3D OPTICAL METROLOGY

ContourX Benchtop Profilometers

Most Accurate and Repeatable
Surface Roughness and Topography Measurements

ContourX 3D Optical Profilometers

Four Decades of Non-Contact Surface Metrology Innovation

Bruker's metrology products have a long history of enabling scientists and engineers to make breakthrough discoveries and drive the frontiers of new applications that improve the quality of our lives. Our suite of ContourX 3D Optical Profilometers helps researchers and engineers in R&D, manufacturing, and QC to tightly control surface-related process parameters with robust, reliable, and easy-to-use non-contact 3D surface metrology for best-in-class accuracy and repeatability.

ContourX benchtop profilometers combine four decades of Wyko® and Bruker technological advances to achieve industry-leading capability and utmost customer satisfaction with:

- Most optimized WLI technology for surface metrology
- Unmatched vertical resolution over large field of view
- Fastest time to results with uncompromised precision and accuracy
- Best-in-class reliability and repeatability

ContourX-500

Flagship benchtop model with full automation, encoded X/Y stage, proprietary tip/tilt metrology head, and a patented measurement algorithm for features beyond optical diffraction limit.

ContourX-100

Streamlined metrology tool with advanced WLI optical module, advanced 3D analytical library, fast auto-focus and intensity, manual stage and tip/tilt adjustments.

ContourX-200

Workhorse system adding automated XYZ stage, advanced find surface, stitching, and large area mapping.

Industry's Best Accuracy, Repeatability, and Reproducibility

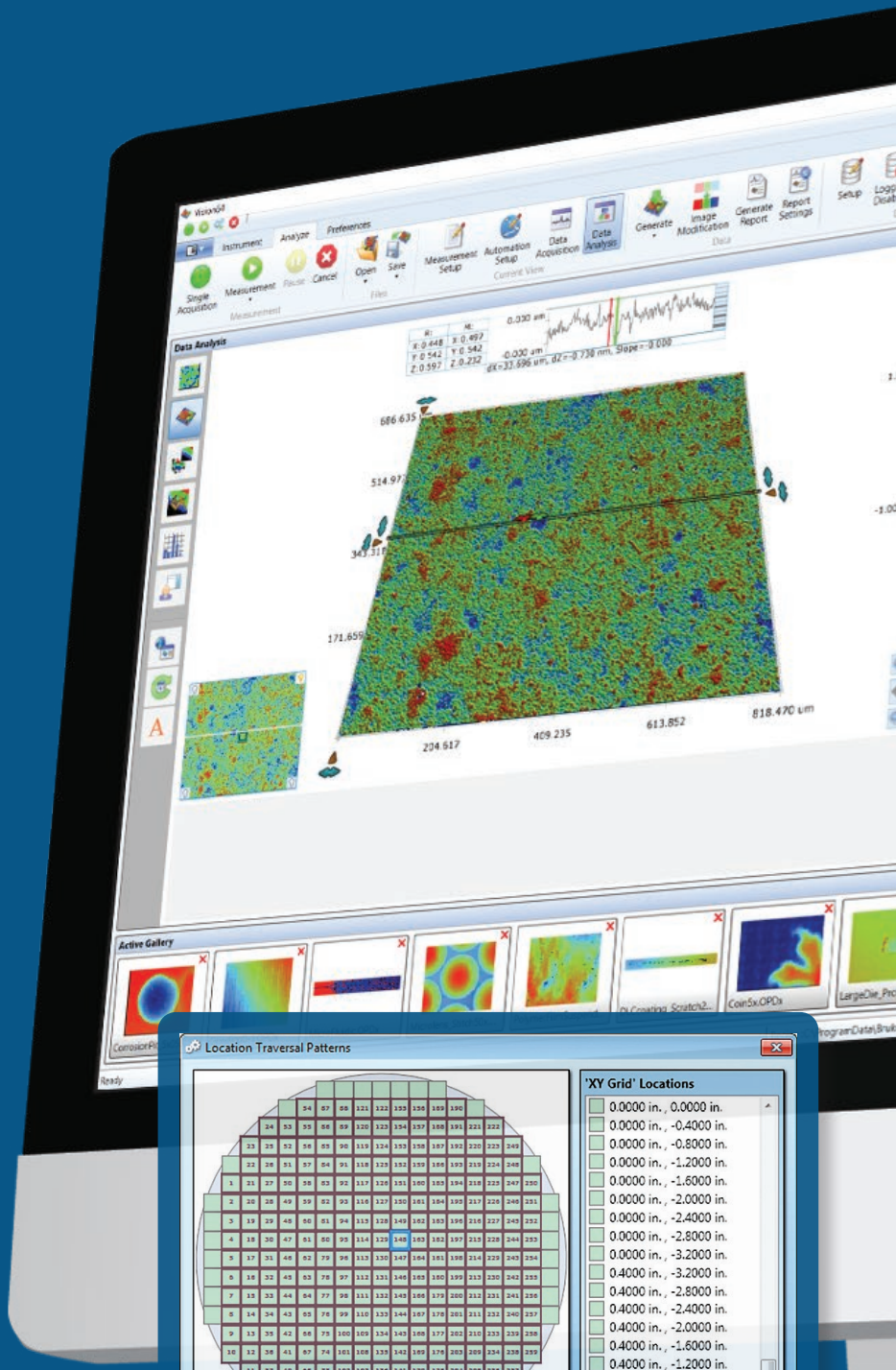
The ContourX platform has set the benchmark for accuracy and repeatability. From better than 0.1% repeatability on a NIST traceable step height standard to better than 0.03 nm repeatability on a super-smooth SiC mirror, ContourX delivers gage-capable metrology for utmost confidence in your application needs.

