Agilent NanoVision Microscopy Module

Data Sheet

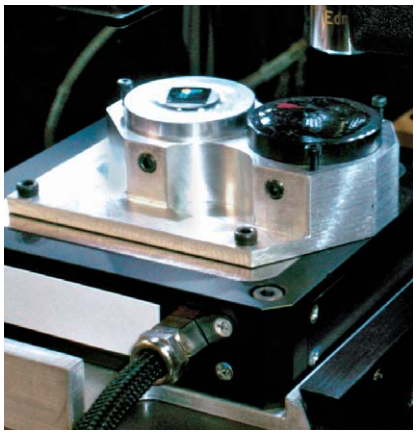

Figure 1. Nanopositioning scanning stage.

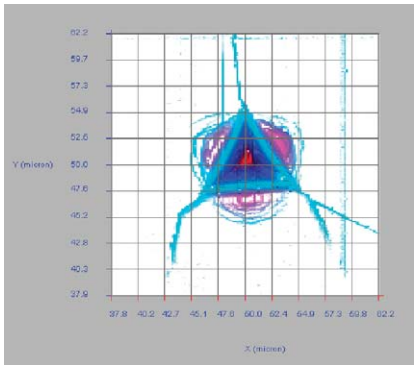

Figure 2. NanoVision enables rapid setup of automated indent and scan routines. Resultant scans make fracture toughness measurements easy.

Features and Benefits

- Create quantitative high-resolution images using an Agilent Nano Indenter
- Target indentation test sites with nanometer-scale precision
- Examine residual impressions in order to quantify material response phenomena such as pile-up, deformed volume, and fracture toughness
- Full integration with Agilent NanoSuite software, including:
  - Parallel control of nanopositioning stage and all other system hardware in NanoSuite
  - NanoSuite 3D software
  - NanoSuite methods that integrate indentation and imaging
- User control over scan area, resolution, and speed
- Includes 10 NanoVision sample pucks

Overview

Backed by decades of nanomechanical testing experience, the Agilent NanoVision nanomechanical microscopy option delivers quantitative imaging by coupling a linear electromagnetic actuation-based indentation head with a closed-loop nanopositioning stage.

Standard NanoVision methods provide quick setup to obtain 3D results, while the option's interactive mode of operation provides a flexible platform for customization of scan routines. NanoVision allows users to create quantitative high-resolution images using an Agilent Nano Indenter, target indentation test sites with nanometer-scale precision, and examine residual impressions in order to quantify material response phenomena such as pile-up, deformed volume, and fracture toughness.

Principles of Operation

The NanoVision option for Agilent Nano Indenters is used to probe the surface of a sample, generating a 3D map of the surface. The indenter tip is brought into contact with the surface and a small constant force is applied while rastering the sample back and forth. In order to maintain this constant force between the tip and the surface, the indenter must move up and down with the surface

profile. This up-and-down motion is measured and then used to generate a topological image of the surface.

Once the topographical image has been generated, it is displayed within the controlling software and can be used to place indentation test sites with nanometer-scale precision. Precise placement of indentations on a complex sample, such as a multilayer composite, allows users to target and characterize individual phases of the material.

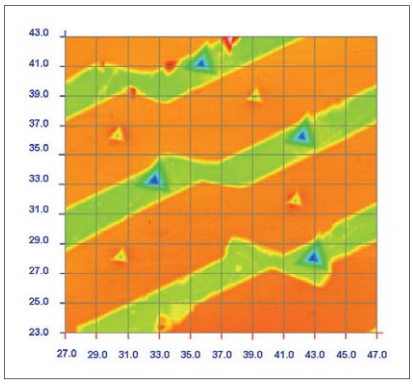

Figure 3. NanoVision probes the surface of the sample to create a topographical image, which can then be used to select test sites. Nano Vision was used to test individual phases of chrome and chrome-silicide.

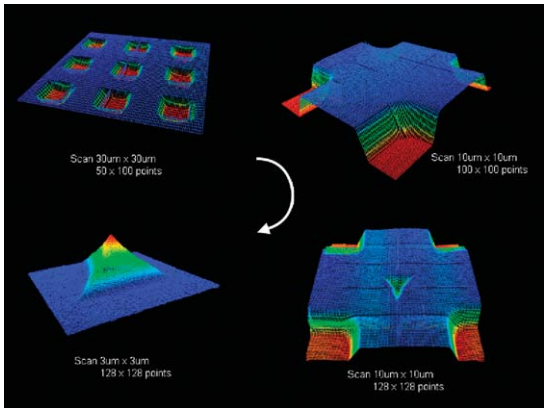

Figure 4. NanoVision option was used to scan a grid with known step heights in order to demonstrate topological accuracy. One advantage of using an indentation system for image generation is that you can rely on the measured displacements. Surface topology is measured with the same system that is used to measure material properties, so displacement measurements must be accurate and repeatable.

Agilent NanoVision Option Specifications

X-Y scan range	100 µm x 100 µm
Z scan range	Indentation head dependent
Positioning repeatability	≤2 nm
Resonant frequency	>120 Hz

Nanoindentation instruments from Agilent Technologies conform to ISO 14577 standards, delivering confidence in test accuracy and repeatability. These state-of-the-art solutions ensure reliable, high-precision measurement of nanomechanical properties for research and industry.

Nano Mechanical Systems from Agilent Technologies

Agilent Technologies, the premier measurement company, offers high-precision, modular nano-measurement solutions for research, industry, and education. Exceptional worldwide support is provided by experienced application scientists and technical service personnel. Agilent's leading-edge R&D laboratories ensure the continued, timely introduction and optimization of innovative, easy-to-use nanomechanical system technologies.

www.agilent.com/find/nanoindenter

Americas

Canada	(877) 894 4414
Latin America	305 269 7500
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	43 (0) 1 360 277 1571
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700* *0.125 €/minute
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland	0800 80 53 53
United Kingdom	44 (0) 118 9276201

Other European Countries:
www.agilent.com/find/contactus

Printed in USA, August 13, 2010
5990-4219EN

Agilent Technologies