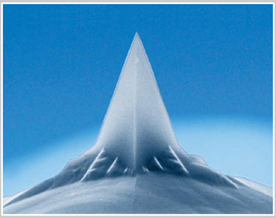
NANO WORLD
INNOVATIVE TECHNOLOGIES

NANOWORLD® SPM AND AFM PROBES

Nanotechnology is our field. Precision is our tradition.

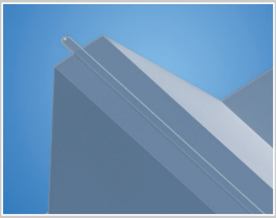
POINTPROBE®

- most widely used and best known SPM and AFM probe world-wide
- silicon SPM and AFM probe for very high resolution imaging
- alignment grooves on back side of support chip
- tip radius typically < 8 nm, guaranteed <12 nm
- available with different tip shapes



ULTRA-SHORT CANTILEVERS

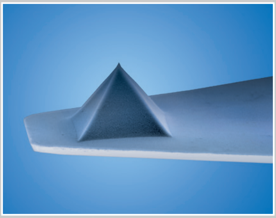
- ultra-short cantilevers designed for High-Speed AFM
- 3 types with very high resonance frequencies (1.2 MHz - 5 MHz) and high force constants for dynamic mode applications in air



- 3 types with high resonance frequencies and low force constants (0.15 N/m - 0.6 N/m) mainly for applications in liquid
- wear resistant High Density Carbon/ Diamond Like Carbon (HDC/DLC) tip
- tip radius typically < 10 nm

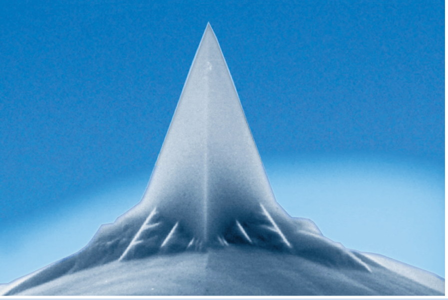
PYREX-NITRIDE

- silicon nitride cantilevers and tips
- designed for various imaging applications in contact mode or dynamic mode
- oxide sharpened pyramidal tips
- tip radius typically < 10 nm
- available either with triangular or rectangular cantilevers
- also available as tipless version



ARROW™

- optimized positioning through maximized tip visibility
- three sided tip defined by real crystal planes
- special tip shape leads to very symmetric scans
- tip at the very end of the cantilever
- tip radius typically < 10 nm, guaranteed < 15 nm
- also available as high speed version with a resonance frequency of typically around 2.0 MHz

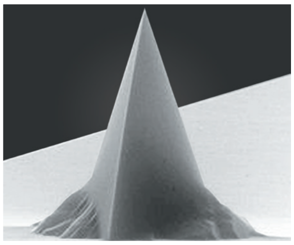


POINTPROBE®
SILICON AFM PROBES

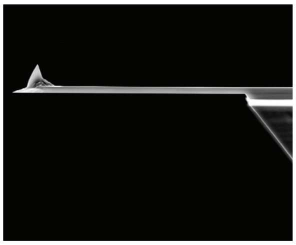
Most widely used and best-known high quality SPM and AFM probe world-wide

Pointprobe® Tip (Standard)

The standard Pointprobe® tip is shaped like a polygon based pyramid.
Its macroscopic halfcone angle is 20° to 25° viewed along the cantilever axis, 25° to 30° when looking from the side and virtually zero at the very tip end.
The Pointprobe® tip is 10 - 15 µm high and shows a tip radius of typically smaller than 8 nm (smaller than 12 nm guaranteed).



Pointprobe® Tip



Pointprobe® Side View

General

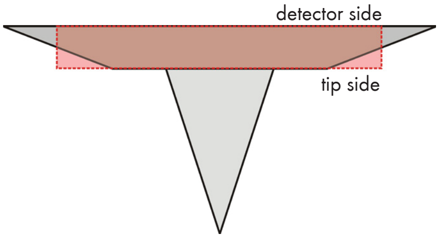
- SPM and AFM probes for very high resolution imaging
- fits to all well-known commercial SPMs and AFMs
- cantilever and tip are supported by a single crystal silicon support chip
- monolithic design of support chip, cantilever and tip

Material Features

- highly doped, single crystal silicon (resistivity 0.01 - 0.025 Ohm•cm)
- no intrinsic stress and absolutely straight cantilevers
- chemically inert silicon for application in fluids or electrochemical cells

Cantilever

- rectangular cantilever with trapezoidal cross section
- wide detector side for easy laser beam adjustment (see sketch on left)
- small width at the tip side reduces damping



A trapezoidal cross section of the cantilever and therefore 30% wider (e.g. NCH) cantilever detector side result in easier and faster laser adjustment. Additionally, because there is simply more space to place and reflect the laser beam, a higher SUM signal is reached.

