

Handling:

Information on using and handling HDC-probes

HDC probes are custom-made, individually manufactured and certificated AFM probes. They are characterised by outstanding resolution in combination with extreme durability and chemical stability. They can be used as any other AFMprobe in all scanning applications. However, In order to obtain thebestresults, please note the following remarks on cleaning and scanning properties:

Imaging in electron microscopes

Every electron imaging system in general does contaminate the sample under investigation, even those working under very high vacuum conditions. The **HDC** tip itself can become easily and very rapidly be contaminated . In most cases this changes the geometry and its unique material properties so drastically that it is not a "real" **HDC** tip anymore. We therefore must give strong advice against any imaging in electron microscope systems. For our certificates, i.e. high resolution images, we use a modified SEM working under inert gas atmosphere and ultra high vacuum conditions in combination with low electron energies. Only this imaging conditions non destructive imaging process.

Behaviour in AFM operations

HDC probes are characterised by the fact that they do not suffer or degrade under high loading forces (contrary to many other AFM probes). **HDC** material itself shows a hardness comparable to that of diamond but is also flexible to a certain degree. Therefore **HDC**-probes tend to elastically bend under very high loading forces. With long and highly sharpened tips this may lead to imaging artefacts, when scanned at high frequencies, low setpoints i.e. high loading forces and large scan sizes. By reducing the force on them, mainly by increasing the setpoint and readjusting the other scanning parameters, the tip will recover and show the initial superb imaging quality. In general we advise to scan slower for longer tips.

Cleaning

In normal scanning operation **HDC** probes do not tend to contaminate, since most materials adhere only very badly on **HDC** material. With particularly adhesive samples, or if the **HDC** probe deeply immerses into the sample like for example in lithography, some contamination might occur. In such cases we recommend to carefully immerse the probe into a solvent (e.g. water, acetone, alcohol,...) and dry blow it with compressed nitrogen or compressed air. **HDC** material is not attacked by most solvents. We strongly discourage you from using plasma cleaning or any physical etching, because some reactive plasma do indeed attack the **HDC** probes.