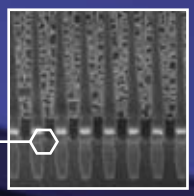
ANY WAY YOU LOOK AT IT,
FEI PROVIDES THE WORLD'S BEST VIEW.

FEI COMPANY™



RIGHT
Right the first time

FIRST
First to market

FAST
Fast to volume

Strata™ 400 DualBeam™ and STEM Family

The Ultimate Solution for Sample Preparation and Analysis

Meeting today's challenges in the lab

As process geometries shrink below 100 nm and materials change, the challenges you face in the semiconductor laboratory are quickly growing in complexity. Nevertheless, to succeed and survive in this industry your company needs to be right the first time, first to market and fast to volume. To meet this demand it is essential that your laboratory deliver the most complete and reliable sample management. The highest-quality preparation, imaging and analytical capabilities are no longer a luxury. They are a necessity for efficient failure analysis and characterization. Drawing on FEI's undisputed technology leadership in the dual-beam market and pioneering legacy in subsurface imaging, the Strata product family features high-quality, streamlined tools that accelerate time to volume, increase yields and reduce costs. Leveraging the Strata family, your lab is ready to meet today's fast-paced challenges and ensure success into future technology nodes.

Enjoy these key benefits:

- *Fast and simple high-resolution, high-contrast STEM imaging for complete structural analysis*
- *Rapidly characterize process and defect excursions*
- *Speed your time to answer by performing material and defect analysis on a single tool that delivers high-resolution images and compositional data*
- *Versatile sample handling optimizes cost of ownership*
- *Hands-off operation using TEM and SEM sample-preparation software*
- *Reduced training requirements and optimum system utilization with automated routines*

Applications:

Failure Analysis

- Cross section
- Ultra high-res FIB milling and imaging
- HR-SEM imaging
- General purpose SEM imaging
- Low damage TEM sample preparation
- Ultra-low damage TEM sample preparation
- TEM prep automation
- X-Ray analysis
- CAD navigation
- Probe compatible
- Metal deposition
- Metal etch
- Dielectric etch
- Dielectric deposition
- FlipStage
- STEM detector
- EMI active cancellation

Circuit Edit

- Front-side edits
- High accuracy feature relocation
- Back-side edits
- Electrical feed-through for probes

Characterization and Analysis

- High throughput STEM mode
- Sub nm STEM (low kV)

Standard
Some capabilites
Optional

The Strata 400 provides high-throughput cross-sectioning and automated TEM-sample preparation, utilizing the Sidewinder ion column and high performance sample stage. The Strata 400 STEM includes integrated sample lift-out and handling, with SEM-STEM imaging to enable high-contrast, high-resolution analysis.

Speed your time to answer

The Strata 400 product family of DualBeams (FIB/SEM) provides a single source for complete sample management. Preparation, imaging and analysis can now be accomplished with one tool, accelerating your time to answer. FEI's innovative FlipStage moves your sample from milling to scanning transmission electron microscopy (STEM) imaging position in seconds, without breaking vacuum and ensuring the integrity of your sample. And with powerful, state-of-the-art components such as high-performance ion and electron columns, a highly stable stage, and reliable automation software, you can count on getting the most accurate and highest-quality data in the shortest time.

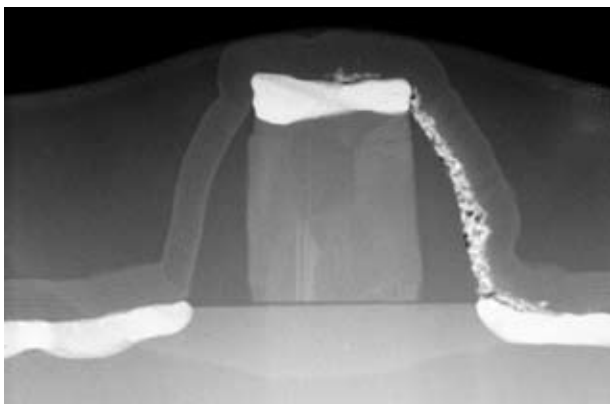
Fast, automated sample preparation

The Strata 400 family is ideal for STEM and transmission electron microscopy (TEM) sample preparation. Now you can automatically prepare multiple thin-film samples in a single session for critical analysis. Strata enables you to obtain the thinnest possible sample with the slice-and-view capability of the DualBeam. You will also experience the benefits of improved sample quality from enhanced low kV milling with the ion beam. As a result, you save valuable time and minimize the potential for error. In addition, the ion beam for milling and electron beam for imaging intersect at your sample, providing unrivaled power to expose the exact feature of interest on your first attempt. Patented beam chemistries can also be used to highlight interface layers for imaging in the system without exposing the whole sample to potential contaminants, getting you the most accurate data possible.