Support Chip

- cantilever is integrated into a silicon support chip
- dimensions of the support chip are very reproducible (3.4 mm x 1.6 mm x 0.3 mm)
- alignment grooves on the back side of the silicon support chip in conjunction with the alignment chip ensure replacement of the probes without major readjustment of the laser beam

Package Sizes

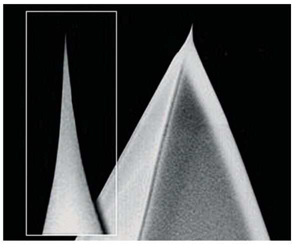
- packages of 10, 20 or 50 AFM probes
- full wafer of 380 AFM probes (up to 388 AFM probes depending on the product)

SuperSharpSilicon™ Tip (SSS)

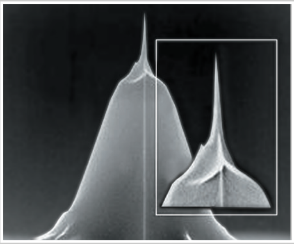
For enhanced resolution of microroughness and nanostructures we have developed an advanced tip manufacturing process leading to a further improvement of the tip sharpness with tip radii as small as 2 nm.
With these AFM tips we have pushed back the frontiers of technology.

Tip Features

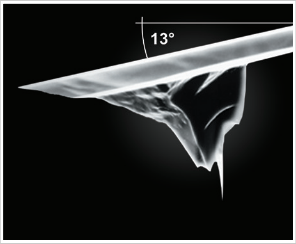
The tip height is 10 -15 µm and the typical radius of a SuperSharpSilicon™ tip is about 2 nm. We guarantee a tip radius of smaller than 5 nm (guaranteed yield: 80%).
The half cone angle is smaller than 10° at the last 200 nm of the tip.



SuperSharpSilicon™ Tip (SSS)



High Aspect Ratio Tip (AR5)



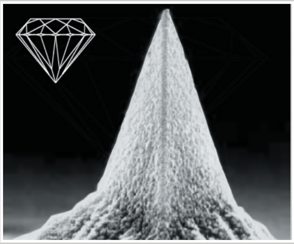
Tilt compensated AR5T
High Aspect Ratio Tip (AR5T)

High Aspect Ratio Tip (AR5/AR5T)

For measurements on samples with sidewall angles approaching 90°, e.g. deep trench measurements or other semiconductor applications, we offer two different types of High Aspect Ratio Tips showing near vertical sidewalls.
These tips have an overall height of 10 - 15 μm which allows measurements on highly corrugated samples. At the last few micrometers the tips show a high aspect ratio portion that is symmetric when viewed from the side as well as along the cantilever axis. The tip radius is typically 10 nm (smaller than 15 nm guaranteed).

Tip Features

The high aspect ratio portion of the AR5/AR5T tip is larger than 2 μm and shows an aspect ratio of typically 7:1 (minimum aspect ratio of 5:1 guaranteed).
Consequently the half cone angle of the high aspect ratio portion is typically smaller than 5°. In order to get symmetrical images when scanning deep trenches it is necessary that the tip is perpendicular to the sample. Therefore, in order to compensate the most common tilt angle of 13° used in commercial AFMs, the high aspect ratio portion of the AR5T is tilted 13° with respect to the central axis of the tip.



Diamond Coated Tip (DT, CDT)

Diamond Coated Tip (DT), Conductive Diamond Coated Tip (CDT)

For SPM and AFM applications that require hard contact between probe and sample we recommend our Diamond Coated Tip (DT). Some typical applications are friction force measurements, measurement of the elastic properties of samples, as well as wear measurements or nanostructuring. The Conductive Diamond Coated Tip (CDT) additionally offers a conductive, non passivated coating.

Tip and Coating Features

True polycrystalline diamond coating on the tip side of the cantilever with the unsurpassed hardness of diamond.
The tip height is 10 - 15 μm and the thickness of the diamond layer is approximately 100 nm. The macroscopic tip radius is in the range of 100 - 200 nm, but the tip often exhibits a nanoroughness in the 10 nm regime.
In case of the CDT the conductivity is in the range of 0.003 - 0.005 Ohm•cm.

AVAILABLE COATINGS

Aluminum Reflex Coating

- 30 nm thick aluminum reflex coating on the detector side of the cantilever
- enhances reflectance of the laser beam by a factor of 2.5
- prevents light from interfering within the cantilever

Hard Magnetic/Soft Magnetic Coating

- hard magnetic coating: cobalt alloy coating on the tip side of the cantilever
- soft magnetic coating: soft magnetic coating on the tip side (coercivity of app. 0.75 Oe, remanence magnetization of app. 225 emu/cm^3)
- permanent magnetization of the tip

Diamond Coating

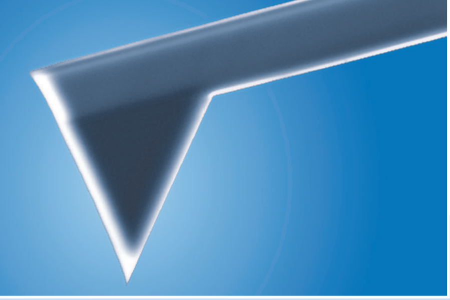
- 100 nm thick polycrystalline diamond coating on the tip side of the cantilever
- unsurpassed hardness of the tip
- resistance <10 kOhm for CDT

PtIr5 Coating

- 25 nm thick platinum iridium5 coating on both sides of the probe
- stress compensated and wear resistant
- detector side coating enhances the reflectance of the laser beam by a factor of 2
- allows electrical measurements

