

Electron Beam Technology



CHIPSCANNER Series Systems

Process Control and Design Verification Solution

Ultra-high-precision large-area SEM imaging for metrology, inspection, and design verification/reverse engineering

DEDICATED REVERSE ENGINEERING

RAITH
NANOFABRICATION

CHIPSCANNER precision SEM solutions

Lab and fab applications for semiconductor and nanotechnology

The CHIPSCANNER family comprises SEM-based metrology and inspection capabilities for process control and design verification, meeting industrial standards for precision and stability. As the well-established gold standard for reverse engineering and 3D layout reconstruction, it serves as basis for a variety of process control applications in compound semiconductor fabs, FA labs, and multi-user facilities, all in one system. Applications include CD SEM, SEM review, final inspection, and precise metrology of large features requiring best stitching performance supported by Raith laser interferometer stage technology.

The CHIPSCANNER technology is available on three Raith platforms, tailored for different use cases and environments. The CHIPSCANNER family can load samples from single chips to 8" wafers.

CHIPSCANNER50 Two



CHIPSCANNER100 Plus

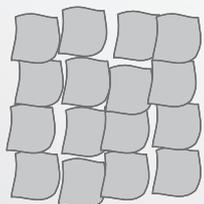


CHIPSCANNER150 Two

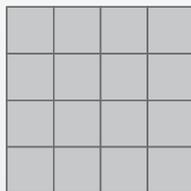


Accurate stitching/ FOV corrections

Raith's unique Laser Interferometer Stage in combination with field-of-view correction enables true large-area SEM imaging with minimum stitching errors. The high absolute accuracy and in-field distortion correction minimizes overlap as well as concomitant computing. Since the absolute position of each pixel is exactly known, image mosaics of different layers can be stacked (3D stitched) with the highest possible accuracy. The process results in a perfectly stitched image mosaic up to the cm² range in area and at nanometer resolution.



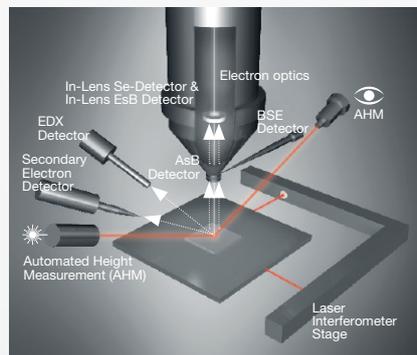
Conventional SEM



Raith SEM

Best imaging and configurable system

CHIPSCANNER systems follow a modular approach with state-of-the-art imaging performance and offer a large variety of configurable options. Automated SEM imaging is complemented by metrology and inspection software solutions. Various wafer sizes can be loaded and multi-chip handling is available for lab automation.



Highest precision, full automation

The CHIPSCANNER family can be configured with environmental shielding and temperature control for stable unattended long-term measurements. Advanced features including height sensing and job management software support fully automated measurements in lab and fab.

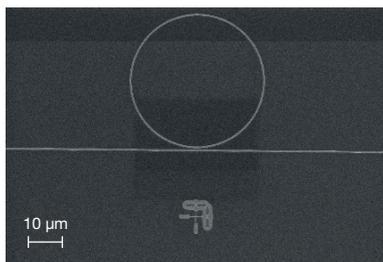


SEM systems for fab and lab automation

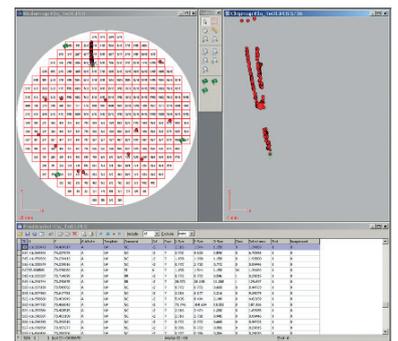
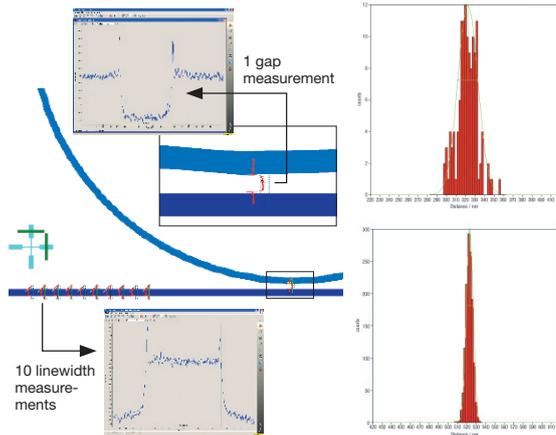
Process control and design verification to highest precision

