

Beyond Conventional Lithography

Made in Germany – Europe



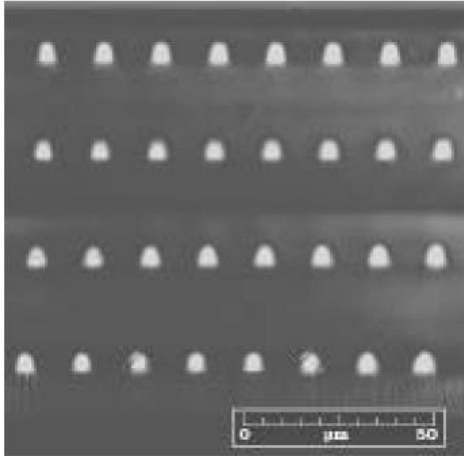
All-in-1 Solution for Transforming Design Ideas into Industrial Manufacturing
for 21st Century Applications

Conventional Lithography

Mask Aligner

UV-assisted Replication/NIL

Projection

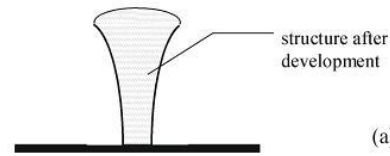
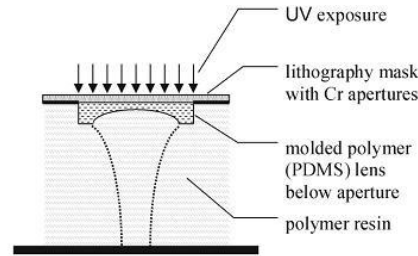


THALES
AIRBORNE SYSTEMS

Fraunhofer
ISC

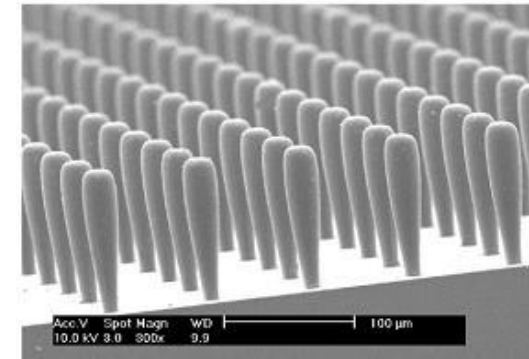
Fraunhofer
IOF

①



(a)

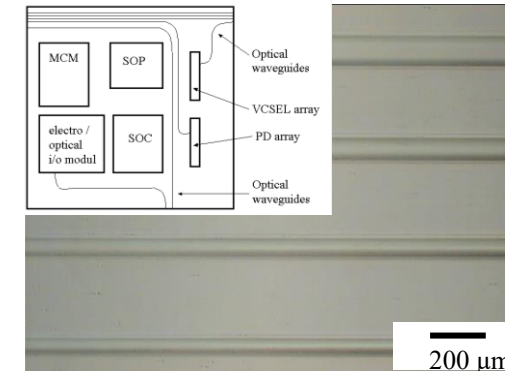
③



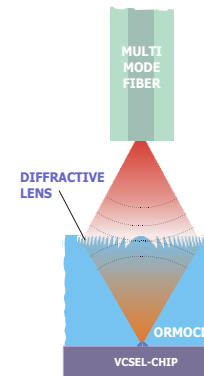
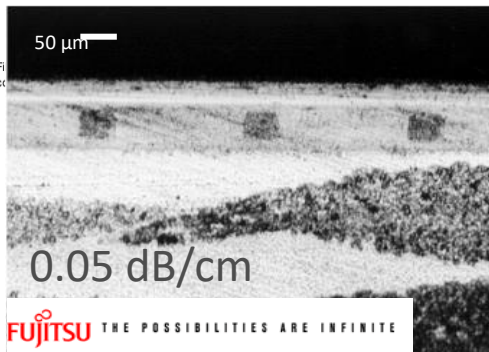
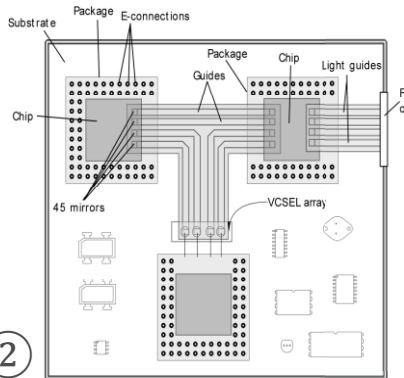
Loss variation < 0.05 dB (horizontally)
0.08 dB (vertically) direction in the stack

