

MLA 150

THE ADVANCED MASKLESS ALIGNER



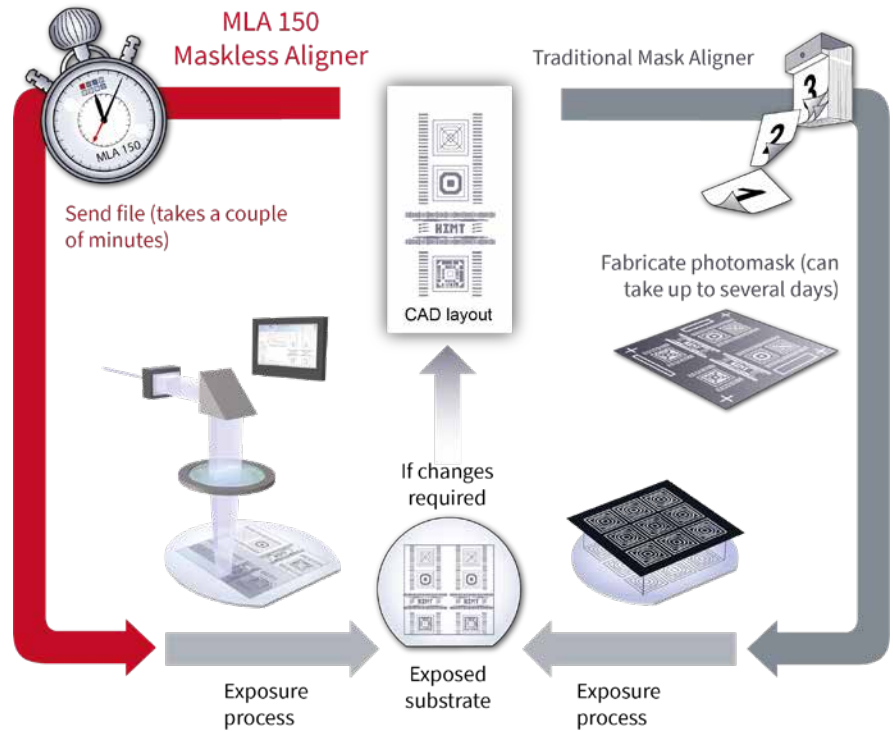
MLA 150

THE ADVANCED MASKLESS ALIGNER

The Maskless Aligner MLA 150 takes you into the future of photolithography: The traditional photomask becomes a thing of the past as your design file is exposed directly onto the resist-coated wafer via a 2-dimensional Spatial Light Modulator.

THE NEW PHOTOLITHOGRAPHY CYCLE

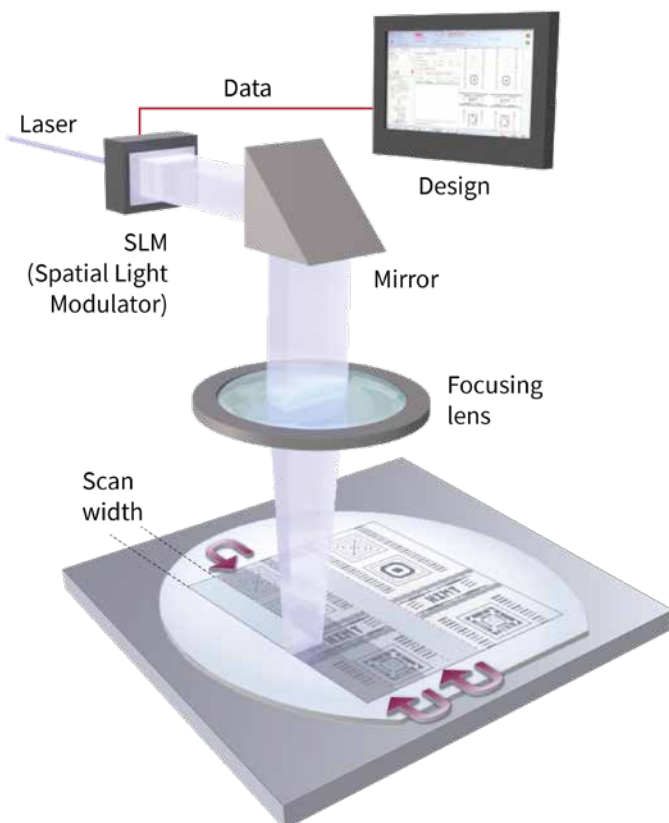
In addition to flexibility and economy, MLA 150 provides non-contact exposure, outstanding ease of use, and high speed, making it the ideal tool in rapid prototyping environments, for low- to mid-volume production, and Research & Development. The Maskless Aligner was first introduced in 2015. Since then, the revolutionary, state-of-the-art maskless technology has become firmly established. Today, the MLA 150 serves as a trusted, indispensable workhorse in many multi-user facilities, nanofabrication labs, and national institutes. Application areas include MEMS, micro-optics, diffractive optical elements, sensors, electronic components, and many more.