Process control and process characterization

Nanotechnology development and production requires well-characterized stable device processing at nm precision level. Process control and full process characterization including process window analysis are key to guaranteeing both, high device performance and long-term process stability. CHIPSCANNER systems provide the stability and the necessary level of automation to implement reproducible process control, meeting requirements of compound semiconductor fabs and FA labs for both, metrology and inspection. The Raith laser-interferometer stage technology in combination with distortion-free imaging expands the CHIPSCANNER's measurement capability beyond standard metrology and inspection tasks to address existing and future challenges of innovative nanostructuring. The Raith all-in-one automated SEM approach is complemented by proven leading-edge reverse engineering applications.



Automated metrology and statistical evaluation for both LER and a single distance measurement for gap determination – all applied to 135 devices exposed at different places



Defect review and navigation

Design verification and reverse engineering

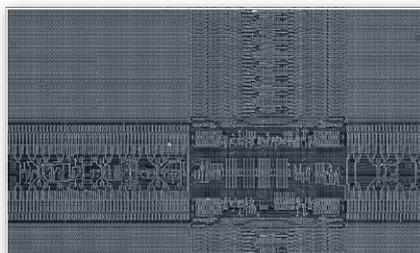
As digitalization continues to grow, companies are confronted with new challenges, including hardware Trojans, chip design recovery, spare parts supply, and IP protection, to name but a few. Raith CHIPSCANNER was designed to meet the demanding

challenges that constantly arise in the field of reverse engineering.

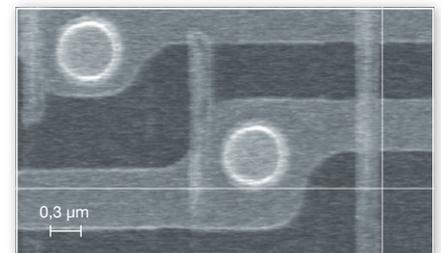
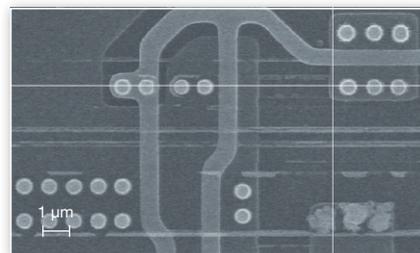
Whole chips can be scanned at nm resolution and excellent layer to layer accuracy for 3D model, layout, and schematic extraction. Depending on the selected stage travel range,

multiple samples can be loaded and image mosaics can automatically be acquired without user interaction.

For IC layout reconstruction, software tools are available which extract and optimize valuable GDSII-CAD data from the images for further processing.



Large-area high-resolution mosaic image of an IC, free from visible stitching errors. The white lines indicate the stitching borders.



CHIPSCANNER Series Systems

Why choose CHIPSCANNER?

- Unique all-in-one SEM metrology and SEM review solution
- Highest-precision CAD-based navigation
- Distortion-free SEM imaging and best-in-class SEM image stitching
- Configurable analysis capability
- Recipe-based automated process control
- Excellent stability, meeting gauge capability requirements
- Python scripting support for Raith and Microsoft commands



Support and service worldwide

Sustainable long-term support channels

There is more to take into consideration than specifications and system performance only. Raith ensures optimal use over a whole system lifetime, with a team of professional trainers and a global support infrastructure from the market leader for Electron Beam Lithography.

High quality service worldwide

Wherever you are, a service engineer is always nearby. Raith has locally based engineers and spare parts in all major regions. Regular training is held at the factory to ensure consistent levels of expertise worldwide. CHIPSCANNER is a modular system that can be field-upgraded later if your

requirements change. This safeguards your long-term investment in the SEM system in combination with our unique long term full service and spare part availability guarantee.

Trainings

We help you benefit from your SEM system quickly with comprehensive onsite training included at every CHIPSCANNER installation, free-of-charge site survey, and advanced facility check. In addition, our Service Centers provide application support. Our expert training courses help experienced customers reach the next level or retrain new colleagues.

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Your challenge is our mission.

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