



# SUSS MicroOptics

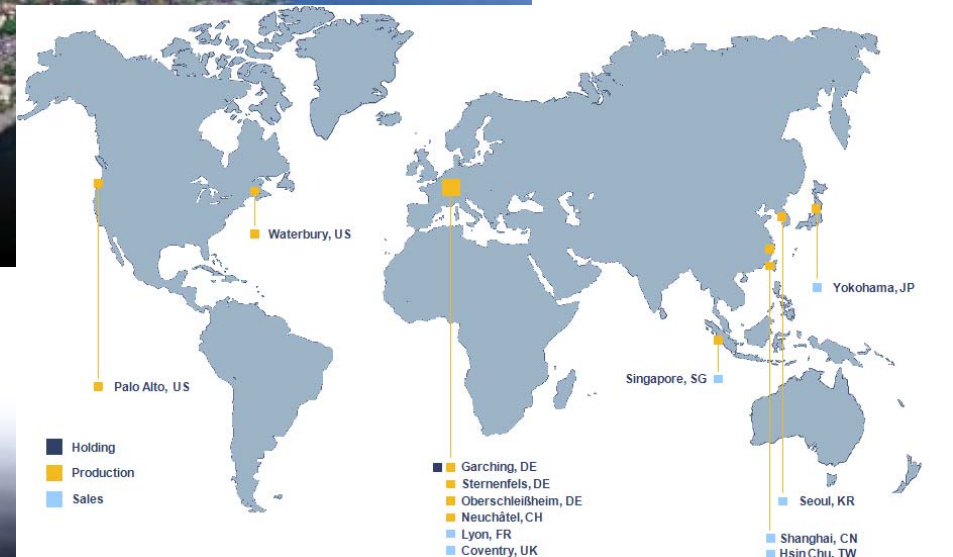
Our MicroOptics set the Standards

# SUSS MicroOptics – We Set The Standards

- + World leading supplier of high-quality Micro-Optics
- + More than 200 active customers
- + Part of the SUSS MicroTec Group ([www.suss.com](http://www.suss.com))

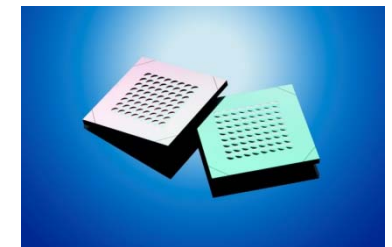
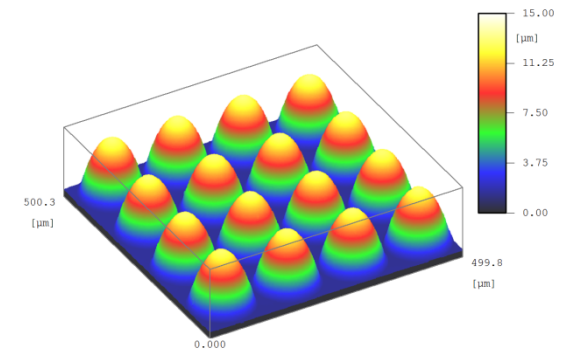
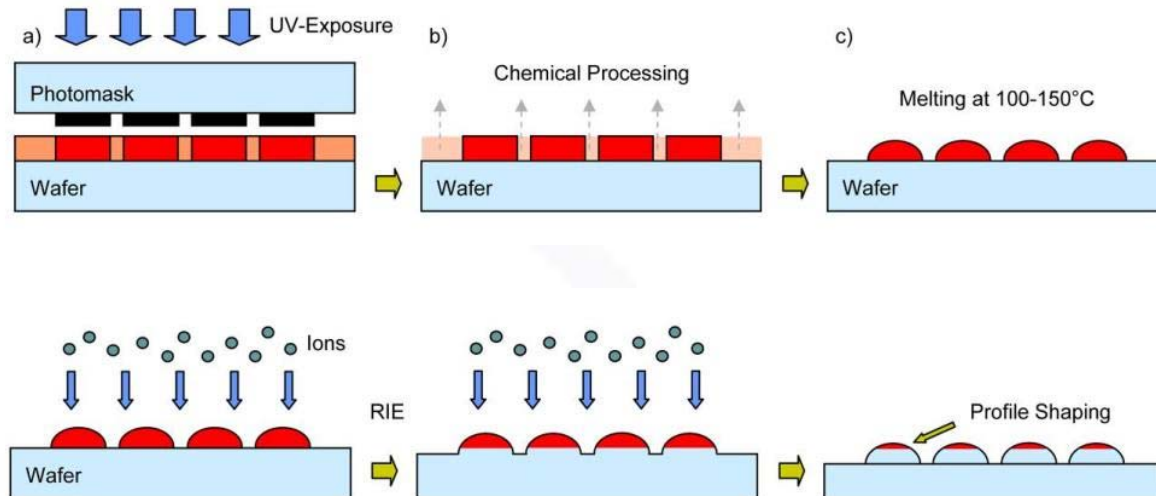


