

OLYMPUS®

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

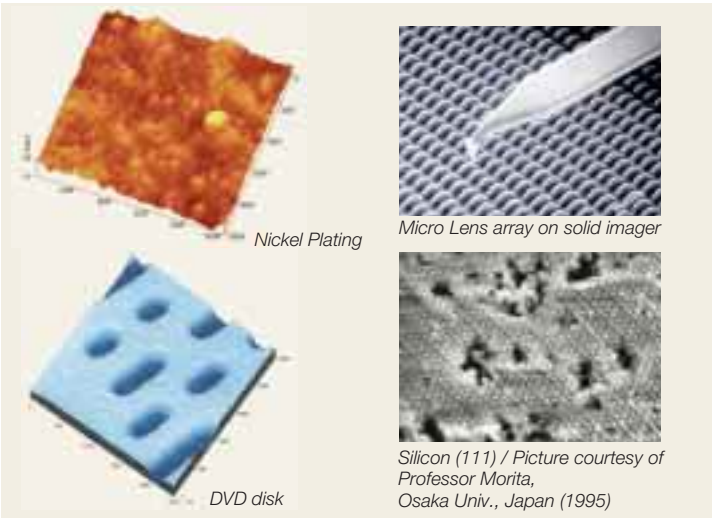
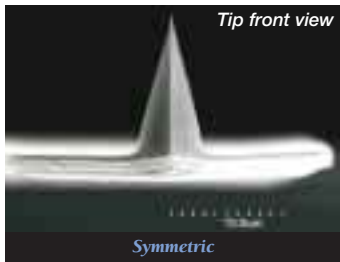
A key feature of the Olympus tetrahedral cantilever is placement of the probe at the very end of the cantilever. This allows clear top-down viewing, and quick, accurate positioning on the targeted area. Three types of silicon probes are available to meet specific requirements: Standard, Platinum-Coated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

Standard silicon probe for AC (dynamic) mode AFM

OMCL- AC160TS-, OMCL-AC240TS-



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).

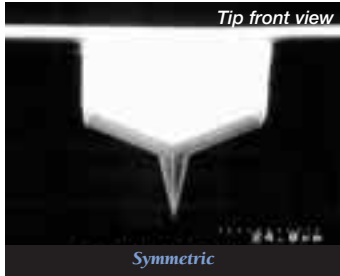


Platinum coated silicon probe

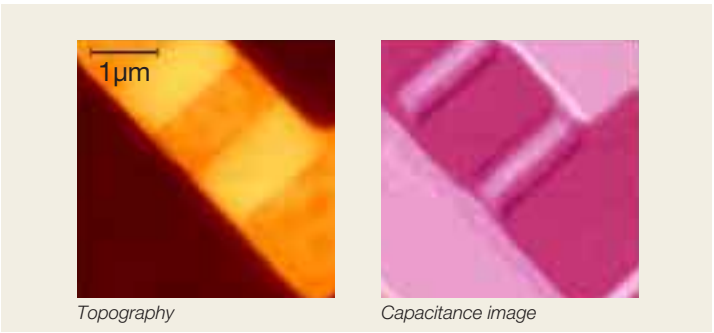
OMCL-AC240TM-



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



Silicon IC / Picture courtesy of Dr. S. Chandler, Agilent Technologies, U.K. (2000)

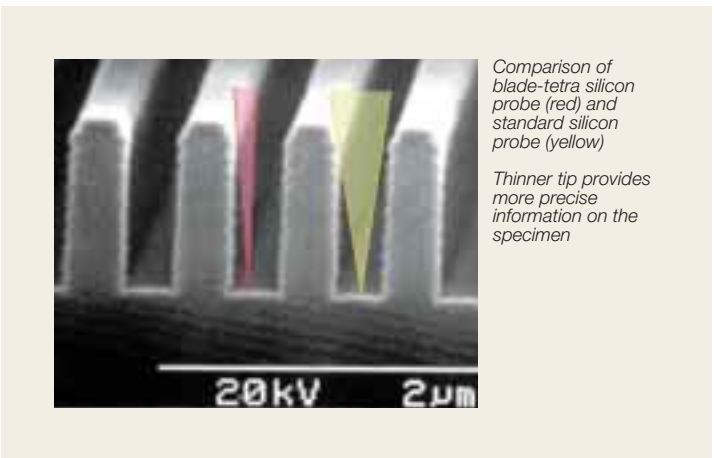
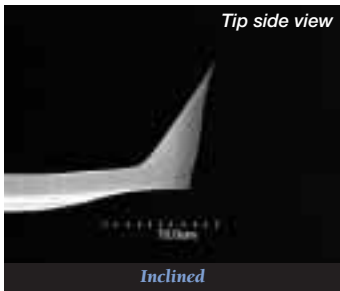
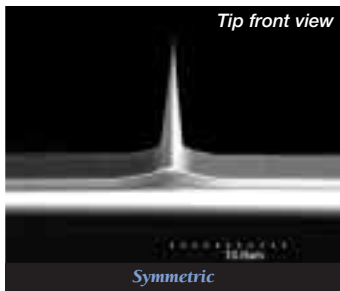


Blade-tetra silicon probe

OMCL-AC160BN-



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.