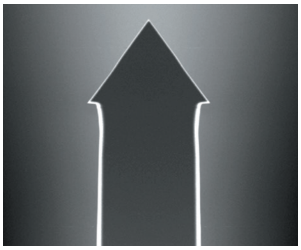
Gold Coating (on request)

- 70 nm thick gold reflex coating on the detector side of the cantilever
- 70 nm thick gold coating on both sides of the probe

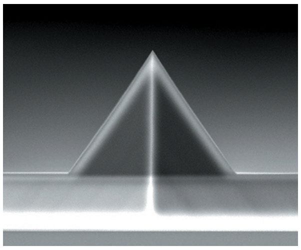


ARROW™
SILICON AFM PROBES

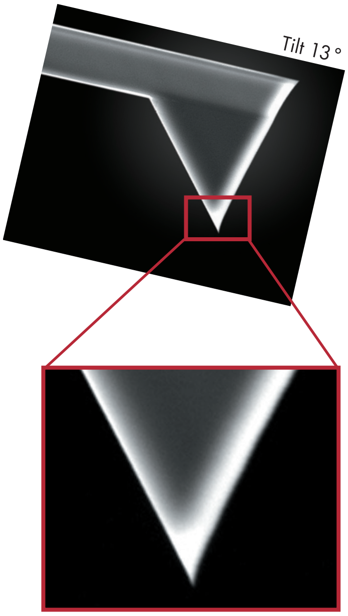
Optimized positioning through maximized tip visibility



Arrow™ Top View



Arrow™ Front View



Special tip shape leads to extremely symmetric scan image in x- and y- direction when probe is tilted due to its mounting on the AFM head.

General

- SPM and AFM probes for high resolution imaging
- fit to all well-known commercial SPMs and AFMs
- cantilever and tip are supported by a single crystal silicon support chip
- monolithic design of support chip, cantilever and tip

Material Features

- highly doped, single crystal silicon (resistivity 0.01 - 0.025 Ohm•cm)
- no intrinsic stress and absolutely straight cantilevers
- chemically inert silicon for application in fluids or electrochemical cells

Cantilever

- rectangular cantilever with triangular free end
- easy positioning of tip on the area of interest due to the Arrow™ shape
- consistent distance between tip and cantilever end
- trapezoidal cross section with wide detector side for easy laser adjustment

Support Chip

- dimensions of the support chip are very reproducible (3.4 mm x 1.6 mm x 0.3 mm)
- etched corners of the support chip avoid contact between the support chip and the sample

Tip

- tip height 10 - 15 μm and radius of curvature typically < 10 nm (< 15 nm guaranteed)
- macroscopic half-cone angles
  - are 30° to 35° seen along the cantilever axis
  - are 20° to 25° seen from the side

Package Sizes

- packages of 10, 20 or 50 AFM probes
- full wafer of at least 380 AFM probes

AVAILABLE COATINGS

Reflex Coating

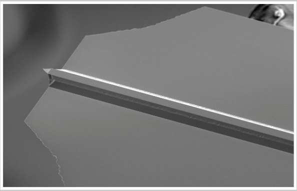
- 30 nm thick aluminum reflex coating on the detector side of the cantilever
- enhances reflectance of the laser beam by a factor of 2.5
- prevents light from interfering within the cantilever

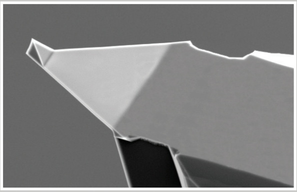
PtIr5 Coating

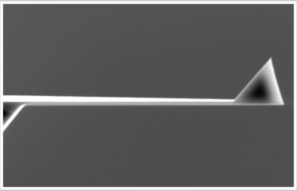
- 25 nm thick platinum iridium5 coating on both sides of the probe
- stress compensated and wear resistant
- detector side coating enhances the reflectance of the laser beam by a factor of 2
- allows electrical measurements

- **Other coatings for standard SPM ans AFM probes available on request**

ARROW™ Ultra High Frequency Scanning Probes (UHF)
ARROW™ Tipless Cantilevers and Cantilever Arrays (TL)


Arrow™ UHF 3D-View


Arrow™ UHF 3D-View Close-up


Arrow™ UHF

Arrow™ UHF

NanoWorld Arrow™ UHF probes have a cantilever capable of resonating with a frequency of typically around 2.0 MHz. These probes combine outstanding sensitivity with fast

scanning ability. As for all probes of the Arrow™ series, the Arrow™ UHF probes are made from monolithic silicon which is highly doped to dissipate static charge. It is chemically inert and offers a high mechanical Q-factor for high sensitivity.

The Arrow™ UHF probes feature a 35 µm long triangular cantilever and a tetrahedral tip with a height of 3 µm and a radius of curvature smaller than 10 nm.
The unique Arrow™ shape allows easy positioning of the tip on the area of interest.

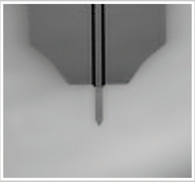
The reflex coating (aluminum or gold) on the detector side of the cantilever enhances the reflectance of the laser beam by a factor of 2.5 and prevents light from interfering within the cantilever.

