1				
Content	Actual	Nominal	Over	UpTol	LowTol	State
<input checked="" type="checkbox"/> Center X	10.527	10.527	0.000			
<input checked="" type="checkbox"/> Center Y	-2.613	-2.613	0.000			
<input checked="" type="checkbox"/> Diameter	5.088	5.088	0.000	0.030	-0.030	OK
<input checked="" type="checkbox"/> T	0.000	0.000	0.000			
<input checked="" type="checkbox"/> Circularity %	100.000	0.000	100.000			

CIR5		Ref Coordinate System : PCS1				
Content	Actual	Nominal	Over	UpTol	LowTol	State
<input checked="" type="checkbox"/> Center X	44.624	44.624	0.000			
<input checked="" type="checkbox"/> Center Y	-34.724	-34.724	0.000			
<input checked="" type="checkbox"/> Diameter	3.987	3.987	0.000	0.030	-0.030	OK
<input checked="" type="checkbox"/> T	0.031	0.031	0.000			
<input checked="" type="checkbox"/> Circularity %	99.201	0.000	99.201			

Show All

CIR7

PSN   
  COC   
  CRO   
  LMC   
  MMC

2D   
  3D

Target:

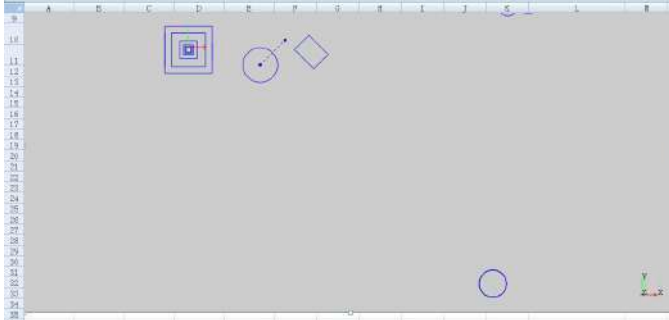
Base:

Measure    Nominal    Over    State

# MIKROSIZE MEASURING SOFTWARE

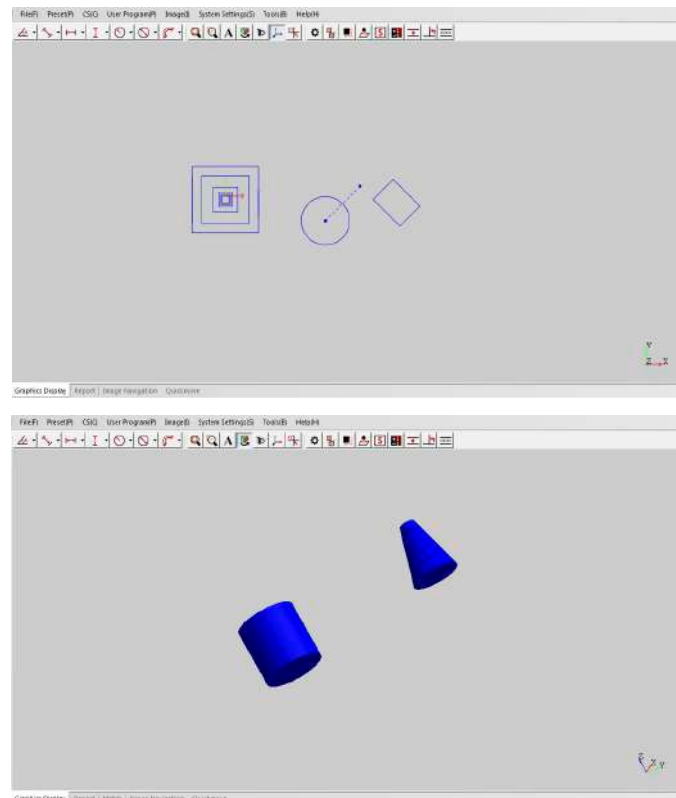
## DIVERSIFIED DATA REPORT AND GRAPHIC DATA EXPORT FUNCTION

- The software can lead-out the result data in a variety of report formats, EXCEL, WORD, TXT, and support the Excel report format setting function.



Content	CIR2-Diameter	CIR3-Diameter	CIR4-Diameter	CIR5-Diameter	CIR6-Diameter	CIR7-Diameter	CIR8-Diameter	CIR9-Diameter	DISH-#	OK/NG	Time
Final	2.78	2.784	2.787	2.787	2.787	2.787	2.787	2.787	2.787		
Ip	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
Low Tolerance	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03		
Ip Value	2.78	2.784	2.787	2.787	2.787	2.787	2.787	2.787	2.787		
P1	0.03	0.034	0.037	0.037	0.037	0.037	0.037	0.037	0.037	OK	0201102-17:20:11
P2	0.03	0.034	0.037	0.037	0.037	0.037	0.037	0.037	0.037	OK	0201102-17:22:11
P3	0.03	0.034	0.037	0.037	0.037	0.037	0.037	0.037	0.037	OK	0201102-17:23:11
P4	0.03	0.034	0.037	0.037	0.037	0.037	0.037	0.037	0.037	OK	0201102-17:24:11
P5	0.03	0.034	0.037	0.037	0.037	0.037	0.037	0.037	0.037	OK	0201102-17:24:11

- The software can export DXF and IGS format graphics data, and can be directly used in reverse engineering.



# VMQ-100 Instant video measuring system



## DESCRIPTION

### One-key instant measuring, batch testing

- Measuring sample can be placed randomly without fixture positioning; software can identify and match automatically.
- Unlimited dimension measurement; measurement task can be completed within 1 second.
- CAD drawing import for direct measurement.
- One-time measurement of the same type of measuring sample.

### Accurate calculation and high repeatability

- Unique patent technology of edge extraction and lens distortion correction.
- Automatic lighting, greatly improves the repeatability.
- It can be compared with the measurement accuracy and repeatability of traditional video measuring machines.

### Easy to operate without training

- Anyone can get started quickly without training.
- Simple interface, intelligent measurement, optimized operation process, real-time operation tips.
- All measurement data can be automatically recorded, statistical analysis can be generated with one key, measurement results can be printed in various file formats or directly printed by printer.

### Various function, automatic report

- The software is divided into three functional modes: measurement setting, continuous measurement and statistical analysis.
- Continuous measurement can be used for real-time measurement and it can judge NG / OK without pressing the key, providing 80 tools of extraction and analysis, including feature extraction tools (such as maximum point, center line, arc, peak circle, etc.), auxiliary tools (such as arbitrary point line circle, fitting line, fitting circle, tangent line, inscribed circle, etc.), intelligent annotation tool, geometric tolerance tool, special application tool (such as R angle, etc.).