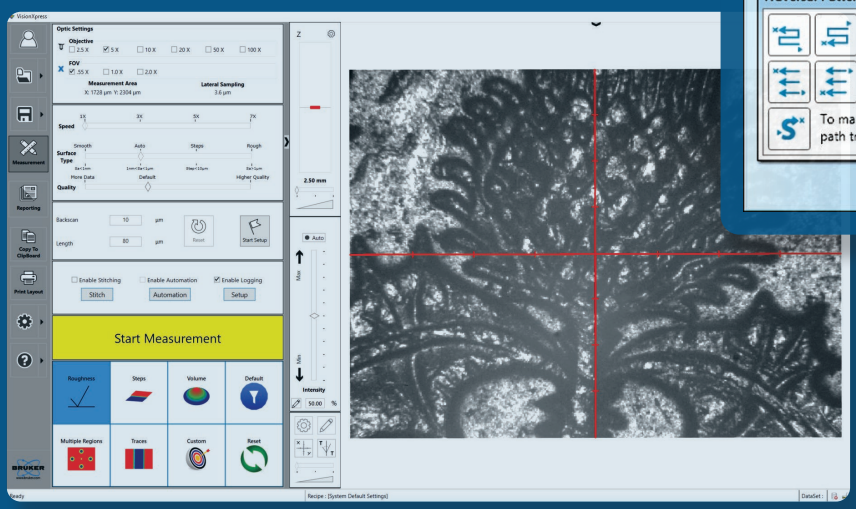
Unmatched Vertical Resolution over Large Field of Views

ContourX systems utilize advanced metrology algorithms to optimize the capabilities of white light interferometry (WLI). The result is the highest degree of vertical resolution even at low magnification. This enables researchers and engineers to quickly obtain extremely accurate and statistically relevant data with results from large measurement areas.

Fast and Easy Measurement Setup with Automation and a Complete Analytical Library

ContourX optical profilometers combine unmatched measurement quality, speed, and ease of use in a choice of desktop configurations. Between the easy-to-use VisionXpress™ interface with its standard test library for multi-user environments, the award-winning full-featured Vision64® interface for advanced setup and automated analysis, and the Advanced Production interface for ultimate automation with minimal user-intervention, you can select the most suitable solution for your unique metrology needs, without compromise.



