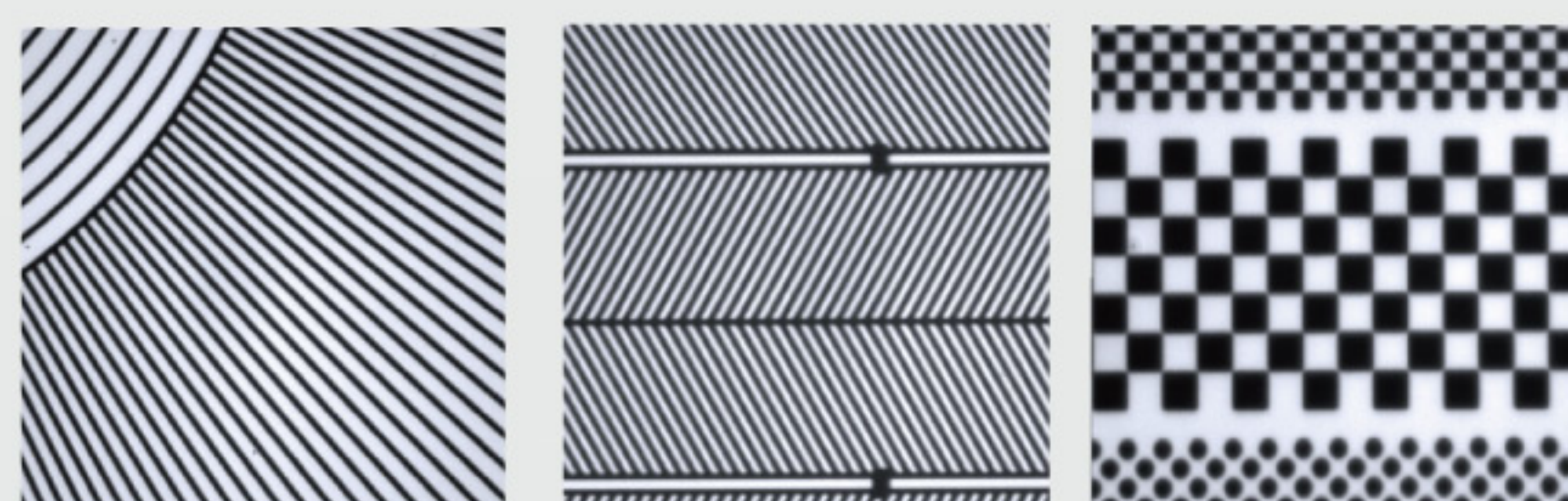


# VPG<sup>+</sup> 200 / VPG<sup>+</sup> 400

THE SMALL-AREA MULTIPURPOSE VOLUME PATTERN GENERATORS



# VPG<sup>+</sup> 200 / VPG<sup>+</sup> 400

## THE SMALL-AREA MULTIPURPOSE VOLUME PATTERN