

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



CLM-3D™ DualBeam™ Family Fully Automated 3D Metrology for the Fab

In-line, on-time process monitoring

In today's demanding fab environment, you simply can't afford to have your product cycle go off track in the development, ramp or volume-production stage of implementation. Stopping production for extended external lab analysis is a worst-case scenario in any production schedule. Effective process monitoring makes the difference between costly downtime and a fast ramp to high-volume production, while ensuring the highest efficiency for semiconductor manufacturing. FEI's CLM-3D DualBeam (FIB/SEM) system is the only in-line process-monitoring solution capable of filling this gap. Quick and effective critical feedback in-line means process characterization and validation in real-time. And three-dimensional metrology data ensures you will meet the rapid prototyping and process-control needs of your fab at every stage of the product life cycle. With CLM-3D, your upstream processes stay on track throughout your production cycle.

Enjoy these key benefits:

- *In-line cross-sectional metrology for the qualification and monitoring of your manufacturing processes*
- *Significantly reduce fab costs by returning wafers to the line following analysis*
- *Cross-sectional metrology data returned in minutes for real-time decision making*
- *High wafer-throughput enables increased sampling for full-wafer characterization*
- *Accelerate time to market for sub-65 nm processes*
- *Faster development, specification and qualification of lithography etch film and copper processes*
- *Fully automated operation meeting the most demanding fab environments*

Right the first time

First to market

Fast to volume

RIGHT
FIRST
FAST



Applications:

In-Line Process Monitoring

- Cross section
- Automated hi-res FIB milling and SEM imaging
- Automated cross-section metrology
- EMI active cancellation
- Wafer return
- Full factory automation
- Metal deposition
- Metal etch
- Dielectric etch
- Dielectric deposition

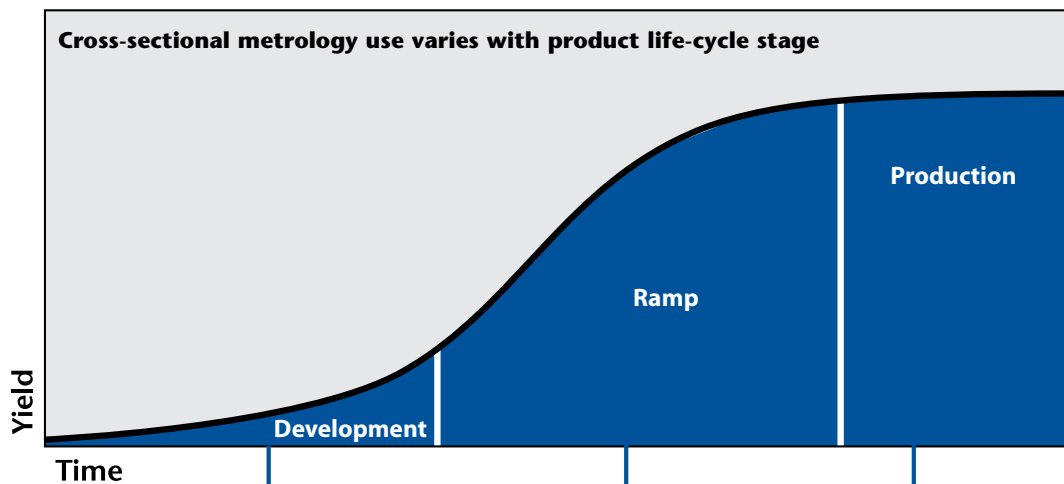
● Standard

○ Optional



Higher productivity, better process control

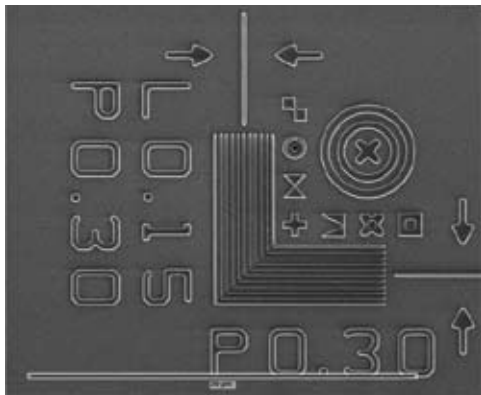
CLM-3D will change the way you develop, validate and control your processes. What has traditionally required extended external lab analysis can now be accomplished in the fab, saving you valuable production time and keeping your cycles on schedule. Easy, physical integration allows you to seamlessly advance the process-monitoring abilities of your workspace. It's a sound investment that ensures higher productivity and better process control, without the risk of delays. CLM-3D is a fab-ready, full-wafer autoloading system delivering automated, digital three-dimensional analysis of semiconductor devices in a clean-room environment. To further ease physical integration and your fab processes, CLM-3D offers full-wafer return, integrated anti-vibration and electromagnetic field cancellation systems. You stay on schedule and enjoy superior metrology data in-fab.



