



MTS



NANO INSTRUMENTS

PLATFORM

NANO IndenterXP

the most accurate indenter technology for sub-micron data acquisition



▣ PLATFORM

NANO Indenter XP

SYSTEM COMPONENTS

NANO Indenter XP testing systems include the following core components:

- ▣ Indentation head assembly tip (Berkovich)
- ▣ Motorized sample manipulation table with mouse control
- ▣ Vibration isolation table and environmental enclosure
- ▣ Optical imaging system
- ▣ Video screen and camera
- ▣ Premounted diamond indentation
- ▣ Fully automated data acquisition and control system including PC, monitor and keyboard (Windows-based system)
- ▣ Complete TestWorks® operating and data analysis software
- ▣ Color ink jet printer

FEATURES AND BENEFITS

- ▣ Superior means of nanomechanical characterization
- ▣ Full characterization of film/substrate interactions
- ▣ Improved surface contact detection
- ▣ Creep measurement on polymer thin films
- ▣ Improved understanding of strain-rate sensitive materials and time-dependent response
- ▣ Storage and loss modulus (anelastic and viscoelastic materials)
- ▣ Hardness and modulus as a function of depth (elastic materials)
- ▣ Automated reporting of test results in both Microsoft® Word and Microsoft® Excel.

NANO Indenter XP systems provide a fast and reliable way to acquire mechanical data on the sub-micron scale. Incorporating the latest technologies for nanoindentation testing, NANO Indenter XP systems are complete test systems that feature a robust design to extend system life, the industry's most powerful software, improved electronics, and a space-saving load frame. Through 23-bit electronics and very high data-sampling rates, NANO Indenter XP systems produce the most accurate data of any instrumented nanoindentation systems on the market. Each recorded data point is an average of 1000 separate measurements.

NANO Indenter XP systems are software-controlled and simple to use. Users need to make only two decisions: where to put the indentations and what experiments to perform at those positions. Simply define the maximum load or depth for the indentation for routine hardness and modulus measurements, and the system will ensure that the tests are consistent, appropriate, and accurate. When applying the patented Continuous Stiffness Measurement (CSM) technique, the system records stiffness data along with load and displacement data dynamically, allowing hardness and Young's modulus to be calculated at every data point acquired during the indentation experiment.

NANO Indenter XP systems can also be fitted with an optional system for lateral force measurement. This option measures the frictional force exerted on the diamond tip during a scratch test. It also

enables a NANO Indenter XP system to be used as a profilometer to examine the topography of a surface before and after testing.

To learn more about NANO Indenter XP systems contact an MTS sales engineer or view our website at www.mtsnano.com.

SYSTEM SPECIFICATIONS

Indentation Head Assembly	
Displacement resolution	<0.01 nm
Total Indenter travel	2 mm
Maximum indentation depth	>500 µm
Load application	Coil / magnet assembly
Displacement measurement	Capacitance gauge
Loading capability	
Maximum load	500 mN (50.8 gm)
Maximum load with high-load option	1 kg
Load resolution	50 nN (5.1 µgm)
Load resolution with high-load option	50 nN (5.1 µgm)
Contact force	<1.0 µN
Load frame stiffness	≈1 x 10 ⁷ N/m
Indentation placement	
Useable surface area	90 x 100 mm
Position control	remote with mouse
Positioning accuracy (within field of view)	1.5 µm
with high performance tables	0.5 µm
Microscope	
Video screen	25X (x objective mag)
Objective	10X & 40X



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