GENERATORS

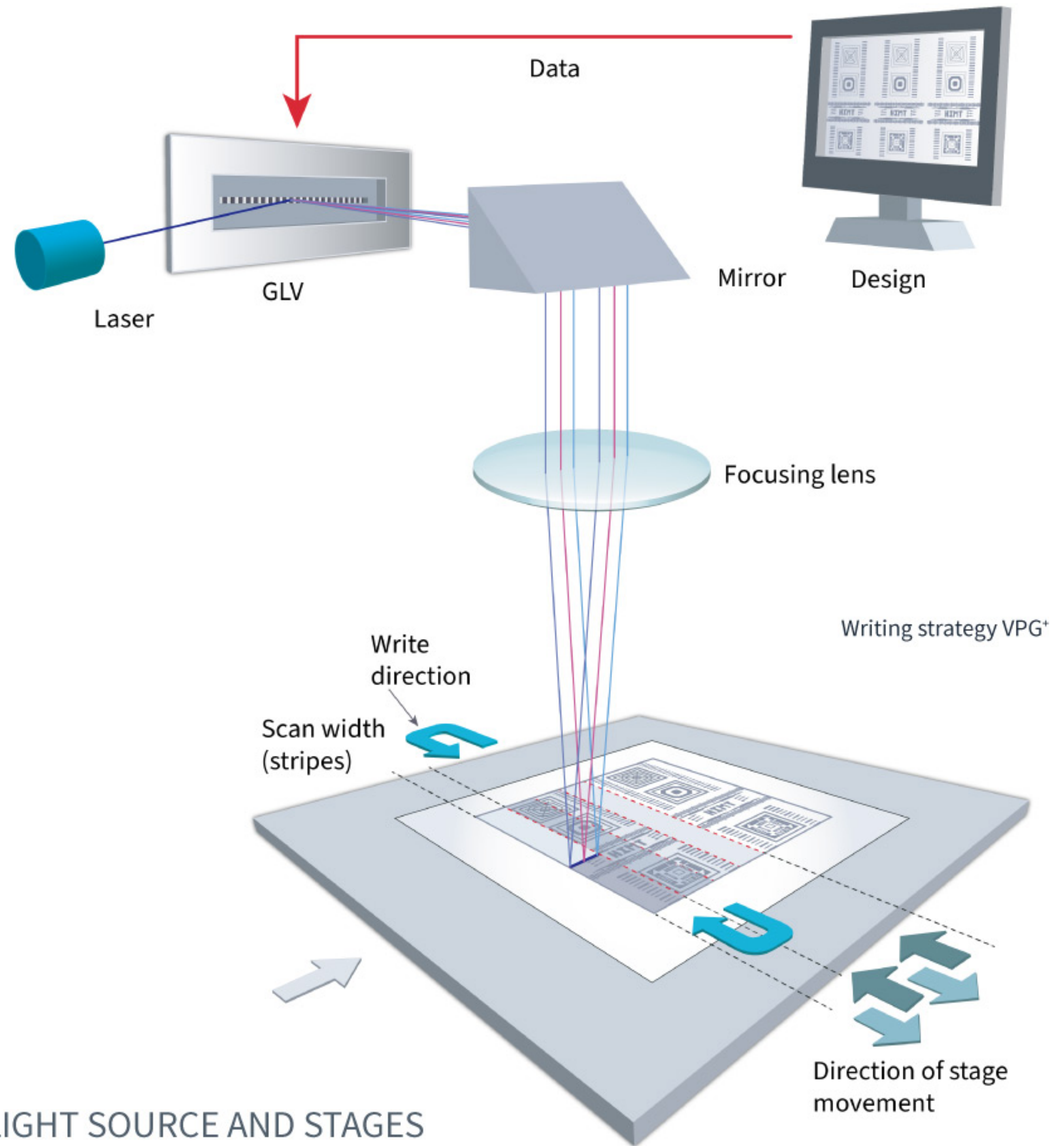
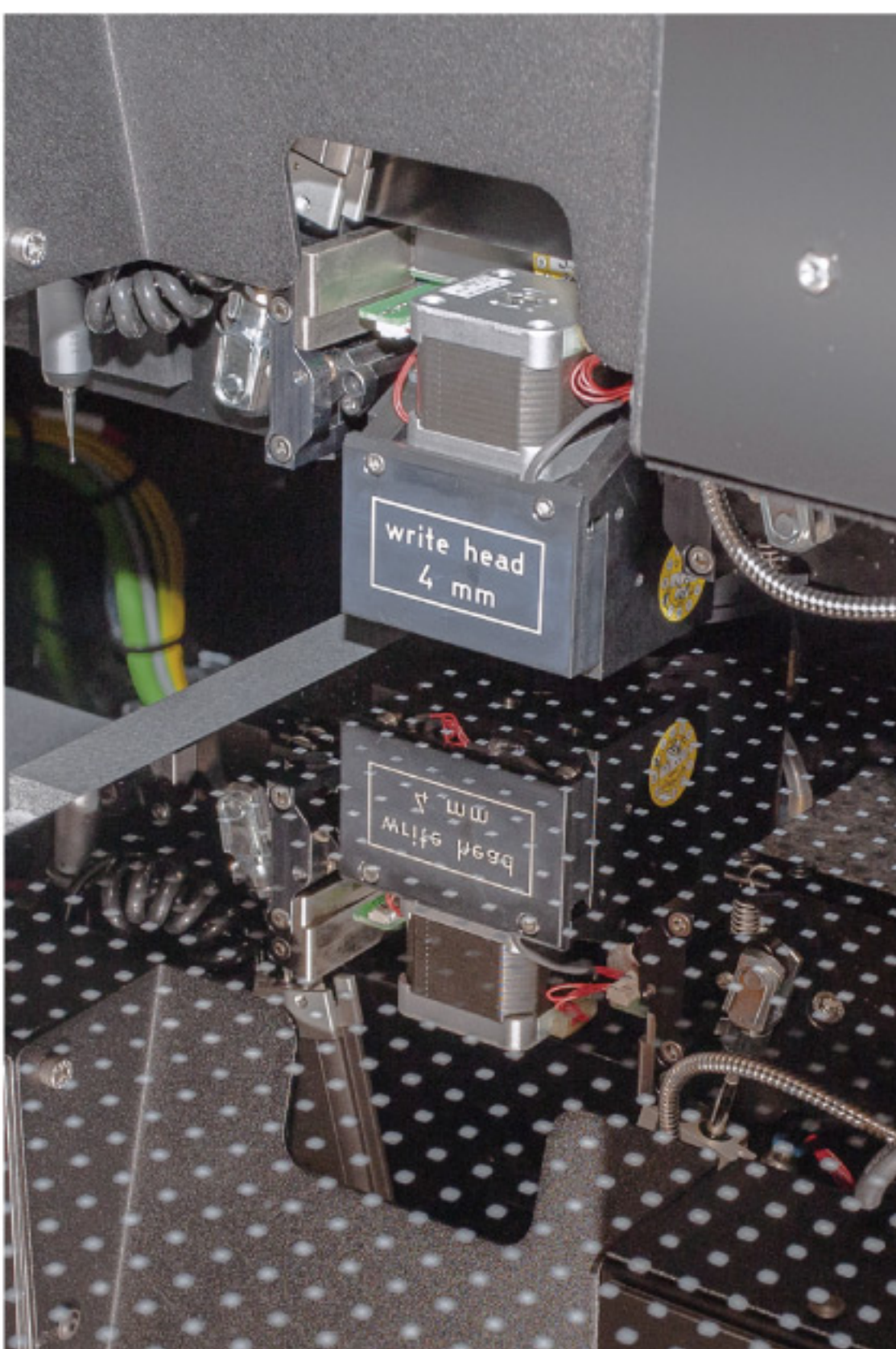
Our small-area multipurpose Volume Pattern Generators VPG<sup>+</sup> 200 and VPG<sup>+</sup> 400 are perfectly suited for the production of standard photomasks as well as for i-line resist applications. An ultra-high-speed exposure engine and automated alignment capability both contribute to systems that excel through high resolution, outstanding image quality, and fast throughput.

