

90° Sample Holders for AFM and SPM

Our 90° sample mounts are intended for mounting or clamping AFM/SPM samples at 90 degrees to enable easy imaging of cross section or the sides of a sample. They are made from magnetic stainless steel (alloy 430) and can be used on AFM/SPM systems which include a magnet in the sample stage (the same systems which use magnetic metal specimen support discs).

S799 Holds the cross section against the vertical side of the mount. Use an SEM glue to adhere to the side. Avoid double sided tape since the sample could still move which would cause imaging artefacts. Dimensions are 12mm Ø x 4.5mm high with base thickness of 1mm on the thinner side.

S800 The sample is securely held by a small set screw. This method is quicker and keeps the sample and holder free from adhesives. Can be used for samples up to 4mm or for multiple thinner sample clamped together. Dimensions are 12mm Ø x 4.5mm high with a 4mm slot.

S801 S-Clip Holds the sample or cross section securely up to a maximum thickness of 2mm. Ideal for thin sections or cross sections of silicon chips. Dimensions are 12mm Ø x 4.5mm high with base thickness of 1mm on the thinner side.

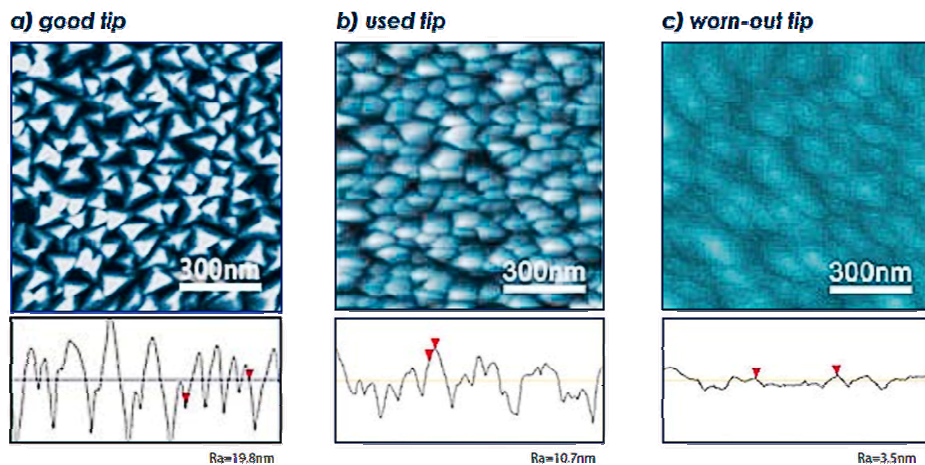


TipCheck Sample for Checking AFM Tips

When imaging a sample surface by AFM, it may be difficult to know whether the surface is imaged accurately or if it is affected by a blunt or broken tip. Blunt or broken tips will dramatically distort measurements like surface roughness or feature dimensions. To be certain that a proper AFM tip is used, they must be renewed regularly or checked by SEM imaging; both methods are time consuming and expensive.

An easier solution is to use the TipCheck sample for quick and convenient determination of the AFM tip condition. A single scan is often enough to clearly show the condition of the AFM tip; Tipcheck offers a quick and easy way to compare and categorize different AFM probes with respect to tip parameters like apex, shape and sharpness.

You can easily check whether the AFM tip is still good, is starting to show showing wear or is blunt or broken without the need of scanning an entire image or performing an SEM inspection of the tip. Additionally, the TipCheck sample works well with Auto Tip Qualification and Tip Characterisation software currently available on the market.



Comparison between different tip conditions measured with the TipCheck sample. Scan size is 1x1µm for all images; height scale is 100nm

The TipCheck sample consists of an extremely wear-resistant thin film coating deposited on a silicon chip. The thin film shows a granular, sharply peaked nanostructure which is ideal for reverse imaging of the AFM probe tip apex.

T709 AFM TipCheck sample 5 x 5mm mounted with electrically conductive epoxy resin on a 12mm metal AFM disc.

AFM/SPM Calibration Standards and Test Gratings

Atomic Force Microscopy (AFM) has become a valuable tool for imaging and accurate measurements at the micro and nanometer scales. In order to validate results, the AFM system needs to be correctly calibrated. Below is a selection of affordable and accurate AFM calibration standards for Z-axis and X-Y axis calibration:

The HS series with 20nm, 100nm and 500nm calibrated Z height also offering X-Y calibration for larger scanners in the 40-100µm range.