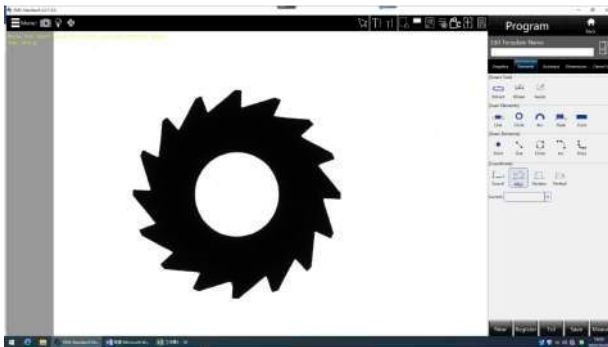
# VMQ-100 Instant video measuring system

<b>Technical features</b>		
<b>Product name</b>	<b>Instant video measuring system</b>	
Dimensions	480 x 240 x 680 mm	
Weight	30 kg	
Working stage capacity	3 kg	
Software	Fom2d	
Camera	5 MegaPixel CCD industrial camera	
Lens	Double telecentric lens	
Illumination	Program controlled parallel light or telecentric parallel light, each section of brightness is controlled independently	
Field of view	30 mm ~ 100 mm	
Focus	Manual	
Measuring accuracy	$\pm 3 \mu\text{m}$	
Measuring function	Point, line, circle, multipoint line, multipoint circle, automatic circle, arc, multisection circle, automatic R angle, contour scanning, fixed point, peak line, circle, etc	
Tagging function	Aligned, vertical, angular, radius / diameter	
Geometrical tolerance	Straightness, roundness, symmetry, profile, etc	
Virtual structure	Center line, bisector, tangent point, tangent point of circle line, circle center, line center, etc	
Automatic template matching	Support	
Report function	SPC analysis report (CPK, CA, PPK, CP, PP)	
Software customization	CAD import profile analysis, automatic management link, APP management application	
Measuring quantity	99 pieces/second	
Template quantity	Unlimited	
Power source	AC 100 ~ 240 V, 50/60 Hz	
Working environment	Temperature: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ; Humidity: 20 - 80% RH	
<b>Packing list</b>		
Machine mainframe	Dell 24" computer	Mikrosize measuring software
Telecentric lens	High resolution camera	Surface lighting
Calibration block	Power line	Product certificate

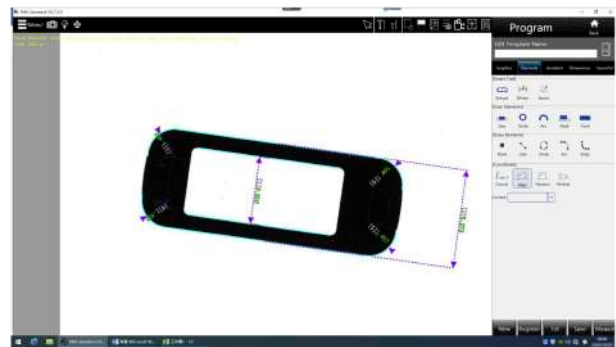
# VMQ-100 Instant video measuring system

## APPLICATIONS

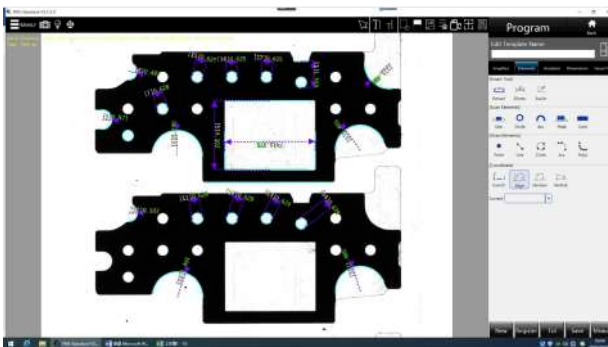
The software can be used in machinery, electronics, mold, injection molding, hardware, rubber, low-voltage electrical appliances, magnetic materials, precision stamping, connectors, terminals, mobile phones, household appliances, printed circuit boards, medical devices, watches, knives and other fields.



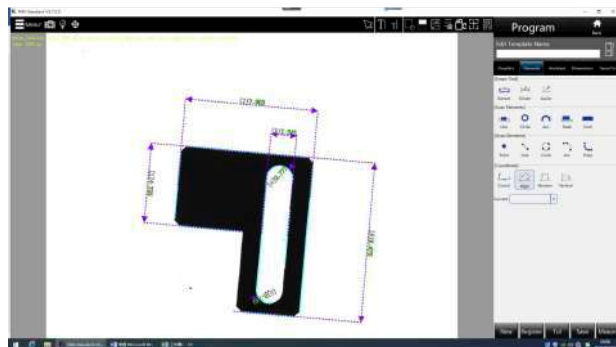
Gears



Mobile phones and watches



Semiconductors (film)



