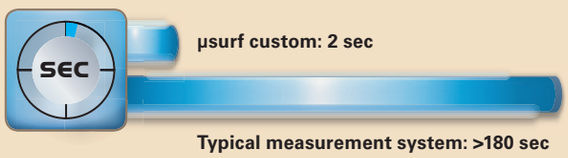
Measurement in seconds

No sample preparation is required for measurement with µsurf explorer. The object simply needs to be placed on the sample stage. Following selection of the measurement parameters, the measurement starts automatically. Useful measurement data are available after 2 to 10 seconds for further analysis.

With the µsoft analysis protocol templates you obtain full evaluation protocols within a few seconds

NEW **Reduced measuring time: only 2 instead of 5 seconds!**



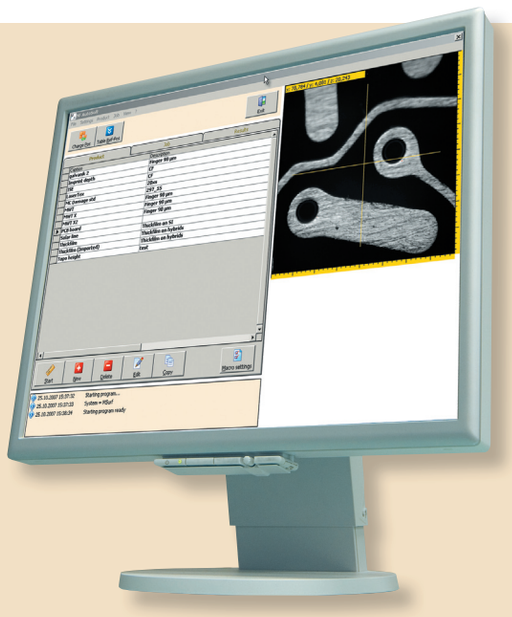
µsurf custom: 2 sec

Typical measurement system: >180 sec

Convenient automation

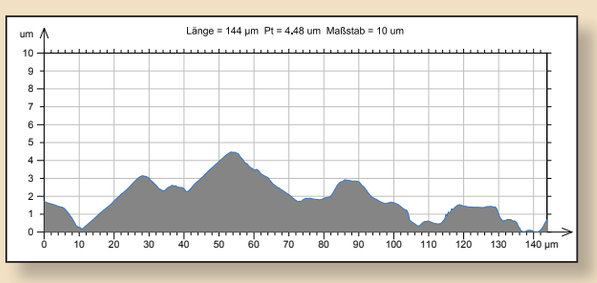
The µsoft automation software enables automated measurements to be carried out at defined points on a sample and the measurement parameters to be preset. This is done by creating a unique measurement recipe in which any number of individual measurements can be stored per measurement process. New measurement templates can be created quickly and easily using the joystick. Measurement coordinates and parameters are transferred directly to the template at the touch of a button.

Measurement data evaluation can be performed via external analysis software such as µsoft analysis or using optional evaluation modules.

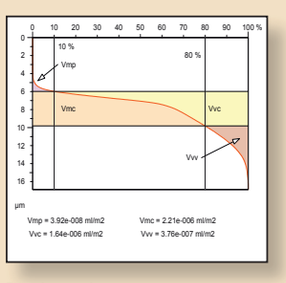


Real 3D measurement data

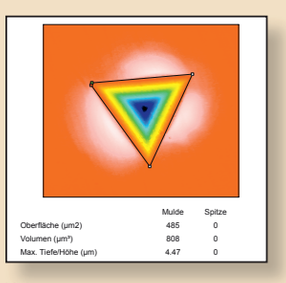
Real 3D data are available after each measurement. Only these quantitative data allow an accurate evaluation of 3D parameters. Besides standardized surface and 3D parameters, µsurf analysis also offers numerous other functions, such as volume determination, calculation of isotropy or particle analysis. Of course, the software also includes all DIN EN ISO standardized 2D parameters and a wealth of international characteristic values.