SUSS MicroOptics is “Preferred Supplier” for Carl Zeiss SMT DUV Laser Beam Shaping Solutions for ASML Litho Stepper



# Wafer-Based Manufacturing (ROE)

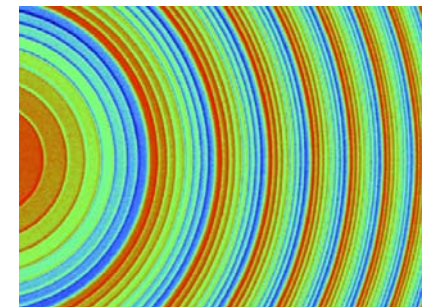
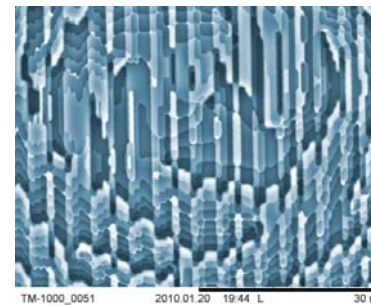
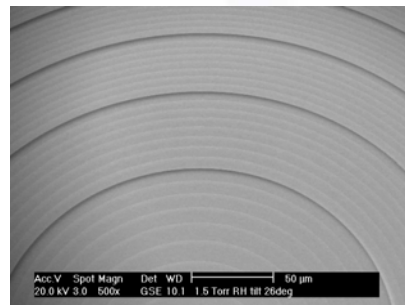
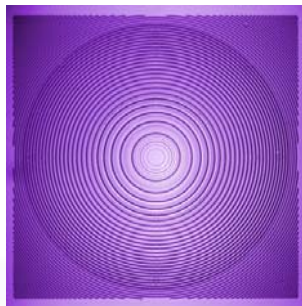
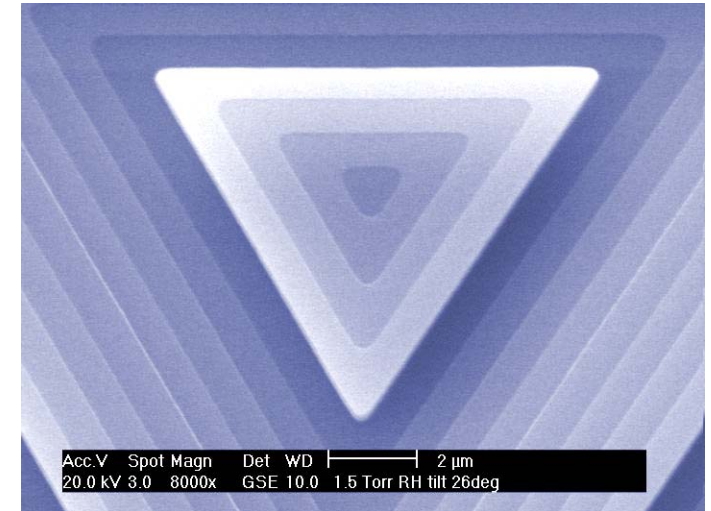
- + 8" Wafer technology: resist coating, lithography, reactive ion etching (RIE), deposition, sputtering and lift-off.