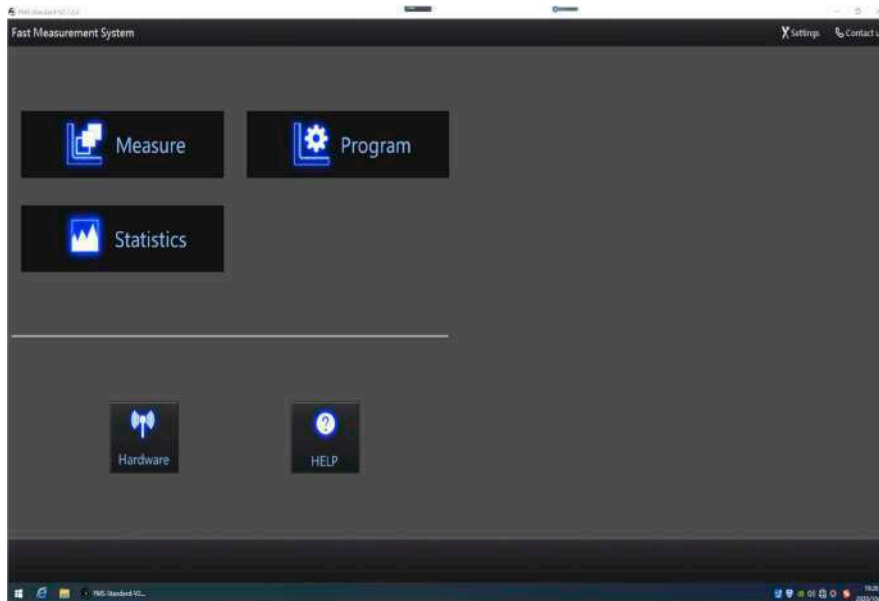
Hardware



# VMQ-100 - MIKROSIZE MEASURING SOFTWARE

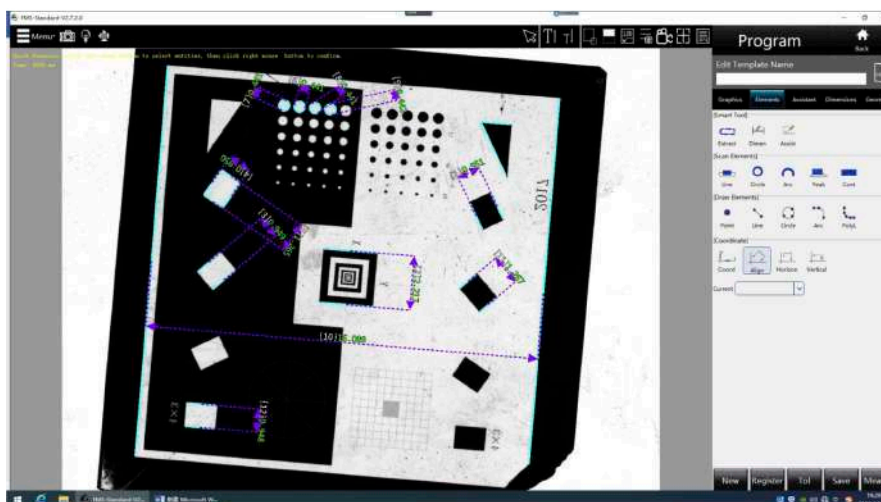
## SOFTWARE INTERFACE

Software main interface is divided into three functional modes: measurement setting, continuous measurement and statistical analysis. Simple, easy to use.

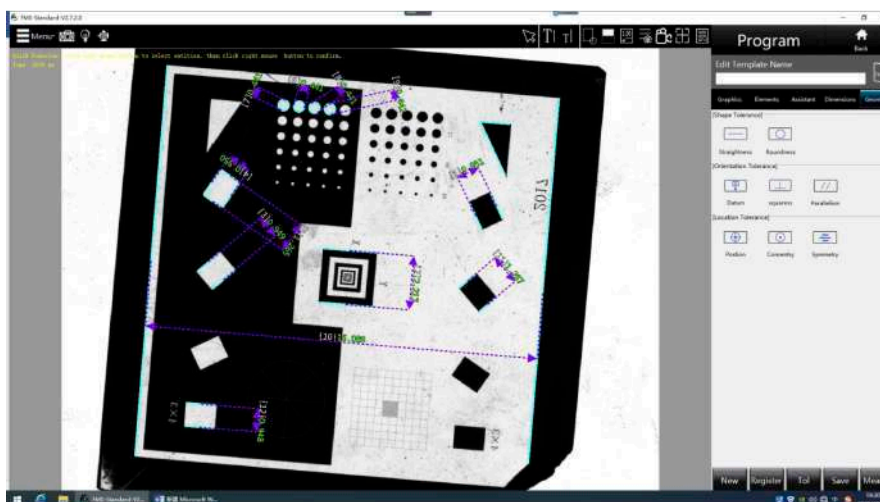
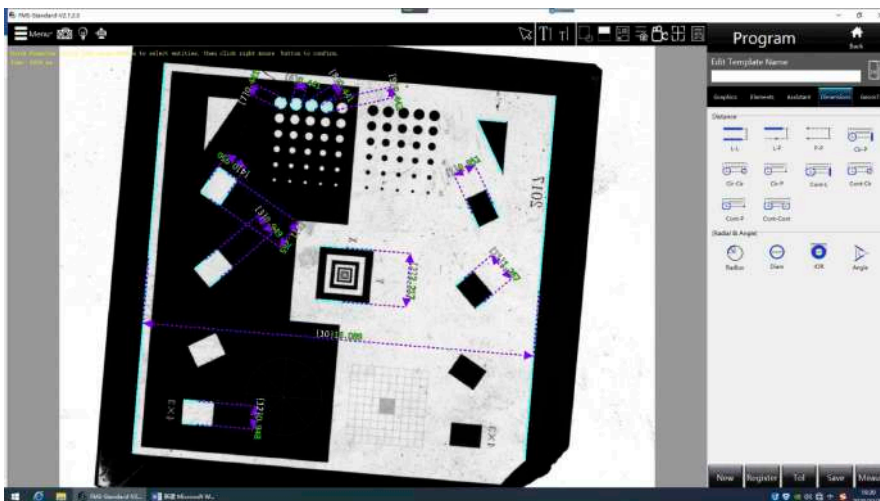
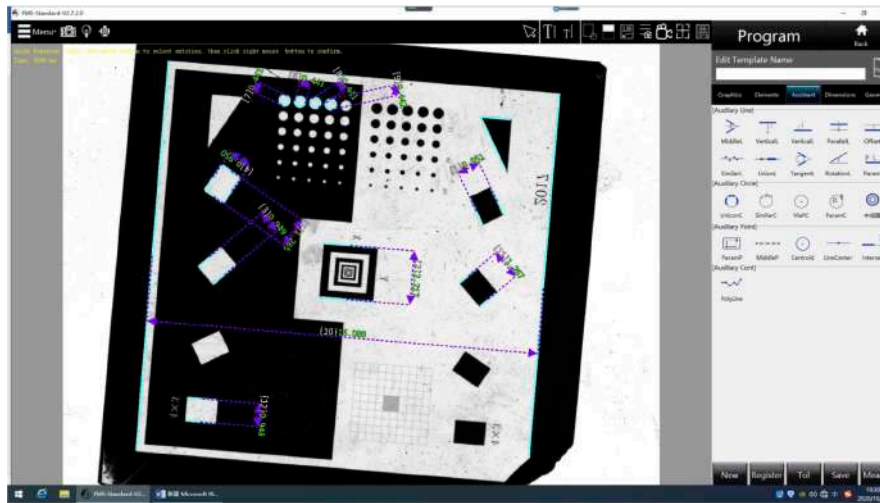


## Measurement setting

In this mode, we can quickly extract geometric elements and do dimensioning to complete the measurement setting.