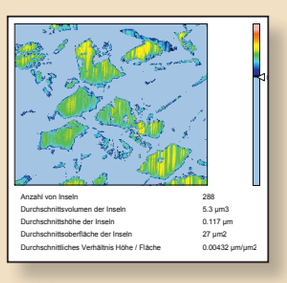
Geometry



Bearing ratio



Volume



Particles

nanofocus
see more

Specifications

Measuring head

Image aquisition module standard*	Fast digital camera with progressive scan technology, up to 55 fps, 512×512 pixel, 10 bit, firewire
Image aquisition module megapixel	Fast digital camera with progressive scan technology, up to 90 fps (Binning), 984×984 pixel, 12 bit, firewire
Light source	High efficiency LED (lambda = 505 nm), MTBF: 50,000 h
z-axis module (piezo)	Fast precision scanning module, range: 250 µm, optional range: 500 µm
z-axis positioning module	Precision scanning module, range: 100 mm, resolution: 0.1 µm
Off-axis-camera*	Color-off-axis camera with 8×6 mm² field of view for 1×, zoom function up to 10×, ring light
RGB module*	Exposure of selective color information
Collision stop*	Automatic switch-off in case of collision (z-axis module, piezo)

* optional

L-stand

Dimensions, weight	Granite L-stand: 410×450×900 mm³ (l×w×h), approx. 80 kg, including passive absorbance
Container dimensions	560×800×750 mm³ (l×w×h)
x,y-axis positioning module MS 100	Motorized x,y-axis positioning table, 100×100 mm², usable area: 252×152 mm², max. sample weight: 5 kg

Bridge

Dimensions, weight	Granite bridge: 900×750×900 mm³ (l×b×h), approx. 300 kg, active and passive absorbance
Container dimensions	550×660×600 mm³ (l×b×h)
x,y-axis positioning module	Motorized x,y-axis positioning table, 200×200 mm² or 300×300 mm²*, max. sample weight: 10 kg

* further more on request

Optical modules

	3200S	1600 S	800L	800S	800XS	320L	320S	320XS***	160L	160S
Magnification	5×	10×	20×	20×	20×	50×	50×	50×	100×	100×
Measuring field (µm)	3200×3200	1600×1600	800×800	800×800	800×800	320×320	320×320	320×320	160×160	160×160
Numerical aperture	0.15	0.3	0.4	0.45	0.6	0.5	0.8	0.95	0.8	0.9
Working distance (mm)	20	11	12	3.1	0.9	10.6	1	0.3	3.4	1
Resolution in z-direction (nm)*	150	20	6	5	4	4	2	2	2	1
Resolution in x,y-direction (µm)**	3.3 (6.3)	1.6 (3.1)	0.8 (1.6)	0.8 (1.6)	0.8 (1.6)	0.3 (0.7)	0.3 (0.7)	0.3 (0.7)	0.2 (0.3)	0.2 (0.3)
(Binning mode)										

* Noise level, ** pixel resolution, *** not with 500 µm z-axis module
L: long working distance, S: normal working distance, XS: short working distance

Software

µsoft control	NanoFocus measurement and analysis software, profile and topography representation, roughness calculation compilant with DIN EN ISO
µsoft analysis*	Software to analyse 3D measurement data, layout function, templates for series measurement and analysis
µsoft automation*	Software for automated measurement and analysis, including analysis of solar specific measuring tasks

* optional, for specifications view corresponding data sheet

General

PC	High performance industrial PC with Raid system, 19" TFT monitor, 2× Front-USB, 4× USB, 2× LAN
File formats, file size	NMS, OMS, ASCII, SDF, TIF, BMP, MNT, SUR; single measurement approx. 3 MB, binning 0.8 MB
Typical measuring time	2-10 seconds
Sample properties	Reflectivity: 1-100 %, coated, uncoated, high reflective to diffuse
Power supply	100-240 V, 50-60 Hz, input approx. 550 VA
Accessories	Vacuum chuck, flatness and calibration standards, sample fixture, working table, housing

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Are you interested in other NanoFocus-Technology?
Please call +49 208 62 000-0 or write an email to sales@nanofocus.de