The CS calibration standard with 20nm Z height also enables X-Y-axis calibration at a smaller scanner size in the µm range.

The CS and HS series AFM calibration standard structures are all fabricated on a Si chip which is mounted on a 12mm stainless steel AFM disc with electrically conductive epoxy resin.

The HS-20MG is predominantly a height calibration standard with a 20nm calibrated height. It consists of silicon dioxide structures on a 5 x 5mm silicon chip. The fabrication process guarantees excellent uniformity of the structures across the chip. The calibration area is located in the centre of the silicon chip and consists of a larger square of 1 x 1mm with square pillars and holes with a 10µm pitch. In the centre of this square is a smaller square of 500 x 500µm with circular pillars and holes with a 5µm pitch.

This design also allows for X/Y axis calibration for larger scanners in the 10-40µm range. The structure symmetry of the HS-20MG enables calibrating your AFM system in one step without rotating the sample in between X and Y axis calibration.

The HS-20MG can be supplied mounted on a 12mm metal AFM disc using electrically conductive epoxy resin or unmounted. The exact height value is stated on the label of the HS-20MG.

S802 HS-20MG AFM XYZ calibration standard 20nm Z mounted on 12mm AFM disc

S802/AH HS-20MG AFM XYZ calibration standard unmounted

The HS-100MG is also a predominantly a height calibration standard with a 100nm calibrated height. It consists of silicon dioxide structures on a 5 x 5mm silicon chip. The calibration area is located in the centre of the silicon chip and consists of a larger square of 1x1mm with square pillars and holes with a 10µm pitch. In the centre is a smaller square of 500 x 500µm with circular pillars and holes with a 5µm pitch.

This design also allows for X/Y axis calibration for larger scanners in the 10-40µm range. The structure symmetry of the HS-100MG enables calibrating the AFM system in one step without rotating the sample in between X and Y axis calibration.

The HS-100MG is either supplied as mounted on a 12mm metal AFM disc using electrically conductive epoxy resin or unmounted. The exact height value is stated on the label of the HS-100MG.

S803 HS-100MG AFM XYZ calibration standard 100nm Z mounted on 12mm AFM disc

S803/A HS-100MG AFM XYZ calibration standard unmounted

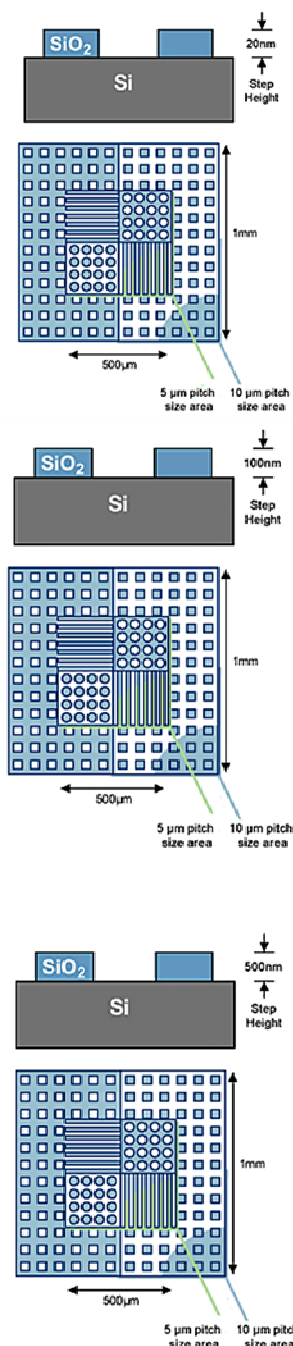
The HS-500MG is also a predominantly a height calibration standard with a 500nm calibrated height. It consists of silicon dioxide structures on a 5 x 5mm silicon chip. The calibration area is located in the centre of the silicon chip and consists of a larger square of 1 x 1mm with square pillars and holes with a 10µm pitch. In the centre is a smaller square of 500 x 500µm with circular pillars and holes with a 5µm pitch.

This design also allows for X/Y axis calibration for larger scanners in the 10-40µm range. The structure symmetry of the HS-500MG enables calibrating the AFM system in one step without rotating the sample in between X and Y axis calibration.

The HS-100MG is either supplied as mounted on a 12mm metal AFM disc using electrically conductive epoxy resin or unmounted. The exact height value is stated on the label of the HS-100MG.

