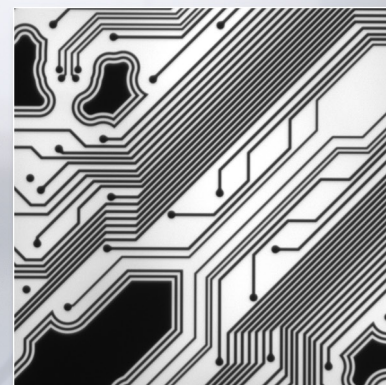


**HEIDELBERG**  
INSTRUMENTS



# ***VPG series***

ADVANCED MASKLESS ALIGNER SYSTEMS



Photomask with electronic circuits

# VPG 200

# VPG 400

## Advanced Maskless Aligner Systems

The VPG 400 and VPG 200 family of systems introduce Heidelberg Instruments' most advanced small and midsize Maskless Aligner Systems currently available on the market. These systems represent over 2 decades of application and process experience in small area lithography combined with advanced and field proven technology used on our industry standard large area VPG (Volume Pattern Generator) platforms. Combining high resolution, outstanding image quality and fast throughput, the VPG 400 and VPG 200 are ideal systems for rapid photomask fabrication.

Because of the high exposure speed, the VPG 400 and VPG 200 can be also used as a Maskless Aligner for direct exposure on wafers or any other flat substrates coated with photosensitive material. As an example, a 4" wafer can be patterned in less than 2 minutes, eliminating the need for photomasks and mask aligner tools. Systems can be used in a variety of demanding fields that require microstructures. Typical applications include MEMS, Advanced Packaging, 3D Integration, LED production and Compound Semiconductor.

The UV light source enables the exposure of i-line resists while staying compatible to standard positive g- and h-line photo resists. The ability to expose SU-8 makes the VPG technology a perfect solution for rapid prototyping and production of micro-fluidics or other areas where thick negative resist are required. The VPG 400 and VPG 200 are equipped with an air-bearing stage offering maximum write area of 16" and 8" respectively and feature an automated alignment capability allowing multilayer exposures with excellent overlay accuracy and repeatability.

The alignment functionality includes distortion compensation and field-by-field alignment, which is required in many semiconductor applications. The automatic calibration of stage positioning is achieved with great efficiency using the 2D Stage Map Correction. Specified overlay accuracy is guaranteed by employing rigorous environment control and compensation of other variations through software corrections

based on precise measurements of environmental parameters. The integrated metrology system enables self-calibration functions and various critical dimensions measurements. Common data formats are supported and data processing is done in parallel with the exposure, eliminating idle time.

### Key Features and Options

Ultra high speed exposure engine

Substrates up to 17" x 17"

Structures down to 0.75  $\mu\text{m}$

Address grid down to 12.5 nm

Real time auto focus system

High power DPSS laser

Exchangeable write modes

Camera system for metrology and alignment

Closed-loop climate chamber

Automatic substrate loading system

Stage map correction

Edge detector system

Multiple data input formats

User programming interface

### SPECIFICATIONS

WRITE MODE	I	II	III	IV
Address Grid [nm]	12.5	25	50	100
Minimum Structure Size [ $\mu\text{m}$ ]	0.75	1	2	4
Max. Write Speed [ $\text{mm}^2/\text{minute}$ ]	320	1200	4200	13500
Edge Roughness [ $3\sigma, \text{nm}$ ]	40	50	70	150
CD Uniformity [ $3\sigma, \text{nm}$ ]	65	75	110	300
Overlay Accuracy [ $3\sigma, \text{nm}$ ]	250	300	400	500