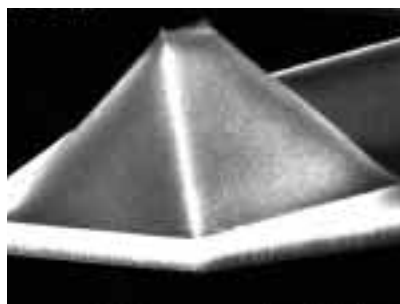


Silicon nitride tip for stable, steady, long-lasting performance

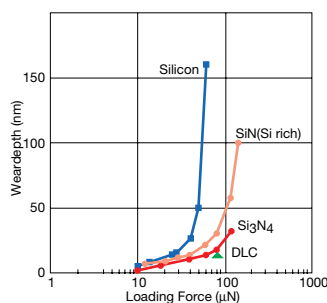
Olympus makes tips from silicon nitride, whose well-known durability minimizes the degradation of AFM data due to tip wear. The thickness of the material reduces tip wear and considerably extends its working life. As well as being designed to the optimum shape, the tip is further sharpened by our exclusive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



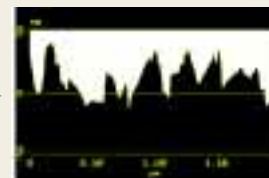
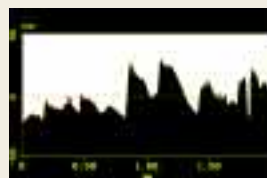
Lunch box wear test of various tip material

OMCL-HA100WS-

NEW

Sharpness differences after ten measurements in acceleration test

OMCL-HA100WS-



Silicon probe



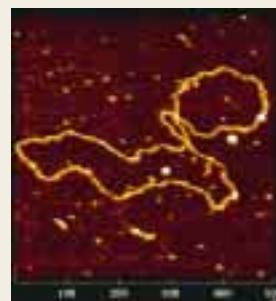
Silicon nitride probe for AC mode AFM (in water)

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

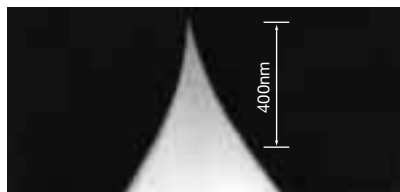
OMCL-TR400PSA-



DNA strand on Mica (in water)

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-

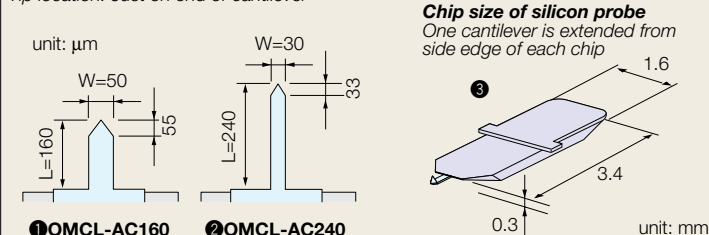
Gold coating is applied to both sides of the contact mode cantilever. Can be used as a general AFM tip, and also to measure the adhesive force of biological specimen.

For AC mode AFM measurement

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
AC mode AFM in air	OMCL-AC160TS-C2	24	Fig. ③	Rectangular	Fig. ①	42	300	4.6	Tetrahedral	11	<10	Si	Non
	OMCL-AC160TS-W2	375										Si	Al
	OMCL-AC240TS-C2	24	Fig. ③	Rectangular	Fig. ②	2	70	2.7	Tetrahedral	14	<10	Si	Non
	OMCL-AC240TS-W2	375										Si	Al
	OMCL-AC160BN-A2	12	Fig. ③	Rectangular	Fig. ①	42	300	4.6	Thinner Tetrahedral	9	<15	Si	Non
	OMCL-HA100WS-1	34	Fig. ⑤	Rectangular	Fig. ④	15	160	2.0	Wedge	0.2 (12)	<25	Si ₃ N ₄	Non
AC mode AFM in water	OMCL-HA100WS-HW	245										SIN	Au
	OMCL-TR400PSA-1	34	Fig. ⑧	Triangular	Fig. ⑥	0.08	34	0.4	Pyramidal	2.9	<20	Si	Non
	OMCL-TR400PSAHW	245				0.02	11					SIN	Au