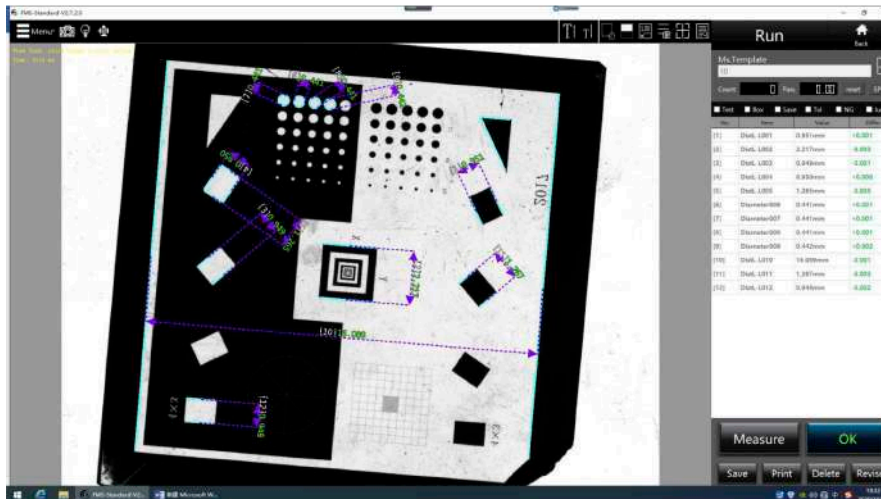
# VMQ-100 - MIKROSIZE MEASURING SOFTWARE



# VMQ-100 - MIKROSIE MEASURING SOFTWARE

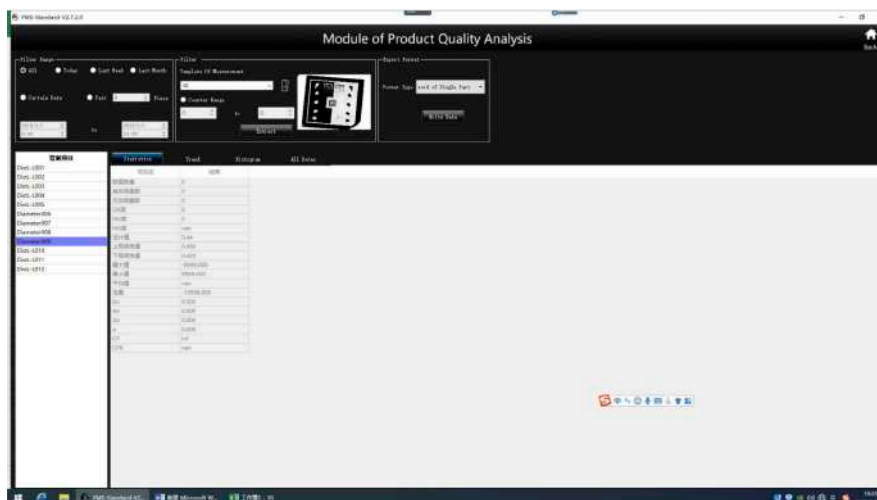
## Continuous measurement

After measurement setting, software enters to the continuous measurement mode, which can be doing rapid and accurate batch measurement.



## Statistical analysis

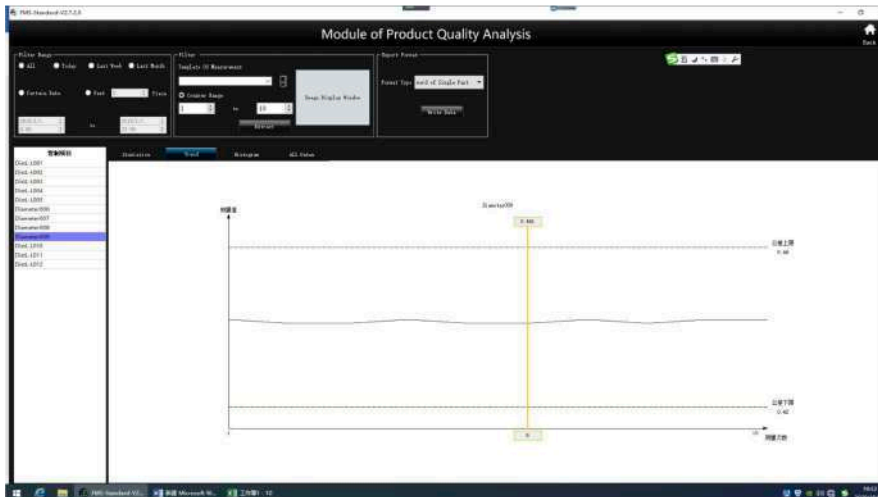
Mikrosie software provides a variety of extraction and analysis tools, the statistical analysis interface has statistical value, trend graph, histogram and data. Measurement results and main statistical information (such as average,  $\sigma$ ,  $3\sigma$ ,  $6\sigma$ , Cpk, etc.) will be automatically recorded and filed. The operator can select different filter conditions to extract history records.



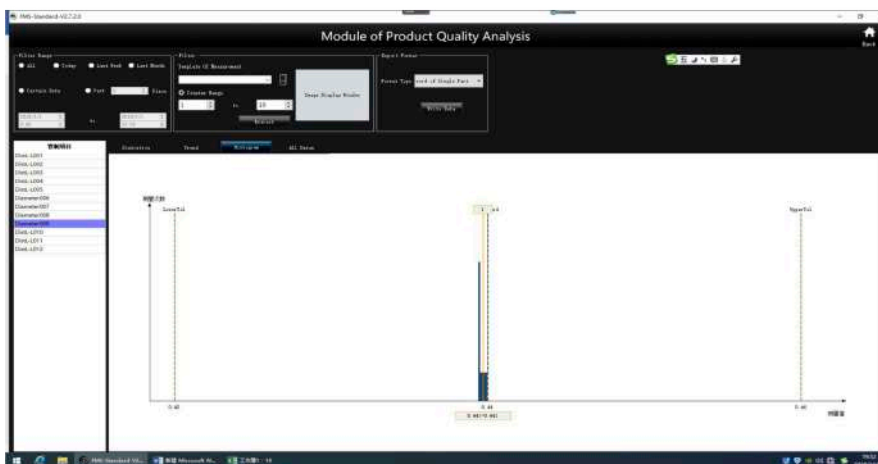
# VMQ-100 - MIKROSIZE MEASURING SOFTWARE

## PRODUCING PROCESS CONTROL AND IMPROVE PRODUCT QUALITY

The trend graph can monitor the abnormal of producing equipment and producing process through the regular tendency of measured value, such as monotonic change and periodic change of measured value.



Histogram can reflect the fluctuation and distribution of product quality, and intuitively transfer the information of quality status, which can be used to judge and predict product quality and unqualified rate. By quality diagnosis, SPC uses statistical methods to monitor the change tendency of product quality and producing process. It plays a preventive role in the producing process as to improve the product quality.



