

OLYMPUS[®]

Your Vision, Our Future

MICRO CANTILEVER

OMCL

SERIES

*Long Experience in Leading-Edge Cantilever Technology:
The Key To High-End SPM Performance*

<http://www.olympus.co.jp/probe/>

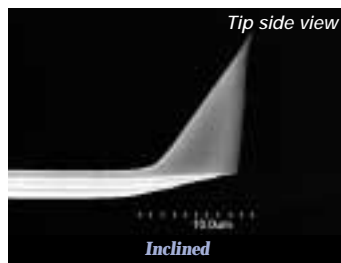
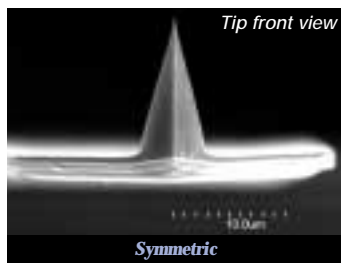


Maximum tip visibility through top-down view

A key feature of the Olympus tetrahedral cantilever is placement of the probe at the very end of the cantilever. This allows clear top-down viewing, and quick, accurate positioning on the targeted area. Three types of silicon probes are available to meet specific requirements: Standard, Platinum-Coated and Blade-tetra.

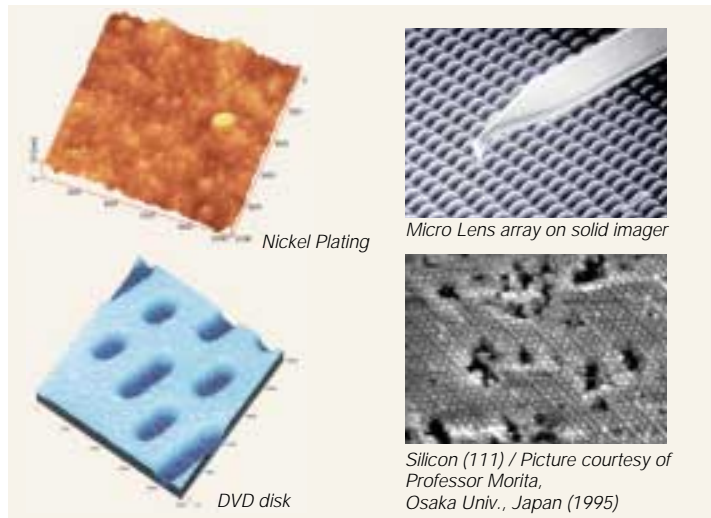
Standard silicon probe for AC (dynamic) mode AFM

The Tetra Tip Cantilever OMCL-AC series is mainly used to measure crystal surfaces, thin film, IC devices etc. AC mode AFM is for measuring samples in highly precise increments from sub nanometer to several micrometers. Together with its unique "tip-view" feature, which makes it much easier to position the tip on the targeted area, this model is reflection-coated to improve S/N ratio in measurements, and has a very small tip radius curvature (less than 10nm) for high lateral resolution and greater accuracy. Two models with different resonant frequencies are available: AC160TS (300KHz) and AC240TS (70KHz).



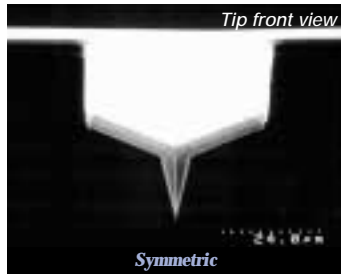
OMCL-AC160TS-, OMCL-AC240TS-

Tip View



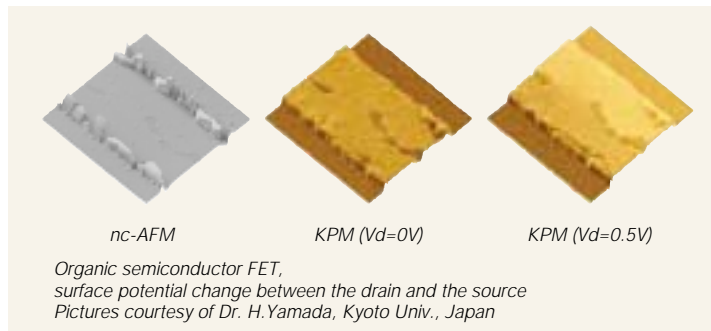
Platinum coated silicon probe

This new model is tip-side coated with a thin platinum film for probing the electric characteristic of specimens in EFM, SCM and KPM.