### THE SMALL AREA VOLUME PATTERN GENERATORS

The VPG<sup>+</sup> 200 and 400 family of systems have always benefitted from Heidelberg Instruments' vast experience in small area lithography; and just as much from the field-proven technology employed on the company's industry standard large area VPG<sup>+</sup> platforms. VPG<sup>+</sup> systems both large and small share the same powerful technology.

### EVEN HIGHER EXPOSURE SPEED

The „plus“ has been added ever since the series has been featuring an even significantly faster high-speed spatial light modulator (custom-made for Heidelberg Instruments and therefore exclusive to this series). The entire exposure engine operates at a higher rate than ever before and the data path too has been vastly enhanced, making the VPG<sup>+</sup> the fastest tool for mask-writing in this market-segment.



### LIGHT SOURCE AND STAGES

The VPG<sup>+</sup> small-area systems operate with a high-power pulsed UV laser source with a wavelength of 355 nm. The systems can be equipped with air-bearing stages designed to accommodate substrates of up to 9" (VPG<sup>+</sup> 200) and 17" (VPG<sup>+</sup> 400) respectively.

### THE SMALL-AREA VPG<sup>+</sup> IN A NUTSHELL

- Ultra-high-speed exposure engine
- Real time auto focus system
- High power DPSS laser with 355 nm
- Exchangeable write modes
- Camera system for metrology and alignment
- Closed-loop climate chamber
- Automatic substrate loading system including pre-alignment
- Stage map correction
- Edge detector system
- Multiple data input formats
- User programmable interface
- Backside and IR alignment options
- Special chucks
- Labelling options
- Optional Zerodur™ chuck
- Minimum structure size down to 0.75 μm

Photograph courtesy of IMS Chips

## ALIGNMENT AND CALIBRATION

System features include automated alignment capabilities allowing multilayer exposures with excellent overlay accuracy and repeatability. The alignment functionality includes distortion compensation and field-by-field alignment. The 2D Stage Map Correction automatically calibrates stage positioning improving registration of the written structures.

## ENVIRONMENTAL CONTROL

Rigorous environmental monitoring and feedback control ensure the specified overlay accuracy: software corrections based on precise measurements compensate for any variations in environmental parameters. An integrated metrology system enables self-calibration functions and various critical dimension measurements. Standard data formats are supported.