- + Excellence in quality, array uniformity, and lateral dimension accuracy

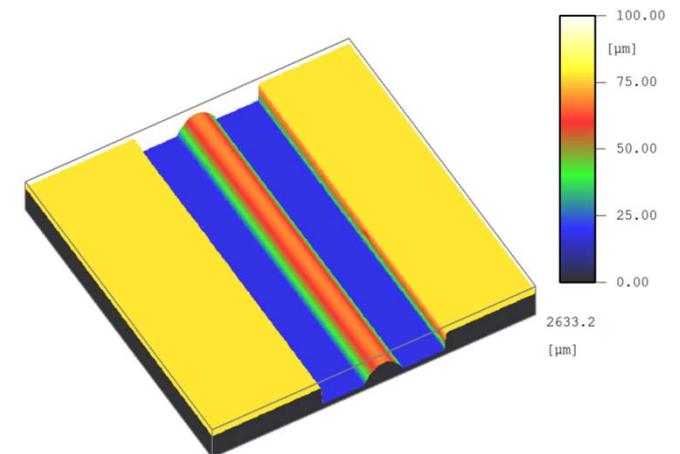
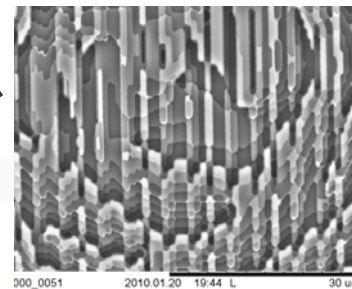
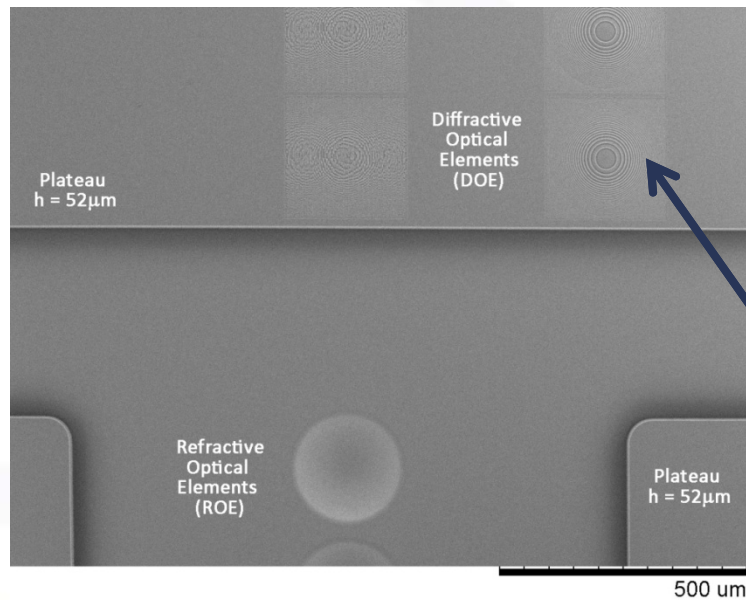
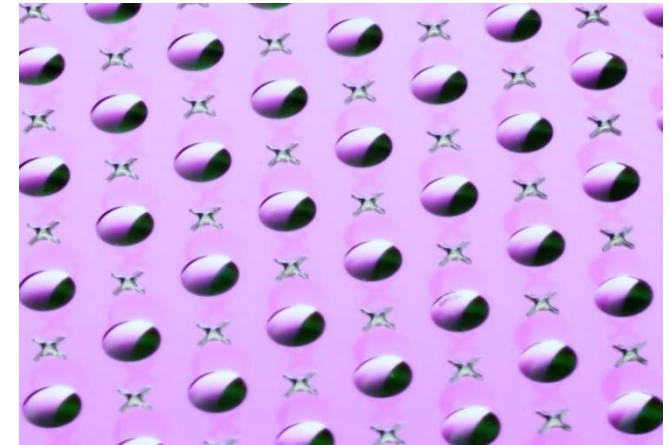
# High-Quality Diffractive Optical Elements (DOE)

- + 8" wafer scale
- + 190nm to 10 $\mu$ m wavelength range
- + 0.5  $\mu$ m min feature size
- + < 50nm overlay accuracy
- + Binary, 8-level, 16-level
- + Upto 98% diffraction efficiency



