

TRIMOS TR Scan Premium

TEC Probe CLS1 M PR



Benchmark Solutions
for non-contact
surface measurements


Swiss
Measuring
Instruments

TR Scan

A Fresh and Simple Approach to Contactless Measurement

TR Scan 2D & 2D ½

- ✓ Simplicity achieved through excellence
- ✓ Contactless
- ✓ Comparable to conventional measurements
- ✓ Nanometric resolution
- ✓ Large vertical measuring range
- ✓ 90x90 mm scope of application
- ✓ Extremely stable cast-iron base
- ✓ Completely CNC controlled
- ✓ Rigid X/Y table
- ✓ Parts weight up to 20kg



INTRODUCTION

Trimos has drawn on its vast experience in metrology to develop a fresh perspective for contactless measurement.

The extremely stable mechanism enables contactless measurements down to a few nanometres.

The simple optical coupling system allows a quick change of measuring range.

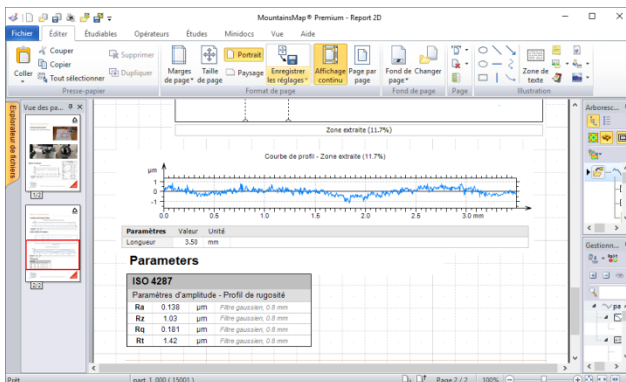
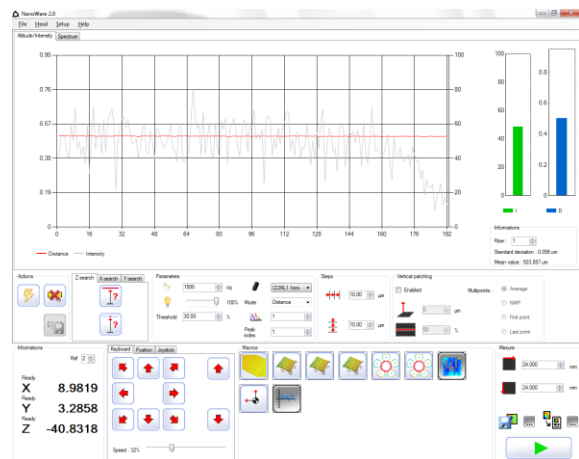


The wide range of sensors meets all your contactless measurement needs. The combination of the TR Scan with an optic with a large numerical aperture enables measurements on a 1 mm. distance with a 35-nanometre resolution and numerical aperture of +/- 45 degrees.

PROGRAM

The simplicity of the Trimos Nanoware measurement programme allows any type of 2D mode measurement.

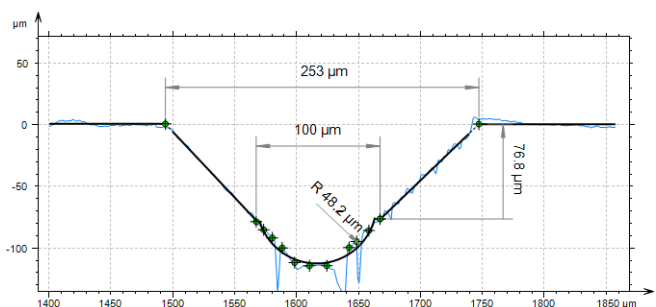
The integration of “vertical patching” enables to overstep the measuring range of the sensor. The creation of “Macro” allows entirely automatic measurement and the link with mini pallets a complete integration into the production line.



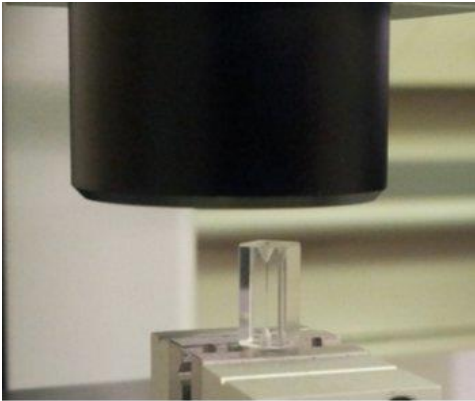
The multi-language analysis program means log sheets can be used in accordance with the current roughness standards and available parameters, such as Ra, Rz, Rq etc.

