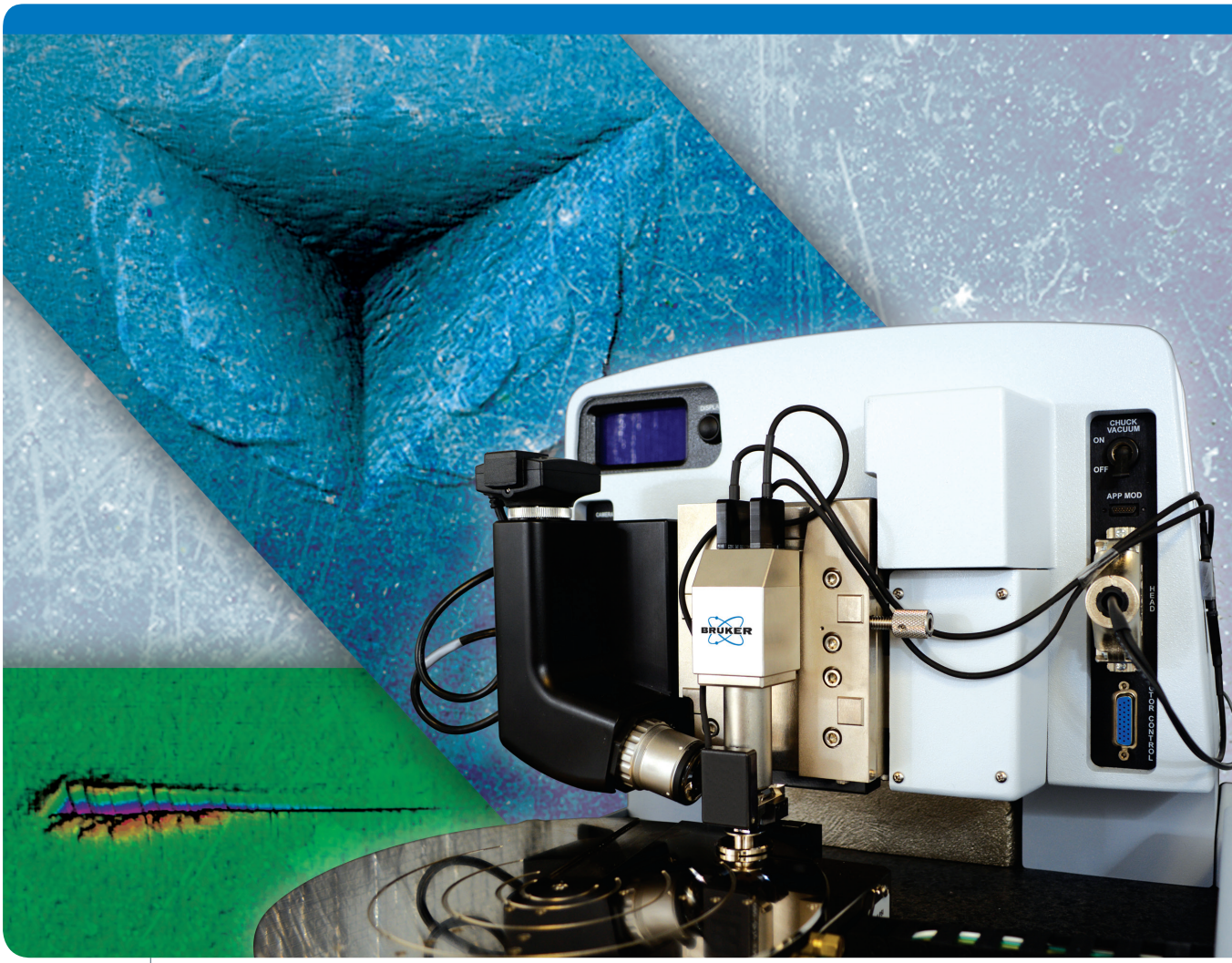


Hysitron TriboScope

- Delivering Quantitative, Rigid-Probe Nanoindentation and Nanotribology to Atomic Force Microscopy

