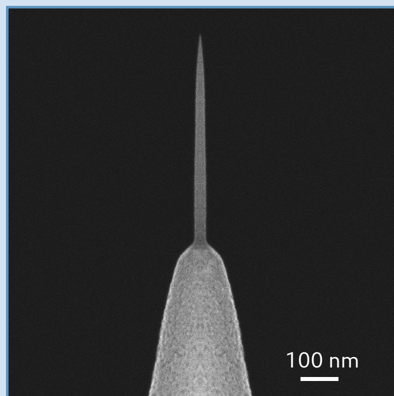
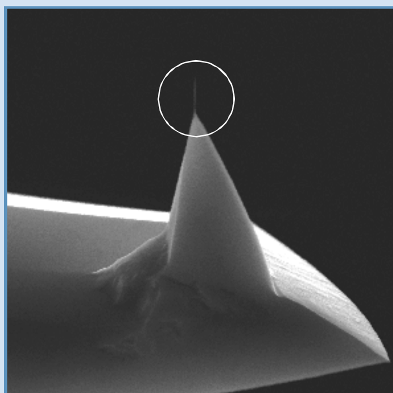
Provided with **TrueDimensions** Online access to key probe parameters for every individual tip

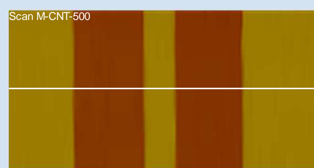
Type: MCNT-500™



MCNT-500™ SEM scan (MAG 100kx).



MCNT-500™ on the very end of a NT-RTESPA AFM probe.



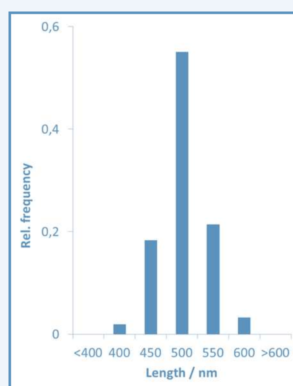
Individual NanoCD line feature (top) and the corresponding average profile (bottom) measured with a MCNT-500™.

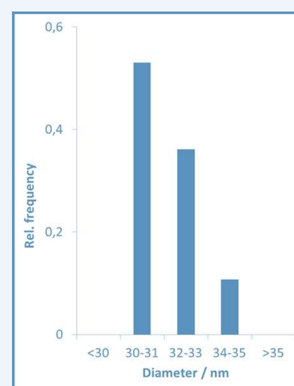
Amorphous CNT solution for high-end depth metrology
Ultrathin, post-like AFM tip for the most challenging depth applications in semiconductor process control. The unique combination of precisely controlled post-like shape parameters and the exceptional wear resistance of high-density diamond-like carbon significantly improves accessibility and throughput in depth metrology applications.

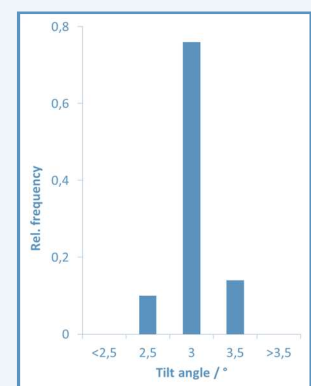
Features

- **Controlled shape.** Precisely controlled tip length of 500 nm and tip width of 30 nm.
- **Controlled orientation.** Precise tilt compensation within ±0.5° for enhanced access capabilities to bottom trench features.
- **Constant resolution.** Uniform tip width for long-lasting high-resolution measurements.
- **Improved throughput.** Excellent tip material properties for consistent performance and reduced cost per measurement.
- **Quality guaranteed.** 100% quality control for every individual tip. Online datasheets including individual dimensional values available 24/7 via QR code.

Controlled tip parameters







Histograms of the MCNT-500™ tip parameters length (left), diameter (center) and tilt angle (right). The relative frequency is shown as a function of tip parameter value ranges. The highly controlled fabrication process allows for the realization of tightest tip parameter specifications thus enabling reliable and consistent tip performance.[1]

NT_CNT500_v0010
NT_CNT500_v0020

[1] Schmidt S. W. et al., *Proc. SPIE*, 8673, 2013.

