

schematic illustration of the AFM measuring principle

### Measuring Principle

Atomic Force Microscopes (AFMs) scan the surface of a sample using a very fine tip on the end of a microscale cantilever.

Atomic interactions between the tip and the surface lead to a deflection of the cantilever which is then detected by a piezoresistive element. Based on this effect, the AFM can measure the topography or roughness of a surface with very high resolution non destructively.

The AFM can be used in different operating modes and thus allows for the investigation of further properties, such as electrical and magnetical forces or elasticity of a specimen.

### Measuring Features

- topography measurement at very high resolution
- automatic approach of the tip to the surface
- sampling of surface areas by means of a piezoresistive element
- contact/non-contact mode, measurement of electrical and magnetic properties, measurement of lateral forces and elasticity\*<sup>1</sup>
- measurement in liquids\*<sup>2</sup>
- further operating modes upon request

\*<sup>1</sup> contact mode in basic version, additional modes upon request

\*<sup>2</sup> optional

### Technical Specifications

- measuring range x,y: 20 / 40 / 80  $\mu\text{m}$
- measuring range z: 3 / 4 / 6  $\mu\text{m}$
- detection principle: fiber-optic-interferometer
- resolution z: up to 0.1 nm
- resolution x,y: up to 1 nm
- scan speed: 1-5 lines/s

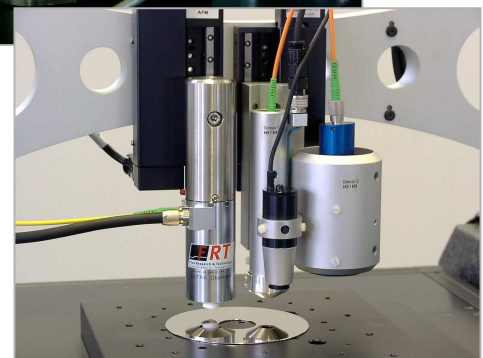
## Surface Characterization at Very High Resolutions

### Typical Applications

- quality assurance in micro technology
- roughness measurement in the nm and sub-nm range, e.g. on wafers or optical components
- surface characterization of biological samples
- measurement of nanostructures
- surface investigation of medical samples, e.g. prostheses, catheters or stents
- inspection of elastical, electrical, and magnetic properties in material science.

### Scope of Delivery

- AFM measuring head
- control unit
- sensor mount with motor-driven z-stage
- software, operating manual



AFM head with topography sensors in multisensor configuration

## Reference Customers

ASE Inc.  
Audi AG  
Ball Packaging Europe GmbH  
Bayer AG  
Beiersdorf AG  
BMW AG  
Boehringer Ingelheim microParts GmbH  
Carl Zeiss SMT AG  
DAIMLERCHRYSLER  
Dow Benelux N.V.  
EKO Stahl GmbH  
Fraunhofer-Institute  
Freescale  
Fuji Magnetics GmbH  
General Electric Plastics B.V.  
Gillette  
HILTI AG  
Hoechst Trespaphan GmbH  
Human Optics AG  
IBM  
Infineon Technologies AG  
Lexmark International, Inc.  
MAN Roland Druckmaschinen AG  
Matsushita Electric Works  
Nortel Networks Optical Components (Switzerland) AG  
Océ-Technologies B.V.  
Optische Werke G. Rodenstock GmbH  
Philips Electronics Nederland B.V.  
Robert Bosch GmbH  
Schott Glas  
SGL Carbon AG  
SIEMENS AG  
Sulzer Innotec AG  
Texas Instruments  
Universities  
Voestalpine Stahl GmbH  
Volkswagen AG  
Western Digital Fremont, Inc.

Your FRT Partner