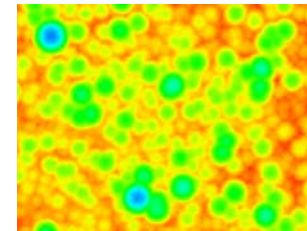
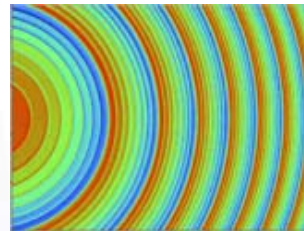
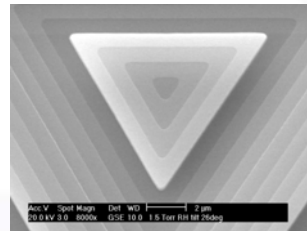
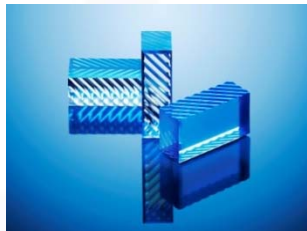
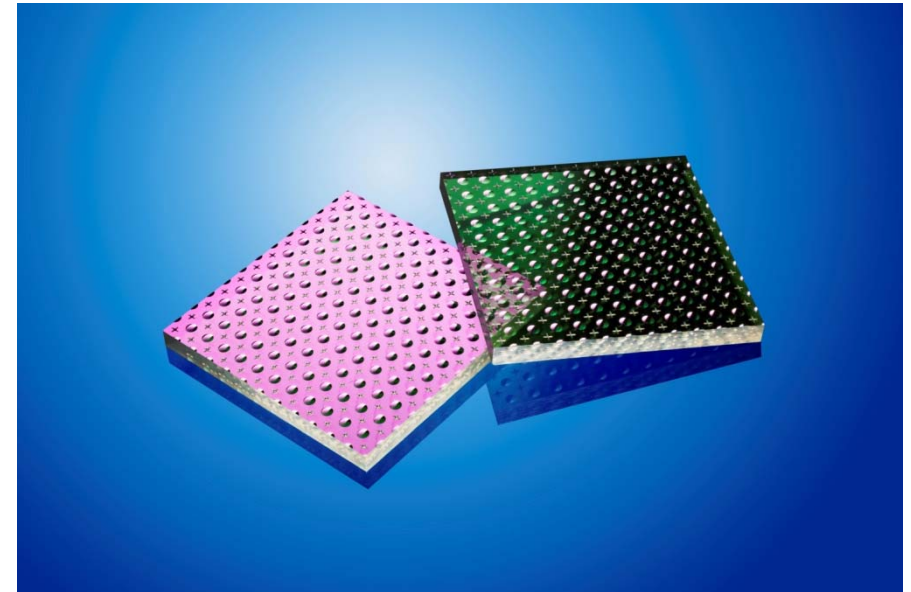
# Hybrid: ROE + DOE + Posts/Trenches + Alignment

- + Refractive Microlens Arrays
- + Diffractive Optical Elements (DOE)
- + Trenches, posts, grooves, holes
- + Full wafer-level integration on 8"



# Key-Enabling Technology

- + Semiconductor Technology
- + Industrial Optics & Vision
- + Healthcare & Life Science
- + Metrology
- + Laser & Material Processing
- + Optical Communication

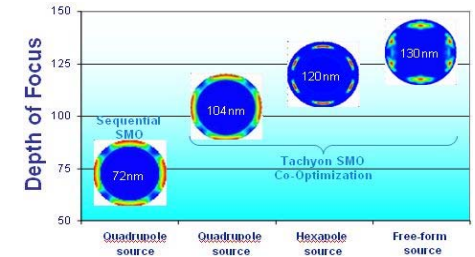


# Micro-Optics in Front-End Lithography



Customized Illumination  
Pupil Shaping (DOE)  
Now: FlexRay™  
programmable illumination  
technology from ASML

Excimer Laser (193nm)  
Laser Beam Shaping  
Laser Beam Homogenizing



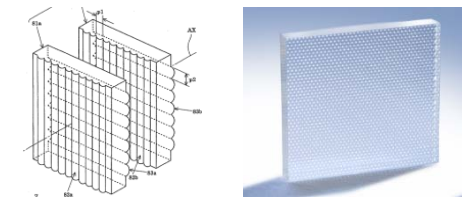
Customized Illumination



Diffractive Optical Elements (DOE)  
MEMS Mirror Arrays (FlexRay™)



