

## PointProbe® Plus Electrostatic Force Microscopy - Ptlr5 Coating

The PointProbe® Plus (PPP) combines high application versatility and compatibility with most commercial SPMs. The typical AFM tip radius of less than 7 nm and the minimized variation in AFM tip shape provide reproducible images and enhanced resolution.

The PPP-EFM probe is offered for electrostatic force microscopy. An overall metallic coating (Ptlr5) on both sides of the AFM cantilever increasing the electrical conductivity of the AFM tip. The force constant of this type is specially tailored for the electrostatic force microscopy yielding very high force sensitivity while simultaneously enabling tapping mode and lift mode operation.

### The AFM probe offers unique features:

- metallic conductivity of the AFM tip
- radius of curvature better than 25 nm
- AFM tip height 10 - 15  $\mu\text{m}$
- 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

### Please note:

- Wear at the AFM tip can occur if operating in contact-, friction- or force modulation mode.
- Although this is possible, it is not recommended to use Ptlr5 coated AFM tips for electrical contacting in applications where it is necessary to conduct high current. The very thin layer of Ptlr5 is unable to support much current.

The Ptlr5 coating is an approximately 25 nm thick double layer of chromium and platinum iridium5 on both sides of the AFM cantilever. The tip side coating enhances the conductivity of the AFM tip and allows electrical contacts. The detector side coating enhances the reflectivity of the laser beam by a factor of about 2 and prevents light from interfering within the AFM cantilever. The coating process is optimized for stress compensation and wear resistance. 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]    | 75            | 45 - 115        |
| Force Constant [N/m]         | 2.8           | 0.5 - 9.5       |
| Length [ $\mu\text{m}$ ]     | 225           | 215 - 235       |
| Mean Width [ $\mu\text{m}$ ] | 28            | 20 - 35         |
| Thickness [ $\mu\text{m}$ ]  | 3             | 2 - 4           |

### Order codes and shipping units:

| Order Code | AFM probes per pack | Data sheet         |
|------------|---------------------|--------------------|
| PPP-EFM-10 | 10                  | of all probes      |
| PPP-EFM-20 | 20                  | of all probes      |
| PPP-EFM-50 | 50                  | .....              |
| PPP-EFM-W  | 380                 | of up to 32 probes |