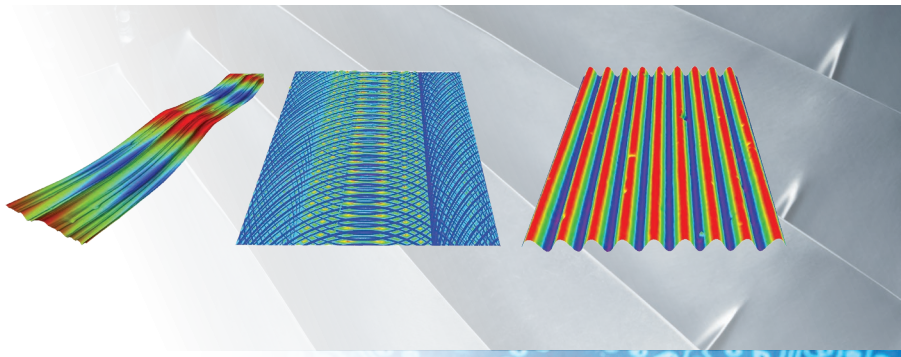


Surface-Independent Metrology with Application-Specific Solutions

The ContourX suite of benchtop profilometers feature industry-leading measurement hardware and analysis advances to provide gage-capable, quantitative 3D surface characterization for an extremely wide range of surfaces, from rough to smooth, bright to dark, transparent to opaque or otherwise difficult to measure. With the available choice of configurations, analytical options, objectives, and measurement modes, ContourX is tailored to meet the needs of virtually any challenging surface metrology application.

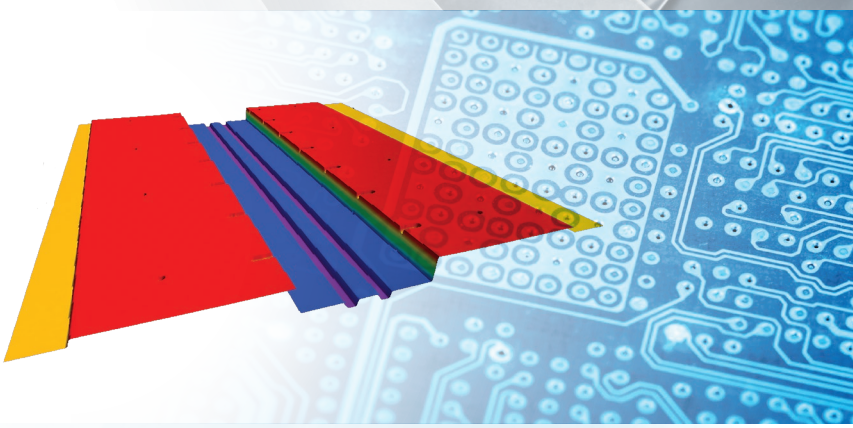
Precision Engineering

- Measure gage-capable surface roughness and flatness
- Access GD&T at millimeter range with micron reproducibility
- Obtain automated process control feedback
- Generate/print QC report



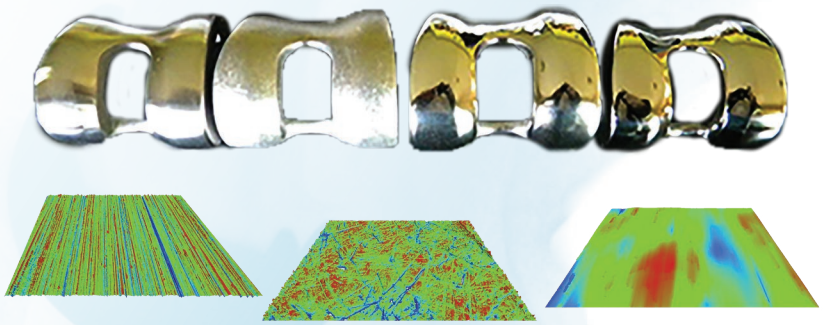
MEMS and Sensors

- Perform high-throughput etch depth measurement with aspect ratio up to 20:1
- Measure film thickness and steps down to nanometer repeatability
- Achieve Critical Dimension check with advanced Trace Analysis
- Measure embedded surfaces through transmissive media



