

# Helios 6 HD FIB-SEM

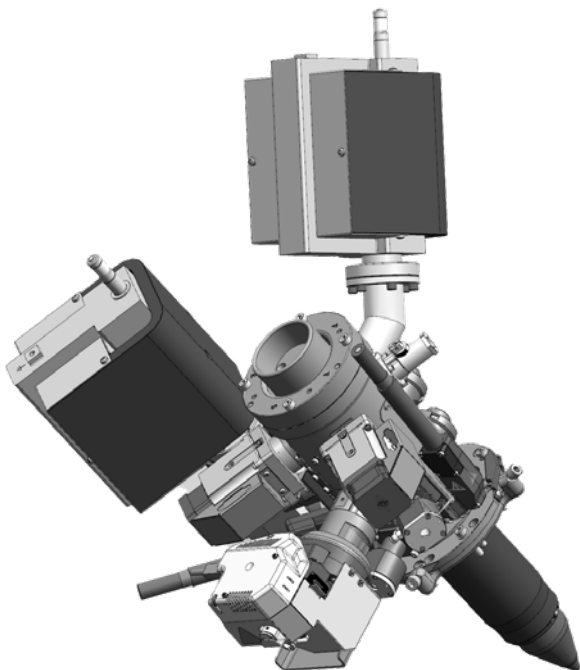
## More productive TEM workflows and better TEM data

The Helios 6 HD FIB-SEM delivers high-volume, high-quality, repeatable TEM samples on a wide variety of semiconductor device types and in a variety of manual and semi-automated workflows, supporting R&D, metrology, and failure analysis applications.

### TEM sample preparation system

The Thermo Scientific™ Helios 6 HD FIB-SEM is part of the industry-standard Helios family of DualBeam™ instruments. It is configured to meet the semiconductor industry’s growing demand for high-quality TEM sample data. This demand is, in turn, driven by the need for more repeatable and trustworthy reference data for R&D, metrology, and failure analysis.

Generating high-quality TEM data requires precisely end-pointed samples to ensure that the region of interest is clearly visible in the TEM. High-quality samples also require very high FIB milling precision and low-kV FIB performance for final thinning. The Helios 6 HD FIB-SEM uses the innovative Osprey FIB column, which incorporates automated source and column alignments and a new digital control architecture to deliver very high-quality, repeatable results.



Osprey FIB column

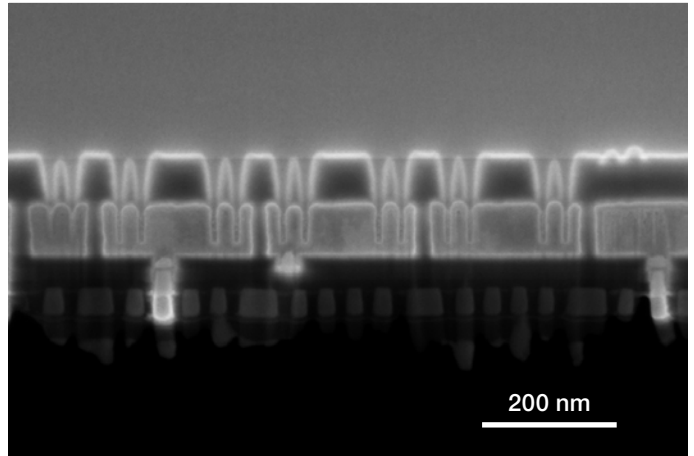
### Key benefits

**Fast, precise end-pointing** with new digital deflection electronics

**Increased sample repeatability** due to streamlined source change and alignments, and FIB immersion for accurate end-pointing

**Optimal planar, inverted, and top-down device alignment** with the precision sample holder

**Improved availability and repeatability** with the new EasyLift NanoManipulator design



The Helios 6 HD FIB-SEM enables precise end-pointing on a wide variety of semiconductor device features.

The Helios 6 HD FIB-SEM features AI-enabled Thermo Scientific AutoTEM™ 6 Software, which performs fully automated *in situ* lift-out and enhances grid management for faster setup. An all-new digital scan engine allows simultaneous SEM imaging and FIB milling while also providing precise scan rotation and accurate pattern positioning. This combination of hardware and software innovations maximizes the production of site-specific samples for semiconductor TEM workflows.

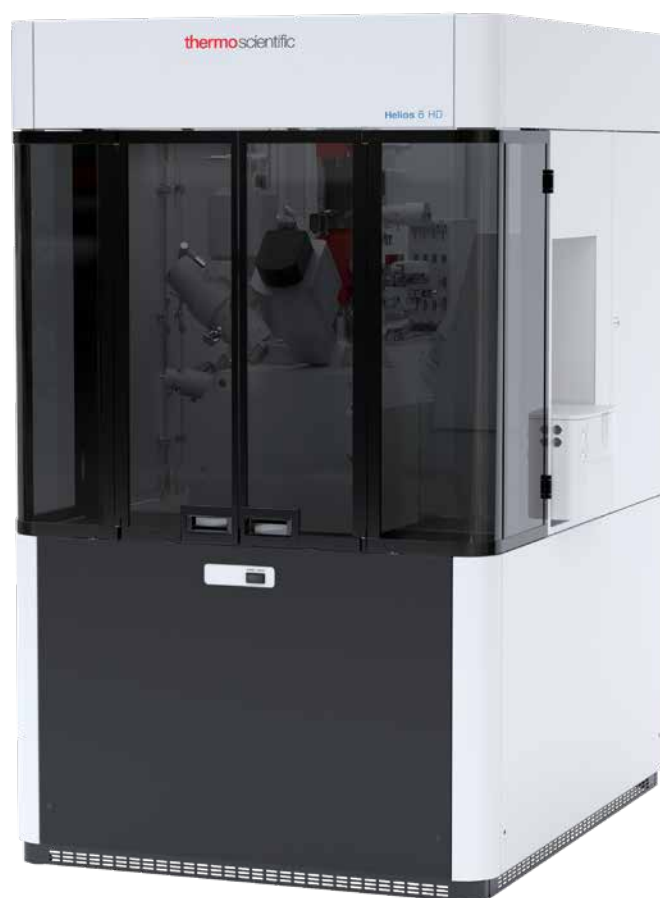
## Specifications

- Electron source
  - Schottky thermal field emitter, over 1 year lifetime
- Ion source
  - Gallium liquid metal, 1,000 hours
- Landing Voltage
  - 20 V–30 kV SEM
  - 500 V–30 kV FIB
- SEM resolution
  - Optimal WD 0.6 nm @ 2–15 kV, 0.7 nm @ 1 kV, 1.0 nm @ 500 V
  - Coincident WD 0.6 nm @ 15 kV, 1.2 nm @ 1 kV
- FIB resolution coincident WD
  - 4.0 nm @ 30 kV using preferred statistical method
  - 2.5 nm @ 30 kV using selective edge method
  - 500 nm @ 500 V using preferred statistical method
- *In situ* TEM sample liftout
  - Thermo Scientific EasyLift™ NanoManipulator
- Stage
  - Five-axis, all-Piezo motorized
  - Auto-QuickFlip Shuttle
  - Automated loadlock

- Sample types
  - Bare or de-packaged die
- Sample size
  - 36 mm x 66 mm
- Application software
  - AutoTEM 6 TEM Software sample preparation suite

## Key options

- Beam chemistry
  - Standard, single Gas Injection System (GIS)
  - Thermo Scientific MultiChem™ Gas Delivery System
- Software
  - Thermo Scientific Auto Slice & View™ Software, CAD Navigation



Learn more at [thermofisher.com/helios6hd](https://thermofisher.com/helios6hd)

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