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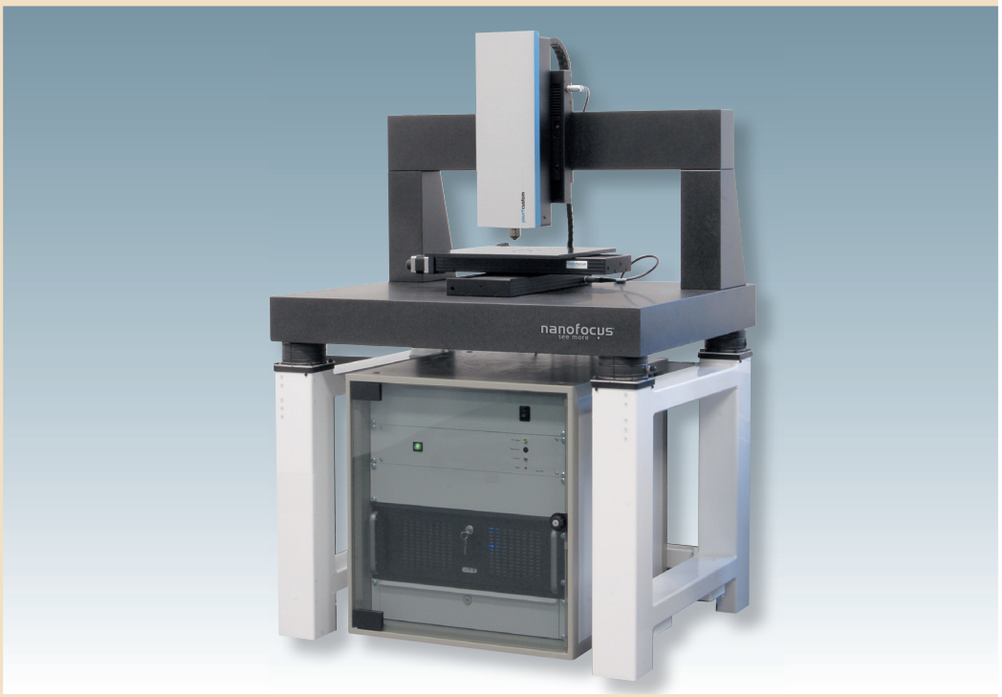
Confocal 3D surface measurement system

nanofocus
see more

µsurf custom



- Optical, non-contact
- User friendly, simple operation
- Nanometer accuracy
- Robust technology
- Automatable
- Flexible hard- and software
- Extended measuring field with stitching

Fast measurement, simple operation, and high reproducibility are the outstanding features of the µsurf custom confocal 3D surface measurement system by NanoFocus.

The µsurf custom non-contact measurement system is based on the fast and robust CMP technology (confocal multi-pinhole) developed by NanoFocus. The system captures exact three-dimensional structures and complex geometry in the micrometer and nanometer range. High reproducible measurement is even possible on surfaces with steep edges and areas of discontinuity. The wide dynamic range offers a broad spectrum of measurable surfaces – from high reflective to rough.

The robust opto-mechanical principle makes µsurf custom insensitive to mechanical oscillations and vibrations. The system works reliably, both in the QA and testing laboratory and in harsh production environments.

NanoFocus will design your µsurf custom exactly according to your requirements. Every measurement system is tailored to the needs of the customer. You can be sure of the economically efficient implementation of your measurement task. The hardware and software can be upgraded and retrofitted. µsurf custom grows with your demands on automation, measurement convenience and precision.

Application

- **Tribology:** Topography and roughness measurement of sheet metal surfaces, wear and material properties of engine components and medical implants.
- **Precision parts:** Measurement of form and roughness compliant with DIN EN ISO standards. NanoFocus µsurf custom results are fully comparable with stylus systems.
- **MEMS:** Form and roughness of micro-injection cast components, micro optics made of silicon glass or polymers, micro geometry of actuators.
- **Semiconductors:** Roughness of contacts, geometry measurement in electronic packages, layer thickness, wafer angle geometry, roughness of backside grinded wafers.

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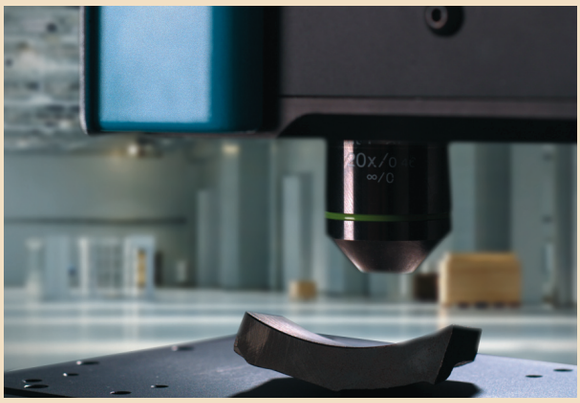
Robust and reliable

Measurement is effortless and reliable, even in harsh production environments. Environmental influences, such as vibrations, dust or splashed water do not affect the precision of the measurement results. Low maintenance and durable components are used in µsurf explorer, for example a high power LED. This guarantees an instrument always ready for use and saves costs.



