

Conductive Diamond Coated Tip - Force Modulation Mode - Reflex Coating

NANOSENSORS™ CDT-FMR probes are designed for force modulation microscopy. The force constant of this AFM probe type spans the gap between contact and non-contact mode and is specially tailored for the force modulation mode. The FM sensor serves also as a basis for magnetic coatings (**MFM**). Furthermore non-contact or tapping mode operation is possible with the FM probe but with reduced operation stability.

For applications that require a wear resistant and an electrically conductive AFM tip we recommend this type. Some applications are Tunneling AFM and Scanning Capacitance Microscopy (SCM). The CDT Diamond Coating is highly doped and the total resistance measured in contact to a platinum surface is $< 10 \text{ k}\Omega$.

The typical macroscopic AFM tip radius of curvature is between 100 and 200 nm. Nanoroughness in the 10 nm regime improves the resolution on flat surfaces.

The AFM probe offers unique features:

- real diamond coating, highly doped
- AFM tip height 10 - 15 μm
- high mechanical Q-factor for high sensitivity
- alignment grooves on backside of silicon holder chip
- precise alignment of the AFM cantilever position (within $\pm 2 \mu\text{m}$) when used with the Alignment Chip
- compatible with **PointProbe® Plus XY-Alignment Series**

The reflective coating is an approximately 30 nm thick aluminum coating on the detector side of the AFM cantilever which enhances the reflectivity of the laser beam by a factor of about 2.5. Furthermore it prevents light from interfering within the AFM cantilever. As the coating is nearly stress-free the bending of the AFM cantilever due to stress is less than 2 degrees.

This AFM probe features alignment grooves on the back side of the holder chip. These grooves fit to the NANOSENSORS Alignment Chip.

Cantilever data:

| Property | Nominal Value | Specified Range |
|------------------------------|---------------|-----------------|
| Resonance Frequency [kHz] | 105 | 65 - 155 |
| Force Constant [N/m] | 6.2 | 1.5 - 18.3 |
| Length [μm] | 225 | 215 - 235 |
| Mean Width [μm] | 27.5 | 20 - 35 |
| Thickness [μm] | 3 | 2 - 4 |

Order codes and shipping units:

| Order Code | AFM probes per pack | Data sheet |
|------------|---------------------|---------------|
| CDT-FMR-10 | 10 | of all probes |
| CDT-FMR-20 | 20 | of all probes |
| CDT-FMR-50 | 50 | |