

POLOS® BEAM

Maskless lithography enables nanopatterning on demand, eliminating the need for costly and time-consuming photomasks. This flexibility makes it ideal for research and rapid prototyping. BEAM takes these advantages by delivering maskless lithography in a true desktop form factor without compromise in performance.



The BEAM Engine focuses a UV laser beam into a diffraction-limited spot and scans the spot to expose any arbitrary pattern on a photoresist. To expose large wafers, precision steppers move the wafer and allows multiple exposures to be stitched. The Beam Engine is capable of producing features smaller than (CD) 0.5 μm across an 8" wafer.

2025 HARDWARE UPDATE

The all new Gen2 BEAM Engine will now come standard with all systems. This means high resolution (<0.5 μm) and highspeed patterning, and improved stitching for all models.

DESKTOP MASKLESS LITHOGRAPHY WITHOUT COMPROMISE IN PERFORMANCE

Desktop form factor. Flagship performance.

Full-featured lithography on a lab bench



- ✓ Sub 0.5 μm line width
- ✓ Installs on any standard bench in minutes

Modular upgradeability.

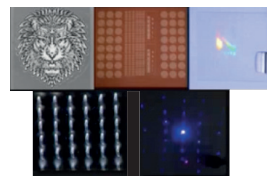
Start Lite, grow to Advanced at any time



- ✓ BEAM Lite -> Standard -> Advanced upgrade path
- ✓ Engine swapped in the field, no new system needed
- ✓ Lens configuration upgraded without recalibration
- ✓ Only BSA must be specified at time of order

Industry-first specifications.

Specs found nowhere else at this price tier



- ✓ 3K/4K DMD chip, world's first in a desktop system
- ✓ 16-bit greyscale for true 3D patterning
- ✓ Dual software-selectable wavelength (405 + 365 m)
- ✓ Gradient stitch, optical proximity correction

Minimal environmental requirements.

Runs anywhere, open lab or cleanroom



- ✓ Built-in passive vibration isolation, no optical table needed
- ✓ Standard power socket only (no compressed air)
- ✓ No cleanroom classification required
- ✓ Power comparable to a laptop when exposing

A POWERFUL TOOL

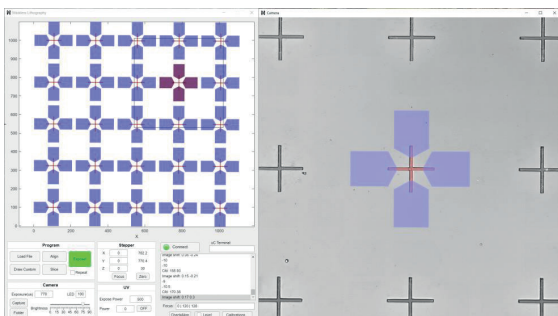
- **Ultrafast autofocus:** Piezo actuators reach focus in less than a second when combined with our closed looped focus optics.
- **No-fuss multilayer:** Semi-automatic alignment allows multilayer alignment to be completed within minutes.
- **Reliable solid-state design:** Trusted by 40+ institutions worldwide

SPECIFICATIONS

PATTERNING	50x	20x	10x	5x
Minimum linewidth (µm)	0.5	0.8	1.5	3
Patterning speed (mm²/min)	3	15	60	200
Exposure wavelength (nm)	405 (standard), 365 and 385 (option) Software-selectable dual wavelength available			
Greyscale	8 bit (standard), 16 bit (advanced)			

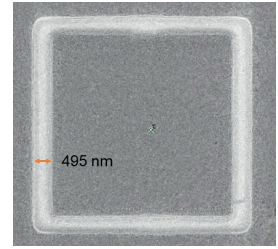
STEPPING	STANDARD	XL	XL8 (Available on request)
Stepper repeatability	0.1 µm		
Autofocus	Piezo-actuated; fast and precise (20 nm) focus Compatible with most transparent substrates		
Wafer alignment	Automatic wafer alignment		
	Topside only	Topside, bottom (option)	Topside, bottom (option)
Max. writing area (mm)	106 x 106	150 x 150	200 x 200
Max. sample size (mm)	130 x 130 (5" compatible)	155 x 155 (6" compatible)	200 x 200 (8" compatible)
Sample mounting	Friction mount (standard), porous vacuum chuck (option)		
Weight (kg)	20	27	33
System size (mm)	330 x 310 x 340	342 x 385 x 338	480 x 410 x 340

SOFTWARE	
Accepted file formats	.bmp, .png, .tiff, .dxf, .gds Patterns can directly be drawn in software
Patterning	Nanyte Beam Xplorer
Drawing	KLayout (most powerful), AutoCAD

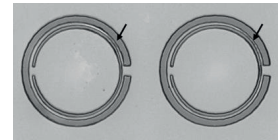


The included software makes quick work of any patterning job; just load, align and expose. Navigation is similar to CNC systems.

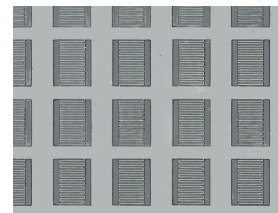
During multilayer exposures, the GDS pattern is overlaid for visualization. The control GUI (left window) has a minimap of the loaded GDS that allows navigation to any area on the wafer with 1 click.



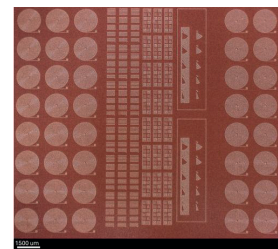
Square with 500 nm linewidth.
Resist used: KL5302.



Split-ring resonator arrays. The separation distance on the right is 1.5 µm (arrows), separation distance on the left is 2 µm. The outer ring is 80 µm across.



Interdigitated Capacitors (IDCs) with 2 µm fingers. Resist used: AZ5214E.



Microcoils and other patterns at 2 µm linewidth. Resist used: 5 µm dry film.