

## AutoTEM G2

### Fast, Repeatable, Automated DualBeam Preparation of Ultra Thin S/TEM samples

AutoTEM™ G2 software for FEI DualBeam™ systems provides fast, reliable, repeatable, automatic preparation of site-specific, ultra thin scanning/transmission electron microscope (S/TEM) samples. Demand for high resolution S/TEM imaging and analysis has increased dramatically as microelectronic structures and critical dimensions have shrunk beyond the resolution limits of scanning electron microscopes (SEM). Conventional methods used to prepare the ultra thin samples required for S/TEM are slow, typically requiring many hours or even days of effort by highly trained personnel. Using the SEM imaging and focused ion beam (FIB) milling capabilities of a DualBeam system, AutoTEM G2 software creates site-specific thin sections ready for S/TEM analysis in as little as 20 minutes.

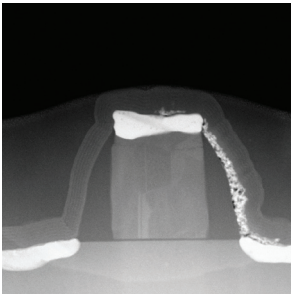
#### Fast

AutoTEM G2 takes full advantage of the high current capabilities of the latest generation Sidewinder™ ion column. Higher current in a smaller spot, combined with sophisticated, pre programmed milling strategies maximize material removal rates while minimizing sample damage and material redeposition. Setup for a basic sample takes less than 30 seconds. The DualBeam's automated stage provides fast accurate navigation to previously detected defects and targeted structures.

#### Reliable

Unlike manual techniques that are notorious for high failure rates, AutoTEM G2 guarantees process reliability greater than 95%, yielding high quality thin sections and preserving the bulk sample for further analysis at other sites or subsequent resampling. Predefined settings ensure optimal performance on a broad range of materials—hard, soft, or both—with minimal artifacts. Low energy, low incidence final polishing, enabled by the extraordinary performance of the Sidewinder ion column, removes surface damage that otherwise could easily obscure critical nano-scale detail.

- *Ultra thin S/TEM samples created in as little as 20 minutes provide fast access to critical, high-resolution process information*
- *High throughput reduces cost of ownership and increases S/TEM utilization*
- *Fast, accurate navigation creates site-specific samples of known defects or targeted structures*
- *95% reliability yields high quality samples routinely*
- *Precise, programmable control provides repeatable operation and improves analytical precision*
- *Pre-defined and user-defined recipes improve reproducibility*
- *Intuitive user interface is flexible and easy to use*
- *Unattended preparation of multiple samples frees operator for other tasks*
- *Quick automated "pre-flight" check to ensure high success rates for multiple site TEM sample preparation*



In this 30 kV STEM image of a defect site the bright material overlaying the spacer on the right of the gate electrode was identified as the root cause of the failure.

### Repeatable

AutoTEM G2 improves repeatability in the preparation process and ultimately in analytical results, increasing confidence that observed variability is real, not an artifact of the preparation. Recipes ensure procedural consistency across systems and operators. Sub pixel control provides beam placement precision better than an operator could even see. Samples vary less than 20% in thickness and less than 30 nm in sample placement.

### Automatic

AutoTEM G2 can automatically prepare single or multiple samples without operator intervention, or it can be setup to perform the initial steps unattended, perhaps overnight, returning later for final thinning under operator control. Users may define custom recipes or use one of the pre-defined recipes for cross sections, pre-thinned, *ex situ* lift

### Specifications

|                |  |
|----------------|--|
| Speed          | < 20 minutes (12 $\mu\text{m}$ X 5 $\mu\text{m}$ X 100 nm) |
| Setup          | < 30 seconds (basic sample)                                |
| Multiple Sites | Up to 100  |
| Reliability    | > 95%  |
| Placement      | < 30 nm (repeatability)                                    |
| Thickness      | < 20% variation (repeatability @ 100 nm)                   |

out and more. The intuitive operator interface includes both basic and advanced modes, making it easy to use without limiting flexibility.

### Right, Fast, First

Fast analytical results accelerate new process development cycles, ramps to volume, and recovery from yield excursions. High throughput reduces cost of ownership, and improves utilization of expensive S/TEMs. Repeatable preparation improves analytical precision for tighter control within narrowing process windows. High reliability increases productivity and ensures that critical process and defect information is not lost. Advanced automation reduces operator qualification and training requirements, improves operator productivity, and enforces consistent procedures for more reproducible results.

### FEI

FEI pioneered the development of DualBeam systems and FIB based S/TEM sample preparation. We have the largest installed base of DualBeam tools, and our revolutionary Titan is unchallenged as the most powerful commercially available S/TEM in the world. No other manufacturer can match our experience and expertise in DualBeam and S/TEM technology. Let AutoTEM G2 bring that power to focus in your lab.

#### FEI Company

World Headquarters and  
North American Sales  
5350 NE Dawson Creek Drive  
Hillsboro, OR 97124-5793 USA  
Tel: +1 503 726 7500  
Fax: +1 503 726 7509

[www.fei.com/sales](http://www.fei.com/sales)

#### European Sales

Tel: +31 40 23 56 110  
Fax: +31 40 23 56 612

#### Asia-Pacific Sales

Tel: +65 6272 0050  
Fax: +65 6272 0034

#### Japan Sales

Tel: +81-3-3740-0970  
Fax: +81-3-3740-0975