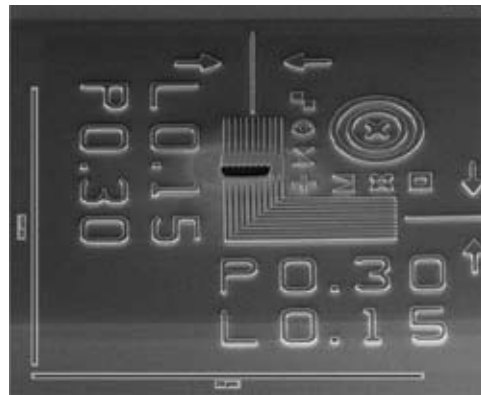
Process Characterization
Process Optimization

Process Integration
Yield Ramp Support
Scatterometry Recipe Development

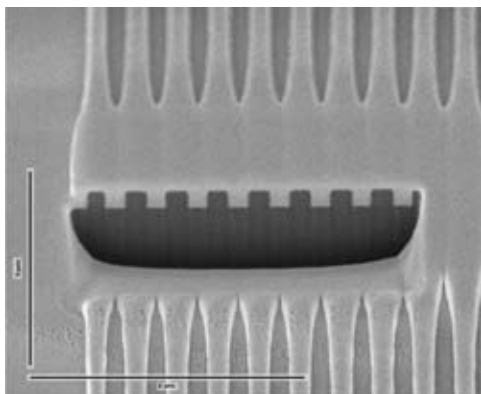
In-line Process Monitoring
Scatterometry Referee
Tool Hardware Qualification



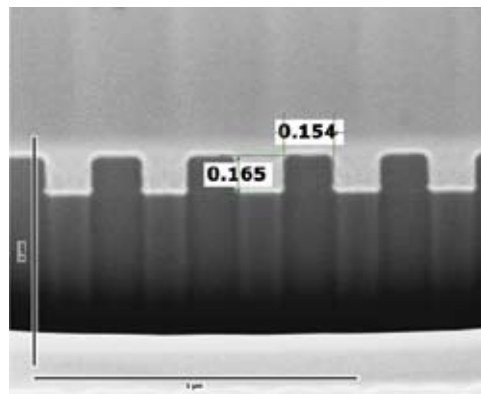
Step 1: Using a predefined recipe and site list, the CLM automatically aligns the wafer, drives to a specific site and completes FIB alignments at the region of interest.



Step 2: Protective metal deposition is applied on the surface to protect the feature of interest and FIB milling is completed.



Step 3: SEM alignment is automatically completed using integrated pattern-recognition software.



Step 4: The pattern reorganization software further pinpoints the exact feature of interest. A high-magnification SEM image is taken, and metrology is automatically completed.

Exceed your expectations

CLM-3D truly is a revolutionary in-line tool. Utilizing FEI's DualBeam technology and three-dimensional metrology software, CLM-3D is the superior solution for rapid prototyping and process control. By combining our latest-generation electron column and high-current ion column on a high-throughput platform, the CLM-3D is uniquely qualified to complete high-precision cross-sectional metrology. Enjoy rapid characterization and optimization with CLM-3D's ability to automatically mill cross-sections and acquire high-resolution scanning electron microscope (SEM) images. For even the most complex manufacturing processes, IC3D™ metrology software enables you to obtain critical points of view of three-dimensional structures to achieve fast, precise characterization and control. Now you can monitor key subsurface features with direct measurements, rather than mathematical models. CLM-3D delivers the most accurate analysis possible. By providing critical statistical feedback in a fraction of the time required by other cross-sectional techniques, CLM-3D allows for early development of your products. You get answers in real time, and that means a faster ramp to volume and profits.

CLM-3D targets the following applications:

- *CMP – Ideal for monitoring etch and plating in CMP or copper dual damascene processes. Execute process monitoring for CMP selectivity, dielectric and new critical thicknesses of copper*
- *Etch – Get analysis of new materials and new processes. Monitor etch-depth and etch-rate uniformity, profile notching, sidewall angle, bowing and CD uniformity even on high-aspect ratio structures*
- *Copper – Determine latitudes of new processes during ramp phase*

Built on a legacy of success

The CLM-3D is brought to you by the company whose fully integrated FIB/SEM technology has made it the leading supplier of three-dimensional analytical and metrology solutions for advanced semiconductor manufacturers. FEI is recognized worldwide as the leading innovator in developing three-dimensional metrology and analysis solutions for semiconductor manufacturers. In fact, as the industry's technology leader, we are uniquely positioned to provide you with the highest-quality characterization and analytic data in the shortest time. This leads to faster productivity and higher yields – giving you competitive advantages through reduced cost and shortened time to market. Wherever you are on your technology roadmap, FEI remains committed to helping you get designs right the first time, get to market first and arrive at full production fast.

See more at www.fei.com.

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