

NANYTE BEAM

DESKTOP MASKLESS LITHOGRAPHY

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 8 inches in diameter.

2025 Hardware Update

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

Compact.

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

Powerful.

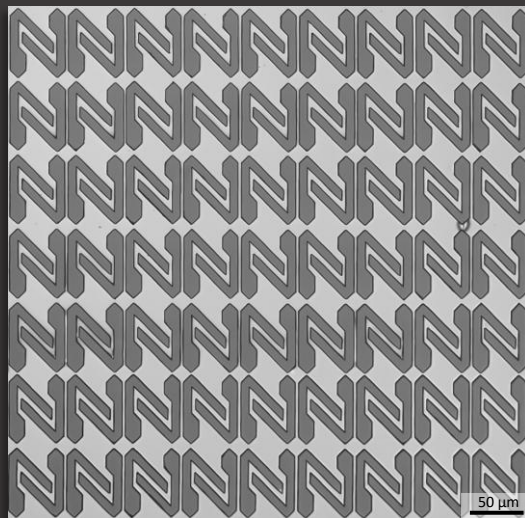
Sub-micron resolution while exposes a writefield in less than two seconds.

Ultrafast autofocus.

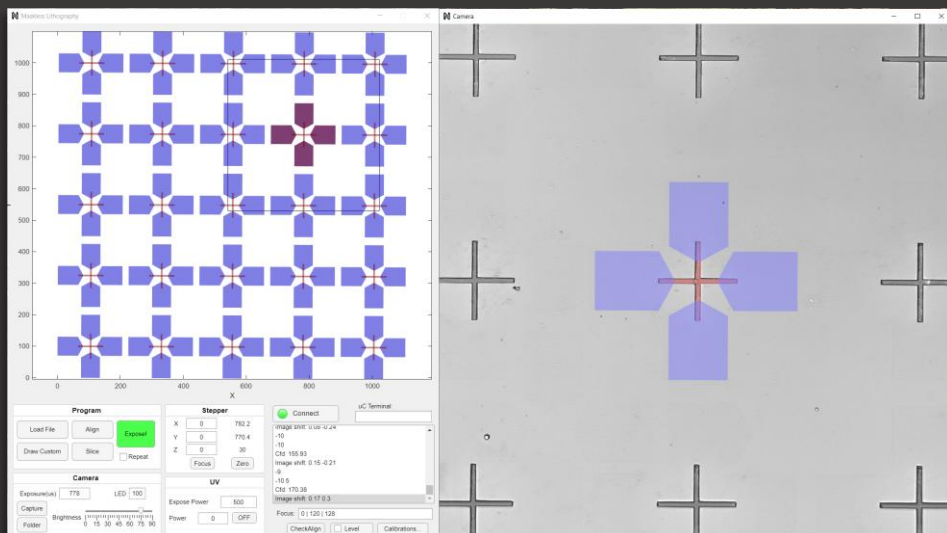
Piezo actuators reach focus in less than a second when combined with our closed-looped focus optics.

No-fuss multilayer.

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



Array of resist micropatterns on silicon substrate. Each cell is $50 \times 63\text{ }\mu\text{m}$, with $3\text{ }\mu\text{m}$ spacing between adjacent patterns. Resist used: AZ5214E



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

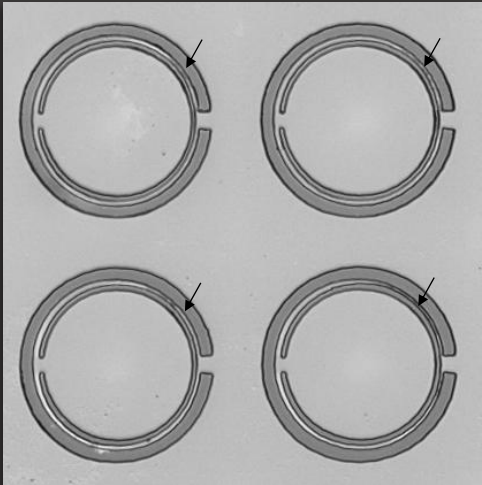
	50x	20x	10x	5x
Min. Linewidth	0.5 μm	0.8 μm	1.5 μm	3 μm
Patterning speed (mm^2/min)	3	15	60	200
Exposure Wavelength (nm)	405 (standard), 365 (option) Software-selectable dual wavelength available			
Greyscale	8-bit (standard), 16-bit (optional)			



Stepping

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

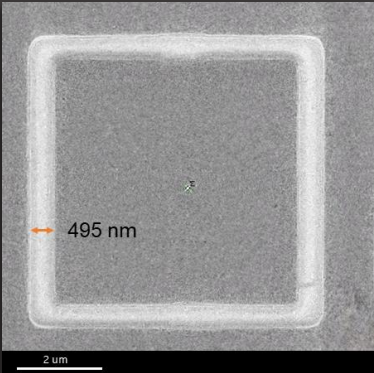
XL 8" writing area upgrade available



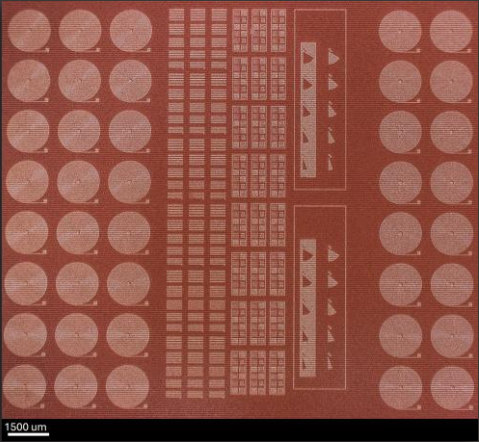
Split-ring resonator arrays. The separation distance on the right is 1.5 μm (arrows), separation distance on the left is 2 μm . The outer ring is 80 μm across.

Software

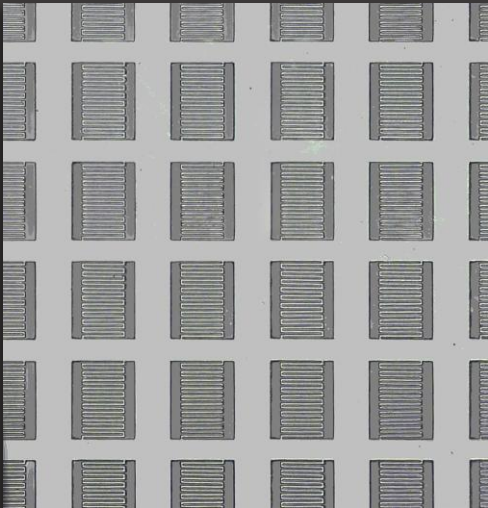
Accepted file formats	.bmp, .png, .tiff, .dxf, .gds Patterns can directly be drawn in software
Patterning	Nanyte Beam Xplorer
Drawing	KLayout (most powerful), AutoCAD



Square with 500 nm linewidth
Resist: KL5302



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



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



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