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µPG 101
Tabletop Micro Pattern Generator
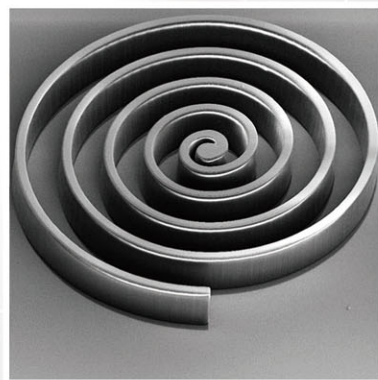
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50µm SU-8, aspect ratio 10:1

The µPG 101 is an extremely economical and easy to use micro pattern generator for direct writing applications and low volume mask making. The system can be used for applications such as MEMS, Bio MEMS, Integrated Optics, Micro Fluidics or any other application that requires high precision, high-resolution microstructures. The µPG 101 offers a small footprint of only 60 x 75 cm², featuring a compact design with all electronic components integrated into the system. A personal computer is used as system control. The GUI based control software makes it easy for users to convert the designs, perform a manual or automatic alignment and start the exposure.

The µPG 101 is designed to provide an easy and fast way to create the microstructures needed for your business or research. The tabletop system features exchangeable write modes to meet the resolution and write speed requirements of your specific application. It is the only available desktop lithography system in the market, which can produce sub-micron features. The small address grid allows placement of structures with very high accuracy. The real-time autofocus system monitors and corrects focus position during exposure, which guarantees high resolution and repeatability over the entire exposure area. Small address grid and real-time autofocus system are essential features for a professional micro pattern solution..

The standard system is equipped with a diode laser at 405 nm, which presents a reliable laser source with a long lifetime. This laser can be used to expose the standard photoresists that are used in lithography. Alternatively, the system can be equipped with a laser diode at 375 nm, making it possible to expose standard resists and UV resists such as SU-8. The system offers a raster-scan and vector exposure mode for high resolution 2D patterns and in addition it is also possible to create complex 3D structures in thick photoresist in a single pass.

Key Features and Options

- Substrates up to 6" X 6"
- Structures down to 0.9 µm
- Address grid down to 40 nm
- Basic gray scale exposure mode
- Real time auto focus system
- Standard or UV diode laser source
- Vector and raster exposure mode
- Exchangeable write modes
- Camera system for alignment
- Multiple data input formats

To ensure the quality of the produced structures, the µPG 101 utilizes a fixed optical path, a high precision mechanical structure and an air-bearing stage driven by linear motors. During exposure the stage position is constantly monitored by a high-resolution linear encoder system.

The camera of the µPG 101 enables the user to perform position measurements on the substrate as well as manual alignment. The optional automatic alignment system provides tools for an advanced alignment to already existing structures on the substrate, making it possible to perform multi-layer overlay exposures with high accuracy.

Specifications

Write Mode	I	II	III
Address Grid [nm]	40	100	200
Minimum Structure Size [µm]	0.9	2.5	5
Write Speed [mm²/minute]	5	35	90
Edge Roughness [3σ/nm]	120	200	400
CD Uniformity [3σ/nm]	200	400	800
Alignment Accuracy [3σ/nm]	200	400	800