The same log sheet can be reused for several different items. A dynamic analysis can be created, allowing the selection of some specific parameters without having to remake the measurements.

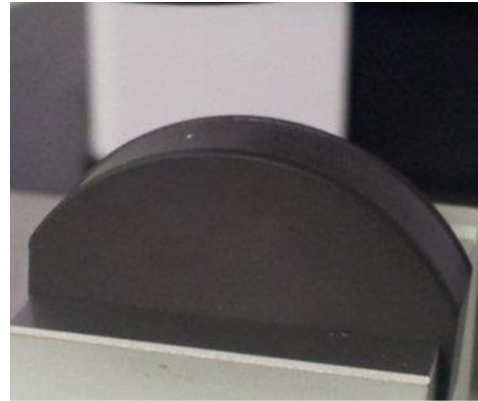
It is possible to transform your profile into a contour analysis by using our “contour” option. DXF import functions allow quick contactless contour measurements.



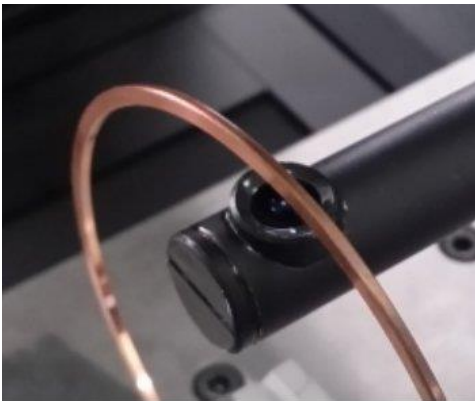
APPLICATIONS



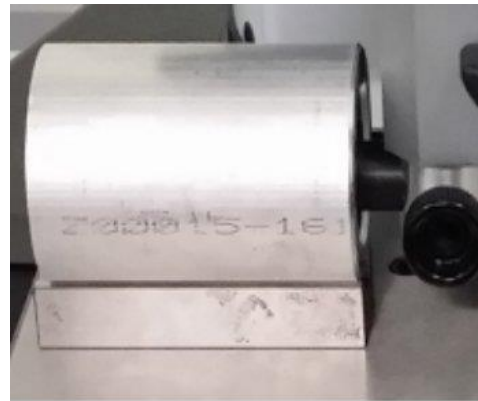
Translucid plastic parts



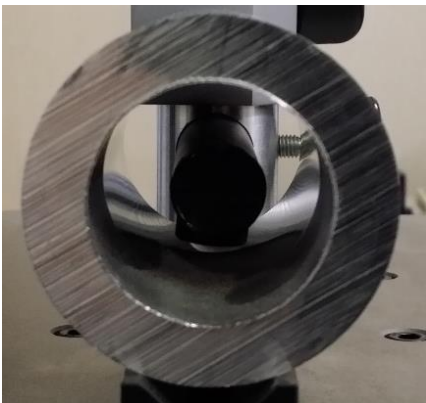
Shape on absorbing materials



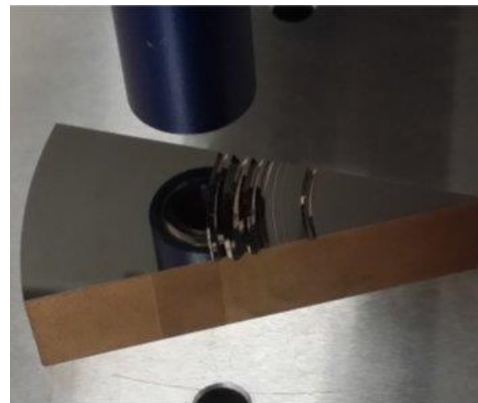
Measurements in various positions



Internal measurement on long distance



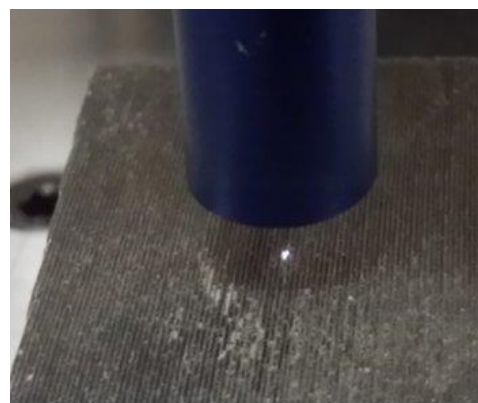
Roughness in internal diameters



Measure step / groove



Shape defects



Strong roughness

TECHNICAL DATA



Specifications	CCMP1 2D	CCMP1 2D ^{1/2}	CCMP2 2D	CCMP2 2D ^{1/2}
Maximum displacement with axis X	100 mm	100 mm	100 mm	100 mm
