



NanoIndenter XP Mechanical Properties Microprobe System

NanoIndenter XP microprobe hardware: consisting of indenter, positioning microscope, controlling hardware. A variety of tip geometries are available, including Berkovitch, cube corner, cone.

	Range	Resolution
Displacement	1.5 mm	<0.01 nm
DCM Mode: Loads	10 mN	1 nN
XP Mode: Loads	500 mN	50 nN
High Load: Loads	10 N	50 nN

Lateral Force option

Allows measurement of force in X and Y lateral directions, simultaneous with vertical mode operation.

High Load option

Extends operation of the XP up to 1 kg in vertical load.

Continuous stiffness option

Applies a harmonic oscillation on top of the quasi-static motion, allowing continuous monitoring of stiffness. Force amplitudes of 60 nN to 300 mN. Frequency range of 0.05 Hz to 200 Hz.

Dynamic Contact Module

High resolution dynamic load indentation head. Force resolution: 1 nN; displacement resolution: < .002 nm. Displacement range: 15 μ m.

TestWorks 4 Explorer Level software

Controls all components, records and analyzes data. Operates within Microsoft NT operating system. Explorer level allows extensive programming of test protocol. Data output exported to Excel files.

Hard materials

Well-developed methods for characterizing material properties of small material volumes:

- Elastic modulus and hardness of metals, ceramics, other hard materials.
- Viscoelastic properties of materials using harmonic loading (storage modulus, loss modulus), constant load (creep response), or constant displacement (relaxation response).
- Scratch testing to determine film adhesion, coefficient of friction, variation of properties with depth.



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Soft tissues

- Non-penetrating indentation to determine elastic and viscoelastic properties of soft tissues.
- Micropenetration to determine fracture toughness of soft tissues.
- Scratch testing to determine fracture toughness of soft tissues.

Specifications:

- Indentation head assembly
- Displacement resolution <0.01 nm
- Total usable indenter travel 1.5 mm
- Maximum indentation depth > 500 μm
- Load application Coil/magnet assembly
- Displacement measurement Capacitance gauge
- Max load 10 N
- Load resolution 50 nN
- Load frame stiffness 1×10^7 N/m
- Motorized x-y sample manipulation table with computer mouse control. Positioning accuracy 1.5 μm .
- High performance vibration isolation system: air isolation table, passive environmental enclosure.
- Optical imaging system with 4X and 40X lenses.
- Fully automated, computerized data acquisition and control system including monitor and keyboard.

Computer

- Pentium III a450 MHz, 128 Mb RAM, 8.4 Gv Hard drive, 4X write/24X read CDRW, 3.5" 1.44 Mb floppy drive, ZIP drive
- Complete operating and data analysis software package
 - TestWorks 4 Professional level operation package
 - TestWorks 4 Analyst data analysis package
 - Microsoft Office 2000
- Hewlett-Packard laser printer