



- 1 *Master-wafer for the replication of micro-optical freeform arrays generated by step-and-repeat technology.*
- 2 *Directly replicated micro-aspheres on a lithographically structured aperture wafer.*
- 3 *Measured surface profile of a replicated freeform array.*

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STEP & REPEAT REPLICATION TECHNOLOGY FOR THE MANUFACTURING OF MICRO-OPTICS

Modern micro-optical components, e. g. micro-aspheres or micro-optical freeform surfaces are key enabling elements in miniaturized imaging and sensing devices. Wafer level replication methods can be used in order to ensure a cost-effective manufacturing of these elements in batch processes.

Therefore, a master-wafer is required. Typical methods for the generation of master-wafers, e. g. grayscale photolithography, electron-beam lithography, ultraprecision-micromachining or two-photon-lithography often permit the manufacturing of small-sized single masters only. The step-and-repeat replication process allows the transition from the single master to a wafer-master. Alternatively, micro-optical elements can be replicated directly on glass substrates with lithographically patterned diaphragms in order to produce prototypes or a small batch.

What we offer

- Manufacturing of master-wafers
- Direct replication of micro-optical components
- Characterization of optical microstructures by surface profilometry
- Consulting services
- Process development

Measurements

- substrate sizes:
 - 6-Inch
 - 8-Inch
- sag heights:
 - < 300 μm