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Online access to key probe parameters for every individual tip

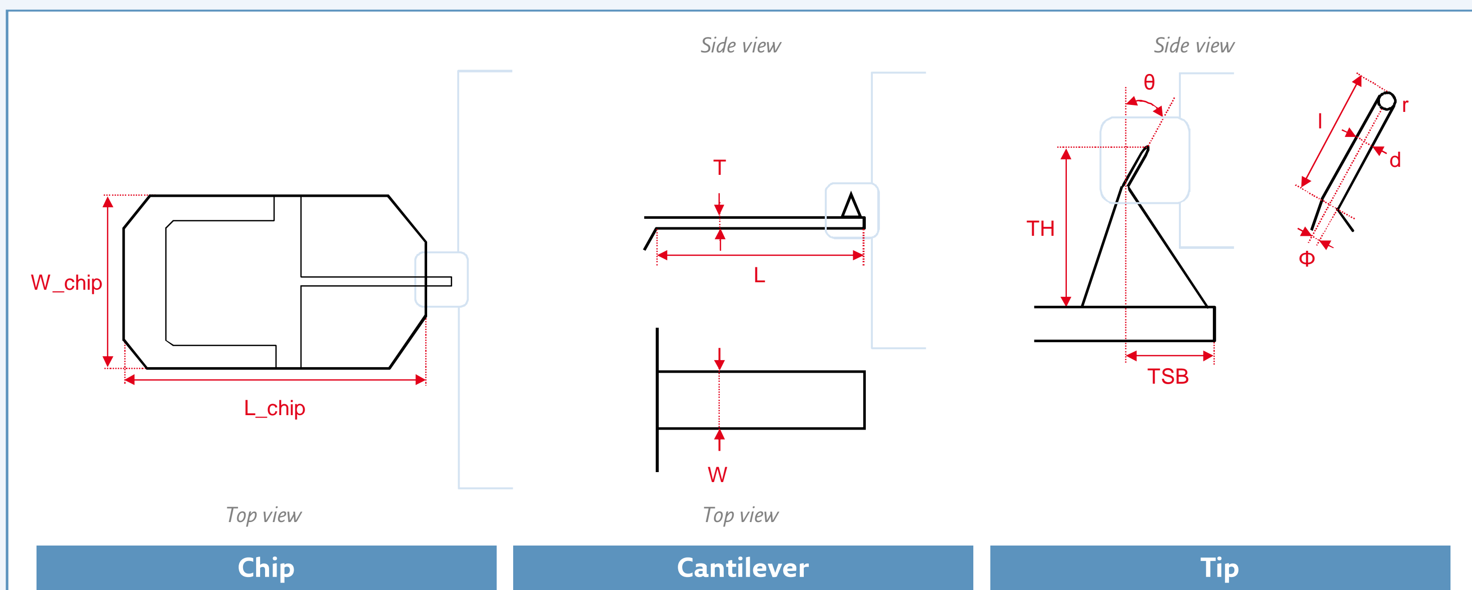
Technical specifications — MCNT-500™

Part number	NT_CNT500_v0010		NT_CNT500_v0020	
Tip				
Length / l	500 nm	(±100 nm)	500 nm	(±100 nm)
Width / d	30 nm	(30-35 nm)	30 nm	(30-35 nm)
Half cone angle / Φ	n/a		n/a	
Sharpness (radius) / r	5 nm	(<7 nm)	5 nm	(<7 nm)
Tilt compensation / θ	3°	(±0.5°)	12°	(±0.5°)
Total tip height / TH	15 µm	(10-15 µm)	15 µm	(10-15 µm)
Tip set back / TSB	15 µm	(±10 µm)	15 µm	(±10 µm)
Cantilever				
Material	Si		Si	
Shape	NT-RTESPA		NT-RTESPA	
Length / L	120 µm	(±5 µm)	120 µm	(±5 µm)
Width / W	30 µm	(±2 µm)	30 µm	(±2 µm)
Thickness / T	4.4 µm	(±0.5 µm)	4.4 µm	(±0.5 µm)
Force constant* / k	40 N/m	(±20 N/m)	40 N/m	(±20 N/m)
Resonance frequency* / f	320 kHz	(±50 kHz)	320 kHz	(±50 kHz)
Tip side coating	none		none	
Back side coating	reflex		reflex	
Chip				
Length / L_chip	3400 µm		3400 µm	
Width / W_chip	1600 µm		1600 µm	
Thickness / T_chip	315 µm		315 µm	
Alignment grooves	no		no	

Also available

Type	l	d	θ	Part number
MCNT-100™	100 nm	10 nm	3°	NT_CNT100_v0010
MCNT-100™ Park AAFM	100 nm	10 nm	12°	NT_CNT100_v0040
MCNT-150™	150 nm	10 nm	3°	NT_CNT150_v0010
MCNT-150™ Park AAFM	150 nm	10 nm	12°	NT_CNT150_v0030
MCNT-300™	300 nm	18 nm	3°	NT_CNT300_v0010
MCNT-300™ Park AAFM	300 nm	18 nm	12°	NT_CNT300_v0020
MCNT-400™	400 nm	22 nm	3°	NT_CNT400_v0010
MCNT-400™ Park AAFM	400 nm	22 nm	12°	NT_CNT400_v0020

*n/a: specification not applicable for this product | *Values are calculated from the (measured) cantilever geometry. Actual values of >90% of all probes are guaranteed to be within the specified range.*



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2017-09-R007

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