# VMQ-100 - MIKROSIZE MEASURING SOFTWARE

## Test report generated with one key

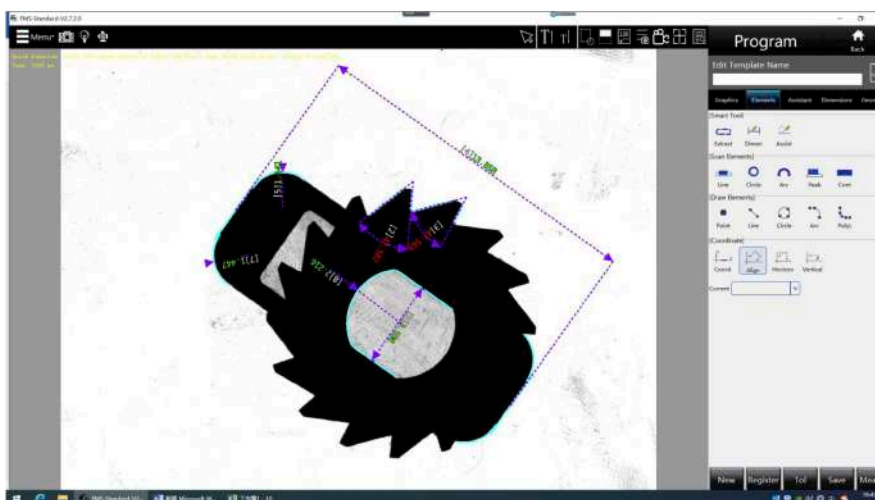
The test results report and SPC analysis report can be automatically generated with one key.

The screenshot shows a software window with a data table. The columns are labeled A through Y, and the rows are numbered 1 through 44. The table contains numerical data, and a green bar highlights a specific row. The software interface includes a menu bar at the top and a status bar at the bottom.

## Special function

- INTELLIGENT EXTRACTION FUNCTION:

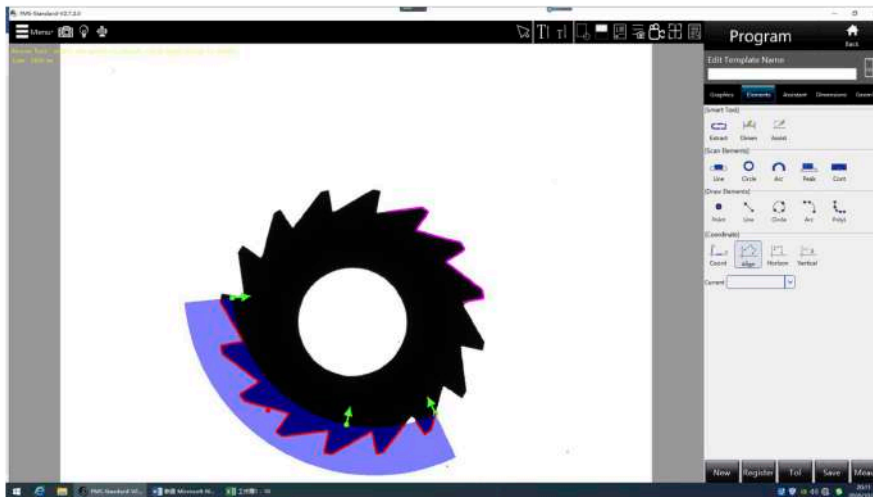
The line, arc and circle can be extracted automatically by mouse clicking the area near the elements to be measured.



# VMQ-100 - MIKROSIZE MEASURING SOFTWARE

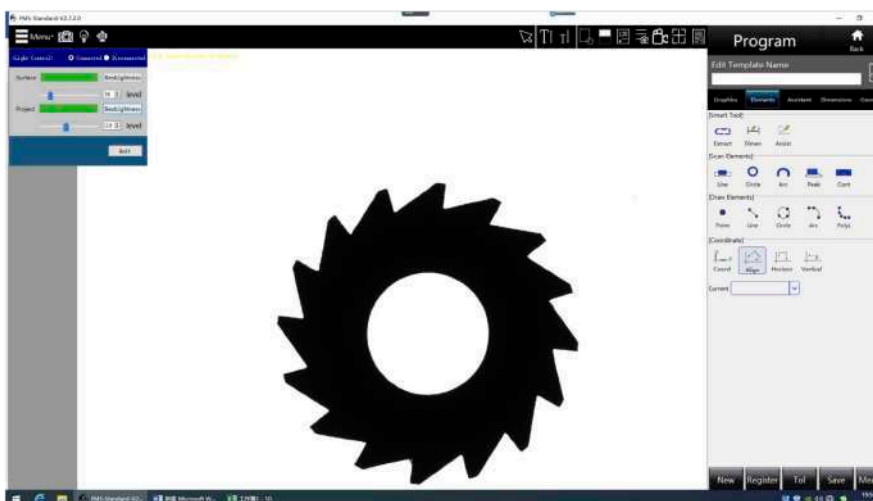
- CONTOUR EXTRACTION FUNCTION:

It provides various methods of contour extraction and contour conversion tools, which can measure irregular objects and small objects.



- AUTOMATIC LIGHTING:

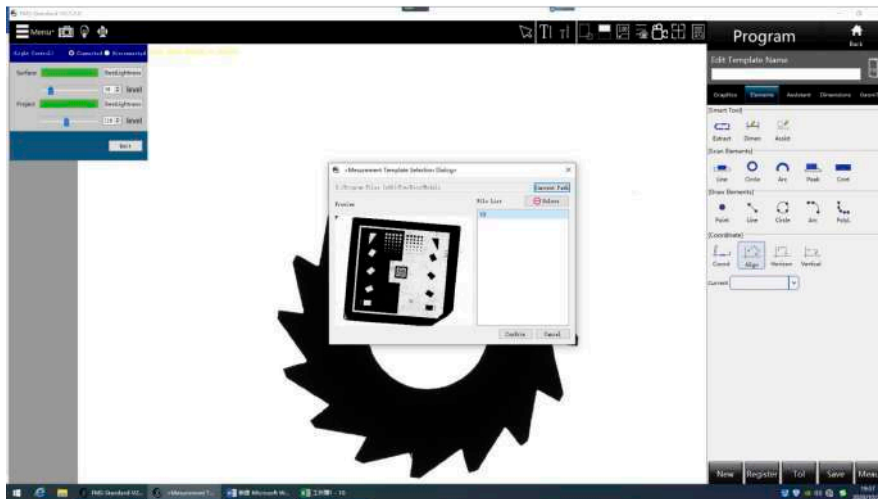
When a single lighting unit, falling lighting or projection lighting, is used, the software can automatically and quickly determine the best illumination brightness (within 5 seconds).