Maximum displacement with axis Y	-	100 mm	-	100 mm
Maximum displacement with axis Z	240 mm			
Resolution of axes X/Y/Z	0.1 µm			
Positioning accuracy X/Y/Z	0.1 µm			
Maximum weight of the item	0.7	0.7	0.7	0.7
Spot size	3.5 µm	5 µm	5 µm	4 µm
Maximum weight of the item	20 Kg			
Measuring range	* depends on the optic used			
Resolution	* depends on the optic used			
Working distance	* depends on the optic used			

OPTIC CCMP1

Optical sensor	CL1	CL2	CL3	CL4	CL5	CL6							
Measuring range	130 µm	400 µm	1400 µm	4000 µm	12000 µm	24000 µm							
Working distance	3.3 mm	11 mm	12.7 mm	16.4 mm	29 mm	19.6 mm							
Resolution	8 nm	22 nm	60 nm	130 nm	400 nm	780 nm							
Maximum angle	+/-42.5°	+/-28°	+/-25°	+/-21°	+/-14°	+/-8.5°							
MG	MG210	MG140	MG210	MG140	MG70	MG140	MG70	MG35	MG20	MG35	MG20	MG35	MG20
Spot diameter in µm	1.9	2.8	2.3	3.4	6.9	4	8	8	14	14	25.5	16	28
Lateral resolution	0.9	1.4	1.2	1.7	3.5	2	4	4	7	7	12.3	8	14
Photometric efficiency Hz	5.8	13	5.5	11.5	46	14	56	30	76	40	100	19.2	48