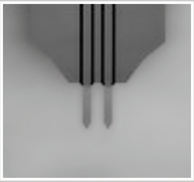
Arrow™ TL (Tipless Cantilevers for Special Applications)

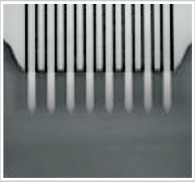
The Arrow™ TL SPM and AFM probes have tipless cantilevers and are available with either 1 cantilever or with cantilever arrays consisting of 2 or 8 rectangular cantilevers with a triangular free end.

All types of the Arrow™ TL series are optionally available with a gold coating on the sample facing side of the cantilever.

Cantilever Data	
Resonance Frequency	6 kHz
Force Constant	0.03 N/m
Length	500 µm
Width (rectangular part)	100 µm
Thickness	1.0 µm
Pitch (in case of TL2 and TL8)	250 µm

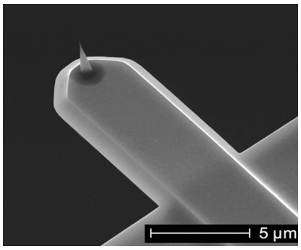

Arrow™ TL1
Tipless cantilever,
single cantilever beam on silicon
support chip


Arrow™ TL2
Tipless cantilever array,
two cantilever beams on a single
silicon support chip

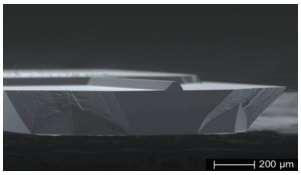

Arrow™ TL8
Tipless cantilever array, eight
cantilever beams on a single
silicon support chip

ULTRA-SHORT CANTILEVERS (USC)

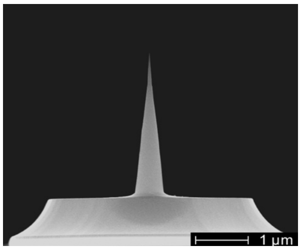
for High-Speed AFM



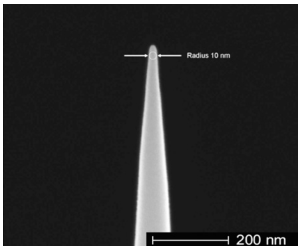
USC Cantilever 3D View



USC Support Chip 3D View



USC Tip Front View



USC Tip Detail

General

NanoWorld Ultra-Short Cantilevers (USC) for High-Speed AFM (HS-AFM) combine very small cantilevers made of a quartz-like material which are designed for resonating at frequencies of up to 5 MHz and a very sharp and wear resistant High Density Carbon/Diamond Like Carbon (HDC/DLC) tip.

- especially designed for high speed scanning applications
- cannot be used in all commercial SPMs and AFMs due to the small dimensions of the cantilevers (see next page)
- cantilever and tip are supported by a single crystal silicon support chip
- no intrinsic stress and absolutely straight cantilevers

Cantilever

- rectangular cantilever with rounded corners at the freestanding end
- cantilever made of quartz-like material

Support Chip

- dimensions of the support chip are very reproducible (3.4 mm x 1.6 mm x 0.3 mm)
- etched and lowered corners of the support chip avoid contact between the support chip and the sample
- alignment grooves on the back side of the silicon support chip in conjunction with the alignment chip ensure replacement of the probes without major readjustment of the laser beam

Tip

- nanotools® High Density Carbon/Diamond Like Carbon (HDC/DLC) tip
- tip height typically 2.5 µm and radius of curvature typically < 10 nm
- tip aspect ratio typically 5:1 and tilt compensation of 8 °

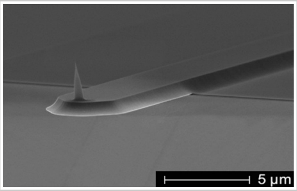
Package Size

- package of 10 AFM probes

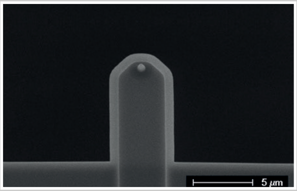
AVAILABLE COATINGS

Gold Reflex Coating

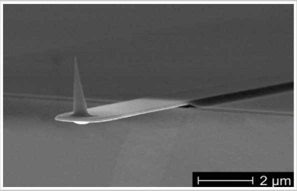
- 20/30 nm thick gold reflex coating on both sides of the probe
- enhances reflectance of the laser beam
- tip remains uncoated



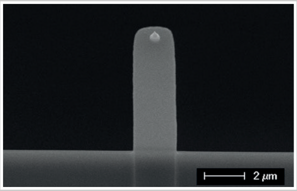
USC-F5-k30 Cantilever
3D View



USC-F5-k30 Cantilever
Top View



USC-F1.2-k0.15 Cantilever
3D View



USC-F1.2-k0.15 Cantilever
Top View

In order to cover a wide range of possible applications using High-Speed AFM, six different types of Ultra-Short Cantilevers (USC) have been developed: three types with very high resonance frequencies (1.2 MHz – 5 MHz) and high force constants mainly for dynamic mode applications in air and three types with high resonance frequencies and low force constants (0.15 N/m - 0.6 N/m) mainly for applications in liquid.

