

CCB High-Resolution AFM Probe

High-aspect ratio for bioscience applications

C|D|I

Carbon Design Innovations

Overview

Carbon Design Innovations' (CDI) carbon core bioprobes (CCB) for atomic force microscopy (AFM) start with a core carbon nanotube (CNT) that is straightened and stabilized using CDI's patented manufacturing processes. The CCB AFM probe offers an overall length of up to 5 μ m, plus extremely high aspect ratio, stability and resolution, with greater than 10x lifetime imaging over standard silicon tips.

The CCB is designed for non-contact (tapping) mode imaging of structures exhibiting extreme topographical features of several microns in Z-dimension.

The CDI Difference

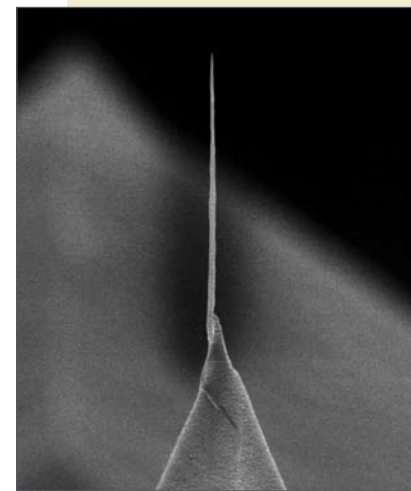
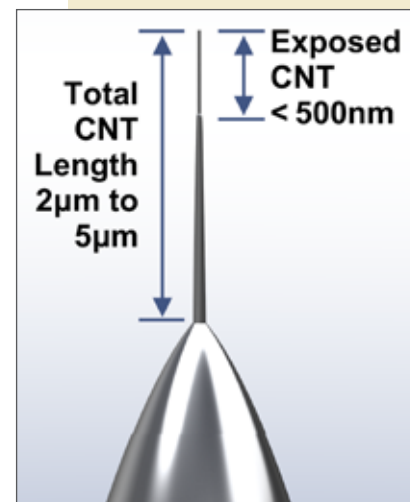
Carbon Nanotube (CNT) probes can offer more robust material properties than traditional silicon probes. CDI CNT AFM probes are not brittle and do not wear down as rapidly as silicon probes or amorphous carbon spikes allowing for greater than 10x longer imaging lifetime.

CCB AFM probes have true multiwall carbon nanotubes (MWCNTs), securely mounted, perfectly straight, and normal to the imaging surface. MWCNTs assure that the probe is extremely robust. CDI's proprietary processes securely attach the CNT to the cantilever and re-enforce the base attachment to ensure the CNT is firmly mounted. CDI technology enables the manufacture of probes with all the advantages of a CNT tip and the stability and familiarity of a silicon cantilever.

In addition, the CCB probe undergoes further reinforcement processing and combined with the physically robust material properties of a MWCNT allows CDI's CNT probes to be able to withstand AFM imaging forces with greater length-to-width ratio than is possible with a silicon or amorphous carbon spike probe. CDI's patented processing techniques provide precise angle and length control that results in nanoengineered critical dimension probes for ultra-high aspect ratio imaging applications.

Benefits

- Longer lifetime allows users to compare samples with the same probe with no loss of resolution
- Reduced breakage, wear or contamination
- Precise length, diameter and angle deliver consistent probe-to-probe performance



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Specifications are subject to change without notice.

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Features

- Stabilized, robust ultra-high aspect ratio CNT probe on a standard cantilever
- Proprietary stabilization coatings
- Imaging lifetime >10x that of silicon probes
- Available on any cantilever of your choosing. CDI uses Applied Nanostructures ANSCM-PT as our standard cantilever.

CCB Probe Characteristics

- Multi-walled CNT probe is nominally 30nm in diameter.
- The effective radius of curvature of the tip is nominally 20nm (unsharpened).
- Typical length of the exposed CNT portion of the tip is < 500nm
- Overall length of the CNT, including coated CNT portion, is 2 μ m to > 4 μ m.
- Aspect ratio > 15:1. Angular displacement nominally 0°

Customization

CDI's high-aspect ratio probes are widely applicable for most non-contact (tapping) mode AFM applications even for extreme high aspect ratio imaging. Proprietary coatings and other custom processes are available.

Talk to us about customizing a tip set for your specialized application.

Applications

- Surface roughness
- Scanning conductance microscopy
- Force modulation