# VMQ-100 - MIKROSIZE MEASURING SOFTWARE

- QUICK MODULE SEARCH:

For the measurement of a large number of different spare parts, the software can automatically find out the corresponding measurement program (within 0.1s) from the measurement module pool after placing a spare part.



# **RETROFIT**

**Measuring instruments update**



# RETROFIT

## VBM SYSTEM FOR HARDNESS TESTERS AND MICRO-HARDNESS TESTERS

This system has been created to be installed on Brinell and Vickers **hardness testers** with loads up to 250 kg. The system is installed on the original instrument and this procedure is always reversible, any time. A camera with suitable technical features and the needed lenses is set up. The whole system is connected to a PC.

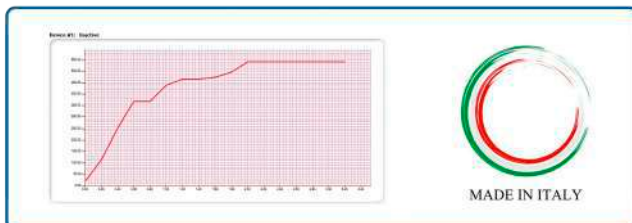
The system consists of:

- VBM measuring software
- CCD or CMOS camera
- USB security key
- CD ROM with original software
- PC on customer's request



## TC SOFTWARE SYSTEM FOR SPRING AND ELASTIC ELEMENT TESTING MACHINES

This system has been created to be installed on **spring testing machines**. It allows the user to have the same results as new and more efficient instruments, starting from machines with an outdated detection system but a very sturdy mechanical structure. New linear potentiometers or optical scales and new load cells are set up. The new system is connected to a detection unit which can interface with a PC.



The system consists of:

- TC measuring software for compression and traction testing
- Measuring optical scales or linear potentiometers for movement
- New load cell
- Digital control unit with microprocessor
- USB security key
- CD ROM with original software
- PC on customer's request

# RETROFIT

## GEAR SOFT SYSTEM FOR GEAR TESTING MACHINES

This system has been created to be installed on **manual** or **automatic gear measuring machines**. The system is installed on the original instrument; it allows the customer to obtain the same results as new and more efficient machines, starting from instruments with an outdated detection system but a very sturdy mechanical structure.

New measuring optical scales and a new testing head are installed according to the type of instrument, and the whole hardware is connected to an interface box that can be managed from any computer.



The system consists of:

- Gear Soft measuring software
- Measuring optical scales for movement
  - New LVDT testing head
  - Hardware interface box
    - USB security key
- CD ROM with original software
  - PC on customer's request

# RETROFIT

## TC SOFTWARE SYSTEM FOR TRACTION TESTING MACHINES

This system has been created to be installed on **universal testing machines**. It is installed on the original machine; it allows the customer to obtain the same results as new and more efficient instruments, starting from machines with an outdated detection system but a very sturdy mechanical structure. New linear potentiometers or optical scales, load cells and/or pressure sensors are installed according to the model and type of instrument. The new system is connected to a detection unit which can interface with a PC.



The system consists of:

- TC measuring software for traction, compression, bend and flexion testing machines
  - Measuring optical scales or linear potentiometers for movement
    - New load cell or pressure sensors (if necessary)
      - Digital control unit with microprocessor
        - USB security key
  - CD ROM with original software
    - PC on customer's request

# **NON-DESTRUCTIVE TESTING INSTRUMENTS**

# NON-DESTRUCTIVE TESTING

## ULTRASONIC THICKNESS GAUGE UT-1M



Portable ultrasonic thickness gauge UT-1M, for operative non-destructive testing of the thickness, works on the principle of ultrasounds' propagation time measurement in the analysed material.

### Advantages

- Wide range of measured thicknesses
- Convenience and ease in operation
- Minimum number of controls
- Select the type of probe through single button
- Preset velocity of ultrasound
- Graphical display with backlight
- Compensation of probe delay
- Control of the batteries
- Mapping the presence of acoustic coupling on the graphic display
- Fixation of the last measurement result in the removal of the transducer surface

## ULTRASONIC THICKNESS GAUGE UT-2A (A-Scan)

It is a powerful, lightweight and portable instrument, made in an ergonomic shock-resistant case with rubber protectors – a modern industrial version of a general-purpose thickness gauge.

### Advantages

- Wide range of measuring thicknesses.
- Function of thickness gauge and flaw detector.
- Convenience and ease in operation.
- B-scan mode, which allows user to get the product profile like a picture that is easy to read.
- Minimum number of controls.
- Select the type of probe from archive.
- Preset velocity of ultrasound.
- High brightness color display.
- Acoustic indicator of the presence of contact.



# NON-DESTRUCTIVE TESTING

## EMAT THICKNESS GAUGE UT-3M-EMA



EMAT thickness gauge allows users also to carry out tests in cases where traditional methods, such as piezo-ultrasonic, laser-optical, X-ray, mechanical, etc., are not applicable.

Electromagnetic-acoustic (EMA) technology for measuring thickness is based on the excitation of ultrasonic waves in the material by the generator of the device's probe, and fixing the path time of ultrasonic waves in the material.

The instrument automatically analyzes the signal, selects the correct measurement method, and adjusts the settings.

The gauge also features a B-scan mode. This mode gives users a visual profile of the product, like a picture, making it easy to read.

## ACTIVE EMAT TRANSDUCER

This transducer expands the capabilities of standard flaw detector /thickness gauge with A-scan up to EMAT thickness gauge. It can be used with any ultrasonic thickness gauge with A-scan that enable bipolar excitation of the required amplitude.

The transducer allows to:

- measure the thickness of metal products through rust;
- measure the thickness of metal products through coatings;
- measure the thickness of metal products through an air gap (contactless);
- take product profile through the surface's scan (\* through a special scanning trolley, buying separately).



# NON-DESTRUCTIVE TESTING

## COATING THICKNESS GAUGE TP-2020

Portable coating thickness gauge NOVOTEST TP-2020 - device for operative non-destructive testing of coating thickness with high measurement accuracy.

### Advantages

- Automatic sensor detection
- Storing individual calibrations in probes memory
- Average calculation, minimum and maximum indication
- Transfer of measurement data to PC via USB
- Shockproof housing with a special protective silicone bumper case
- Four operating modes: Normal, Control, Statistics, Automatic Averaging mode
- Different specialized probes to measure many parameters



## COATING THICKNESS GAUGE



Coating thickness knife tester is designed to measure the thickness of both single and multiple layer coatings on any grounds, both metallic and non-metallic. The operation principle is based on the local cut (notch) of the coating at the tested place of object with following thickness measurement of this coating. The thickness of coating is determined by the width of notch, it is possible because of the special form of cutter of the instrument.