USC mainly for dynamic mode applications in air

- resonance frequency of 1.2 MHz and higher
- stiffness of 3.0 N/m and higher
- mainly designed for applications in non-contact mode in air but can also be used for other applications

Type	USC-F5-k30	USC-F2-k3	USC-F1.2-k7.3
Resonance Frequency	5.0 MHz	2.0 MHz	1.2 MHz
Force Constant	30 N/m	3.0 N/m	7.3 N/m
Cantilever length	10 µm	10 µm	20 µm
Cantilever width	5 µm	5 µm	10 µm
Thickness	0.68 µm	0.28 µm	0.67 µm

USC mainly for applications in liquid

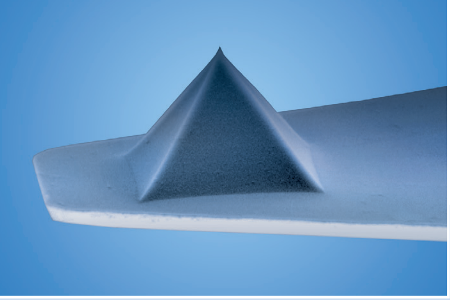
- resonance frequency of 1.5 MHz and lower
- stiffness of 0.6 N/m and lower
- mainly designed for applications in liquid but can also be used for applications in air (depending on the application)

Type	USC-F1.5-k0.6	USC-F1.2-k0.15	USC-F0.3-k0.3
Resonance Frequency	1.5 MHz	1.2 MHz	0.3 MHz
Force Constant	0.6 N/m	0.15 N/m	0.3 N/m
Cantilever length	7 µm	7 µm	20 µm
Cantilever width	3 µm	2 µm	10 µm
Cantilever thickness	0.10 µm	0.08 µm	0.19 µm

* Values in air

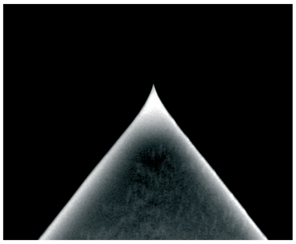
For more information on ongoing developments of AFM probes for High-Speed AFM and for application examples please have a look at: www.highspeedscanning.com

⚠ **System limitations:** due to their small cantilever sizes and their very high resonance frequencies USC probes currently cannot be used in all commercially available SPMs and AFMs. Only AFMs with a sufficiently small laser spot and electronics that are capable of dealing with high resonance frequencies of up to 5 MHz are able to work with the USC probes. If in doubt whether these probes can be used in your AFM please check back with us or with your AFM manufacturer.



PYREX-NITRIDE-AFM-PROBES

Leading edge in sharpness and durability



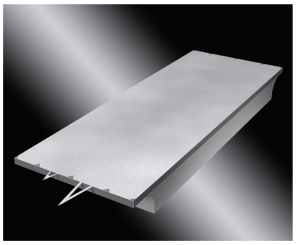
Pyrex-Nitride AFM probe Close-up

General

- SPM and AFM probes for a wide range of applications in contact mode or dynamic mode
- fit to all well-known commercial SPMs and AFMs
- silicon nitride cantilevers and tips
- cantilevers are supported by a support chip made of pyrex-glass
- delivered as separated single support chips for easy handling

Material Features

- low-stress silicon nitride for lowest cantilever bending
- excellent hardness for wear resistance and extended lifetime



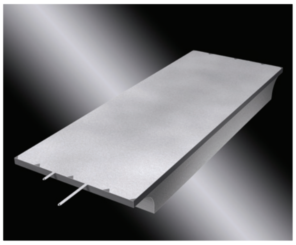
Pyrex-Nitride
Triangular Cantilevers 3D Sketch

Cantilevers

- multi-lever versions with either rectangular cantilevers or triangular cantilevers
- single lever version with one triangular cantilever (compatible with PeakForce Tapping™ and ScanAsyst® mode)
- reflective gold coating on the detector side of the cantilevers
- stress compensated with bending below 2°

Support Chip

- support chip made of pyrex-glass (3.4 mm x 1.6 mm x 0.5 mm)
- easy handling due to single support chips



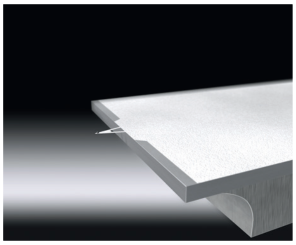
Pyrex-Nitride
Rectangular (Diving Board)
Cantilevers 3D Sketch

Tips

- oxide sharpened pyramidal tips
- tip height 3.5 µm and radius of curvature typically < 10 nm
- macroscopic half cone angles 35°

Package Sizes

- packages of 20 or 50 AFM probes



Pyrex-Nitride
Triangular Single Cantilevers
for PeakForce Tapping™ and
ScanAsyst® mode 3D Sketch

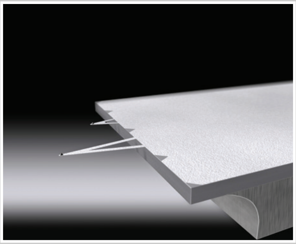
AVAILABLE COATINGS

Gold Coating

- 70 nm thick gold reflex coating on the detector side of the cantilevers enhances reflectance of the laser beam
- optional 35 nm thick gold coating on the tip side (front side) of the cantilevers

