

NaniteAFM

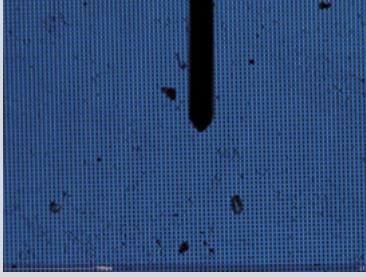
Mountable AFM for industrial applications

Compact

Robust

Easy to integrate

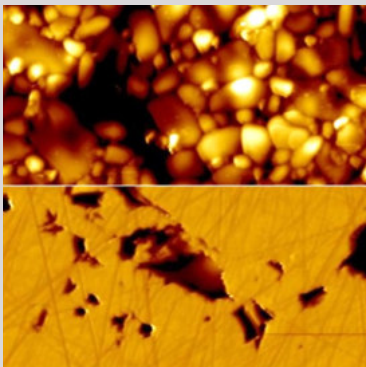




Top view image by the high resolution NaniteAFM video camera showing the AFM cantilever on a test grid. The individual structures of the grid are approximately $5\ \mu\text{m} \times 5\ \mu\text{m}$ in size.



Simultaneous side view image of the same cantilever and sample. Availability of side view is ideal for a first coarse approach.



Unpolished (top) and polished (bottom) ceramic plate. The respective roughness values were determined to be 570 and 310 nm. Polishing scratches are visible in the bottom image. This quantitative and qualitative surface information can help optimize the polishing process and its QC. Image size: $90\ \mu\text{m} \times 90\ \mu\text{m}$.

NaniteAFM: Mountable AFM for industrial applications

The unparalleled small footprint of the NaniteAFM scan head and its high-precision/quick lock mounting system make it the ideal atomic force microscope for integration into automated industrial environments. With a resolution below one nanometer, the NaniteAFM is capable of detecting and visualizing even the smallest surface structures. Simple handling and a multitude of integration possibilities will elevate your product analysis to the next level. Check coatings for intended structures or irregularities alike, or use additional measurement modes to detect features not visible in topography alone. Its ease of use and reproducibility make the NaniteAFM the perfect quality control tool for precision engineering, production process optimization, or semiconductor fabrication — just to name a few.

NaniteAFM scan head specifications

Scan head type	110- μm	70- μm	25- μm
Maximum scan range ^(1,2)	110 μm	70 μm	25 μm
Maximum Z-range ⁽¹⁾	22 μm	14 μm	5 μm
XY-linearity mean error	< 0.6%	< 1.2%	< 0.7%
Z-measurement noise ⁽³⁾ (RMS, Static mode)	typ. 350 pm (max. 500 pm)	typ. 350 pm (max. 500 pm)	typ. 80 pm (max. 150 pm)
Z-measurement noise ⁽³⁾ (RMS, Dynamic mode)	typ. 90 pm (max. 150 pm)	typ. 90 pm (max. 150 pm)	typ. 30 pm (max. 50 pm)
Mounting	Removable scan head ($86 \times 45 \times 61\ \text{mm}$) with 3-point quick-lock mounting plate, mountable to Nanosurf or custom stages		
Alignment of cantilever	Automatic self-alignment for cantilevers with alignment grooves		
Automatic approach range	4.5 mm (1.5 mm below focal plane of internal optics)		
Sample observation	Dual USB video camera system (simultaneous top and side view): Top view: 3.1 MPixel color CMOS camera 4 \times optical magnification (+digital zoom via software) Maximum field of view $\approx 1.75\ \text{mm} \times 1.25\ \text{mm}$ Maximum resolution $\approx 2.1\ \mu\text{m}$ Numerical aperture ≈ 0.115 Side view: 1.3 MPixel monochrome CMOS camera		
Sample illumination	White LEDs (brightness 0–100%); Axial illumination for top view		

(1) Manufacturing tolerances are $\pm 10\%$ for the 110- μm scan head and $\pm 15\%$ for the 70- and 25- μm scan heads

(2) Maximum scan range at 45° scan rotation

(3) Measured using the C3000 controller

Compatible cantilevers

Cantilevers for the NaniteAFM scan head should have all of the following properties:

- Grooves that are compatible with the alignment chip used by NanoSensors, NanoWorld, Applied Nanostructures, BudgetSensors, and VISTAprobes
- A nominal length of 225 μm or more, and a width of 40 μm or more
- A coating on the backside of the cantilever to reflect (infra)red light

Options and accessories

NaniteAFM Sample Stage, Automated Translation Stage 204, Isostage, Micrometer Translation Stage, Acoustic Enclosure 100, 300 or 500, Small Sample Heater, AFM Extended Sample Kit

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