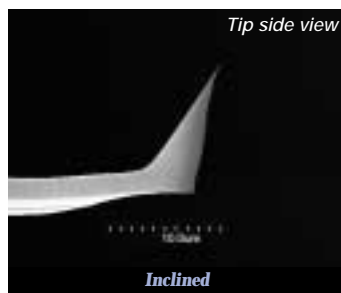
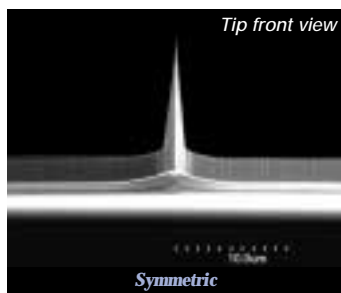
OMCL-AC240TM-

NEW Tip View



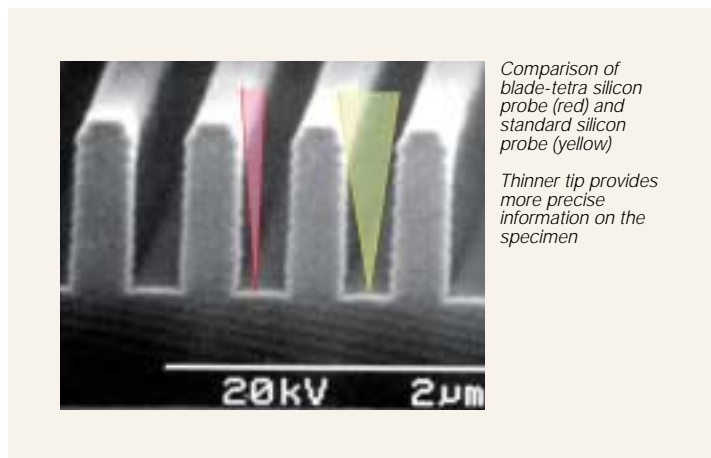
Blade-tetra silicon probe

This model has a sharper, blade-like tip with an aspect ratio of 7:1, which corresponds to a half tip angle of 6 degrees or less. (up to 2µm from the tip end). Typical applications include measuring the electrode patterns of IC and the pits in optical disks, and reproducing of highly precise images of grains on the thin film surface. Production by batch-fabrication ensures excellent cost-efficiency.



OMCL-AC160BN-

NEW Tip View

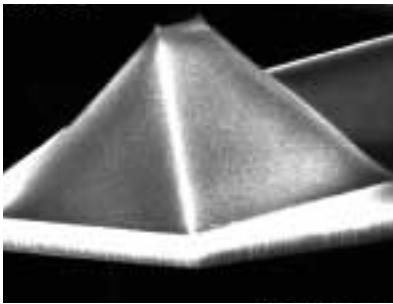


Silicon nitride tip for stable, steady, long-lasting performance

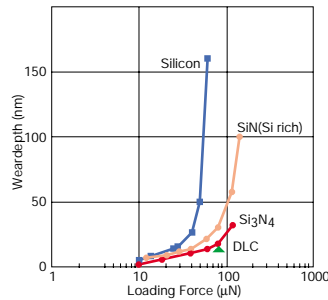
Olympus makes tips from silicon nitride, whose well-known durability minimizes the degradation of AFM data due to tip wear. The thickness of the material reduces tip wear and considerably extends its working life. As well as being designed to the optimum shape, the tip is further sharpened by our exclusive sharpening process.

Low-wear probe for AC mode AFM

This silicon nitride cantilever is for AC mode applications, features sharpened wedge tips and is designed for extended use with low wear. The tip is made from stoichiometric silicon nitride, whose 0.2µm thickness provides excellent anti-wear performance. The effective tip height is 0.2-0.4µm, making it suitable for routine inspections using AFM, such as for thin film in semiconductors. Measurements are taken by one of two protrusions (called "twin tips") on the sharpened wedge tip.