PYREX-NITRIDE-AFM-PROBES

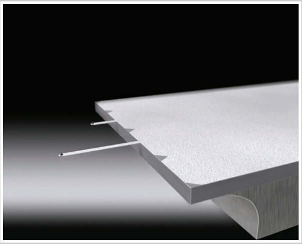
Triangular Cantilevers (PNP-TR)
Diving Board Shaped Cantilevers (PNP-DB)
Single Triangular Cantilever (PNP-TRS)



Triangular Cantilevers (PNP-TR)

- triangular shaped cantilevers
- multi-lever design
- gold reflex coating on the detector side of the cantilevers
- available with gold coating on both sides of the probe

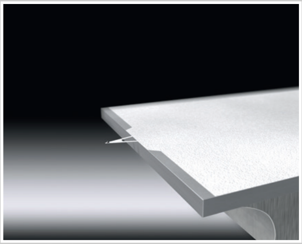
Cantilever #	1	2
Shape	Triangular	
Resonance Frequency	67 kHz	17 kHz
Force Constant	0.32 N/m	0.08 N/m
Length	100 µm	200 µm
Width	2 x 13.5 µm	2 x 28 µm
Thickness	600 nm	600 nm



Diving Board Cantilevers (PNP-DB)

- rectangular diving board shaped cantilevers
- multi-lever design
- gold reflex coating on the detector side of the cantilevers

Cantilever #	1	2
Shape	Rectangular	
Resonance Frequency	67 kHz	17 kHz
Force Constant	0.48 N/m	0.06 N/m
Length	100 µm	200 µm
Width	40 µm	40 µm
Thickness	600 nm	600 nm



Single Triangular Cantilever (PNP-TRS)

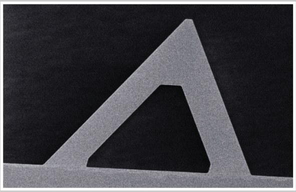
- single triangular shaped cantilever
- one cantilever per chip
- gold reflex coating on the detector side of the cantilever
- designed for PeakForce Tapping^{TM} and ScanAsyst$^{®}$ Mode*

Cantilever #	1
Shape	Triangular
Resonance Frequency	67 kHz
Force Constant	0.32 N/m
Length	100 µm
Width	2 x 13.5 µm
Thickness	600 nm

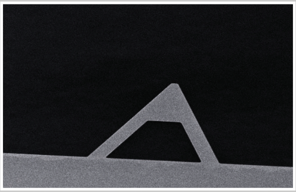
PNP Tipless (PNP-TR-TL)

- triangular Pyrex-Nitride probes are also available in a tipless version
- gold reflex coating on the detector side of the cantilevers
- available with gold coating on both sides of the probe

Pyrex-Nitride AFM Probe
Triangular Tipless Cantilevers



Pyrex-Nitride AFM Probe
Triangular Tipless Long Cantilever
Close-up

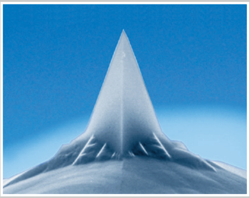


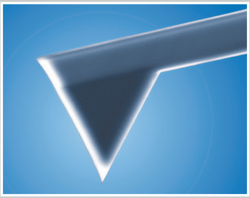
Pyrex-Nitride AFM Probe
Triangular Tipless Short Cantilever
Close-up

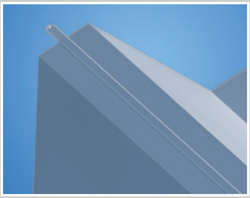
*PeakForce Tapping^{TM} and ScanAsyst$^{®}$ are registered trademarks of Bruker Corp.

