

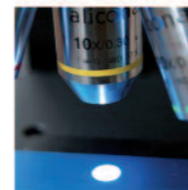
OPTICAL 3D MICRO-COORDINATE MEASUREMENT FORM & ROUGHNESS



MEASURE

- » FORM AND ROUGHNESS WITH ONLY ONE SYSTEM
- » SMALL RADII AND ANGLES EVEN ACROSS LARGE MEASUREMENT VOLUMES
- » STEEP FLANKS UP TO 86°
- » MATERIAL WITH VARYING REFLECTION PROPERTIES
- » SURFACES INCLUDING REGISTERED 3D COLOR INFORMATION
- » COMPONENTS AROUND 360° TO PERFORM FULL FORM MEASUREMENT OF E.G. TOOLS
- » IN BOTH RESEARCH AND PRODUCTION AND ACHIEVE A VERTICAL RESOLUTION OF UP TO 10NM

How Focus-Variation works



The specimen is placed onto the stage and is illuminated with modulated light. This light is transmitted through the optic and focused through a beam splitter onto the specimen. Coaxial illumination is created.



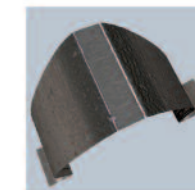
The light is reflected by the specimen and projected on to a digital sensor in the precision optic. Depending on the objective selected various lateral and vertical resolutions can be achieved.



As the distance between specimen and objective is varied the change of sharpness is measured. Depending on the 3-dimensional structure of the specimen some areas are depicted sharp or not, the sharp data is used to construct the 3D dataset.



Essential to the measurement result is the correct interaction of modulated illumination with continuous vertical movement and the quality of the sensor measurement. This process is achieved with the SmartFlash technology developed by Alicona.



For every position on the object the sharp regions are measured. The variation of the sharpness values is used for the measurement of the 3D-position. This is how dense 3D-datasets are created.

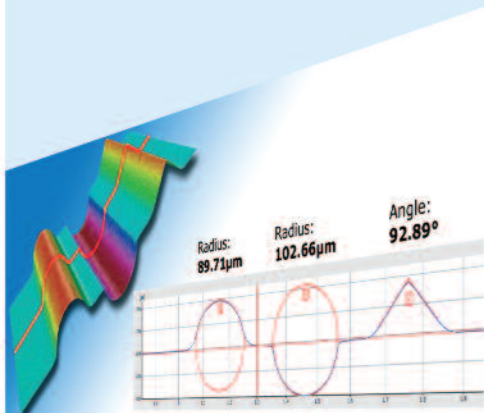
Objectives Details

Objectives		2,5x	5x	10x	20x	50x	100x
Lateral sampling distance	µm	3.52	1.76	0.88	0.44	0.18	0.09
Min. lateral resolution	µm	58.71	23.48	11.74	8.8	6.4	4.4
Max. lateral resolution	µm	6.92	3.49	1.75	0.88	0.64	0.44
Min. repeatability (vert.)	µm	0.8	0.12	0.03	0.015	0.008	0.003
Best vertical resolution*	nm	2300	410	100	50	20	10
Working distance	mm	8.8	23.5	17.5	13.0	10.1	3.5
Field of view X	µm	5716	2858	1429	715	286	143
Field of view Y	µm	4351	2175	1088	544	218	109
Max. measurable height (approx.)	mm	8	22	16	12	9	3.2
Step height accuracy (1mm height step)	%	-	0.05	0.05	0.05	0.05	0.05
Min. measurable roughness (Ra)**	nm	7000	1200	300	150	60	30
Min. measurable roughness (Sa)**	nm	3500	600	150	75	30	15

*) Vertical resolution can be adjusted depending on the application, this also influences the scan speed.
**) The minimum measurable values are dependent on the structure of the specimen.

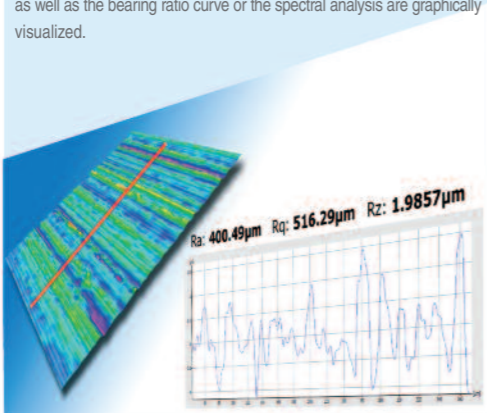
Form measurement of a profile

Profile-Form measurement – form measurement along a user defined profile
Measure radii, angles, height steps and normal distances manually or automatically.



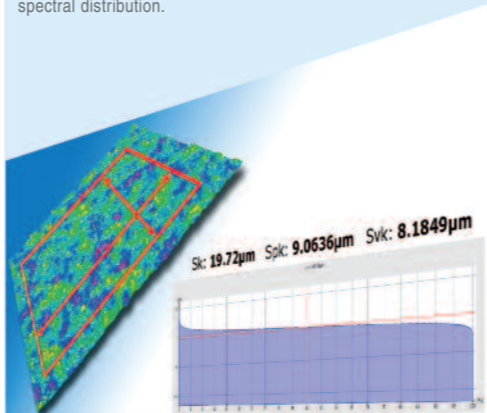
Roughness measurement, profile based

Profile-Roughness measurement – roughness measurement conforming to EN ISO 4287, 4288
The roughness is measured with comprehensive parameter evaluation of roughness, waviness and frequency analysis. Statistical evaluations as well as the bearing ratio curve or the spectral analysis are graphically visualized.



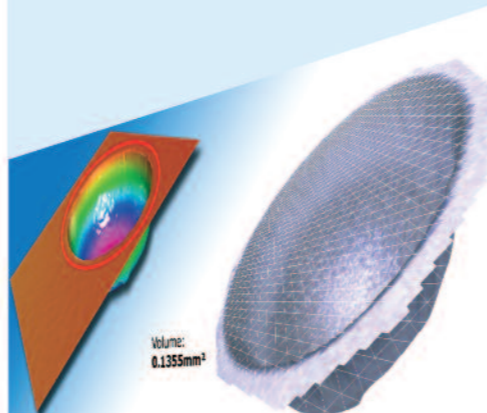
Surface texture measurement, areal based

Surface measurement conforming to EN ISO 25178
Measurement of several common surface parameters including statistical evaluation: Bearing area curve, fractal dimension, auto-correlation, gradient distribution, local homogeneity and spectral distribution.



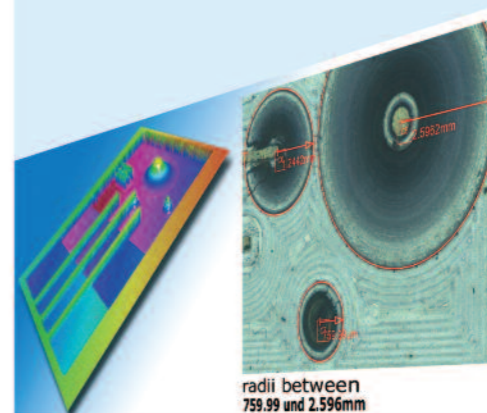
Volume measurement

Quantification of pits and peaks
The volume is measured according to a defined border. The extensive definition of cutting layers or cutting surfaces support a global tool.



2D image measurement

Evaluation of 2D-geometries
In the 2D-view of the measured surface features as circles, straight lines, angles, parallel lines, distances, ellipses, rectangles etc. are quantified.



Automation

Programmable solution for repeating measurement tasks
Several InfiniteFocus measurement applications are programmable. No matter if it is a simple profile form measurement or the more complex hardware control.