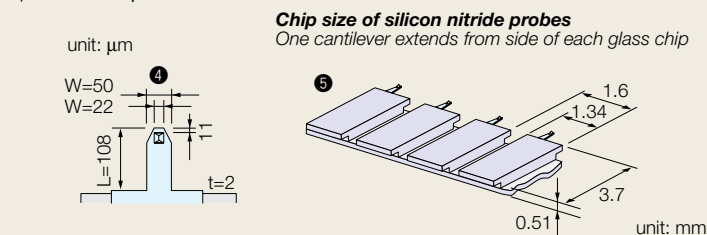
OMCL-AC series Rectangular cantilevers with tetrahedral tips

Tip location: Just on end of cantilever



OMCL-HA series Rectangular cantilevers with wedge tip (twin tip)

Tip location: 11 μm below end of cantilever

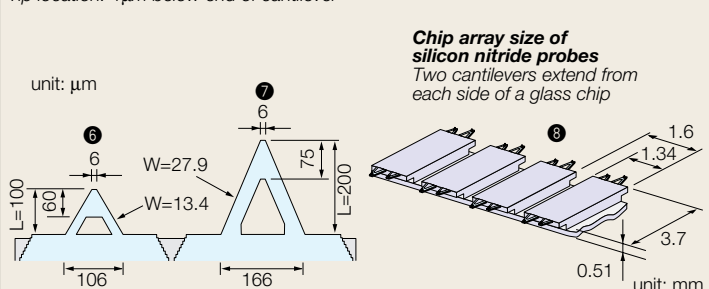


For Contact mode AFM measurement

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. ⑧	Triangular	Fig. ⑥	0.08	34	0.4	Pyramidal	2.9	<20	SIN	Non
	OMCL-TR400PSAHW	245			Fig. ⑦	0.02	11					SIN	Au
	OMCL-TR800PSA-1	34	Fig. ⑧	Triangular	Fig. ⑥	0.57	73	0.8	Pyramidal	2.9	<20	SIN	Non
	OMCL-TR800PSA-W	490			Fig. ⑦	0.15	24					SIN	Au
	OMCL-RC800PSA-1	34	Fig. ⑩	Rectangular	Fig. ⑨	0.39	69	0.8	Pyramidal	2.9	<20	SIN	Non
	OMCL-RC800PSA-W	490			Fig. ⑩	0.76	71						
					Fig. ⑪	0.05	18						
					Fig. ⑫	0.10	19						
	OMCL-TR400PB-1	34	Fig. ⑧	Triangular	Fig. ⑥	0.09	32	0.4	Pyramidal	2.9	<40	SIN	Au
			Fig. ⑦	0.02	10	SIN	Au						
	OMCL-TR800PB-1	34	Fig. ⑧	Triangular	Fig. ⑥	0.61	68	0.8	Pyramidal	2.9	<40	SIN	Au
			Fig. ⑦	0.16	22	SIN	Au						
	OMCL-RC800PB-1	34	Fig. ⑩	Rectangular	Fig. ⑨	0.42	64	0.8	Pyramidal	2.9	<40	SIN	Au
					Fig. ⑩	0.82	66						
					Fig. ⑪	0.06	17						
Fig. ⑫					0.11	17							
Electrical probing	OMCL-AC240TM-B2	18	Fig. ③	Rectangular	Fig. ②	2	70	2.7	Tetrahedral	14	<25	Si Si	Pt Al

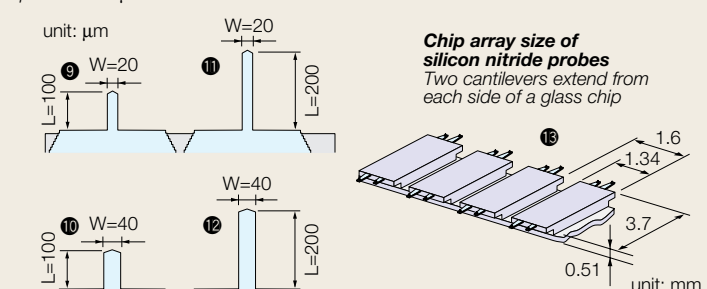
OMCL-TR series Triangular cantilevers with pyramidal tips

Tip location: 4 μm below end of cantilever



OMCL-RC series Rectangular cantilevers with pyramidal tips

Tip location: 4 μm below end of cantilever



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

OLYMPUS
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For more technical information, please access our web site below.
<http://www.olympus.co.jp/probe/>

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