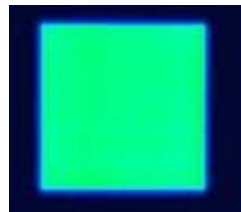
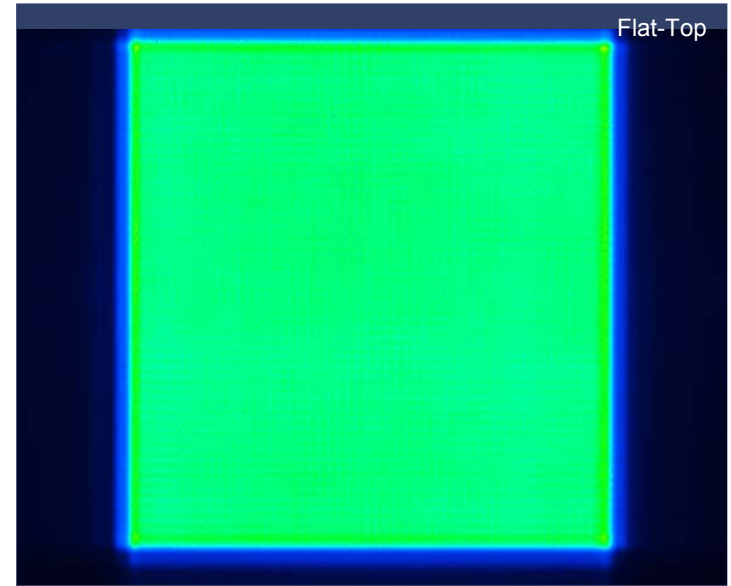
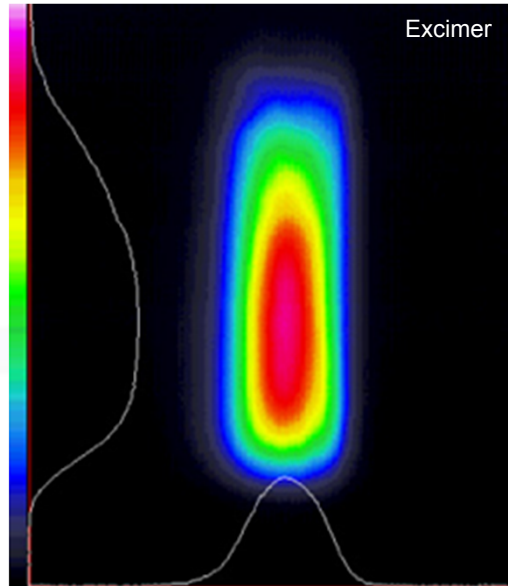
## Key Enabling Technology



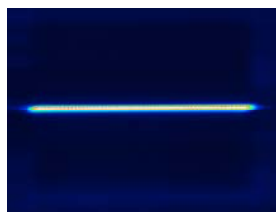
Microlens Köhler Homogenizer



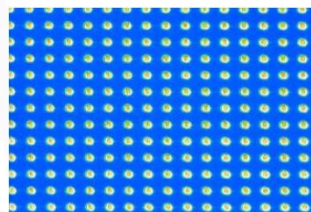
# Laser Beam Shaping



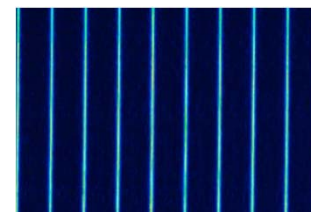
Flat-Top (2D)



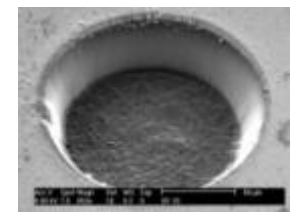
Flat-Top (1D)