OPTIC CCMP2

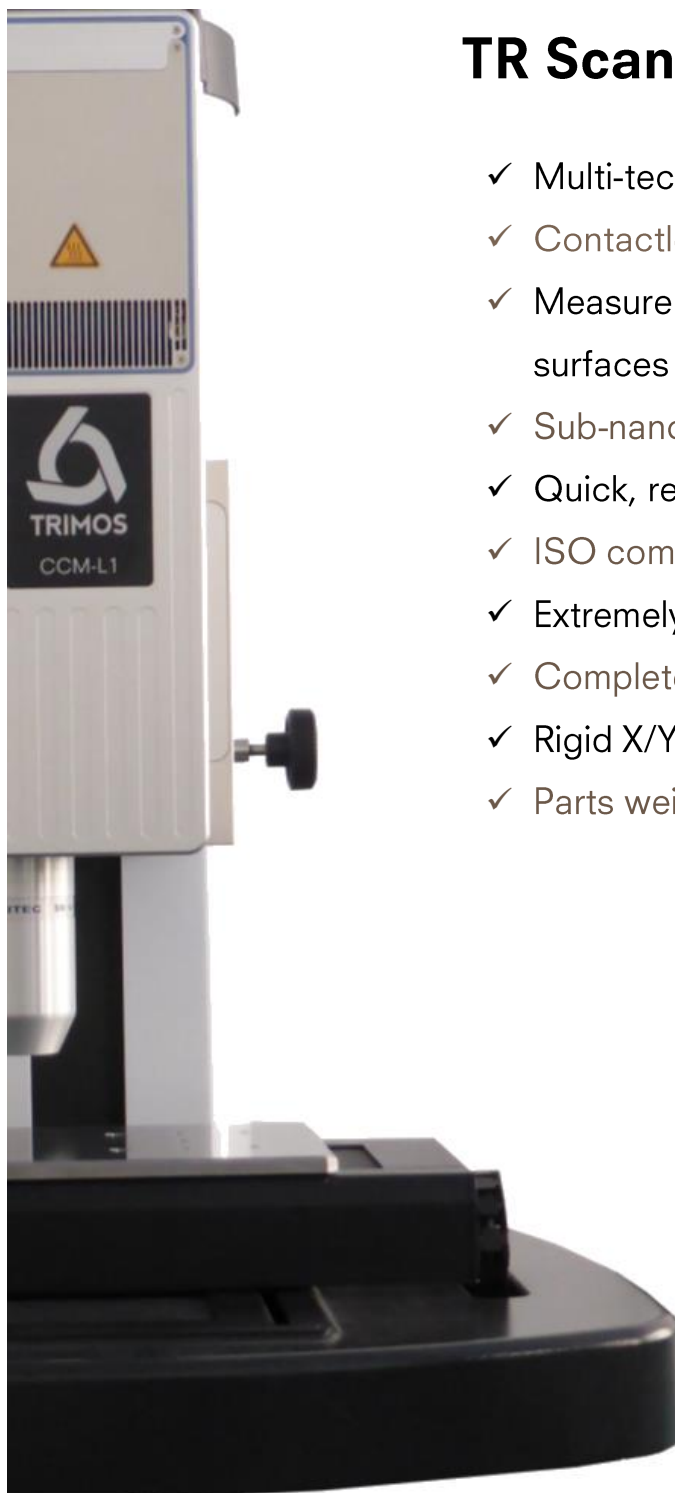
Optical sensor	CL100 µm	CL300 µm	CL350 µm	CL400 µm	CL600 µm	CL1000 µm
Measuring range	100 µm	300 µm	350 µm	400 µm	600 µm	1000 µm
Working distance 1)	1.4 mm	4.5 mm	8.4 mm	15.3 mm	6.5 mm	19.1 mm
Resolution	3 nm	10 nm	12 nm	14 nm	20 nm	35 nm
Maximum angle 2)	+/-45°	+/-30°	+/-20°	+/-45°	+/-30°	+/- 45°
Lateral resolution	1.8 µm	2.5 µm	2.5 µm	2 µm	2 µm	1.8 µm
Numerical aperture	0.7	0.7	0.7	0.7	0.7	0.26
Spot size	3.5 µm	5 µm	5 µm	4 µm	4 µm	3.5 µm
Optical sensor	CL2 mm	CL3 mm	CL6 mm	CL10 mm	CL25 mm	
Measuring range	2 mm	3 mm	6 mm	10 mm	25 mm	
Working distance 1)	61 mm	22.5 mm	35 mm	70 mm	76.5 mm	
Resolution	70 nm	100 nm	200 nm	300 nm	800 nm	
Maximum angle 2)	+/-15°	+/-30°	+/-25°	+/- 20°	+/- 15°	
Lateral resolution	6 µm	6 µm	8 µm	12 µm	12 µm	
Numerical aperture	0.26	0.5	0.43	0.33	0.26	
Spot size	12.5 µm	12 µm	16 µm	24 µm	25 µm	

- 1) Base of the sensor is in the centre of the measuring range
 2) Accuracy decreases within the limits of the refraction index $n = 1.5$



TR Scan

An Extensive Range of Contactless Measuring Products

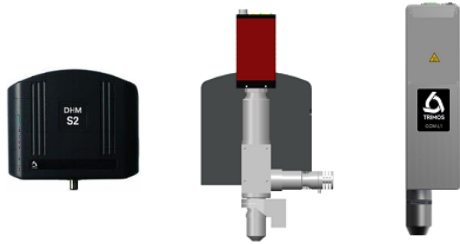


TR Scan 3D

- ✓ Multi-technology
- ✓ Contactless
- ✓ Measurements on very reflective and transparent surfaces
- ✓ Sub-nanometric resolution
- ✓ Quick, reliable and replicable measurements
- ✓ ISO compatible measurements
- ✓ Extremely stable cast-iron base
- ✓ Completely CNC controlled
- ✓ Rigid X/Y table
- ✓ Parts weight up to 20kg

INTRODUCTION

Trimos provides you with a unique, multi-technology solution allowing a wide range of measurement possibilities on reflective, non-reflective and transparent surfaces. The quick clamping system allows you to change the measuring head in seconds, without having to restart the application.



