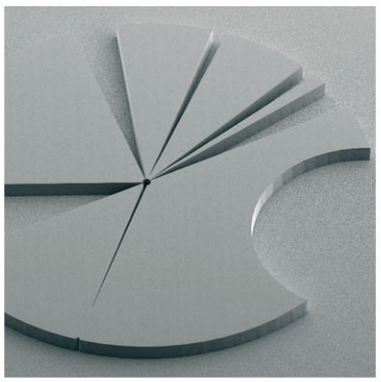
HEIDELBERG
INSTRUMENTS

µPG 501

Tabletop Maskless Aligner System



70µm SU-8, aspect ratio 40:1

Stella
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µPG 501

Tabletop Maskless Aligner System

Heidelberg Instruments Mikrotechnik GmbH, the market leader in Direct Write Lithography Systems with an installation base over 500 systems in 40 countries and global offices in Asia, America and Europe presents the µPG 501, a Tabletop Maskless Aligner System.

Designed with the focus on high performance at an affordable price, the µPG 501 is the perfect solution for prototyping and fabrication of MEMS, Integrated Optics, Micro Fluids, Lab-on-a-Chip devices and Photomasks. The µPG 501 offers two optional configurations. With "Write Mode-1" it is possible to write structures down to 1 µm at a speed of 50 mm^2/minute. In "Write Mode II" you can produce features down to 2 µm with a speed of 100 mm^2/min. This equals an exposure time of less than 25 minutes for a 2" x 2" pattern. The integrated exposure wizard(GUI) guides the operator through the complete procedure: Load the substrate, select the design and start the exposure.

With a footprint of 60 x 75 cm the µPG 501 was designed to fit even into the smallest R&D laboratories, and requires only power connection and an air pressure supply to operate. The data conversion software has inherited all the performances and functions from our high volume, large area production systems. It is very simple to operate and provides basic design operations and features a viewer for the design data as well as for the converted pixel data. The software supports multiple data formats: GDSII, DXF, GERBER, CIF, BMP, STL. Other formats are available on request.

µPG 501 is equipped with a high power LED light source, providing exceptional reliability and very long lifetime.The standard wavelength is 390 nm. Other wavelengths may be available upon request. The µPG 501 can expose standard positive and negative photo resists as well as UV-resists such as SU8. Since the intensity dose is not limited, the system is suitable for applications, which require thick resists.

Key Features and Options

- High speed exposure engine
- Substrates up to 6" X 6"
- Structures down to 1 µm
- Address grid down to 50 nm
- Basic gray scale exposure mode
- Real time auto focus system
- High Power UV LED
- Camera system for metrology and alignment
- Multiple data input formats

The light engine features the Digital Micro Mirror Device (DMD) as the imaging device, a platform, which is already available in the market and has been constantly improved for usage in commercial as well as R&D applications. Besides enabling high throughput, a major advantage of the DMD is its reliability in the visible as well as in the UV spectrum of the illumination.

The integrated metrology system allows to do overlay exposures either by manual or automatic alignment to multiple targets on the substrate. Our field proven Autofocus System compensates flatness variation of the substrate in real-time. This is an essential feature especially for high-resolution lithography systems. Custom made vacuum chucks can hold substrates with various sizes up to 6". The stage is driven by powerful linear motors and controlled by encoders at a resolution of 20 nm.

Specifications

Write Mode	I	II
Address Grid [nm]	50	100
Minimum Structure Size [µm]	1	2
Write Speed [mm^2/minute]	50	100
Edge Roughness [3σ/nm]	100	150
CD Uniformity [3σ/nm]	200	300
Alignment Accuracy [3σ/nm]	200	400

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