Spot-Generator



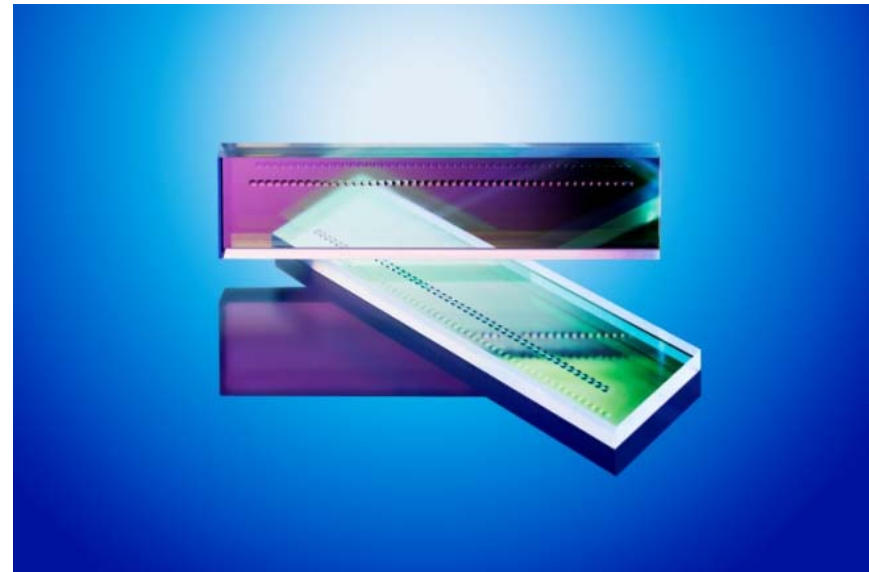
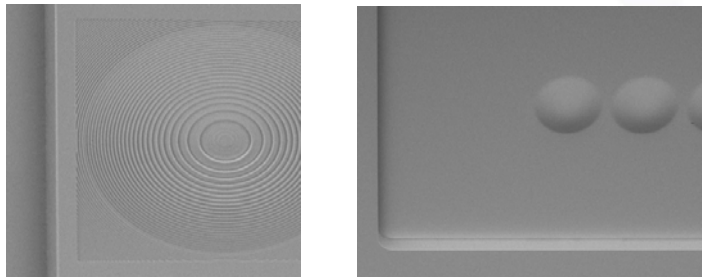
Line-Generator



Ablation

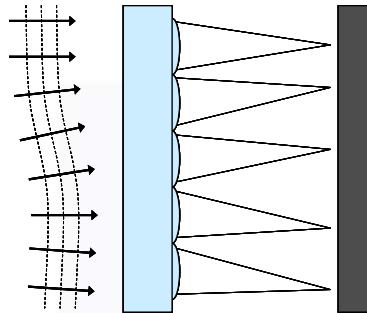
# Optical Communication

- + Leading supplier of micro-optical components for communication industry (ROADM, WSS, Transceiver...)
- + High-quality micro-optics for most competitive prices due to 8" wafer manufacturing

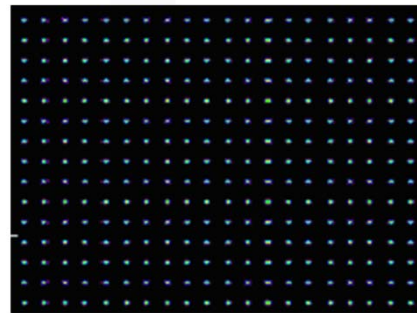


# Microlens Arrays for Shack-Hartmann Sensors

- + Shack Hartmann wavefront sensors divide an incident wavefront into a number of beamlets by 2D sub-apertures of a microlens array.
- + Each microlens provides a separate focus on the detector .
- + The position of each focus spot is displaced by local wavefront aberrations.



Shack Hartmann



Hartmann Pattern

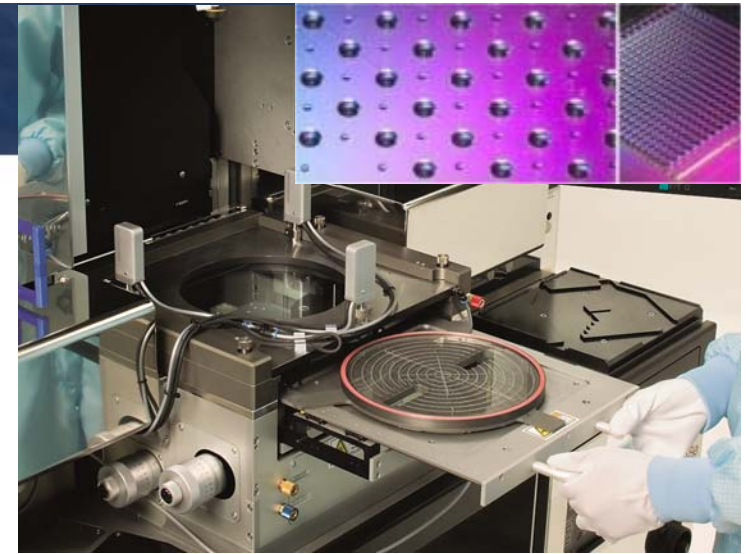


Artificial Star Above Paranal

ESO 07b\_06, Image by Sylvain Oberti, ESO.jpg

# Wafer-Level Camera (WLC)

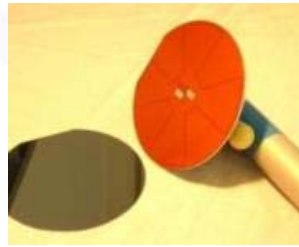
- + 100 $\mu$ m thin 8" lens wafer
- + Lens Imprint Litho (SMILE)
- + Wafer-Level Packaging (WLP)