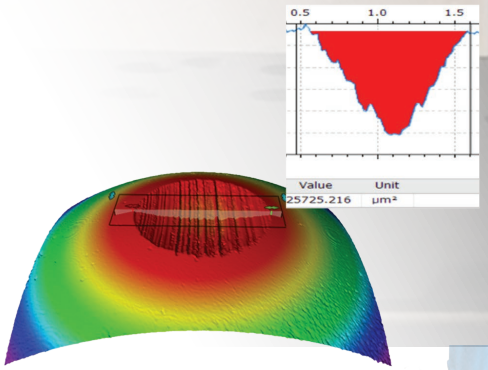
Orthopedics/Ophthalmics

- Verify implant surface finish
- Analyze component wear
- Control residual roughness of lenses and surface texture of injection molds
- Quantify radius of lens curvature and shape deviation for aspheres



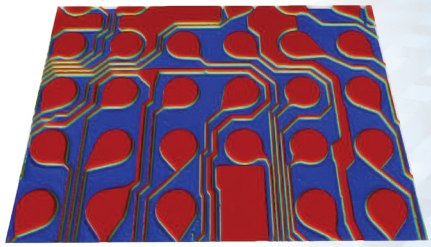
Tribology

- Analyze impact of friction and corrosion
- Determine quantitative wear parameters
- Perform fast pass/fail inspection



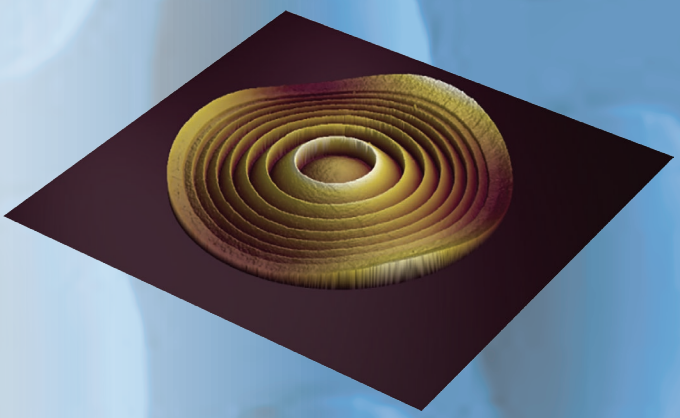
Semiconductors

- Measure bump height, coplanarity, and defects
- Inspect wafer roughness and post-CMP die flatness
- Determine critical dimensions for through silicon via (TSV) and redistribution layer (RDL)
- Perform automated wafer-scale measurements



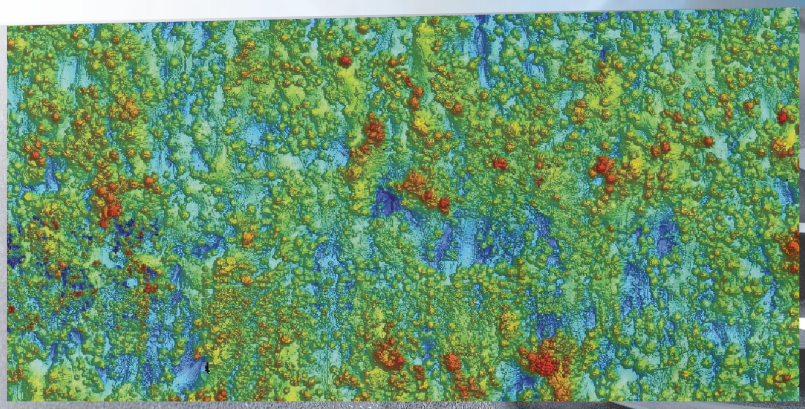
Optics

- Characterize small aspheric and free-form optics
- Measure diffraction gratings and microlenses
- Determine accurate and repeatable sub-nm roughness
- Automate defect classification



Advanced Research

- Optimize surface finish for additive manufacturing
- Monitor topography changes in micro-bacterial colonies