µsurf custom in production.

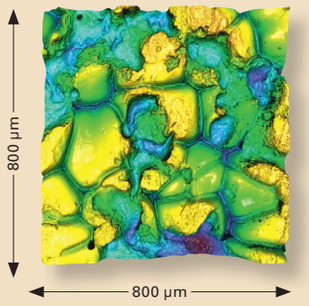
Flexible all round measurement solution

µsurf custom is ideal for a broad spectrum of materials. From polymers to metals through to composite materials, all surfaces can be transformed into precise measurement data. Special algorithms, measurement modes and analysis programs open up an enormous bandwidth of measurement tasks.

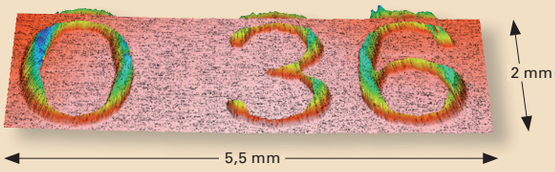
The stitching function is a standard and allows expanded measurement fields.

µsurf custom is suitable both for automated quality assurance in production, as well as for versatile use in the research laboratory.

hot-dip galvanised metal sheet



8x3 stitching of a laser mark

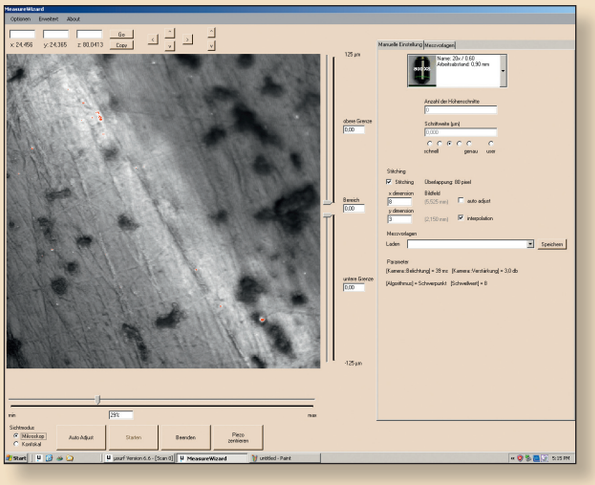


User-friendly concept

The basic concept of µsurf custom is simple and intuitive operation of hardware and software. Even untrained operators can generate significant measurements after a brief induction period.

The one click function provides for measurements on the same type of sample or on series components. The measurement settings can be set once for the entire measurement series. Linking with individually configurable protocol templates makes evaluation easy, reliable and meaningful.

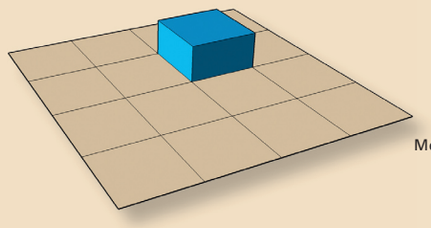
The user obtains additional support with the auto-adjustfunction. The measuring range and light intensity are automatically set by the system.



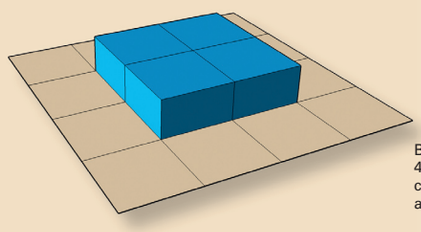
High-resolution image acquisition module

With up to 984×984 pixels, the µsurf custom image acquisition module offers nanometre-scale lateral resolution. This system is based on the innovative confocal multi-pinhole technology combined with a precise piezo adjustment module. Depending on the lens magnification, individual measuring field sizes ranging from 3.2×3.2 mm to 160×160 µm with freely selectable lateral resolution are available.

The image acquisition module has a genuine 2×2 binning mode. This enables 4 single pixels to be combined to form a pixel block, which increases the sensitivity of the pixels, allowing the image acquisition module to be read more quickly. This increases the speed from 58 fps to 90 fps at constant dynamic range.