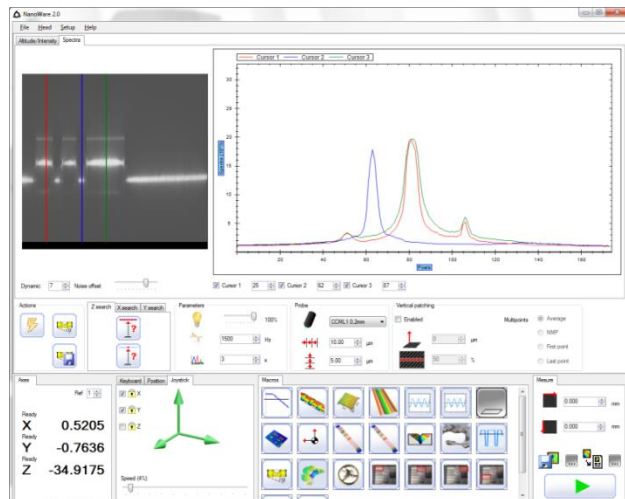
Both the wide range of high-resolution matrix measuring heads and the ultra-fast line sensor mean measurements can be taken quickly on a measurement range of several millimetres. Depending on the type of optics mounted on the system, it is possible to carry out large-scale measurements.

PROGRAM

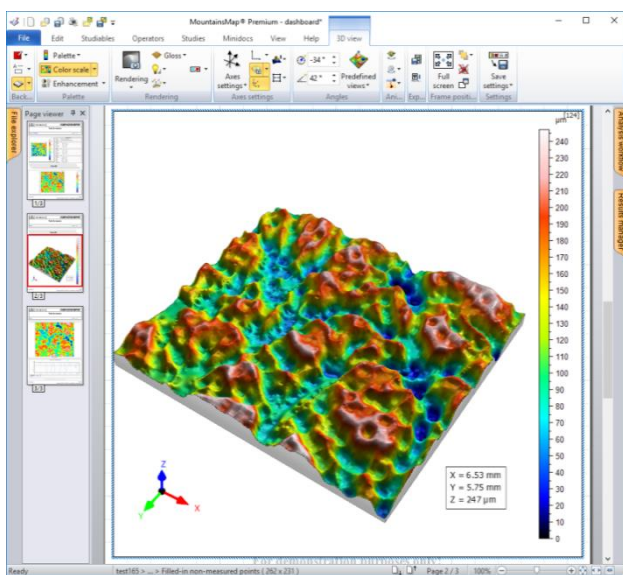
The simplicity of Trimos Nanoware measuring program enables both 3D and 2D measurements.

The "Spectra" mode means artefacts can be analysed on transparent items and enables the system to "pass through" the item taking multi-layer measurements.

"Macro" allows to carry out fully automatic measurements.



Live display of 3D topography :

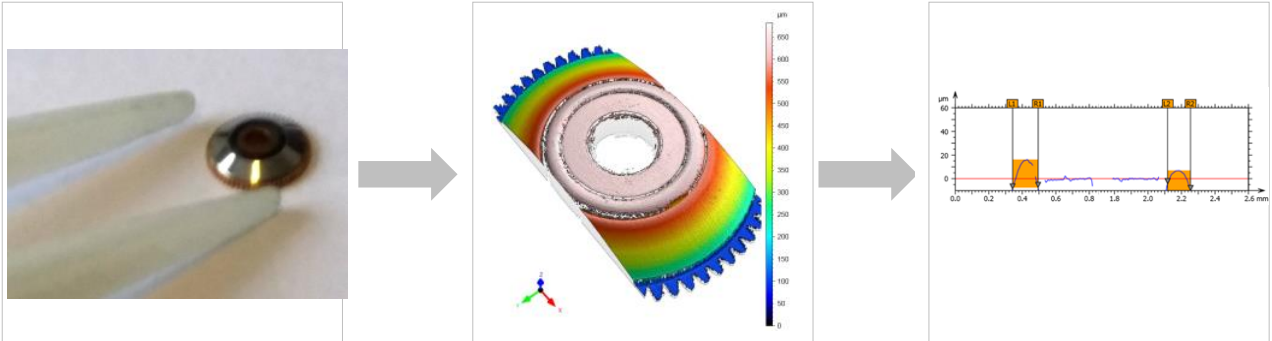


- Zoom and rotation of 3D surface topography.
- Image improvement tools.
- Choice of best lighting conditions.
- Selection of type rendered.
- Adjustment of amplification of surface height.
- Optimisation of the colour palette for the vertical scale.
- Specification of the flight plan, choice of features of interest and back-up of the "flight" as a video to use in presentations.
- View of contour diagrams and photo simulations.
- Extraction of 2D profiles from a 3D surface for visualisation and analysis.
- Conversion of RVB images into 3D pseudo images with the Z axis in intensity.