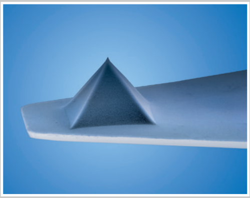
QUICK SELECTION TABLE

	Application	Type		Coating Tip/Front Side	Coating Detector Side	Tip Shape	Resonance Frequency	Force Constant	Cantilever Length x Width x Thickness
Contact Mode	Contact Mode	Arrow CONT		–	-	Arrow™	14 kHz	0.2 N/m	450 x 45 x 2 µm
		CONT		-		Pointprobe®	13 kHz	0.2 N/m	450 x 50 x 2 µm
		Arrow CONTR		-	Reflex (Al)	Arrow™	14 kHz	0.2 N/m	450 x 45 x 2 µm
		CONTR		-		Pointprobe®	13 kHz	0.2 N/m	450 x 50 x 2 µm
		ZEILR		-			27 kHz	1.6 N/m	450 x 55 x 4 µm
		Arrow CONTPt		PtIr5	PtIr5	Arrow™	14 kHz	0.2 N/m	450 x 45 x 2 µm
		CONTPt				Pointprobe®	13 kHz	0.2 N/m	450 x 50 x 2 µm
	Contact Mode (short cantilever)	CONTSC		-		Pointprobe®	25 kHz	0.2 N/m	225 x 48 x 1 µm
		CONTSCR		-	Reflex (Al)				
Contact Mode TappingMode	Contact Mode or Tapping Mode	PNP-TR (triangular cantilevers)	Cantilever 1	-	Reflex (Cr/Au)	Pyramidal silicon nitride	67 kHz	0.32 N/m	100 x 13.5 x 0.5 µm
			Cantilever 2				17 kHz	0.08 N/m	200 x 28 x 0.5 µm
		PNP-TR-Au (triangular cantilevers)	Cantilever 1	Cr/Au	Cr/Au		67 kHz	0.32 N/m	100 x 13.5 x 0.5 µm
			Cantilever 2				17 kHz	0.08 N/m	200 x 28 x 0.5 µm
		PNP-DB (rectangular cantilevers)	Cantilever 1	-	Reflex (Cr/Au)		67 kHz	0.48 N/m	100 x 40 x 0.5 µm
			Cantilever 2				17 kHz	0.06 N/m	200 x 40 x 0.5 µm
Non-Contact Mode / TappingMode	Non-Contact / TappingMode (high frequency)	Arrow NC		-	-	Arrow™	285 kHz	42 N/m	160 x 45 x 4.6 µm
		NCH				Pointprobe®	330 kHz		125 x 30 x 4 µm
		Arrow NCR		-	Reflex (Al)	Arrow™	285 kHz		160 x 45 x 4.6 µm
		NCHR				Pointprobe®	330 kHz		125 x 30 x 4 µm
		Arrow NCPt		PtIr5	PtIr5	Arrow™	285 kHz		160 x 45 x 4.6 µm
		NCHPt				Pointprobe®	330 kHz		125 x 30 x 4 µm
		SSS-NCH		-	-	SuperSharpSilicon™			
		AR5-NCHR		-	Reflex (Al)	High Aspect Ratio (5:1)			
		AR5T-NCHR (Tilt Compensated)							
		AR10-NCHR				High Aspect Ratio (10:1)			
		DT-NCHR		Diamond	Reflex (Al)	Diamond	400 kHz	80 N/m	125 x 30 x 4 µm
		CDT-NCHR							
	Non-Contact/ Soft-Tapping Mode	NCST		-	-	Pointprobe®	160 kHz	7.4 N/m	150 x 27 x 2.8 µm
		NCSTR		-	Reflex (Al)	Pointprobe®			
	Non-Contact / TappingMode (long cantilever)	NCL		-	-	Pointprobe®	190 kHz	48 N/m	225 x 38 x 7 µm
		NCLR		-	Reflex (Al)				
		NCLPt		PtIr5	PtIr5				
		SSS-NCL		-	-	SuperSharpSilicon™			
		AR5-NCLR		-	Reflex (Al)	High Aspect Ratio (5:1)			
		DT-NCLR		Diamond	Reflex (Al)	Diamond			
		CDT-NCLR							
	Non-Contact / TappingMode (Seiko Non-Contact Mode)	SEIHR		-	Reflex (Al)	Pointprobe®	130 kHz	15 N/m	225 x 33 x 5 µm
		SSS-SEIH		-	-	SuperSharpSilicon™			