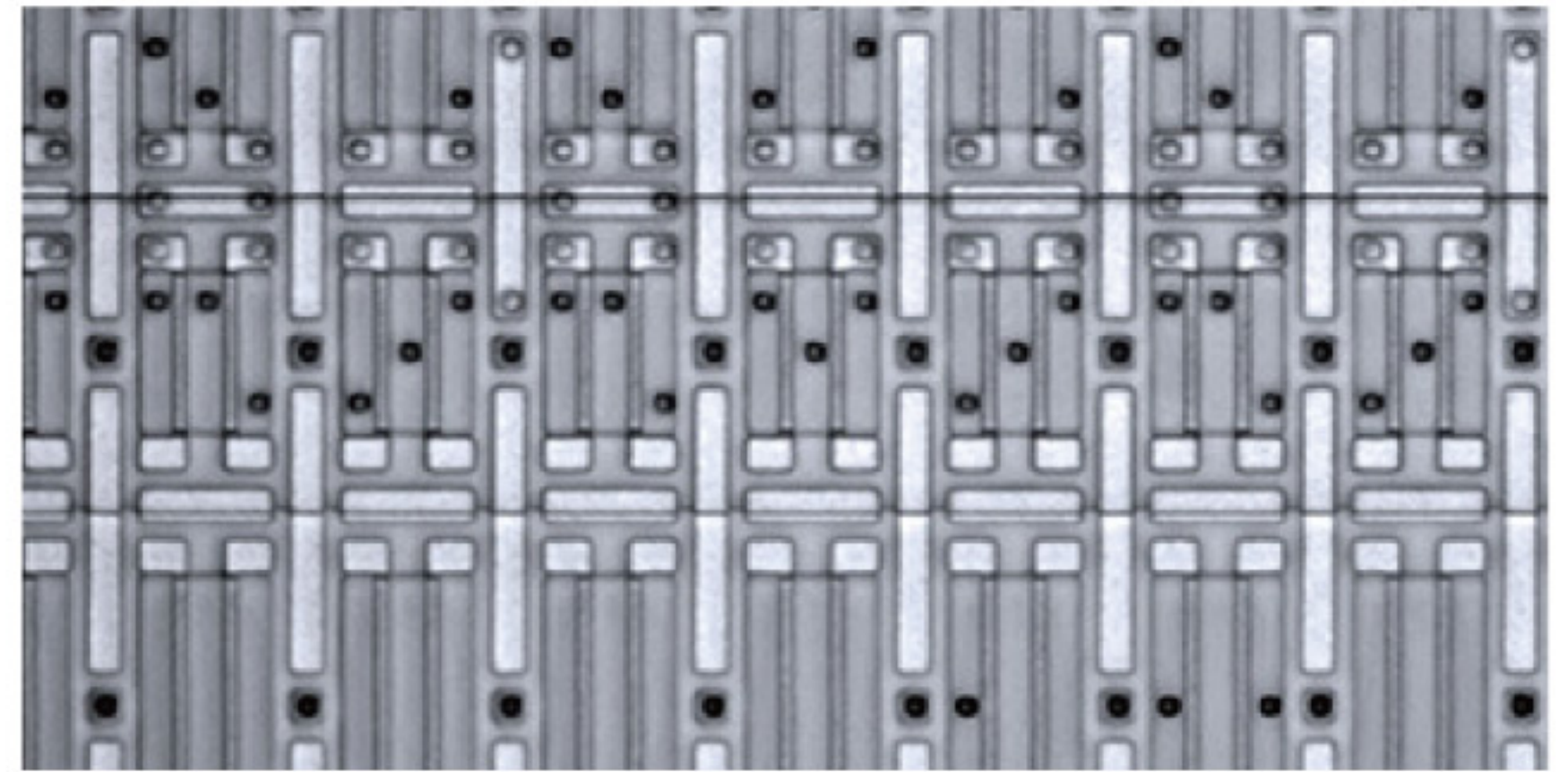
## APPLICATIONS

The VPG<sup>+</sup> 200 and VPG<sup>+</sup> 400 are perfectly suited for the production of standard photomasks and also for applications that use i-line resists such as SU-8 and IP 3500. The ability to expose SU-8 in fact makes the VPG<sup>+</sup> a perfect solution for rapid prototyping of microfluidics or in other areas where thick negative resists are required. In effect, the Heidelberg Instruments small-area VPG<sup>+</sup> systems represent an excellent alternative to any i-line stepper. The systems can be used in a range of demanding fields that require microstructures: Typical applications include MEMS, advanced packaging, 3D integration, LED production and compound semiconductors.

### APPLICATIONS IN A NUTSHELL

- Photomask writing
- Rapid prototyping
- Microfluidics, MEMS
- Advanced packaging
- 3D integration
- LED production
- Compound semiconductors
- Particularly suitable for i-line resists such as SU-8 and IP 3600
- Direct write on i-line resists for industrial R&D
- Mix-and-match with e-beam