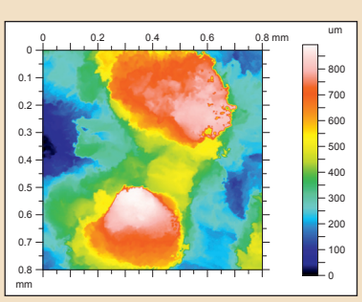
Megapixel mode

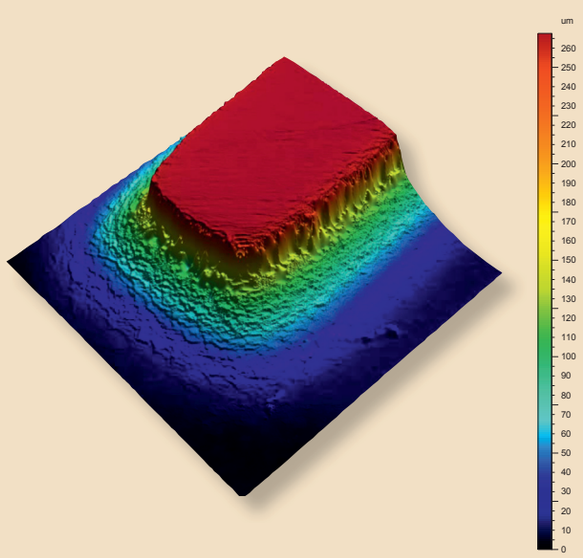


Binning mode:
4 single pixels are combined to form a pixel block.

Selectable measurement modules

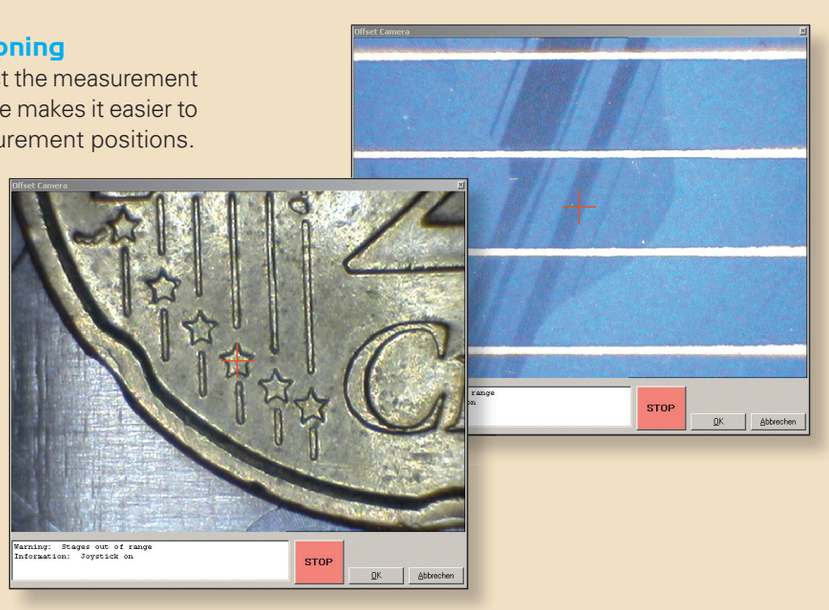
Measurement modules with 250 µm and 500 µm are optionally available. The 250 µm piezo module is perfect for capturing fine structures, whilst the 500 µm piezo module is the ideal solution for larger structures. This enables significantly quicker stitching measurement in samples with large height differences, since the z axis does not have to be traced.





Off-axis camera for easy positioning

The off-axis camera helps the user select the measurement range. This convenient piece of hardware makes it easier to locate and move to the relevant measurement positions.



More information with true colour representation

The RGB module provides additional information about the surface texture by simultaneously capturing 3D structures and true colour. This combination of height, intensity and colour data gives the measurement results a particularly rich depth of focus, making the measurement substantially more accurate and increasing the options for evaluation.

Compact with L-stand

The µsurf custom is available in two different designs. The confocal system with L-stand is the perfect entry level model in the µsurf custom range. Thanks to its compact design, it is space-saving, yet suitable for a wide range of tasks in the measuring laboratory.

Optimum flexibility with bridge design

The bridge design enables the axes to be individually adjusted to the samples to be measured. For example, positioning stages can be extended into the metre range. The µsurf custom bridge version is also available with housing, which provides additional protection from environmental influences such as moisture and dust.