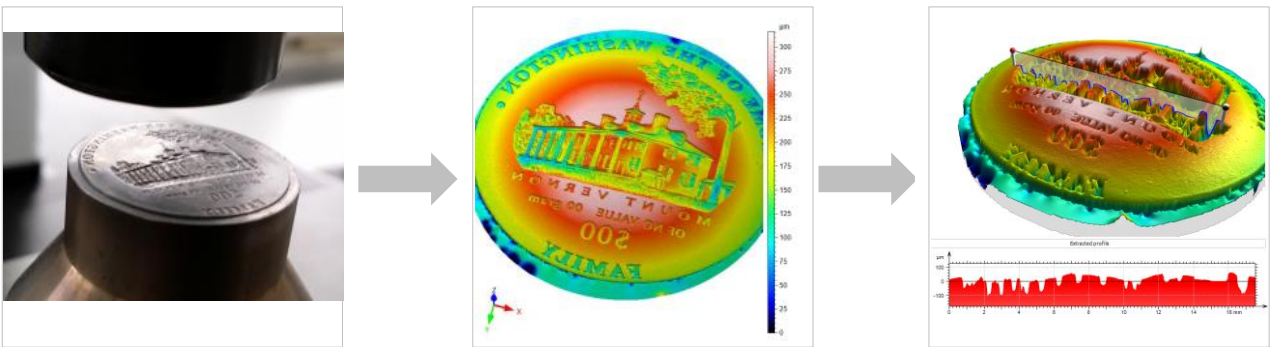
And more functionalities at your disposal.

APPLICATIONS

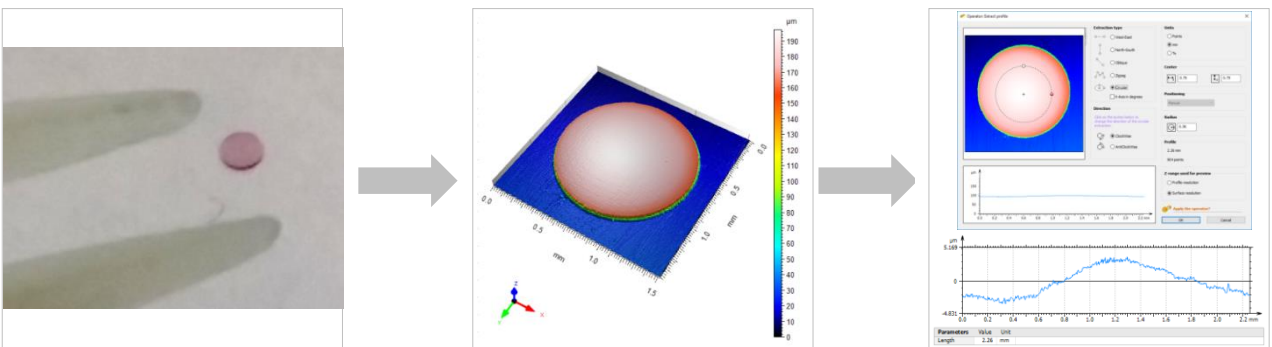
Measurement of the height of assembly on the flexible section, with various materials



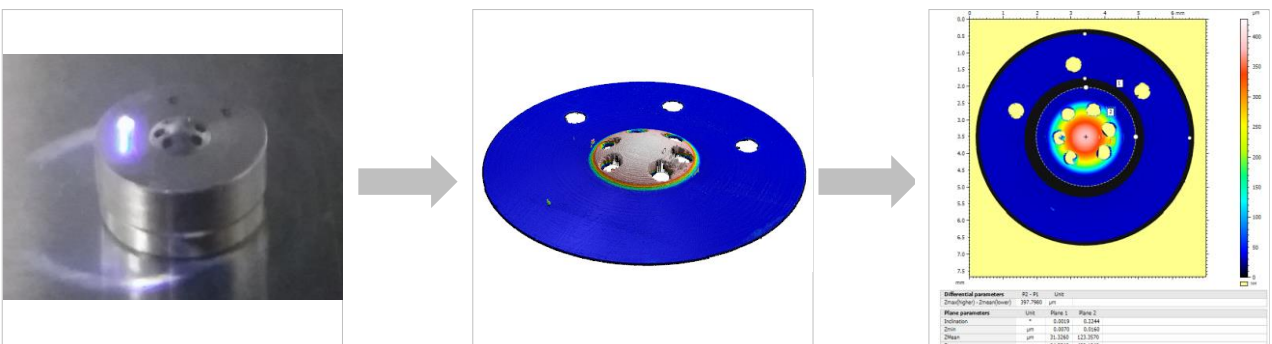
Measurement of quality / detection of imperfections / form



