

## Helios NanoLab™ 1200AT Full Wafer DualBeam™

Accelerates process development and yield ramp

Shrinking geometries and the wide-spread transition to new device architectures has significantly increased the volume of TEM analysis required for process development and yield ramp. This critical data is needed to diagnose the root cause of defects and evaluate process maturity on the path to high volume manufacturing.

The Helios NanoLab 1200AT is the newest generation of FEI's full-wafer DualBeam and has been designed to satisfy 14nm node and beyond TEM sample preparation challenges. This system is capable of producing sub 15nm thick lamella samples in exactly the right location to capture point defects and isolate pre-defined structures for monitoring.

Significant automation enhancements make generation of ultra-thin TEM samples routine and consistent. FEI's iFast™ automation software now combines wafer, defect- and cell-level navigation with recipe definition and execution in a single, fully-integrated program, ensuring efficiency and consistency among operators with varying levels of expertise.

Incorporation of FEI's latest technology provides substantial advances to major system components. The EasyLift NanoManipulator is integrated into the microscope's existing xT software to provide a simple, intuitive method for *in situ* lift-out and transfer of TEM samples. The MultiChem gas delivery system provides advanced, integrated process control capabilities previously unavailable with traditional gas injection systems.

The addition of an optional FOUF loader allows the Helios NanoLab 1200AT to be located inside the semiconductor wafer factory and integrated with factory automation. Moving the 1200AT inside the fab and closer to the wafer process line can deliver critical TEM analysis up to three times faster than laboratory-based analysis of cleaved wafer pieces, enabling acceleration of the development of new processes and the yield ramp to high-volume production.

### KEY BENEFITS

Ultra-thin TEM lamella preparation to support the 14nm node and beyond

Optional Automated FOUF Loader (AFL) allows the system to be located inside a semiconductor wafer factory and integrated with factory automation

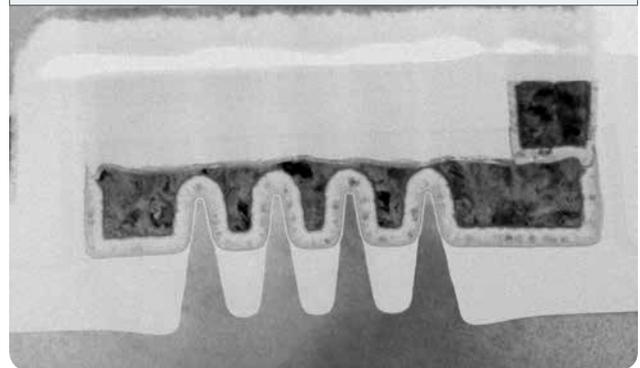
iFast Semiconductor Wafer Navigation software integrates defect, sample plan & cell navigation all into the iFast automated recipe framework

MultiChem Gas Delivery System provides the most advanced capabilities for electron and ion beam induced deposition and etching on DualBeams

EasyLift NanoManipulator provides seamless *in situ* TEM lamella lift-out through integration into the xT software and precise movement control

STEM III detector provides outstanding resolution and contrast on thin TEM samples

Integrated acoustic enclosure allows installation in the noisiest environments





## Essential Specifications

### Elstar UHR Immersion Lens FESEM Column

- Elstar electron gun with:
  - Ultra-stable Schottky field emitter gun
- Electron beam resolution @ coincident point:
  - 1.0 nm @ 15 kV
  - 1.4 nm @ 1 kV
- Electron source lifetime: 12 months

### Tomahawk Ion Column

- Superior high current performance, with up to 65 nA max beam current
- Lowest voltage (500 V) for ultimate sample preparation quality
- Ion beam resolution @ coincident point:
  - 4.0 nm @ 30 kV using preferred statistical method
- Ion source: 1000 hours guaranteed

### Detectors

- Elstar in-lens SE detector (TLD-SE)
- Elstar in-lens BSE detector (TLD-BSE)
- Everhart-Thornley SE detector (ETD)
- High performance Ion Conversion and Electron (ICE) detector for secondary ions (SI) and electrons (SE)

### Sample Handling

- 300 mm and 200 mm semiconductor wafers
- 150 and 200 mm data storage wafers
- Wafer pieces up to 1/4 wafer size
- 6" x 0.25" standard photomasks
- Packaged parts up to 7 mm thick

## Key Options

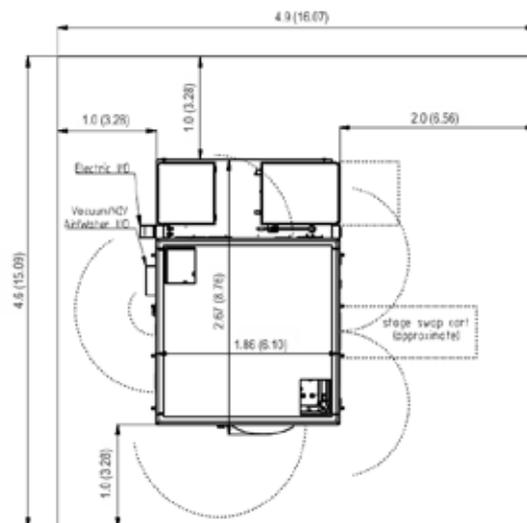
- Automated FOUF Loader for automated loading of 300mm wafers
  - ISO Class 1 EFEM with pre-aligner
  - GEM300 factory automation functionality
- 30 kV STEM detector with BF/DF/HAADF segments
- Optical Microscope with 850um FOV
- Oxford INCA Energy EDS with 80 mm<sup>2</sup> X-Max SDD
- Beam chemistry
  - Range of deposition and etch chemistries
  - Chemistries can be delivered with MultiChem and/or conventional gas injection
- Easy Lift integrated *in situ* TEM lamella sample lift-out

## Software Options

- iFast Semiconductor Wafer Navigation
  - Integrated defect navigation based on KLARF 1.2 standards
  - User defined wafer maps & site plans
  - Cell Navigator to locate a bit in large repeating array
- Stand Alone Cell Navigator (MultiChem compatible)
- Knight's Camelot CAD Navigation
- The FEI Viewer is a web database program that provides an intuitive view into the status and performance of processes run on the 1200AT with iFast software.
- FEI RAPID™ remote diagnostic support

## Installation and facilities requirements

Available upon request



Recommended tool clearance

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Learn more at [FEI.com](http://FEI.com)



TÜV Certification for design, manufacture, installation, and support of focused ion- and electron-beam microscopes for the electronics, life sciences, materials science, and natural resources markets.

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