S804 HS-500MG AFM XYZ calibration standard 500nm Z mounted on 12mm AFM disc

S804/A HS-500MG AFM XYZ calibration standard unmounted



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AFM/SPM Calibration cont.....

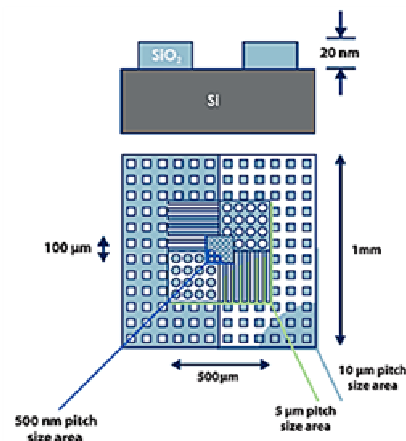
The CS-20NG is an XYZ calibration standard with a 20nm calibrated height. It consists of silicon dioxide structures on a 5 x 5mm silicon chip. The fabrication process guarantees excellent uniformity of the structures across the chip. The calibration area is located in the centre of the silicon chip and consists of a larger square of 1 x 1mm with square pillars and holes with a 10µm pitch. In the centre is a medium square of 500 x 500µm with circular pillars and holes with a 5µm pitch. The small square in the centre has a size of 100 x 100µm and contains circular holes with a 500nm pitch.

This design of the nanogrid allows for both lateral and vertical scanner calibration. The structure symmetry of the CS-20NG enables calibration an AFM system in one step without rotating the sample in between X and Y axis calibration.

The CS-20NG is supplied either mounted on a 12mm metal AFM disc using electrically conductive epoxy resin or unmounted. The exact height value is stated on the label of the CS-20NG.

S805 CS-20NG AFM XYZ calibration standard, 20nm Z, mounted on 12mm AFM disc

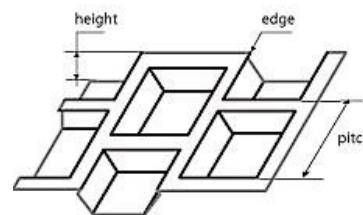
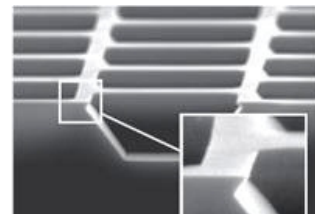
S805/A CS-20NG AFM XYZ calibration standard, 20nm Z, unmounted



TGX AFM/SPM calibration grating, 3µm pitch, undercut edges. The TGX calibration grating with an undercut edge is made by two-dimensional anisotropic etching along the (111) crystallographic planes of silicon. Typical radius of the edges is 5nm. The TGX calibration grating is intended for lateral calibration of SPM scanners, but is equally useful for detection of lateral non-linearity, hysteresis, creep, cross-coupling effects and determination of the tip aspect ratio. Calibrated pitch is 3µm with a non-calibrated step height of 1µm. Chip size is 5 x 5 x 0.3mm with an active area of 1 x 1mm. Supplied either unmounted or mounted on a 12mm AFM disc.

S806 AFM/SPM calibration grating, 3µm pitch, undercut edges mounted on 12mm AFM disc

S806/A AFM/SPM calibration grating, 3µm pitch, undercut edges, unmounted



TGF11 AFM/SPM calibration grating, 10µm pitch, trapezoid structure. The TGF11 calibration gratings exhibit one-dimensional arrays of trapezoid steps. These steps are etched into a silicon substrate along the (111) planes in mono-crystalline silicon. The result is a planar structure with smooth sidewalls on the trapezoid at an angle of 54.74°. The TGF11 grating is useful for assessment of scanner non-linearity in the vertical direction. Calibration of the lateral force can be obtained by analyzing the contact response on the flat and sloped planes. Calibrated pitch is 10µm with a non-calibrated step height of 1.75µm. Chip size is 5 x 5 x 0.3mm with an active area of 3 x 3mm. Supplied either unmounted or mounted on a 12mm AFM disc.

S807 TGF11 AFM / SPM calibration grating, 10µm pitch, trapezoid structure, mounted on 12mm AFM disc

S807/A TGF11 AFM / SPM calibration grating, 10µm pitch, trapezoid structure, unmounted