Control of polishing form on ruby of clockmaking



Measurement of maximum radius on a high-pressure injector



TECHNICAL DATA



LINE CCML1

Specifications	CCM-L1 0.2mm	CCM-L1 1mm	CCM-L1 4mm
Vertical measuring range	200 µm	0.95 mm	3.9 mm
Line width	0.96 mm ± 0.01 mm	1.91 mm ± 0.01 mm	4.78 mm ± 0.02 mm
Lateral range	5 µm	10 µm	25 µm
Working distance	5.3 mm ± 0.2 mm	18.5 mm ± 0.2 mm	41 mm ± 0.2 mm
Spot size	2 µm	4 µm	10 µm
Lateral resolution	1 µm	2 µm	5 µm
Axial resolution	20 nm	80 nm	320 nm
Accuracy ²⁾	± 80 nm	± 300 nm	± 1.2 µm
Numerical aperture	0.7	0.55	0.33
Maximum measurement angle	90°+/-44°	90°+/-33°	90°+/-20°
Range of thickness measurements	20 µm - 280 µm	75 µm - 1.35 mm	300 µm - 5.5 mm



DHM

Specifications	DHMS1	DHMS2	DHMS3
Z resolution	0.1 nm	0.1 nm	0.1 nm
Lateral resolution (X/Y)	0.5 µm	0.6 µm	0.6 µm
Vertical measuring range ¹⁾	3 µm	7 µm	7 µm
Measuring range X/Y	~250 µm x ~250 µm	~330 µm x ~330 µm	~330 µm x ~330 µm
Optical zoom	10x	7x	7x
Lambda 1 wavelength	~850 nm	~760 nm	~760 nm
Lambda 2 wavelength	~665 nm	~665 nm	~665 nm
Working distance	~6 mm	~6 mm	~6 mm
Specimen reflectiveness	< 1% to 100 %	< 1% to 100 %	< 1% to 100 %



WLI

Specifications	WLI 2.5x	WLI 5x	WLI 10x	WLI 20x	WLI 50x	WLI 100x
Resolution	0.1 nm	0.1 nm	0.1 nm	0.1 nm	0.1 nm	0.1 nm
Lateral resolution (X/Y)	4.81 µm	4.81 µm	1.2 µm	0.9 µm	0.66 µm	0.52 µm
Measuring range	400 µm	400 µm	400 µm	400 µm	400 µm	400 µm
Measuring range X/Y	~4536 µm x ~3447 µm	~2268 µm x ~1723 µm	~1134 µm x ~861 µm	~567 µm x ~430 µm	~226 µm x ~172 µm	~113 µm x ~86 µm
Optical zoom	2.5x	5x	10x	20x	50x	50x
Working distance	~10.3 mm	~9.3 mm	~7.4 mm	~4.7 mm	~3.4 mm	~3.4 mm

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TR Scan

OPTICAL TECHNICAL DATA



OPTIC CCMP1

Optical sensor	CL1		CL2		CL3		CL4		CL5		CL6			
Measuring range	130 µm		400 µm		1400 µm		4000 µm		12000 µm		24000 µm			
Working distance	3.3 mm		11 mm		12.7 mm		16.4 mm		29 mm		19.6 mm			
Resolution	8 nm		22 nm		60 nm		130 nm		400 nm		780 nm			
Maximum angle	+/-42.5°		+/-28°		+/-25°		+/-21°		+/-14°		+/-8.5°			
MG	MG210	MG140	MG210	MG140	MG70	MG140	MG70	MG35	MG20	MG35	MG20	MG35	MG20	
Spot diameter in µm	1.9	2.8	2.3	3.4	6.9	4	8	8	14	14	25.5	16	28	
Lateral resolution	0.9	1.4	1.2	1.7	3.5	2	4	4	7	7	12.3	8	14	
Photometric efficiency Hz	5.8	13	5.5	11.5	46	14	56	30	76	40	100	19.2	48	
Min Ra meas. 3)	< 0.1 µm		< 0.1 µm		< 0.8 µm		NA		NA		NA		NA	