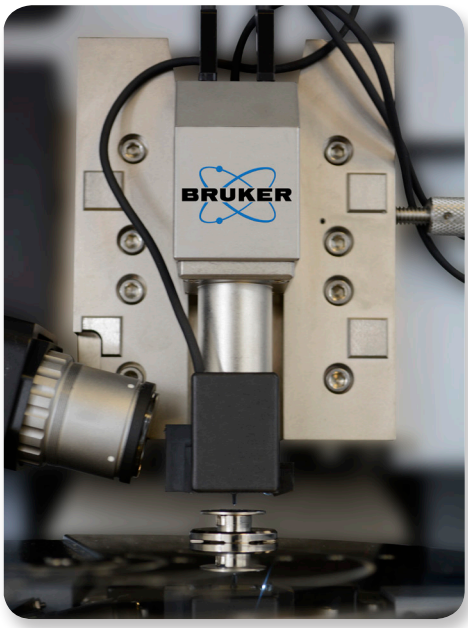
Innovation with Integrity

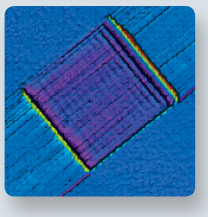
Tribology & Mechanical Testing

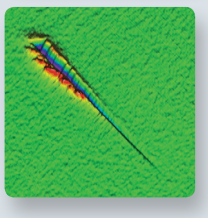
Hysitron TriboScope

Enhance the Characterization Capabilities of Your AFM

Bruker's Hysitron TriboScope® delivers quantitative, rigid-probe nanoindentation and nanotribological characterization capabilities to the world of atomic force microscopy. The Hysitron TriboScope interfaces with Bruker's Dimension Icon®, Dimension Edge™, and MultiMode® 8 AFMs to expand the characterization capabilities of these microscopes. By utilizing a rigid test probe, the TriboScope removes the intrinsic limitations, variability, and complexity associated with cantilever-based measurements to deliver quantitative and repeatable mechanical and tribological characterization over nanometer-to-micrometer length scales.







The TriboScope Advances Your Research with Innovative Testing Modes

Quasi-Static Nanoindentation

Perform quantitative measurement of elastic modulus, hardness, creep, stress relaxation, and fracture toughness of localized microstructures, interfaces, small surface features, and thin films.

In-Situ SPM Imaging

Utilize the same test probe for testing and topographic imaging for nanometer precision test placement accuracy and the ability to characterize post-test material deformation behavior.

ScanningWear

Raster scan the test probe over the sample surface at a user-definable force setpoint for quantitative wear resistance characterization at the nanoscale.

NanoScratch

Perform quantitative scratch/mar resistance, friction coefficient, and thin film adhesion measurements with Bruker's exclusive 2D lateral force transducer technology.

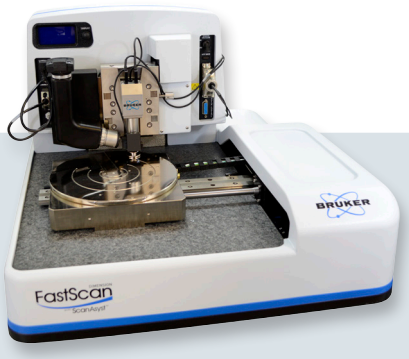
nanoDMA III - Dynamic Nanoindentation

Continuously measure elastic-plastic and viscoelastic properties as a function of indentation depth, frequency, and time with Bruker's nanoDMA® III option.

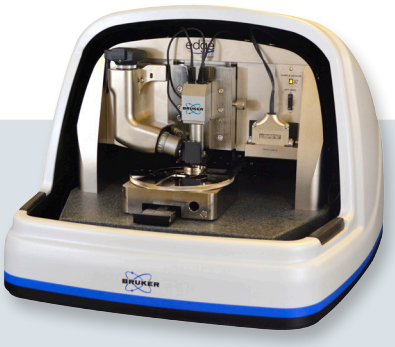
Quantitative, Reliable, and Repeatable

Expanding the Capabilities of our Industry-Leading AFMs

The TriboScope quickly interfaces to Bruker's Dimension Icon, Dimension Edge, and MultiMode 8 systems.



