KLA-TENCOR SUPPORT
Maintaining system productivity is an integral part of KLA-Tencor's yield optimization solution. Efforts in this area include system maintenance, global supply chain management, cost reduction and obsolescence mitigation, system relocation, performance and productivity enhancements, and certified tool resale.

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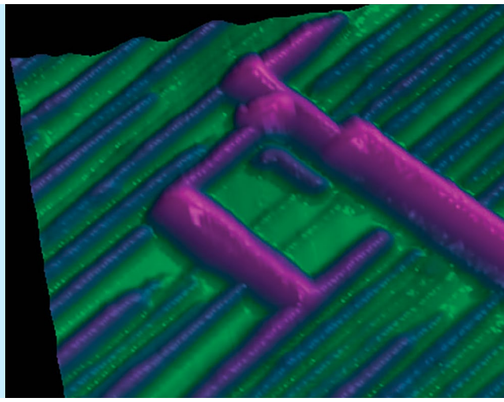
KLA-Tencor Corporation
One Technology Drive
Milpitas, CA 95035

Phone: 408.875.3000
www.kla-tencor.com

NANOMECHANICAL TESTERS

Nano Indenter G200 and T150 UTM

TOOLS FOR NANOMECHANICAL CHARACTERIZATION AND TESTING



NANO INDENTER G200

The Nano Indenter G200 is an accurate, flexible, user-friendly instrument for nanomechanical testing. Electromagnetic actuation allows superior dynamic range in force and displacement. The G200 lets researchers measure Young's modulus and hardness in compliance with the ISO 14577 standard. It also enables measurement of deformation over six orders of magnitude, from nanometers to millimeters. Users are able to quantify the relationship between structure, properties, and performance of their materials quickly and easily with minimal sample preparation. Express Test allows the Nano Indenter G200 to be operated in controlled-force or controlled-displacement mode. Testing is simple and fast, just point and measure, as fast as one second per site. A laser heated stage option keeps the sample and the tip at the same temperature, resulting in precise measurements that cannot be achieved by conventional sample heater systems.

Advantages

- Award winning Express Test for ultra-fast testing capabilities, as fast as 1 second per site
- Accurate, repeatable results compliant with ISO 14577
- Superior dynamic range in force and displacement
- Dynamic properties characterization via continuous measurement of stiffness by indentation depth

Applications

- Semiconductor
- Thin films
- MEMS structures
- Hard coatings
- Diamond Like Carbon (DLC) films
- Biomaterials

Express Test for the G200

A recipient of the prestigious R&D 100 Award, the Express Test option enables fast nanoindentation for mechanical-properties mapping. This technology, which has been designed and optimized for exclusive use with the Nano Indenter G200, delivers high-precision data on a wide variety of materials. The Express Test option is compatible with all DCM II and XP heads and translation stages.

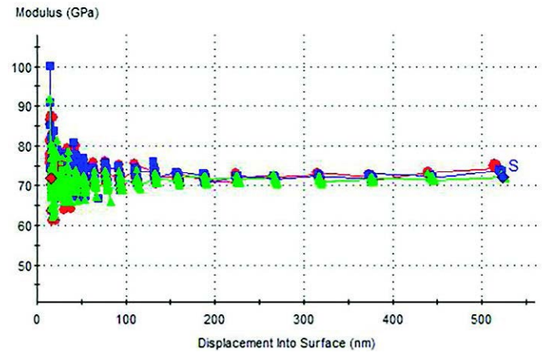
Achieve ultra-fast testing capabilities (up to 100 indents at 100 different surface sites in as little as 100 seconds). Express Test allows the G200 to be operated in controlled-force or controlled-displacement mode. Perform area calibration and Young's modulus in minutes.

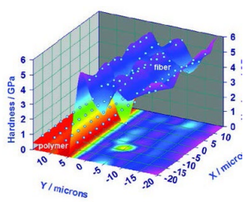
Advantages

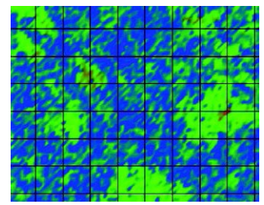
- Ultra-fast indentation
- True mechanical-properties maps
- Rapidly evaluates Young's modulus and hardness with robust statistics
- Automatically generated histograms
- Negligible thermal drift

Applications

- Metals
- Glasses
- Ceramics
- Structural polymers
- Thin films
- Low-k materials







UNIVERSAL TESTING MACHINE T150 UTM

The Universal Testing Machine T150 UTM offers researchers a superior means of nanomechanical characterization by utilizing a nanomechanical actuating transducer head to produce tensile force. The T150 UTM enables researchers to understand dynamic properties of compliant fibers via a large dynamic range and high resolution (five orders of magnitude of storage and loss modulus).