OPTIC CCMP2

Optical sensor	CL100 µm	CL300 µm	CL350 µm	CL400 µm	CL600 µm	CL1000 µm
Measuring range	100 µm	300 µm	350 µm	400 µm	600 µm	1000 µm
Working distance 1)	1.4 mm	4.5 mm	8.4 mm	15.3 mm	6.5 mm	19.1 mm
Resolution	3 nm	10 nm	12 nm	14 nm	20 nm	35 nm
Maximum angle 2)	+/-45°	+/-30°	+/-20°	+/-45°	+/-30°	+/- 45°
Lateral resolution	1.8 µm	2.5 µm	2.5 µm	2 µm	2 µm	1.8 µm
Numerical aperture	0.7	0.7	0.7	0.7	0.7	0.26
Spot size	3.5 µm	5 µm	5 µm	4 µm	4 µm	3.5 µm
Min Ra meas. 3)	< 80 nm	< 80 nm	< 0.1 µm	< 0.1 µm	< 0.1 µm	< 0.1 µm
Optical sensor	CL2 mm	CL3 mm	CL6 mm	CL10 mm	CL25 mm	
Measuring range	2 mm	3 mm	6 mm	10 mm	25 mm	
Working distance 1)	61 mm	22.5 mm	35 mm	70 mm	76.5 mm	
Resolution	70 nm	100 nm	200 nm	300 nm	800 nm	
Maximum angle 2)	+/-15°	+/-30°	+/-25°	+/- 20°	+/- 15°	
Lateral resolution	6 µm	6 µm	8 µm	12 µm	12 µm	
Numerical aperture	0.26	0.5	0.43	0.33	0.26	
Spot size	12.5 µm	12 µm	16 µm	24 µm	25 µm	
Min Ra meas. 3)	NA	NA	NA	NA	NA	

1) Base of the sensor is in the centre of the measuring range

2) Accuracy decreases within the limits of the refraction index $n = 1.5$



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Axial resolution	20 nm	80 nm	320 nm
Accuracy ²⁾	± 80 nm	± 300 nm	± 1.2 µm
Numerical aperture	0.7	0.55	0.33
Maximum measurement angle	90° +/- 44°	90° +/- 33°	90° +/- 20°
Range of thickness measurements	20 µm - 280 µm	75 µm - 1.35 mm	300 µm - 5.5 mm
Min Ra meas. ³⁾	< 0.1 µm	< 0.8 µm	NA



DHM

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Z resolution	0.1 nm	0.1 nm	0.1 nm
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Working distance	~6 mm	~6 mm	~6 mm
Specimen reflectiveness	< 1% to 100 %	< 1% to 100 %	< 1% to 100 %
Min Ra meas. ³⁾	< 5 nm	< 5 nm	< 5 nm



WLI

Specifications	WLI 2.5x	WLI 5x	WLI 10x	WLI 20x	WLI 50x	WLI 100x
Resolution	0.1 nm	0.1 nm	0.1 nm	0.1 nm	0.1 nm	0.1 nm
Lateral resolution (X/Y)	4.81 µm	4.81 µm	1.2 µm	0.9 µm	0.66 µm	0.52 µm
Measuring range	400 µm	400 µm	400 µm	400 µm	400 µm	400 µm
Measuring range X/Y	~4536 µm x ~3447 µm	~2268 µm x ~1723 µm	~1134 µm x ~861 µm	~567 µm x ~430 µm	~226 µm x ~172 µm	~113 µm x ~86 µm
Optical zoom	2.5x	5x	10x	20x	50x	50x
Working distance	~10.3 mm	~9.3 mm	~7.4 mm	~4.7 mm	~3.4 mm	~3.4 mm
Min Ra meas. ³⁾	NA	NA	< 80 nm	< 20 nm	< 5 nm	< 5 nm

3) Measurement carried out perpendicularly on a sinusoidal symmetrical metallic surface

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