## MIX-AND-MATCH APPLICATIONS

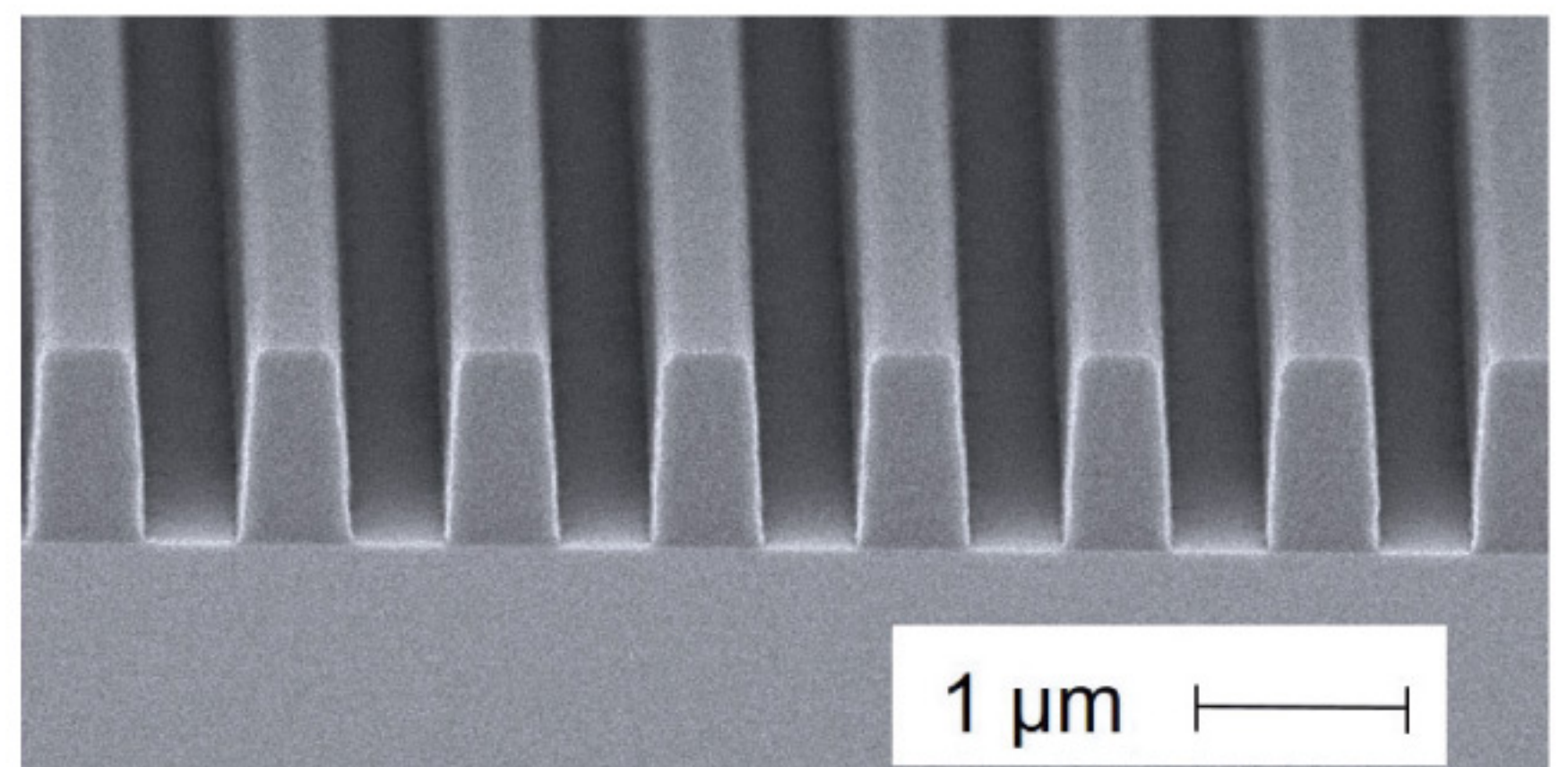


Mixed-signal gate array.

Courtesy of IMS Chips.

The example shows a “sea-of-gates” type mixed-signal gate array (IMS Gate Forest<sup>®</sup> technology) which allows the integration of analog and digital functionality on a single chip. The microelectronic elements on the master can be individually configured by adding the respective contacts. In a Mix-&Match-approach, IMS Chips fabricated the CMOS masters by stepper lithography and added the personalized contacts and metallization layers with direct write laser lithography, using a VPG 400.