The measurement is performed by any portable measuring microscope with a suitable measuring range.

Coating thickness knife tester TPN-1 complies with ISO 2808, ASTM B 4138, DIN EN 1071-2.

# NON-DESTRUCTIVE TESTING

## ULTRASONIC FLAW DETECTORS



An ultrasonic flaw detector is designed to search for voids and inhomogeneities inside the materials under testing with ultrasound. It is the most common device for non-destructive testing of metal (and other materials with low attenuation of ultrasonic waves) products in production, as well as objects in operation.

Ultrasonic flaw detector **UD2301** is a powerful, ergonomic, portable device that has all the functions of a general industrial ultrasonic flaw detectors and can be used in laboratories and workshops, and is perfect for field use. The device is supplied with PC software for uploading the measurement archive and processing the results.

Ultrasonic flaw detector **UD2303** is a compact version of an industrial flaw detector with a set of functions and modes that are designed to simplify the routine process of product quality control as much as possible. Shock-resistant aluminum alloy case with a large battery will provide a long service life of the device and ability to be used in adverse conditions. UD2303 ultrasonic flaw detector has the function of screen rotation.



The ultrasonic flaw detector **UD3701** is designed to detect internal defects, such as discontinuities and heterogeneities of materials in products and welds; determine coordinates and evaluate defect parameters; measure thickness and the velocity of propagation and attenuation of ultrasonic waves in the materials (metals, plastics, glass, etc.); the search for places of corrosion, cracks, internal delamination and other defects.



# NON-DESTRUCTIVE TESTING

## PULSE HOLIDAY DETECTOR



Pulse Holiday Detector is a device for detecting defects (thinning, microholes, cracks, etc.) in dielectric coatings on metals.

The principle of operation of the device is based on the electrospark method. A probe with electrode connected to one pole of the voltage source scans the surface of the tested object directly along the coating.

The second pole of the voltage source from the ground connector is connected directly to the metal structure.

The electronic unit fixes the gaps by voltage between the electrode and the conductive base.

## MAGNETIC FLAW DETECTOR

Magnetic flaw detector (magnetic yoke) applies in circumstances where the electric equipment must not be used or is prohibited by the rules.

Device is used during magnetic particle inspection (where it is applicable) according to ASTM E 709, ASTM E 1444, ASME Section V Article 7 and MIL-STD-1949. Magnetic flaw detector is used to detect surface and subsurface cracks of all kinds (flake, lack of fusion welded joints, tears etc.) in structures made of ferromagnetic materials.

The device has two permanent magnets placed in a cylindrical shells, which are connected by a flexible magnetic wire, so it can be used for MPI of remote locations, corner welds and other products of various shapes and sizes.



# NON-DESTRUCTIVE TESTING

## MAGNETOMETER



Magnetometer is designed to control the residual magnetization and study the magnetic heterogeneity of the surface of ferromagnetic products, to control the level of residual magnetization before welding gas and oil pipes, to control the induction of static (DC), alternating (AC) and pulsed magnetic fields generated by various magnetic and electromagnetic devices, such as magnetic particle flaw detectors, magnetic tables and chucks of grinding machines, demagnetizing devices, permanent magnets etc. The device has the ability to create a measurement archive that can be transferred to a PC using special software.

## STEEL STRUCTURE ANALYZER

Steel structure analyzer is designed for measuring coercive force of metal products and is used for non-destructive testing of chemical-thermal, thermal and thermomechanical treatments, evaluation of mechanical properties and residual stresses. It is used for determination of mechanical properties, and for measurement of the hardness of metal products, as well as measurements of products of ferromagnetic alloys in the presence of correlations between the studied parameters. In addition, the device is used for testing the surface layer of ferromagnetic material for grading the metal in steel grades. It has an electromagnet transmitter with integrated Hall sensor and removable pole tips.



# NON-DESTRUCTIVE TESTING

## ADHESION TESTERS

Adhesion is the tendency of dissimilar particles or surfaces to cling to one another. In the field of quality testing, adhesion of coatings to the base material, such as paints, plastic, epoxy mixtures, sprayed metal, laminate to wood and other metal and polymer coatings, is the most often measured. There are various instruments for adhesion testing of a coating over the base, depending on their nature and measurement's requirements.



Peel adhesion tester



Tensile adhesion tester



Bitumen and mastic insulation adhesion tester



Scratch adhesion tester



Cross hatch adhesion plate



Cross cut adhesion tester

# NON-DESTRUCTIVE TESTING

## DENSITY AND VISCOSITY CUPS

An important parameter of lubricants, paints and other liquids is viscosity. This parameter characterizes the ability of materials to resist the movement of one part relative to another.



Density cup – Pycnometer



Viscosity flow cup



Viscosity mug

## COATING HARDNESS TESTERS

The coating surface hardness testing allows to measure the scratch resistance of coatings and paints.



Pencil coating hardness tester



Scratch hardness coating tester



Buchholz coating hardness tester

# NON-DESTRUCTIVE TESTING

## BENDING COATING TESTERS

The instrument measures the elasticity and the flexural strength of coatings through rounding the test sample on the set of cylindrical rods with different diameters. Starting from the rod with maximum diameter, if it does not cause any mechanical destruction or de-lamination of paint film, the user has to continue bending the test sample on smaller rods.

The result is the minimum diameter of the rod in millimetres that causes no destruction when testing the paint film.



Bending coating tester



Conical bending coating tester



Cylindrical bending coating tester



Bending coating tester ShG

# NON-DESTRUCTIVE TESTING

## IMPACT TESTERS

The impact coating strength tester is used to check the resistance of technical products to external factors during operation (such as punching, impacts), as well as to verify the manufacturer's specifications.

There are various instruments for measurements on different types of coating, like paints, laminate and plastic coatings, and many kinds of bases.

Impact testing is useful to measure coatings resistance to damages caused by accident, but also to verify the quality of coatings during the production process, so that all required resistance standards are satisfied. Tests result is evaluated based on cracking or deformation of the coating.



Pipe impact tester



Impact tester



Impact tester Universal

## OTHER COATING TESTING INSTRUMENTS



Film applicator



Erichsen cupping tester



Pinhole detector

# NON-DESTRUCTIVE TESTING

## ROUGHNESS TESTERS

Instruments used to measure the roughness of surfaces in non-destructive way. Possibility to measure different parameters and to set various measurement profiles. They are commonly employed for quality control activities and to check incoming and outgoing goods. Compliant with international standards: ISO 4287, BS 1134, JIS B 0601, ASME B46.1.



