

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.



At its core, the BEAM Engine projects submicron patterns directly onto the substrate. Precision steppers enable seamless stitching of multiple writefields, making it possible to expose substrates up to 6 inches in diameter.

2025 HARDWARE UPDATE

The all new Gen2 BEAM Engine will now come standard with all systems. Expect high resolution ($<0.5 \mu\text{m}$) and highspeed patterning, and improved stitching. More details overleaf.

COMPACT

Full-featured maskless lithography, smaller than a desktop computer.

POWERFUL

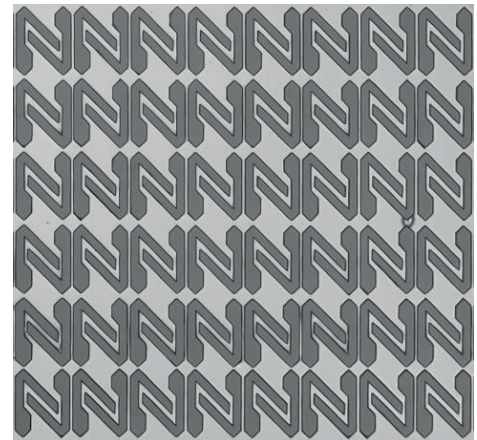
Sub-micron resolution while exposes a writefield in less than two seconds.

ULTRAFAST AUTOFOCUS

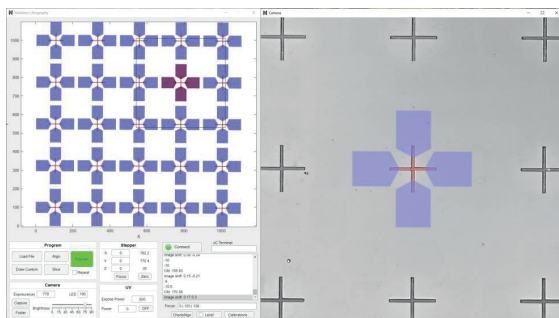
Piezo actuators reach focus in less than a second when combined with our closed looped focus optics.

NO-FUSS MULTILAYER

Semi-automatic alignment allows multilayer alignment to be completed within minutes.



Array of resist micropatterns on silicon substrate. Each cell is $50 \times 63 \mu\text{m}$, with $3 \mu\text{m}$ spacing between adjacent patterns. Resist used AZ 5214 E.

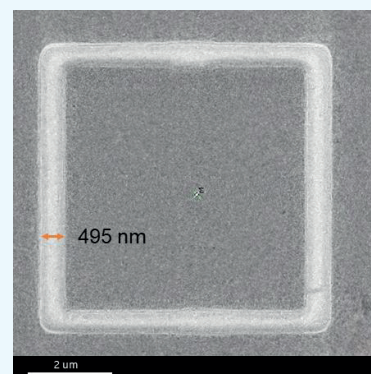


The included software makes quick work of any patterning job; just load, align and expose. Navigation is similar to CNC systems

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.

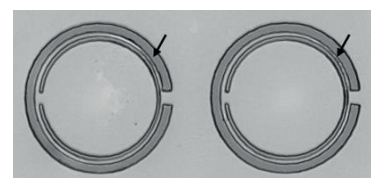
SPECIFICATIONS

PATTERNING	50x	20x	10x	5x
Minimum linewidth (μm)	0.5	0.8	1.5	3
Patterning speed (mm^2/min)	3	15	60	200
Exposure wavelength (nm)	405 (standard), 365 (option) Software-selectable dual wavelength available			
Greyscale	8-bit (standard), 16-bit (optional)			



Square with 500 nm linewidth. Resist: KL5302.

STEPPING	STANDARD	XL
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)
Maximum writing area (mm)	106 x 106	150 x 150
Maximum sample size (mm)	130 x 130 (5" compatible)	155 x 155 (6" compatible)
Sample mounting	Friction mount, porous vacuum chuck (option)	
Weight (kg)	20	27
System size	330 x 310 x 340	342 x 385 x 338

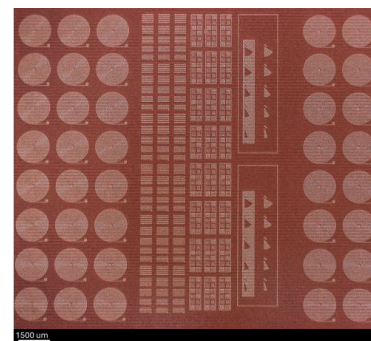


Split-ring resonator arrays. The separation distance on the right is 1.5 μm (arrows), separation distance on the left is 2 μm . The outer ring is 80 μm across.



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

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



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