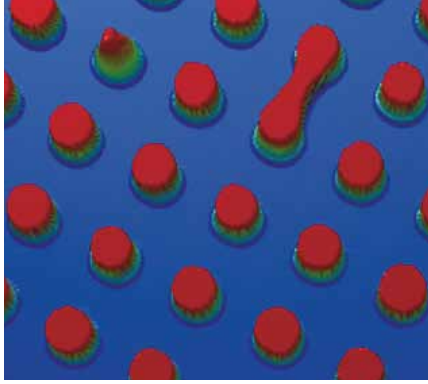

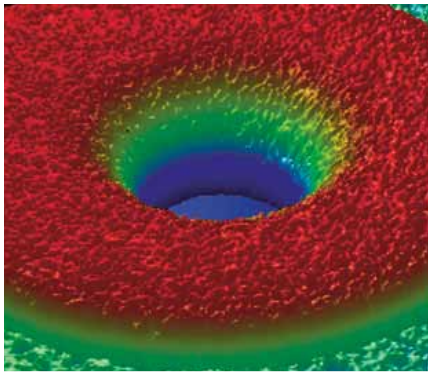

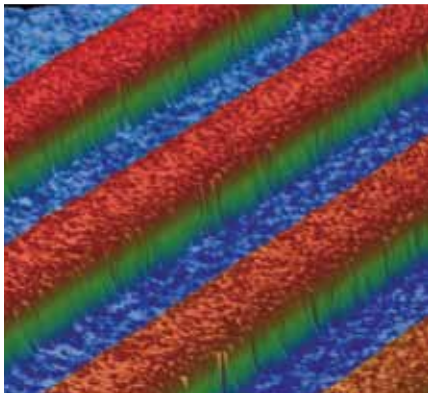

SP9900 Large-Format Surface Profiling System

Unprecedented Speed and Performance

- Fast Gauge-Capable Data Acquisition
- Automated Non-Contact 3D Inspection
- Panel Sizes up to 600x600mm
- Configurable Sampling Plans and Analyses

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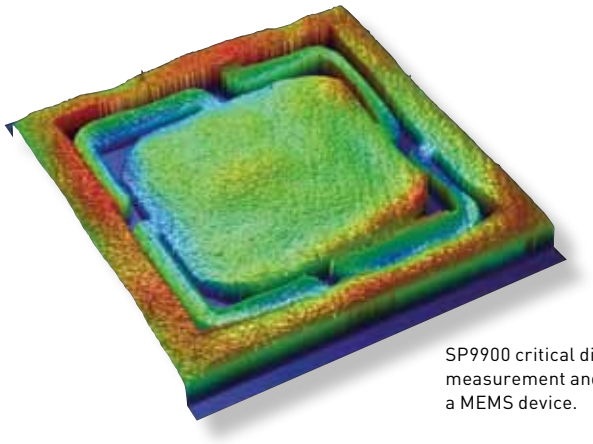
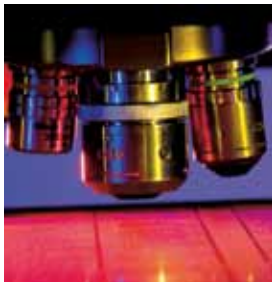


SP9900 critical dimension measurement and 3D analysis of a MEMS device.