Pointprobe®


Arrow™


Ultra-Short Cantilevers

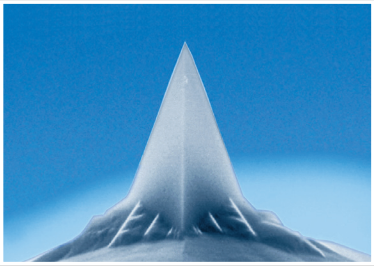

Pyrex-Nitride

QUICK SELECTION TABLE

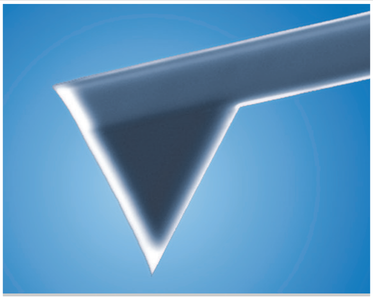
	Application	Type			Coating Tip/Front Side	Coating Detector Side	Tip Shape	Resonance Frequency	Force Constant	Cantilever Length x Width x Thickness
High-Speed AFM	Contact Mode	USC-F1.5-k0.6			Au (tip remains uncoated)	Reflex (Au)	Electron Beam Deposited (EBD) spike	1.5 MHz	0.6 N/m	7 x 3 x 0.10 µm
		USC-F1.2-k0.15						1.2 MHz	0.15 N/m	7 x 2 x 0.08 µm
		USC-F0.3-k0.3						0.3 MHz	0.3 N/m	20 x 10 x 0.19 µm
	Non-Contact / TappingMode	USC-F5-k30			Au (tip remains uncoated)	Reflex (Au)	Electron Beam Deposited (EBD) spike	5.0 MHz	30 N/m	20 x 5 x 0.68 µm
		USC-F2-k3						2.0 MHz	3.0 N/m	10 x 5 x 0.28 µm
		USC-F1.2-k7.3						1.2 MHz	7.3 N/m	20 x 10 x 0.67 µm
		Arrow UHF				Reflex (Al)	Arrow™	up to 2.0 MHz		35 x 42 x 0.7 µm
		Arrow UHF-AuD				Reflex (Au)				
Special Applications	PeakForce TappingTM / ScanAsyst® Mode	PNP-TRS			-	Reflex (Al)	Pyramidal silicon nitride	67 kHz	0.32 N/m	100 x 13.5 x 0.6 µm
	Force Modulation Mode	Arrow FM			-	-	Arrow™	75 kHz	2.8 N/m	240 x 35 x 3 µm
		FM					Pointprobe®			225 x 28 x 3 µm
		Arrow FMR			-	Reflex (Al)	Arrow™			240 x 35 x 3 µm
		FMR					Pointprobe®			225 x 28 x 3 µm
		DT-FMR			Diamond	Reflex (Al)	Diamond	105 kHz	6.2 N/m	225 x 28 x 3 µm
		CDT-FMR								
	Electrostatic Force Microscopy	Arrow EFM			PtIr5	PtIr5	Arrow™	75 kHz	2.8 N/m	240 x 35 x 3 µm
		EFM			PtIr5	PtIr5	Pointprobe®			225 x 28 x 3 µm
	Magnetic Force Microscopy	MFMR			Hard magnetic	Reflex (Al)	Pointprobe®	75 kHz	2.8 N/m	225 x 28 x 3 µm
		S-MFMR			Soft magnetic	Reflex (Al)				
	Tipless Cantilevers	Arrow TL1	1 cantilever		-	-	Tipless silicon	6 kHz	0.03 N/m	500 x 100 x 1 µm
		Arrow TL1-Au	1 cantilever		Ti/Au	-				
		Arrow TL2	Array of 2 cantilevers		-	-				
		Arrow TL2-Au	Array of 2 cantilevers		Ti/Au	-				
		Arrow TL8	Array of 8 cantilevers		-	-				
		Arrow TL8-Au	Array of 8 cantilevers		Ti/Au	-				
		PNP-TR-TL	triangular cantilevers	Cantilever 1	-	Reflex (Au)	Tipless silicon nitride	67 kHz	0.32 N/m	100 x 13.5 x 0.6 µm
				Cantilever 2				17 kHz	0.08 N/m	200 x 28 x 0.6 µm
		PNP-TR-TL-Au	triangular cantilevers	Cantilever 1	Au			67 kHz	0.32 N/m	100 x 13.5 x 0.6 µm
				Cantilever 2				17 kHz	0.08 N/m	200 x 28 x 0.6 µm

For further information please visit our website at www.nanoworld.com. All data are subject to change. NanoWorld® and Pointprobe® are registered trademarks of NanoWorld AG. PeakForce Tapping™ and ScanAsyst® are registered trademarks of Bruker Corp.

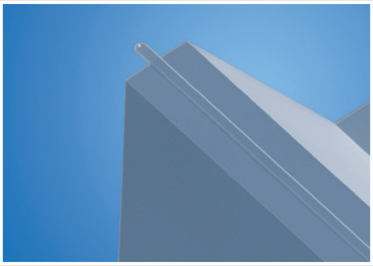
POINTPROBE®



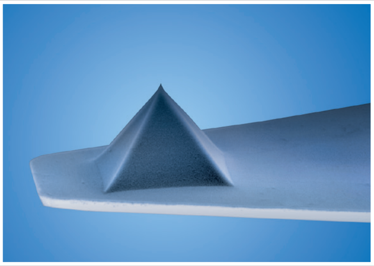
ARROW™



ULTRA-SHORT CANTILEVERS



PYREX-NITRIDE



About NanoWorld

Nanotechnology is our field. Precision is our tradition.

Innovation is our key instrument.
That's why we are located in Switzerland,
one of the most powerful and innovative areas in Europe.

Using our knowledge as well as our high precision SPM and AFM probes, our clients achieve the best results with Scanning Probe Microscopy (SPM) and with Atomic Force Microscopy (AFM).

The wide selection of tip shapes, spring constants, resonance frequencies and coatings translates to the most appropriate probe for your research as well as industrial applications.

The Pointprobe® Silicon AFM probes are the most widely used and best known AFM probes world-wide and have become the standard probes in many laboratories. The AFM probes of the Pointprobe® series are available in many different cantilever versions and tip shapes.

The AFM probes of the Arrow™ series feature a unique tip shape that allows easy positioning of the tip on the area of interest. The Arrow™ UHF version is designed for high speed scanning with a resonance frequency of up to 2 MHz.

With the Ultra-Short Cantilevers series NanoWorld now offers a whole range of AFM probes for High-Speed AFM. They are designed to resonate at frequencies of up to 5 MHz and feature a very wear resistant tip made of High Density Carbon/Diamond Like Carbon (HDC/DLC). Three different versions mainly for applications in air and three different versions mainly for applications in liquid are currently available.

The PNP Silicon Nitride AFM probes are available as versions with multiple triangular cantilevers, a version with a single triangular cantilever as well as a version with multiple rectangular cantilevers. They feature a pyramidal silicon nitride tip with a radius of curvature smaller than 10 nm. Tipless triangular silicon nitride cantilevers with either gold coating on the detector side or on both sides of the cantilevers are also available.

NANO WORLD
INNOVATIVE TECHNOLOGIES

NanoWorld AG
Headquarters
Rue des Saars 10
CH-2000 Neuchâtel
Switzerland

Phone: +41 325 521 515
Fax: +41 325 521 516
e-mail: info@nanoworld.com
web: www.nanoworld.com