Dimension Icon

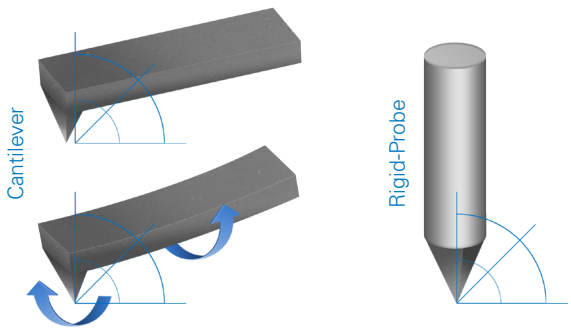


Dimension Edge

MultiMode 8

The Rigid-Probe Advantage

Most AFMs utilize a compliant cantilever to conduct mechanical or tribological testing, posing significant challenges in separating a cantilever's flexural and rotational stiffness from the material's response to applied stress. The TriboScope utilizes a rigid test probe assembly, allowing direct control and measurement of applied force and displacement during the test.

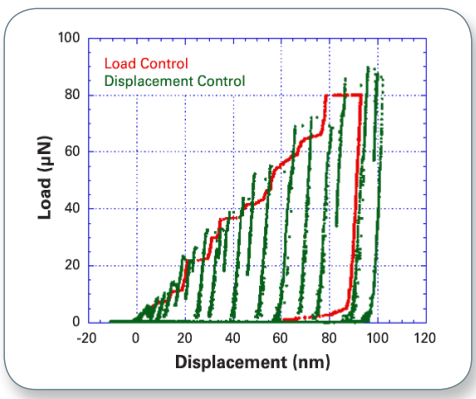


Electrostatic Actuation

The TriboScope utilizes proprietary electrostatic force actuation and capacitive displacement sensing transducer technology to deliver industry-leading noise floors and low thermal drift for characterizing properties to the bottom of the nanoscale.

Force and Displacement Feedback Control

The TriboScope operates under closed-loop force control or displacement control. Utilizing a 78 kHz feedback loop rate, the TriboScope can respond to fast material deformation transient events and faithfully reproduce the test function defined by the operator.



TriboScope Features

- Quantitative, rigid-probe characterization removes the uncertainties and complexities intrinsically caused by cantilever-based nanoindentation and nanotribological testing techniques
- Industry-leading transducer technologies provide measurement of elastic modulus, hardness, creep, stress relaxation, fracture toughness, and viscoelastic properties over nanometer-to-micrometer length scales
- An intuitive mechanical interface streamlines integration with popular commercially available AFMs, including Bruker's Dimension Icon, Dimension Edge, and MultiMode 8 systems
- Proprietary capacitive transducer and Performech® control technologies provide superior control over the nanoindentation process and deliver industry-leading force and displacement noise floors
- In-situ SPM imaging provides nanometer-precision test placement accuracy and observation of post-test material deformation behavior
- Enables quantitative nanomechanical and nanotribological characterization of the broadest range of materials, from soft polymers to ultra-thin diamond thin films

Standard Configuration

Testing Modes	Quasi-Static Nanoindentation, In-Situ SPM Imaging, ScanningWear
Normal Force	Maximum Force: 10 mN Noise Floor: 75 nN Resolution: 1 nN
Normal Displacement	Maximum Displacement: 5 µm Noise Floor: <0.2 nm Resolution: 0.006 nm Drift Rate: <0.05 nm/sec

Optional Configurations

nanoDMA III	
Testing Modes	Dynamic Nanoindentation, Quasi-Static Nanoindentation, In-Situ SPM Imaging, ScanningWear
Dynamic Specifications	Frequency Range: 0.1 Hz - 300 Hz Maximum Dynamic Force Amplitude: 5 mN Maximum Dynamic Displacement Amplitude: 2.5 µm
NanoScratch	
Testing Modes	NanoScratch, Quasi-Static Nanoindentation, In-Situ SPM Imaging, ScanningWear
Lateral Specifications	Maximum Displacement: 15 µm Displacement Noise Floor: <2 nm Maximum Force: 2 mN Force Noise Floor: <3.5 µN

Bruker Nano Surfaces Division

Minneapolis, MN • USA
Phone +1.952.835.6366
productinfo@bruker.com

www.bruker.com/nanomechanical-testing

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