SP9900 Large-Format Surface Profiler System

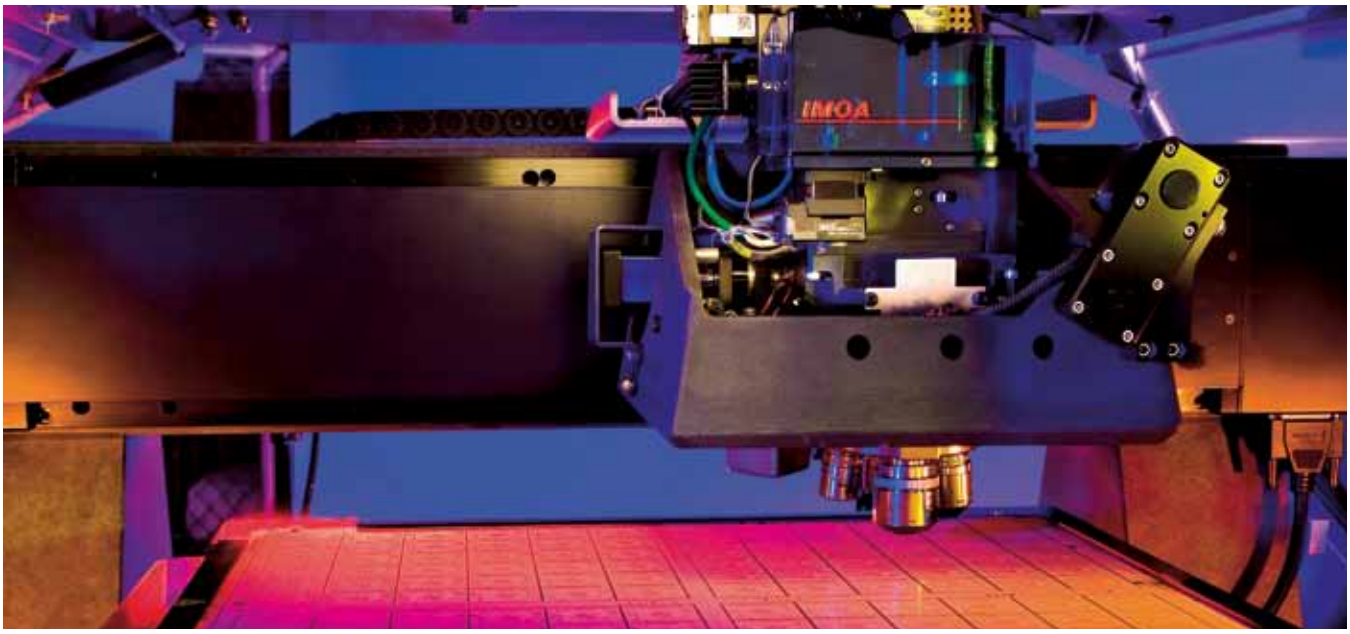
Enhance Product Performance and Maximize Yield



The third-generation SP9900™ Large-Format Surface Profiling System delivers unmatched measurement performance on substrate panels, bumped substrates, flat panels, and circuit boards for improved process monitoring and increased yields. The SP9900 incorporates over 10 years of packaging and panel measurement experience to provide unprecedented speed, metrology capability, reliability, serviceability, and manufacturing readiness for 3D critical dimension measurements in large-format applications.

SETTING INDUSTRY STANDARDS

- Automated, non-contact 3D inspection for production-boosting performance
- Faster data acquisition for higher-throughput in-line process monitoring
- Larger stage design accommodating panels up to 600x600mm
- Improved production interface for ease of use and custom configurations



The SP9900 gantry design provides a 600x600mm measurement area with the same footprint as previous instruments.

FASTER MEASUREMENTS, LARGER MEASURABLE AREA

The SP9900 provides extremely fast characterization of large panels and singulated substrates, without sacrificing accuracy or repeatability. This instrument incorporates a host of features to increase its measurement speed, including faster auto-focus and auto-intensity functions, a faster camera, and a faster stage. In addition, a revolutionary fixture-loading mechanism removes the need for a vertical axis, thus eliminating time-consuming motion within the system.

The SP9900 also utilizes a revolutionary gantry stage to deliver an industry-first 600x600-millimeter measurement area, with virtually the same footprint as our previous-generation large-format SP profilers. Taken together, the speed improvements and larger sample support make the SP9900 an ideal platform for demanding in-line process metrology in a host of applications.

COMPARISON WITH PREVIOUS-GENERATION SP SYSTEMS

Parameter	SP3050/3250	SP9900
Throughput*	7:26 min	3:50 min
Max panel size	400 x 500mm	600 x 600mm
System footprint (W x L x H)	145 x 122 x 229cm	114 x 142 x 162cm
Installation time	2 days	<1 day
Enclosure	Painted steel	Stainless steel
User interface console	Integrated on front door	Mobile station
Sample/Fixture access	Good (multiple access points)	Better (ergonomic loading position)

*for 5 locations per panel via measurement.