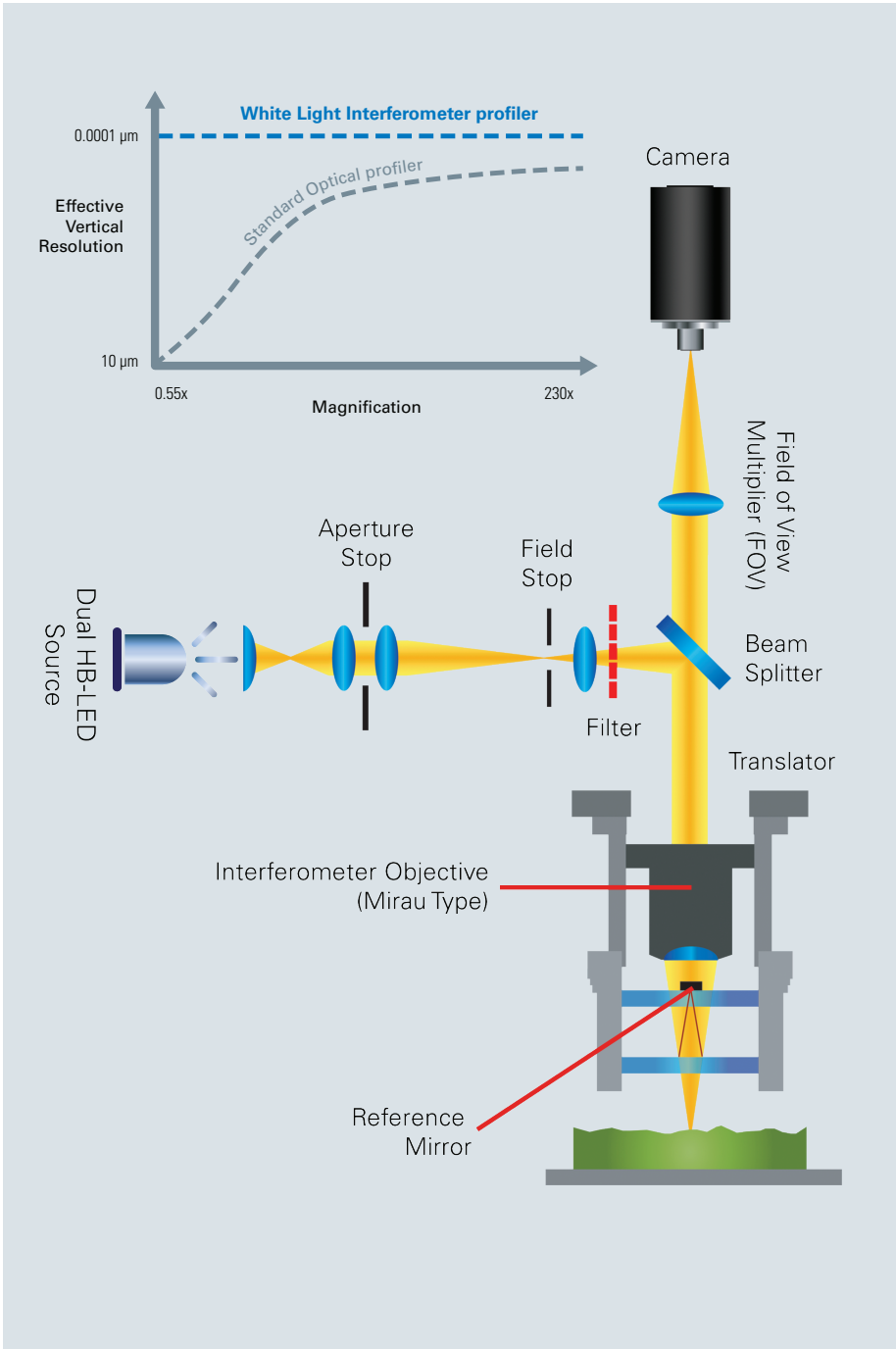
The Benchmark in WLI-Based 3D Optical Profilometery

The ContourX suite of profilometers combine four decades of industry-leading design functionality with dramatic advances in WLI measurement hardware and software to deliver the most accurate and repeatable optical profiling performance available. Bruker's optical surface profiling systems have a proven track record of robust performance, with thousands of installations in settings ranging from research labs to manufacturing fabs.

Why White Light Interferometry?