THE RASTER SCAN WRITING STRATEGY

Directly modulated light illuminates the resist-covered surface according to the design data; this precise exposure immediately generates the pattern. This process is called “direct writing” – as opposed to projecting an image through a mask. The design layout is converted into a pixel image and during exposure, the image is created by projecting each pixel onto the photoresist through the optical system while the stage advances continuously. The Spatial Light Modulator effectively takes on the role of a programmable photomask.

- High-speed Spatial Light Modulator (SLM)
- Bi-directional writing process
- „Empty stripes“ optimization
- Ultra-fast x-y stage



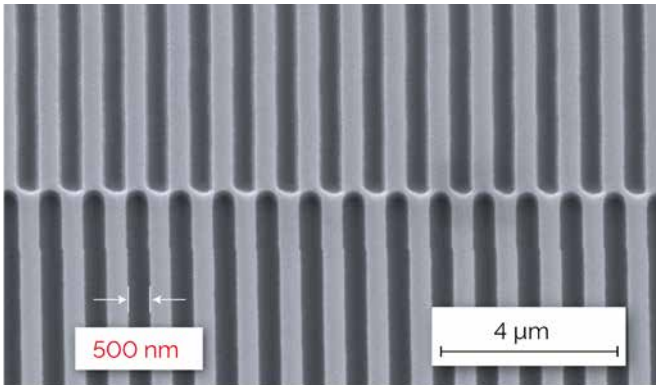
MLA 150 EXPOSURE TIMES *

Laser wavelength	405 nm
50 x 50 mm ²	4 minutes
100 x 100 mm ²	9 minutes
150 x 150 mm ²	16 minutes
200 x 200 mm ²	36 minutes

Writing strategy MLA 150

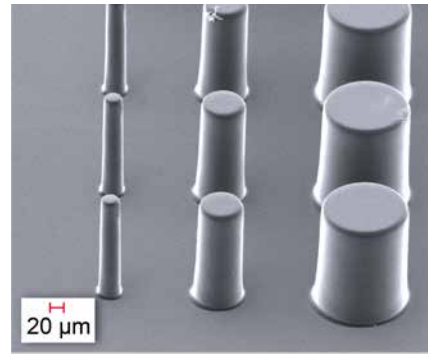
*For exposure at 100 mJ/cm² and minimum feature size of 1 μm

HIGH RESOLUTION



High-resolution mode: Vertical 500 nm lines and spaces. Resist: S1805. Wavelength: 375 nm

HIGH-ASPECT-RATIO

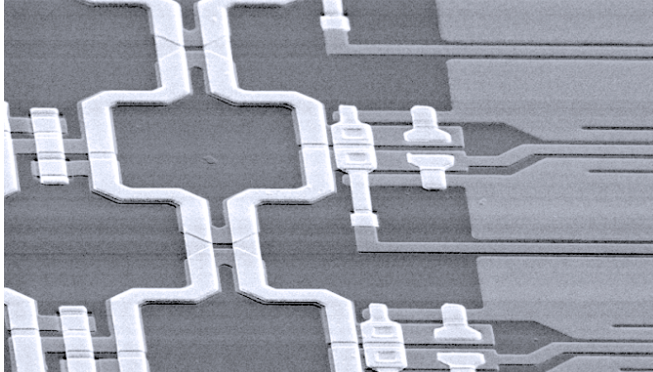


High-aspect ratio: Pillars. Resist: 160 μm SU-8

- Adjustable depth of focus
- Aspect ratio up to 1:20
- Applications: Micro-fluidics, MEMS, waveguides

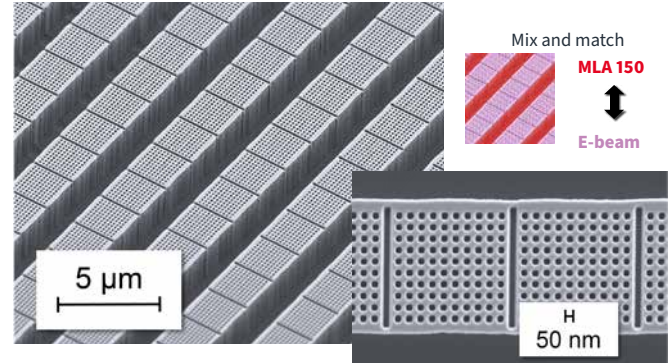
FAST AND HIGH-PRECISION ALIGNMENT

- Global and field-by-field alignment
- Backside alignment
- Alignment accuracy of better than 500 nm
- Fast and easy alignment procedure
- Alignment error compensation: Corrects for rotation, offset, scaling and shearing
- Allows mix and match between different tool-sets, e.g. e-beam or thermal scanning probe lithography and laser lithography