HIGHEST RESOLUTION, BEST ACCURACY

Utilizing high-resolution imaging and patented Vertical Scanning Interferometry (VSI), the gauge-capable SP9900 system can perform accurate 3D critical dimension measurements, with nanometer resolution. This allows the SP9900 to operate as both a powerful surface metrology instrument and an easy-to-use defect inspection tool.

The system uses the latest optical measuring head technology with optional internal reference signal to deliver closed-loop feedback for applications requiring the utmost accuracy and repeatability. The patent-pending all-LED illumination design provides superior illumination and uniformity for better results on low-reflectivity panels and other very rough surfaces.

INDUSTRY-FRIENDLY OPERATION, INCREASED UPTIME

Every feature of the SP9900 has been engineered for production convenience, ease of use, and reliability. The system ships mostly pre-assembled, making installation and setup a matter of hours, not days. All hardware components use industry-standard interfaces such as Ethernet, Firewire, and USB, making maintenance simple and cost-effective. In addition, all control lights utilize LED technology to keep consumables at a minimum and maximize uptime and reliability.

Fast image processing, an operator-friendly interface, and field-proven advanced automation enable production-speed data acquisition with minimal operator-to-operator variability. This intuitive production interface offers faster and easier mouse-click fiducial alignment and configurable user input fields for database customization. In addition to pass/fail information, users can now select detailed parameter results for display on the summary screen. Measurement recipes enable fast setup of production sequences and lot-sampling plans. All these features combine to make this latest generation SP system the best metrology solution available.

SP9900 SPECIFICATIONS

Measurement Capability	Non-contact, three-dimensional, surface, critical dimension, film thickness, tribology
Objectives	1.5X, 2.5X, 5X, 10X, 20X, 50X for magnifications from 0.75X to 100X; Long working distance objectives available; Optional through transmissive media objective
Field of View Multipliers	0.55X, 0.75X, 1X, 1.5X, 2X; Auto-sensing motorized selector, discreet zoom
Measurement Array	Maximum array 640 x 480, high-speed, non-interlaced; Optional large-format camera available
Light Source	Long-lifetime green and white LEDs
Stages	600mm X/Y auto stage
Optical Assembly	Integrated computer-controlled illuminator
Computer System	Bruker-qualified Dell® PC; 17 in. flat panel monitor, mounted on Ergotron® mobile workstation
Software	Wyko Vision® running under Microsoft® Windows XP® Professional; Production mode, built-in data basing with pass/fail for any parameter; Optional Stitching, MATLAB®/TCPIP, Film Analysis,Optical Analysis and SureVision
Vertical Measurement Range	0.1nm to 10mm standard
Vertical Resolution[1]	<0.1nm
RMS Repeatability[2]	0.01nm
Vertical Scan Speed	User selectable up to 80µm/sec
Lateral Spatial Sampling	0.1 to 13.2µm (≤160nm with large-format camera)
Optical Resolution	0.55µm min. (based on Sparrow Criteria at 600nm)
Field-of-View	8.45mm to 0.05mm (10.8mm x 8.1mm max. with large format camera); Optional stitching for larger FOVs
Reflectivity	<1 to 100%
Step Height	50.6% accuracy; <0.1% at 1s repeatability
Footprint	163cm H x 143cm D x 115cm W (64in. H x 56in. D x 45 in. W)

As demonstrated by a PSI measurement with nulled fringes on a SiC reference mirror.
[2] As demonstrated by taking the one sigma Rq value of 30 PSI repeatability measurements on a SiC reference mirror.
Note: Specifications are subject to change without notice. Visit the Bruker website for most up-to-date specifications.

Front cover images: The SP9900 provides critical dimension measurements for a wide variety of large-format applications, including (from top to bottom) bump measurements (revealing solder bridge and missing bump), via on copper pad, and panel traces.

WORLDWIDE CUSTOMER SUPPORT FROM THE INDUSTRY LEADER

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B510, Rev B0