Fraunhofer
ISC

Fraunhofer
IOF



200 μm



csem
Swiss Center for Electronics and Microtechnology

micro resist
technology

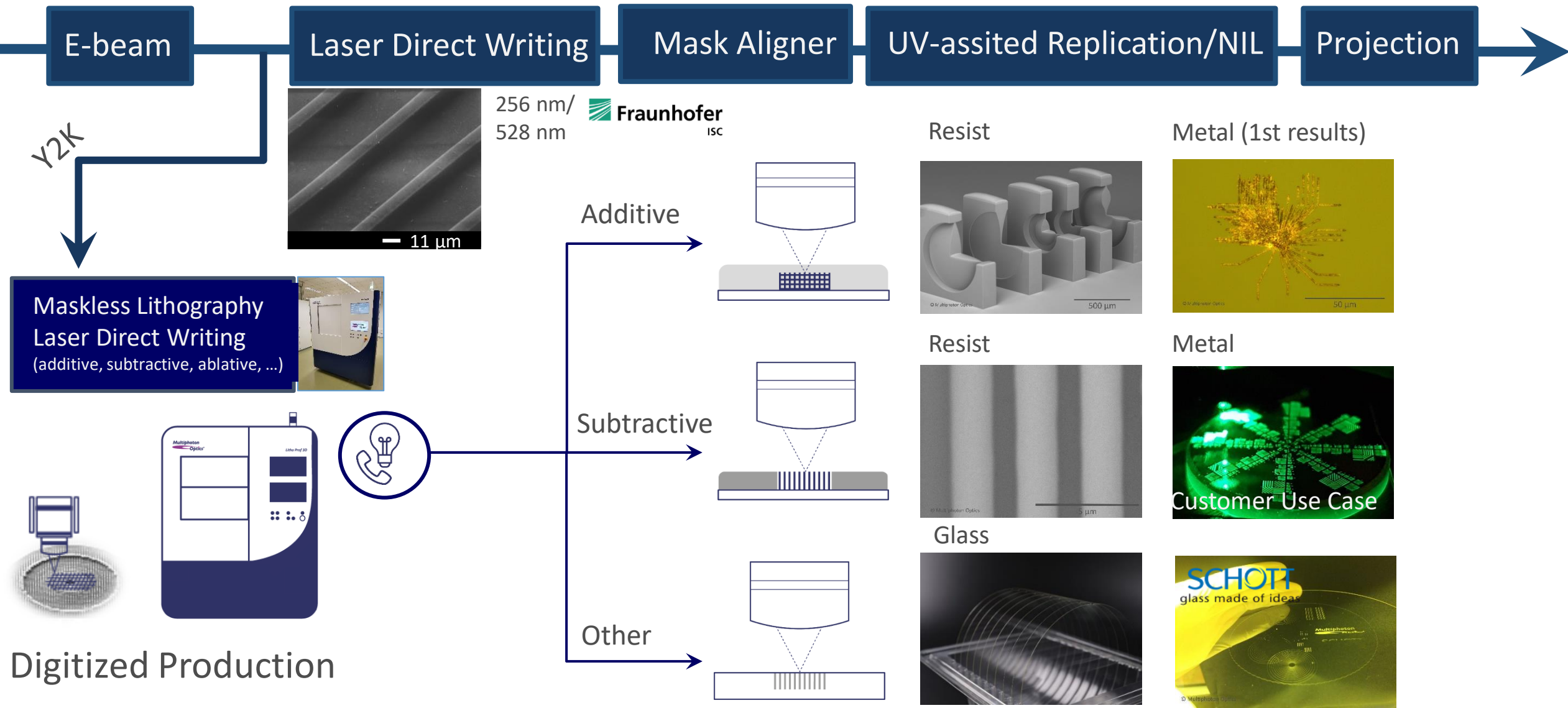
②



③

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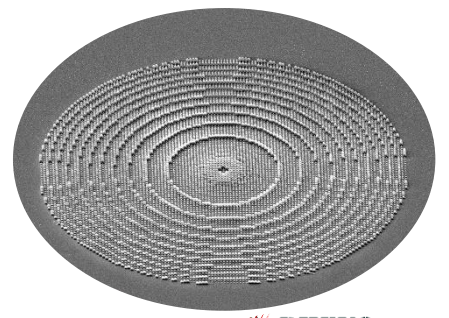
Beyond Conventional Lithography – Embedding 3D Litho



