CAMECA®
SCIENCE & METROLOGY SOLUTIONS
/ AMETEK®



AKONIS
IN-LINE SIMS

SIMS Excellence Brought to the Fab

AKONIS Secondary Ion Mass Spectrometer (SIMS): on-the-fly composition measurements for high-volume semiconductor manufacturing.

The AKONIS SIMS tool fills a critical gap in semiconductor fabrication processes by providing high throughput, high precision detection for implant profiles, composition analysis and interfacial data to unable high-volume manufacturing. AKONIS provides a very high level of automation to ensure repeatability across tools for fab level process control and tool-to-tool matching.

Building upon 60 years of experience in ion instrumentation and SIMS analytical expertise as well as over 40 years of close partnerships with leading semiconductor manufacturers worldwide, AKONIS is a leap forward in high precision characterization of implants, interfaces and compositional analysis along with high repeatability metrology for the most demanding semiconductor process development and control applications.

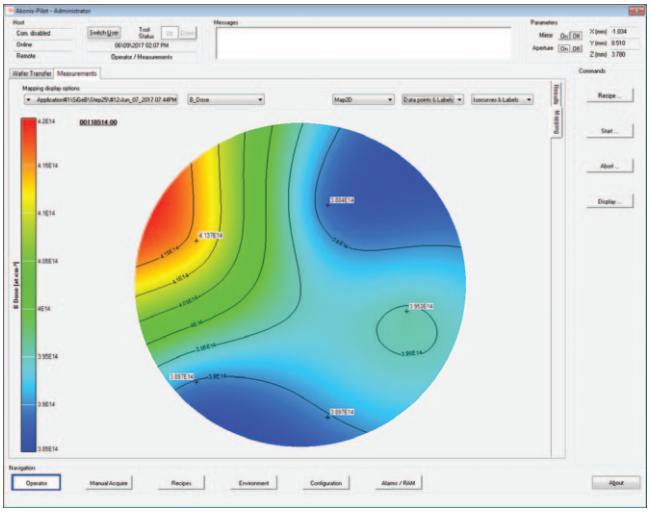
Complementing the IMS Wf/SC Ultra as well as the SIMS 4550 (quadrupole SIMS) used to support the semiconductor industry via characterization labs, AKONIS - with full automation of instrument set-up and acquisition routines - enables rapid, within-fab analysis without compromise in analytical sensitivity.

AKONIS benefits from recent development in EXtremely Low Impact Energy (EXLIE) ionic column technology (< 150 eV), coupled with a full wafer handling system including a high resolution stage enabling measurements on pads down to 20 µm.

Key features

High resolution composition and fast dopant depth profiling of SiGe and SiP multilayer stacks
Unrivalled in pad detection limits down to 20 µm
More than 97% of time reduction to feedback data to the process line
Blanket and patterned full wafer measurement
Pattern recognition engine coupled with high resolution interferometric stage for < 2 µm position accuracy
Intuitive recipe creation based on unique material database
SEMI certified (S2/S8, E4, E5, E39, E84...)





A robust configuration for SiGe/SiP demanding processes as illustrated with the high sensitivity B concentration map obtained automatically using the fab operator friendly AKONIS software.

High quality SIMS data without need of SIMS experts.

Fast without compromise!

New high density EXLIE column

- Allows to keep spot size compatible with raster scan of less than 30 µm
- An unequalled sputtering rate in any energy configuration (> 5 nm/min @ 150 eV), ensuring high throughput even on thick stacks (x5 higher than previous generation)
- High RSF stability over time
- Access to sub-nm resolution
- Automated beam alignment

High reliability

Best-in-class hardware without compromise on reliability:

- Brooks front-end wafer handling
- Pfeiffer vacuum based system
- Cognex-based pattern recognition
- High resolution, interferometric stage
- Fixed detectors with auto beam centering

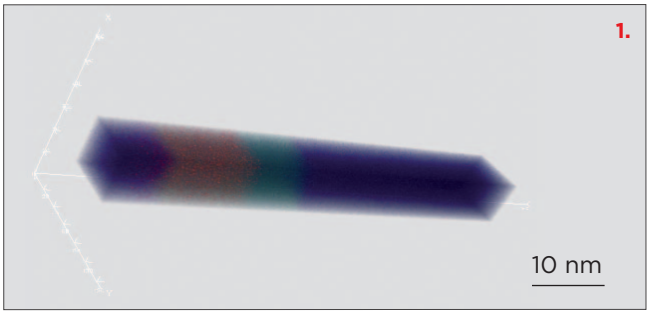
Ease of use

- Fully automatic primary column and auto adaptive secondary optics to ensure highest ionic collection
- New charge compensation technology (near UV OCE) for insulator analysis
- New intuitive graphical user interface for fast and easy recipe set up
- Automatic data output with selectable format fuelled by CAMECA data treatment engines

Reduced cost of ownership

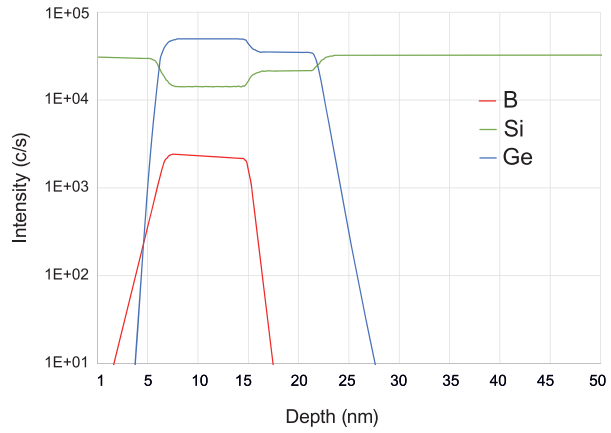
- Reduced footprint (with electronic in sub fab)
- High throughput thanks to pre loadlock (less than 90 seconds from airlock to analysis chamber)
- Low maintenance primary ion source
- Low maintenance detectors

1.

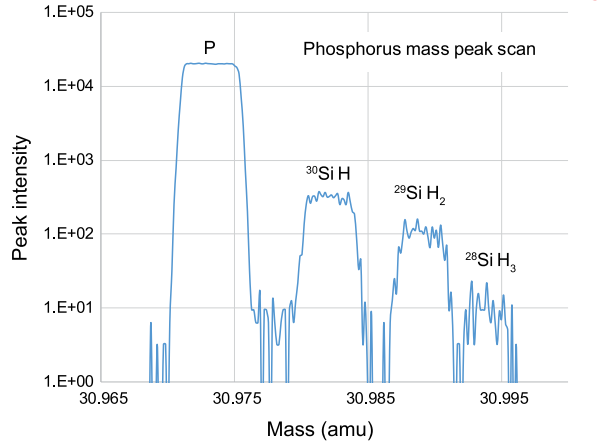


The high yield unabler on N5 and beyond SiGe/SiP based CMOS processes.

2.



3.



1. Powerful 3D imaging capabilities
2. High sensitivity and resolution
3. High mass resolution without compromise on beam size and sensitivity

AKONIS

IN-LINE SIMS

On-the-fly composition measurements for high-volume semiconductor manufacturing.



Inspired from the Greek Akontio (javelin), AKONIS expresses the speed and precision of our analyses.

Specification overview	
Detection limit	≤ 10^{14} atom/cm^3
Depth resolution	< 1 nm/decade
Dynamic range	Up to 5 decades
Reproducibility	< 1%
Repeatablily	< 1%
Minimum pad size	20 µm
Throughput	8 wafers per hour
Uptime	95%

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