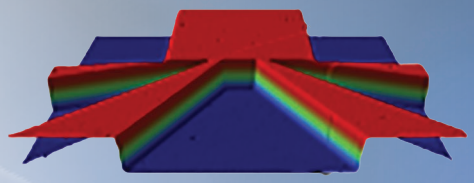
The majority of non-contact areal profiler techniques are magnification dependent, which has led to the common use of high-resolution objectives with short working distances to achieve the best vertical resolution. White light interferometry (WLI), on the other hand, utilizes interferometric objectives that reveal the sample surface via a moiré pattern only when focus is reached. Due to the limited coherence length of white illumination, the depth of field for the moiré presence does not exceed ±1 micron, and the focal plane can be easily worked out within a couple of nanometers. Thus, the technique is independent from the objective, which guarantees nanometer precision even with low-magnification objectives (e.g., 1x, 2.5x or 5x). This provides significant metrology advantages:

- Long working distance objectives can be used without compromising vertical resolution to access recessed or specific locations in complex parts
- Ease of use is increased with the extra safety margin between objective and surface, as well with the ability to target challenging locations
- A mirror can be inserted along the focusing beam to deflect the optical path to measure vertical walls with a high degree of precision
- If large area needs to be measured, a single acquisition at low magnification covers a wide area (100 mm²), making rapid detection of defects possible, or permitting high-throughput flatness control
- Stitching can be used to combine high lateral resolution over even wider areas
- Metrology assessment and budget allocation become easier since all objectives have the same vertical precision

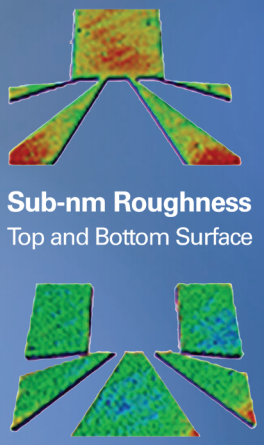


NEW Universal Scanning Interferometry Mode

Bruker's innovative new Universal Scanning Interferometry (USI) mode enables superior WLI measurement results across a wider range of surfaces for ContourX profilometers. Where other technologies require switching scanning modes or objectives, the adaptive surface intelligence of USI mode automatically adjusts algorithm parameters for optimum results on different surface textures in the same field of view, even on surfaces with differing contrast, intensity, and heights. This ability to automatically sense the type of surface and provide the most accurate areal metrology makes it one of the easiest and most robust measurement methods for almost any surface, transparent to opaque, with a vertical range up to 120 microns.



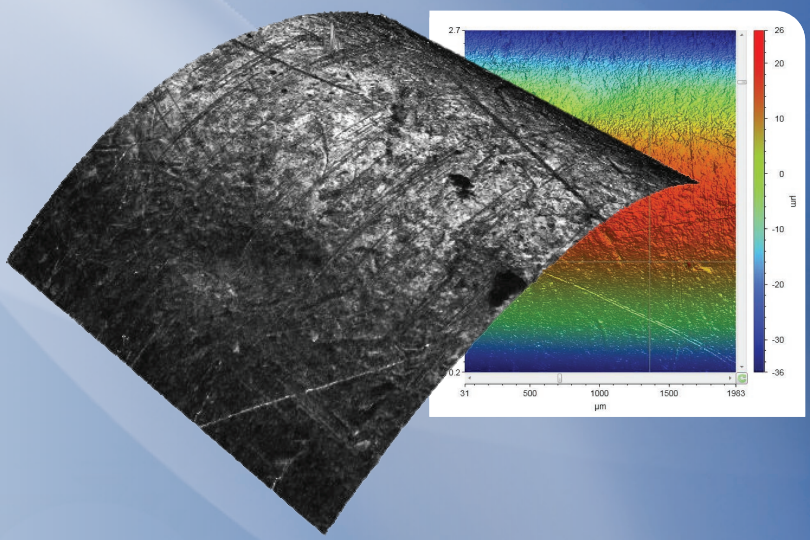
3D Profile Showing µm Step



Sub-nm Roughness
Top and Bottom Surface

NEW Advanced Find Surface

The Advanced Find Surface feature in the ContourX benchtop profilometers enables ultimate ease of use for multi-user environment. It not only enables auto-focus, but also adjusts key illumination parameters for uncompromised metrology on varied material surfaces.

