Nanolithography and imaging with a single tool

WRITE AND VIEW with

- TFE Technology
- Sub 20nm lithography
- High resolution imaging and pattern inspection
- Laser interferometer controlled stage with modular rotation and tilt

Integrated Rotation / Tilt function

Grating-coupled surface emitting quantum cascade laser

Defect holes in photonic crystal

...the perfect EBL-SEM-Hybrid

www.raft.com
... complements the widely used Raith portfolio of lithography and nanofabrication tools. Raith PIONEER is a new compact electron beam lithography (EBL) system based on thermal field emission (TFE) technology.

With sub 20nm lithography, highest resolution imaging capabilities and very low cost of ownership, the PIONEER is the ideal choice if you are looking for an uncompromised and affordable solution for fabrication and inspection of nanostructures. The PIONEER is the first true EB/SEM hybrid available!

Compared to a state of the art SEM with a third-party pattern generator, the PIONEER is a complete turnkey EBL system from a single trusted vendor at a very competitive price. The PIONEER's highest grade ingredients enable much wider application bandwidth: Raith's most recent laser interferometer controlled stage technology, which is a must for a dedicated EBL system, now provides integrated “on board” rotation and tilt of the entire sample holder thus preserving full SEM imaging capability.

Unique InLens detector hardware significantly improves secondary electron collection efficiency for brightly high contrast imaging and symmetric mark recognition. Especially at low voltages this detector delivers excellent surface information.

NEW PIONEER

Electron Beam Lithography main specifications:

- Filament type: Schottky-TFE
- Laserstage travel range: 50x50x25 mm
- Beam size (resolution): ≤ 2.5 nm (≤ 1.6 nm *)
- Minimum feature size: ≤ 20 nm (guaranteed)
- Field stitching: ≤ 50 (60)nm (m+2σ) ** (guaranteed)
- Overlay accuracy (alignment): ≤ 50 (60)nm (m+2σ) **
- Beam current drift: ≤ 0.5% / 1 hour
- Writing speed: 2.5 MHz (10MHz optional)

* Following simple formula, resolution approx. relates to beam size by: resolution = 0.6 * d FWHM with d FWHM: half width of beam size assuming a scan across an ideal edge (equivalent to “20%/80% greyscale criterion”)

** Values in brackets valid for basic ET-SE-detector configuration only

Better signal to noise and more precise edge detection with inlens detector. Integrated Tilt / Rotation function.