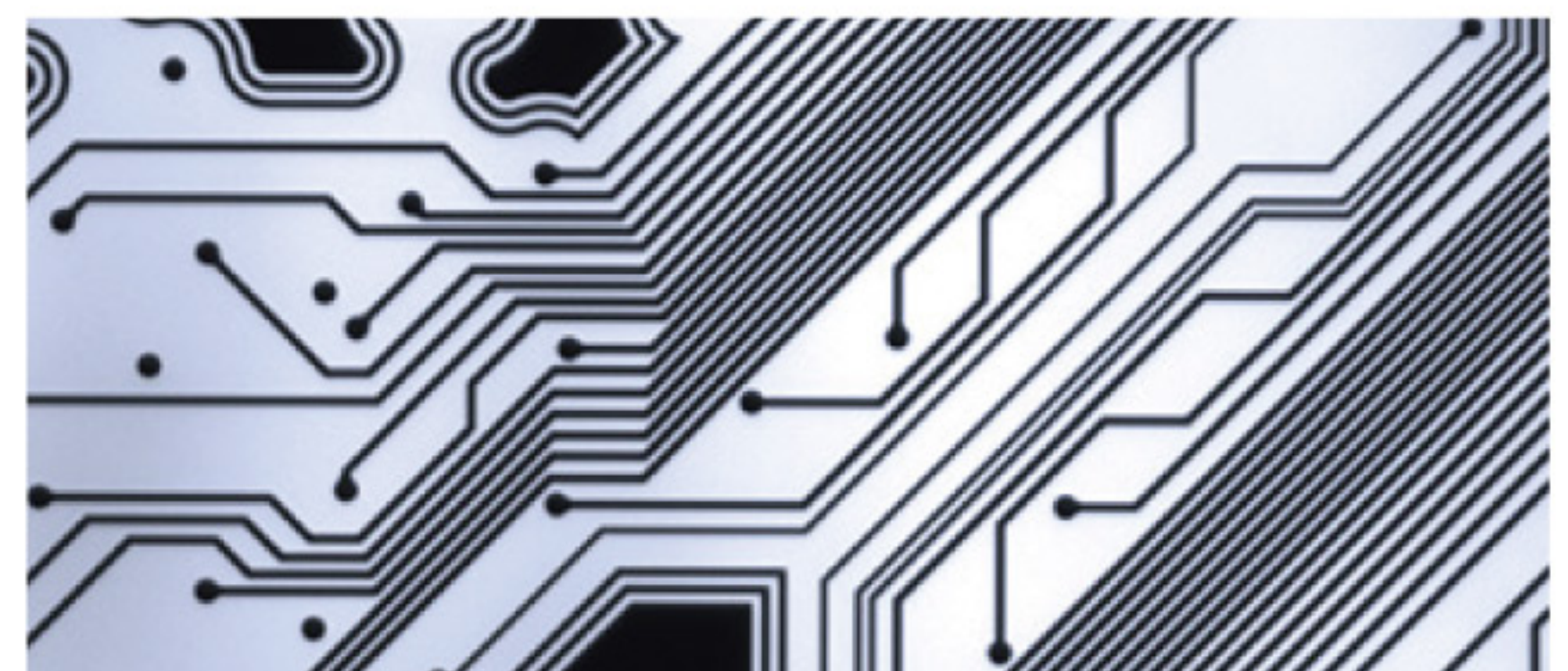
## HIGH-RESOLUTION STRUCTURES



Structures created with IP3250 (1 µm thickness).

Courtesy of IMS Chips.

## ADVANCED PACKAGING



The VPG<sup>+</sup> series presents the solution for the fabrication of the high-quality photomasks or direct writing required for advanced packaging applications. For some critical applications direct write lithography is currently the only available solution. The VPG<sup>+</sup> series of maskless lithography systems offer high speed, automatic distortion compensation, and excellent resolution in order to master these applications.

# VPG<sup>+</sup> 200 / VPG<sup>+</sup> 400

## SYSTEM SPECIFICATIONS

Write mode	I	II	III
<b>Writing performance</b>			
Minimum structure size [ $\mu\text{m}$ ]	0.75	1	2
Address grid [nm]	12.5	25	50
Edge roughness [ $3\sigma$ , nm]	40	50	70
CD uniformity [ $3\sigma$ , nm]	65	75	110
Stitching [ $3\sigma$ , nm]	60	70	100
2nd layer alignment [ $3\sigma$ , nm]	225	350	500
Write speed [ $\text{mm}^2/\text{min}$ ]	970	3150	6400
<b>System features</b>			
Light source	High-power DPSS laser with 355 nm		
Maximum substrate sizes	9" x 9" / 17" x 17"		
Substrate thickness	0 to 12 mm (other thicknesses on request)		
Maximum exposure area	205 mm x 205 mm / 410 mm x 410 mm		
Autofocus	Realtime autofocus system (optical and pneumatic)		
Autofocus compensation range	Up to 150 $\mu\text{m}$		
Flowbox	(Closed-loop) temperature controlled environmental chamber		
Alignment	Camera system for metrology and alignment; backside and IR alignment options		
Other features and options	Stage map correction, Mura correction, Edge detector system, Multiple data input formats (DXF, CIF, GDSII and Gerber files); full automatic wafer and mask handling options including prealigner, optional Zerodur™ stage and special chucks		

### System dimensions

	System	Electronic rack
Width [mm]	2605	800
Depth [mm]	1652	650
Height [mm]	2102	1800
Weight [kg]	3000	180

### Installation requirements

Electrical	400 VAC $\pm$ 5 %, 50/60 Hz, 32 A
Compressed air	6 - 10 bar

Please note: Specifications depend on individual process conditions and may vary according to equipment configuration. Write speed depends on exposure area. Design and specifications are subject to change without prior notice.

聯絡人: 江俊葳 先生 / Wesley  
聯絡電話: 0910 792 940  
Email: wesley@stella.com.tw



聯絡人: 邱重鎧 先生 / CK  
聯絡電話: 0908 785 626  
Email: ckchiu@stella.com.tw



Tel: 02 2528 9668  
Fax: 02 8772 7711



www.stella.com.tw