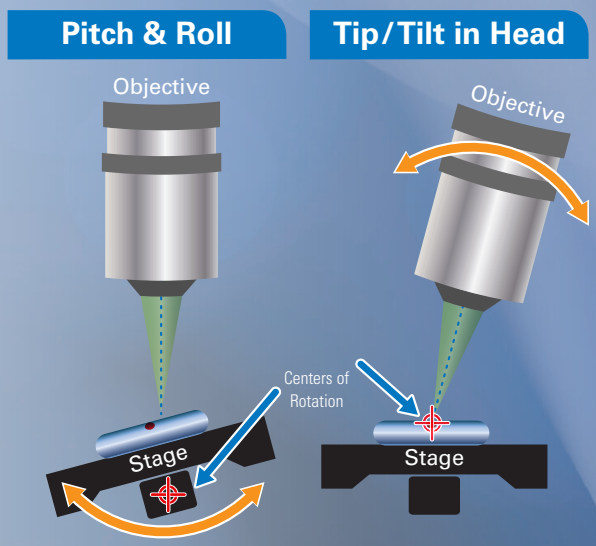


Elite Illumination and Imaging

Bruker's patented *Elite* imaging package captures high fidelity through-focus monochrome/color images of the measured surface that can be overlaid on accurate height data from the same measurement.

Automated Tip/Tilt Adjustment

Bruker's proprietary tip/tilt in the head for ContourX-500 provides unmatched user flexibility for production setup and inspection. By coupling the auto tip/tilt functionality with the optical path in the microscope head, Bruker has coupled the point of inspection to the line of sight independent of tilt. This results in less operator intervention, providing the maximum reproducibility.



ContourX — Confidently Expand Your Metrology

Comprehensive Suite of Accessories

Bruker's ContourX benchtop 3D optical profilometers offer unmatched flexibility in choosing the right combination of hardware to address critical application needs. Available accessories include standard and long working distance interferometric objectives, bright-field objectives, through transmissive media (TTM) objectives, side illumination, rotational stage for cylindrical samples and wafer vacuum chucks.

Advanced Software Modules

With thousands of customized analyses and reporting through Bruker's simple and powerful Vision64® and VisionMap software, ContourX systems are optimized for productivity in both labs and factory floors. Advanced software modules enable you to customize these instruments specifically for your application requirements.

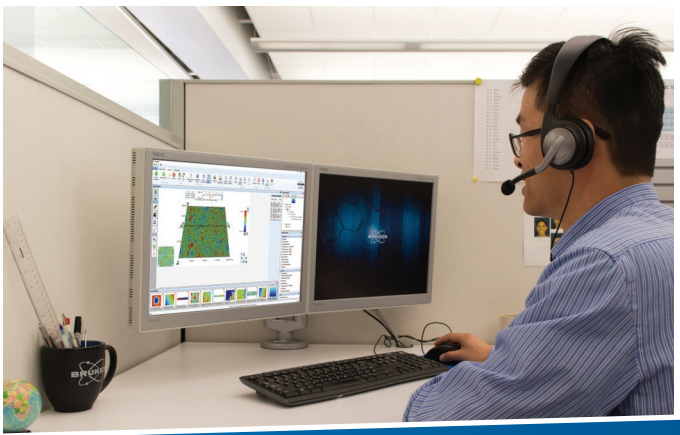
Security of Bruker's Industry-Best Service and Support

Experienced Support Staff with Broad Applications Knowledge

Solutions to complex challenges are never just a happy accident. They require innovative problem-solving through advanced research, intelligent design, and precision engineering. The ContourX family of products combines more than four decades of industry-leading design and functionality with dramatic advances to deliver the best combined imaging and metrology solution. And Bruker's value does not end there. Across a very large and varied base of installed systems, Bruker enjoys a strong reputation for having highly trained and experienced support staff, most of whom have one or more advanced degrees in science or engineering, with many years of experience solving real-world application problems.

Bruker's Industry Best Service and Support

Our surface profiling systems have a proven track record of robust performance, with thousands of installations in settings ranging from research labs to manufacturing shop floors and semiconductor fabs. Bruker products, support, and service options are designed to work together to help you with your particular challenges and demands for success and growth. It's what sets Bruker apart. We provide the best support and technical expertise.



World-Wide Service and Training Facilities

Today, the Bruker family comprises more than 6,000 employees, across 90 world-wide locations, all guided by a single purpose: provide the very best products, service, and support to each and every customer. With training and service centers around the globe, every Bruker customer is ensured of receiving timely and personalized user and system support.

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