Pyramidal tip with two protrusions

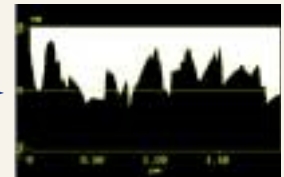
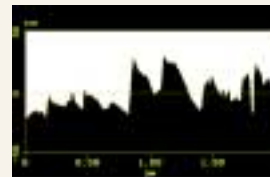


Lunch box wear test of various tip material

OMCL-HA100WS-

Sharpness differences after ten measurements in acceleration test

OMCL-HA100WS-

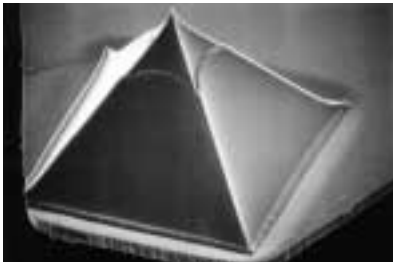


Silicon probe



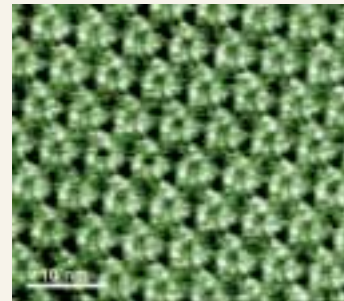
Silicon nitride probe for AC mode AFM (in water)

At 100µm in length, and with a resonant frequency of about 7kHz in water, this cantilever is ideal for AC mode AFM measurements of specimens in water — and particularly, for obtaining images of live specimens which are active only in water. The pyramidal tip is sharpened by Olympus' original oxide sharpening process and maintains steady, consistent performance.



Pyramidal tip

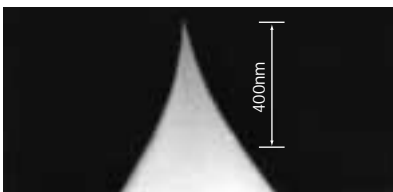
OMCL-TR400PSA-



A topograph of the cytoplasmic Bacteriorhodopsin surface
Contact mode AFM in buffer solution
Courtesy of Prof. D.J. Müller,
BioTechnological Center,
University of Technology Dresden

Standard silicon nitride probe for contact mode AFM

The silicon nitride pyramidal tip is widely used in contact mode AFM measurements, due to its softness and resistance to wear.



OMCL-TR400PSA-, OMCL-TR800PSA-

It has become a standard in cantilever design since its introduction about 10 years ago.

Model for LFM (lateral force microscope)

OMCL-RC800PSA-

This model consists of four types of rectangular cantilevers with different spring stiffness, to meet various user needs.

Tip-side gold coating model

OMCL-TR400PB-, OMCL-TR800PB-, OMCL-RC800PB-

Gold coating is applied to both sides of the contact mode cantilever. Can be used as a general AFM tip, and also to measure the adhesive force of biological specimen.

For AC mode AFM measurement

Note: Dimensions and mechanical properties below are typical values.