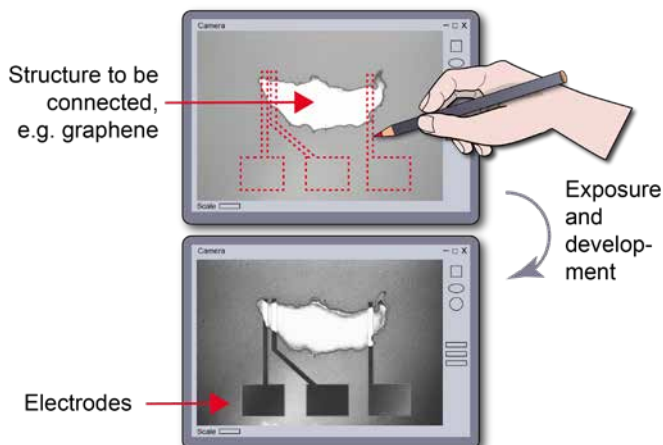
SQUID magnetic flux sensor; 18 layer process
Courtesy of the Kirchhoff Institute for Physics, Heidelberg

MIX-AND-MATCH APPLICATIONS



Mix-and-match lithography

Courtesy of EPFL LMIS1, Lausanne



FLEXIBILITY

- The available solid-state laser sources (405 and 375 nm) make the system compatible with all broadband UV photoresists (including SU-8) and can both be installed in the MLA 150 at the same time
- 3D-patterning with grayscale lithography
- Optional: exchangeable chucks with individual vacuum layouts
- The Draw Mode: Add individual features to a previously patterned substrate. Using graphic elements, or even a bitmap, simply „draw“ the desired structures - such as labels, markers, or electrical connections - directly into the camera image

MLA 150

SYSTEM SPECIFICATIONS

	Write Mode I *	Write Mode II *
Writing performance		
Minimum feature size [μm]	0.6	1
Minimum lines & spaces [μm]	0.8	1.2
Global 2nd layer alignment [3σ , nm]	500	500
Local 2nd layer alignment [3σ , nm]	250	250
Backside alignment [3σ , nm]	1000	1000
Exposure time 405 nm laser for 4" wafer [min]	35	9
Exposure time 375 nm laser for 4" wafer [min]	35	20
Max. write speed 405 nm laser [mm^2/min]	285	1100
Max. write speed 375 nm laser [mm^2/min]	285	500
System features		
Light source	Diode lasers: 8 W at 405 nm, 2.8 W at 375 nm, or both	
Substrate sizes	Variable: 3 x 3 mm ² to 6" x 6" Optional: 8" x 8" Customizable on request	
Substrate thickness	0 - 12 mm	
Maximum exposure area	150 x 150 mm ² Optional: 200 x 200 mm ²	
Environmental chamber	Temperature stability $\pm 0.1^\circ$	
Real-time autofocus	Air-gauge or optical	
Autofocus compensation range	180 μm	
Grayscale	128 gray levels	
Software features	Exposure wizard, resist database, automatic labeling and serialization, Draw Mode for CADless exposures, substrate tracking / history	
Optional Automatic Loading System	<ul style="list-style-type: none"> Can handle masks up to 7" and wafers up to 8" A second cassette station, and a prealigner and wafer scanner are available as options 	
System dimensions (lithography unit)		
Height x width x depth	1950 mm x 1300 mm x 1300 mm	
Weight	1100 kg	
Installation requirements		
Electrical	230 VAC $\pm 5\%$, 50/60 Hz, 16 A	
Compressed air	6 - 10 bar, stability ± 0.5 bar	
Economical considerations		
Saves on the cost of photomasks		
Low running costs for maintenance, energy consumption, spare parts		
Solid-state laser light sources with lifetime of several years		

* Only one write mode can be installed on the system



Tel: +86-512-62529622

Fax: +86-512-62522966

苏州工业园区北摆宴街8号
恒润商务大厦一楼A-3



www.stella-litho.com

联系人: 江俊葳 先生 / Wesley
移动电话: +86 186 0621 7371
Email: wesley@stella-litho.com



联系人: 邱重铠 先生 / CK
移动电话: +86 180 3682 6293
Email: ckchiu@stella-litho.com