Advantages

- Load cell delivers high sensitivity over large range of strain
- Large dynamic range and high resolution
- Flexibility and upgradability for repeatable or new applications
- Real-time control and easy test protocol development

Applications

- Dynamic studies of fibers and biological materials
- Tensile and compression studies of polymers
- Yield of compliant fibers and biological materials

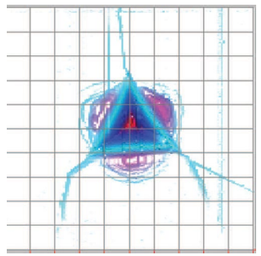
NANOSUITE AND NANOVISION SOFTWARE

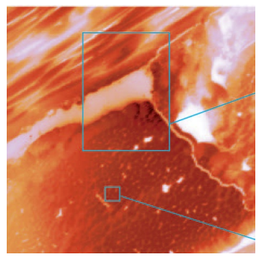
NanoSuite software lets users run tests and manage data with ease on the Nano Indenter G200 and Universal Testing Machine T150 UTM. Through the intuitive interface, you can set up and run experiments quickly — changing test parameters as often as desired — with just a few clicks.

NanoVision software allows you to create quantitative high-resolution images using a Nano Indenter with a high precision closed-loop stage. User can target indentation test sites with nanometer-scale precision, and examine residual impressions in order to quantify material response phenomena.

Advantages

- Survey scanning of areas up to 500 x 500 µm
- Custom test development methods
- Superior experiment data analysis
- Simulation mode for offline sample setup, sample runs, method writing and data analysis
- Quantitative, high-resolution topographical images
- Quantification of pile-up, deformed volume and fracture toughness





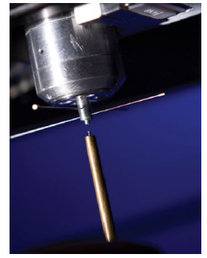
NANOMECHANICAL OPTIONS AND ACCESSORIES

We offer many options and accessories to enhance the capabilities of your nanoindentation system or universal testing machine.

The Dynamic Contact Module II option offers a high loading capability. It also offers easy tip exchange for quick removal and installation of application-specific tips, in addition to a wide range of indenter travel. As a fully dynamic indentation head designed for low noise, low-load mechanical properties characterization, the DCM II extends the range of load-displacement experimentation down to the surface contact level. When applying the Continuous Stiffness Measurement technique, which provides a means of separating the in-phase and out-of-phase components of the load-displacement history, the DCM II delivers the complete benefits of dynamic nanoindentation testing.

The High Load option, expands the load capabilities of Nano Indenters up to 10N of force, allowing the complete mechanical characterization of ceramics, bulk metals and composites. The Lateral Force Measurement option, provides three-dimensional quantitative analysis for scratch testing, wear testing and MEMs probing. We also offer a precision heating stage designed specifically for the Nano Indenter G200 (standard XP head configuration) to facilitate the study of materials of interest as they are heated from room temperature to as high as 350C.

T150 UTM users can also utilize the Continuous Dynamic Analysis option. This technology offers a direct, accurate measurement of the specimen's stiffness at each point in the experiment, enabling mechanical properties to be determined continuously as the specimen is strained.

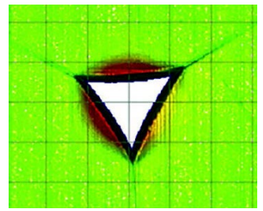


Options/Accessories

- Dynamic Contact Module II (DCM II)
- Continuous Stiffness Measurement (CSM)
- High Load
- Lateral Force Measurement (LFM)
- Continuous Dynamic Analysis (CDA)
- Heating Stage
- Nanovision Software
- Express Test
- Indentation Kit
- Consumables

Materials Science

For nanomechanical testing of DLC thin films, MEM structures, nanocomposite fibers and other materials, the Nano Indenter G200 systems offer accurate and repeatable results compliant with the ISO 14577 standard, along with "low-load first then high-load" capabilities. Additionally, the T150 UTM enables researchers to understand dynamic properties of compliant fibers and composites via the largest dynamic range and best resolution on the market.



Polymer Science

Polymer studies can benefit greatly from the use of the Nano Indenter G200 system. The G200 high-precision nanomechanical test instrument is configurable with our low-noise, ultra-low-load Dynamic Contact Module II (DCM II) option, which provides loading capability up to 30 mN max load.