Main application	Product name	Chip		Cantilever				Tip			Material	Coating Metal	
		Number	Illustration	Shape	Illustration	Stiffness (N/m)	Fres (kHz)	Thickness (μm)	Shape	Height (μm)			Radius (nm)
AC mode AFM in air	OMCL-AC160TS-C2	24	Fig. ③	Rectangular	Fig. ①	42	300	4.6	Tetrahedral	14	7	Si	Non
	OMCL-AC160TS-W2	375										Si	Al
	OMCL-AC240TS-C2	24	Fig. ③	Rectangular	Fig. ②	2	70	2.7	Tetrahedral	15	7	Si	Non
	OMCL-AC240TS-W2	375										Si	Al
	OMCL-AC160BN-A2	12	Fig. ③	Rectangular	Fig. ①	42	300	4.6	Thinner Tetrahedral	11	8	Si	Non
	OMCL-HA100WS-1	34	Fig. ⑤	Rectangular	Fig. ④	15	160	2.0	Wedge	0.2 (12)	15	Si3N4	Non
OMCL-HA100WS-HW	245	SiN										Au	
AC mode AFM in water	OMCL-TR400PSA-1	34	Fig. ⑥	Triangular	Fig. ⑥	0.08	34	0.4	Pyramidal	2.9	15	SiN	Non
	OMCL-TR400PSAHW	245										SiN	Au
Electrical probing	OMCL-AC240TM-B2	18	Fig. ③	Rectangular	Fig. ②	2	70	2.7	Tetrahedral	15	15	Si	Pt
	OMCL-AC240TM-W2	375										Si	Al

OMCL-AC series Rectangular cantilevers with tetrahedral tips
 Tip location: Just on end of cantilever

Chip size of silicon probe
 One cantilever is extended from side edge of each chip

unit: μm

① OMCL-AC160 ② OMCL-AC240

unit: mm

OMCL-HA series Rectangular cantilevers with wedge tip (twin tip)
 Tip location: 11μm below end of cantilever

Chip size of silicon nitride probes
 One cantilever extends from side of each glass chip

unit: μm

④ ⑤

unit: mm

For Contact mode AFM measurement

Note: Dimensions and mechanical properties below are typical values.

Main application	Product name	Chip		Cantilever				Tip			Material	Coating Metal										
		Number	Illustration	Shape	Illustration	Stiffness (N/m)	Fres (kHz)	Thickness (μm)	Shape	Height (μm)			Radius (nm)	Tip Lever	Tip side Reflex							
Contact mode AFM in air/water	OMCL-TR400PSA-1	34	Fig. ⑥	Triangular	Fig. ⑥	0.08	34	0.4	Pyramidal	2.9	15	SiN	Non									
	OMCL-TR400PSAHW	245										SiN	Au									
	OMCL-TR800PSA-1	34	Fig. ⑧	Triangular	Fig. ⑥	0.57	73	0.8	Pyramidal	2.9	15	SiN	Non									
	OMCL-TR800PSA-W	490										SiN	Au									
	OMCL-RC800PSA-1	34	Fig. ⑩	Rectangular	Fig. ⑨	0.39	69	0.8	Pyramidal	2.9	15	SiN	Non									
	OMCL-RC800PSA-W	490										SiN	Au									
	OMCL-TR400PB-1	34										Fig. ⑧	Triangular	Fig. ⑥	0.09	32	0.4	Pyramidal	2.9	30	SiN	Au
	OMCL-TR800PB-1	34																			Fig. ⑧	Triangular
	OMCL-RC800PB-1	34	Fig. ⑩	Rectangular	Fig. ⑨	0.61	68	0.8	Pyramidal	2.9	30	SiN	Au									
												Fig. ⑩	0.82	66	SiN	Au						
												Fig. ⑪	0.06	17	SiN	Au						
												Fig. ⑫	0.11	17	SiN	Au						
Electrical probing	OMCL-AC240TM-B2	18	Fig. ③	Rectangular	Fig. ②	2	70	2.7	Tetrahedral	15	15	Si	Pt									
	OMCL-AC240TM-W2	375										Si	Al									

OMCL-TR series Triangular cantilevers with pyramidal tips
 Tip location: 4μm below end of cantilever

Chip array size of silicon nitride probes
 Two cantilevers extend from each side of a glass chip

unit: μm

⑥ ⑦

unit: mm

OMCL-RC series Rectangular cantilevers with pyramidal tips
 Tip location: 4μm below end of cantilever

Chip array size of silicon nitride probes
 Two cantilevers extend from each side of a glass chip

unit: μm

⑨ ⑩ ⑪ ⑫

unit: mm

Specifications are subject to change without any obligation on the part of the manufacturer.



For purchasing information, please contact below by e-mail or fax.
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For more technical information, please access our web site below.
<http://www.olympus.co.jp/probe/>