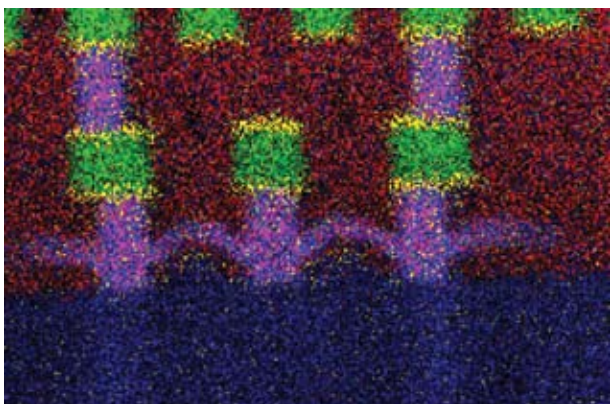
Product	STEM Mode	SEM Resolution at Optimum WD	SEM Resolution at Coincident WD	FIB Energy Range	Tilting TEM Grid Sub-stage
Strata 400	< 0.8 nm	1.0 nm @ 15 kV 2.5 nm @ 1 kV	1.0 nm @ 15 kV 2.0 nm @ 5 kV	2 - 30 kV	No
Strata 400 STEM	< 0.8 nm	1.0 nm @ 15 kV 2.5 nm @ 1 kV	1.0 nm @ 15 kV 2.0 nm @ 5 kV	2 - 30 kV	Standard

Product	TEM Sample Lift-out	Sample Transfer	Automated TEM Sample Preparation Software	Stage Travel
Strata 400	Option	Automatic load lock, chamber access	Option	100 mm
Strata 400 STEM	Standard	Automatic load lock, chamber access	Option	100 mm

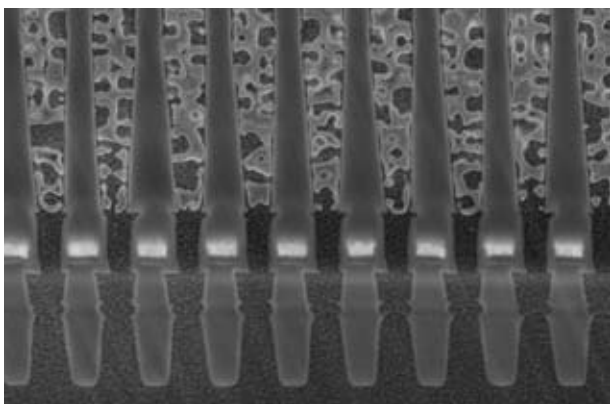
A thinned section prepared by FIB automation for TEM is ready for ex-situ lift-out.



Sample thinned to a transmission sample for in-chamber STEM and EDS analysis, showing titanium-rich material shorting out the gate.



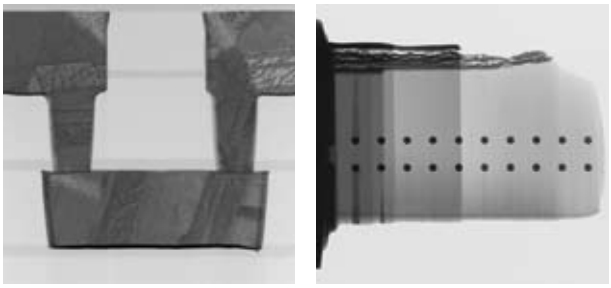
A thinned sample prepared on a Strata system with EDS provides an easy-to-use analytical resolution less than 30 nm.



An insulator-enhanced etch is used to delineate polysilicon and oxide layers in a DRAM memory array.

Comprehensive structural analysis well into your future technology nodes

High-resolution, high-contrast analysis from the Strata 400 makes the solution ideal for addressing shrinking dimensions and defects. Providing rapid, accurate characterization, a configurable X-ray capability allows you to better investigate the composition of defects. X-ray analysis with energy dispersive spectroscopy (EDS) provides chemical-composition analysis for both thin and bulk samples. Although EDS analysis of bulk samples is typically characterized by very large excitation volume and limited spatial resolution at 500 nm at best, the Strata 400 surpasses these standards by not only making conventional cross-sections, but also by preparing thin TEM-like sections to deliver analytical resolutions below 30 nm – more than an order of magnitude better than can be typically achieved on a bulk sample. With Strata 400, deeper material analysis keeps you in line with evolving technology nodes.



STEM imaging of the same device type made with a cross-sectional view (left) and top-down planar section. The process of making samples parallel to the surface is straightforward with the FlipStage. The Strata's STEM system allows bright, dark or even high-angle dark-field images to be easily captured.

Drawing from the legacy of a superior supplier

FEI continues to be the undisputed technology leader and most experienced provider of dual-beam solutions. It's a legacy that enables FEI to provide you with the highest-quality characterization, analytic and metrology data in the shortest amount of time. FEI remains the only company offering the range of products necessary to address all of the imaging and sample preparation needs of today's semiconductor lab. Now and in the future, you can count on FEI to provide the most innovative solutions available for cross-sectional imaging, analysis, characterization and sample preparation. The performance advantages you receive from products such as the Strata 400 family secure long-life solutions that are extensible through the next several technology nodes, ensuring your technology investment is safe and secure. Wherever you are on your technology roadmap, FEI remains committed to helping you get designs right the first time, get to market first and ramp to volume fast.

See more at **www.fei.com**.

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