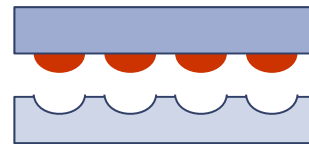
SUSS MicroTec Mask Aligner: MA/BA8 Gen3



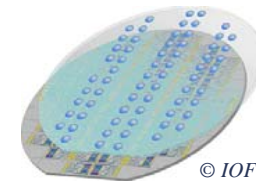
Lens Master



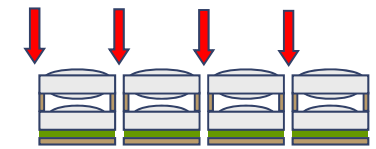
Thin Wafer Handling



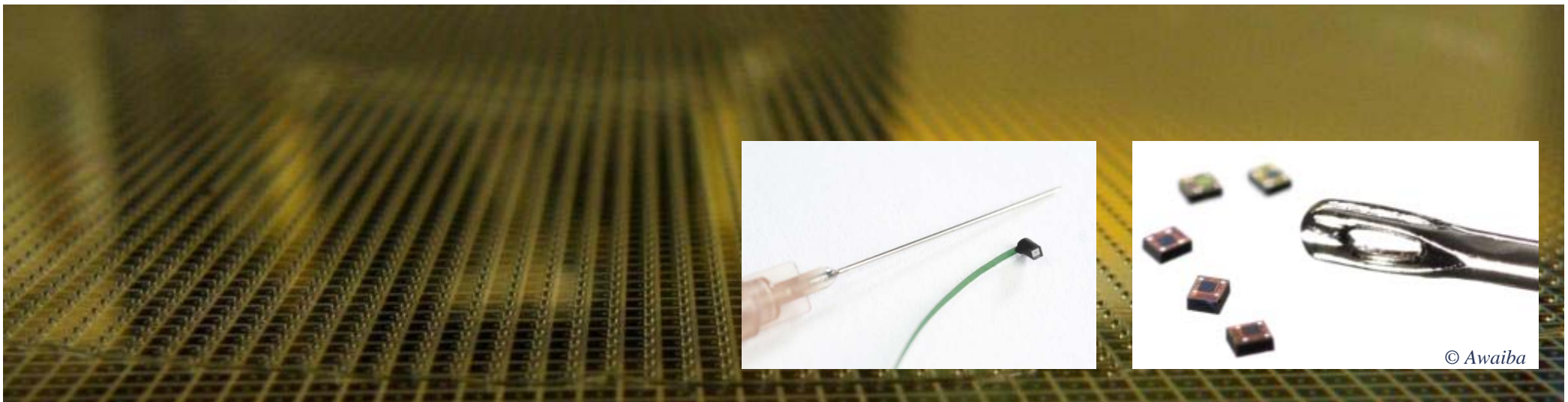
Imprint Lithography



Wafer-Level Packaging



Wafer Dicing



# High-Quality MicroOptics



# SUSS MicroOptics - Quality Management System

SUSS MicroOptics has implemented a quality system according to the standard norm ISO 9001:2000.

We will focus on four main topics:

**Working with Integrity:** We build trust and commitment through our daily actions. Interactions with our customers, our suppliers, and our co-workers occur within a code of moral and ethical conduct that is above reproach.

**Technology:** We stay on the leading edge of technology in the development, production, testing and application of our products. Our investment in technology will ensure quality and reliability of our Micro-Optics. We motivate and train our collaborators.

**Advocating for the Customer:** We value our customers and do whatever it takes to satisfy their needs. We ensure that customer interactions are enjoyable, efficient, and effective.

**Delivering Quality:** We strive to do the right thing the first time. If a problem does arise, we take immediate action to resolve it. The quality of our people, our products, and our services will ensure the long-term viability of our company.



# SUSS

## Our Solutions Set Standards

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