### Portable digital roughness tester

Easy and handy, the possibility to measure different parameters makes it a professional device, suitable to operate both in production and in laboratory. It is commonly employed for quality control activities and to check incoming and outgoing goods.

### Digital portable roughness tester with external probe

Easy and handy, the possibility to measure different parameters makes it a suitable device to operate both in production and in laboratory. Due to the external probe it is recommended to be used with a stand with specific probes. It is commonly employed for quality control activities and to check incoming and outgoing goods.



### Graphic roughness tester

It is a professional instrument which allows to display the profile and choose between many roughness parameters. Equipped with a remote control to avoid any movement during the measurement, it is suitable both for use in production and in laboratory. It is commonly employed for quality control activities and to check incoming and outgoing goods.

# NON-DESTRUCTIVE TESTING

## VARIOUS NON-DESTRUCTIVE TESTING INSTRUMENTS



Grindometer



Concrete rebound hammer – Sclerometer



Strength meter



Concrete cover meter



Digital surface profile gauge



Dew point meter



Depth gauge



**ACCESSORIES  
AND  
SERVICES**

# ACCESSORIES AND SERVICES

## TECHNICAL SERVICE

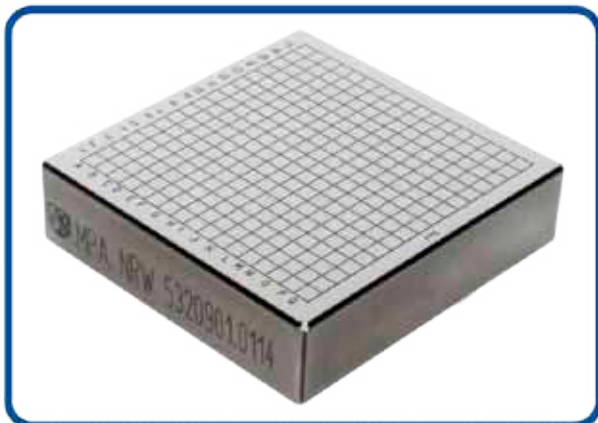


**Installation, calibration and education:** these are the services CRASE s.r.l. offers after sales. They are developed with planned maintenance contracts carried out directly by our specialized technicians.

### SPARE PARTS

The spare parts' warehouse is equipped with the whole product line, and we are able to create accessories on customer's specific request.

- Instrument work benches
- Measuring dial gauges
- Lamps and lighting systems
- Diamond indenters with calibration certificate ISO - ASTM
- Ball indenters with calibration certificate ISO - ASTM
- Spares for measuring and optical microscopes
- Measuring probes
- Workpiece holders
- Reference test blocks with calibration certificate ISO - ASTM



### ON-SITE REPAIR

In case of fault, the intervention is carried out on site by our technicians. In this way the downtime of your instrument can be reduced.



### PREVENTIVE MAINTENANCE

We provide annual maintenance contracts which establish that your instruments would be maintained at regular prearranged intervals. Thanks to these contracts you will always have calibrated and verified instruments. A regular maintenance guarantees to the customer a longer lasting in time of the machine and a better control of operating costs.

# ACCESSORIES AND SERVICES

## INSTRUMENTS REPAIR SERVICE

Equipement for metrology room of all the best brands.



### REPAIR:

Hardness testers (with issue of Accredia certificate, also on site), micrometers (also with surface polishing), dial gauges, thickness testers, glossmeters, roughness testers, bore meters, bench instruments, calipers, altimeters, profile projectors, pneumatic instruments and digital instruments.

### SUPPLY:

Masters and calibration blocks  
ORIGINAL SPARES



# ACCESSORIES AND SERVICES

## TECHNICAL CONSULTING

Thanks to technical knowledge of testing and production processes, CRASE s.r.l. offers a consulting service for choosing new or secondhand equipment to realize your project. In order to do that, we can count both on our staff and on collaborations with technicians and engineers working in the sector.



## SECONDHAND SALE

CRASE s.r.l. is in secondhand market. Various instruments are available, such as hardness testers, gear measuring machines and universal testing machines, all inspected and with a warranty. You can find the complete list of available secondhand instruments on our website [www.crase.com](http://www.crase.com).

## INSPECTION

CRASE s.r.l. offers measuring systems which allow to update almost every machine of various known brands. Our retrofits combined with mechanical inspections, carried out in our laboratory in Burago di Molgora, are able to lengthen the instrument's life, updating just the measuring system. In this way, our customers can have a modern and inexpensive testing machine.

## CERTIFICATION

We guarantee our instruments for 12 months, the quality warranty is given by the *ACCREDIA* primary certificate, accomplished by an external laboratory.

**ACCREDIA CALIBRATION CERTIFICATE:** it is a document issued exclusively by an accredited calibration centre. This certificate is officially valid in Italy and it is recognised in the EA's European States. An *Accredia* certificate guarantees that the instrument has been calibrated according to all the procedures recognised as valid by primary institutions of expertise. The *Accredia* certificates relieve the user from proving that calibrations were carried out in compliance with the standards of calibration institutions' quality system (UNI CEI EN ISO/IEC 17025) and with methods approved by *Accredia*. The *Accredia* certified instruments and test blocks are usually used as "primary standards" for calibration and control of other instruments.

**CALIBRATION REPORT WITH TRACEABILITY TO NATIONAL STANDARDS (RDT) (UNI EN ISO 10012: 2004):** it is a document released by calibration centres which assure the measurement traceability to national standards, without any validation by the responsible institutions. The validity of these documents is given by the laboratory's qualification, the technical knowledge of workers and the used metrological procedures. The customer has the right to verify these elements with on-site inspections. A calibration report can be released either by an accredited *Accredia* centre or another centre, but in the first case you will have more guarantees.



# ACCESSORIES AND SERVICES

## INSTRUMENTS' CALIBRATION SERVICE

Equipement for metrology room of all the best brands.



### CALIBRATION WITH POSSIBLE ISSUE OF ACCREDIA CERTIFICATE FOR:

Hardness testers, micrometers, dial gauges, thickness testers, bore gauges, roughness testers, bench instruments, smooth cylindrical buffers and rings, smooth flat buffers, measuring forks, set or single parallel reference test blocks, conical buffers, threaded buffers and rings, prisms, masters to design, calipers and special equipement, altimeters, profile projectors, pneumatic instruments, digital instruments, torque wrenches, thermocouples, conductivity meters, gas analyzers.



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**Chennai Metco**