Beyond Conventional Litho – Special Features of 3D Litho

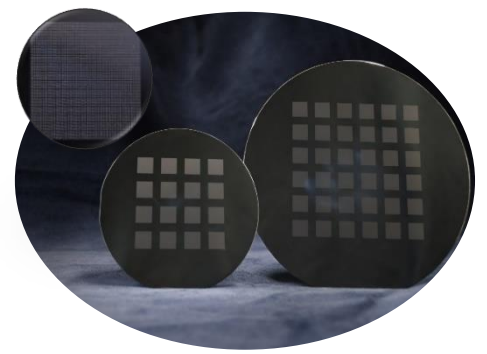


Ultraflat Optics



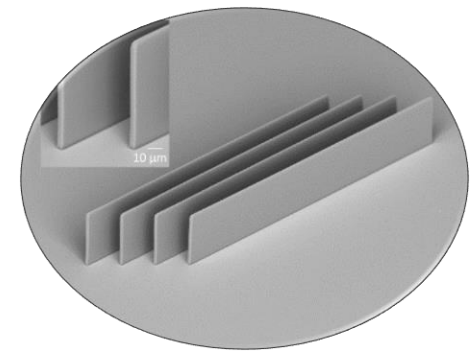
$D \approx 1.1 \mu\text{m}$ PHENOMENON

Wafer Level Optics



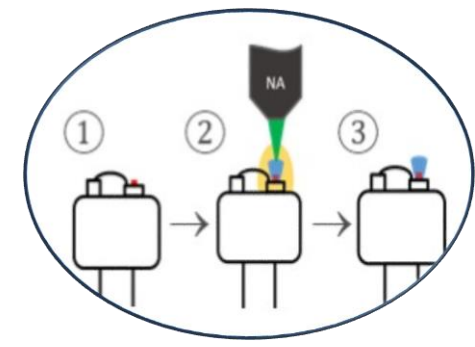
6" (ex.)

Extreme Aspect Ratio



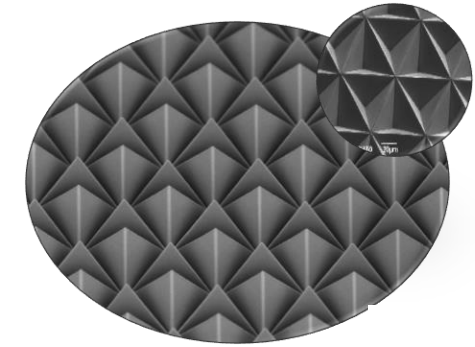
16:1 (ex.) ...43:1

Lean Processes



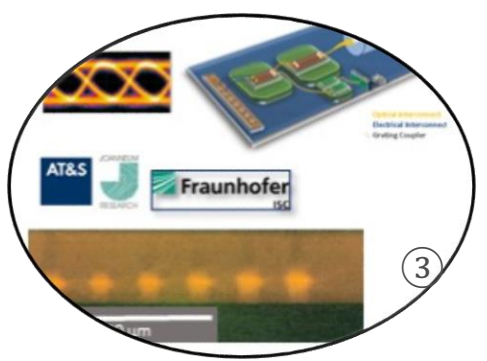
#3

Automation

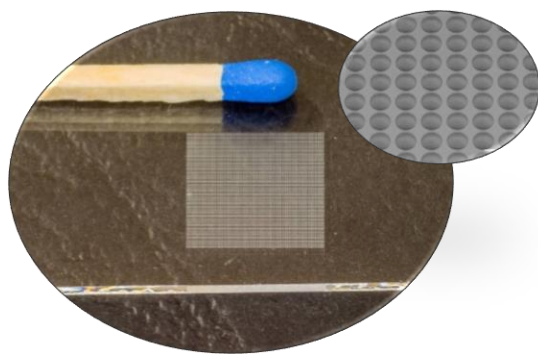


24/7

3D Optical Interconnects



High Throughput



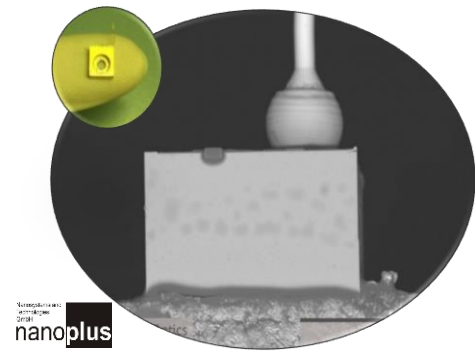
> 1 – 5 s/lens (ex.)

Upscale

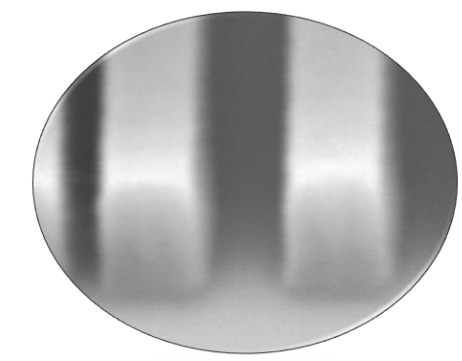


> 1 cm

Arbitrary Substrates



Resolution



≤ 250 nm