

CAPITAL MARKETS DAY 2020

INSIGHTS MICROOPTICS

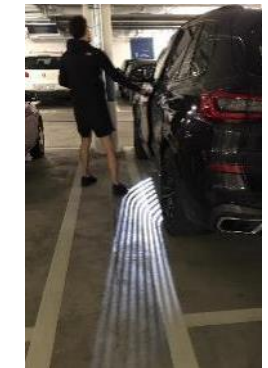
September 24th

Reinhard Völkel, CEO SUSS MicroOptics

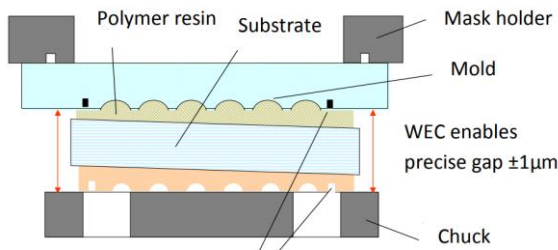


MICRO-OPTICS MARKET TREND

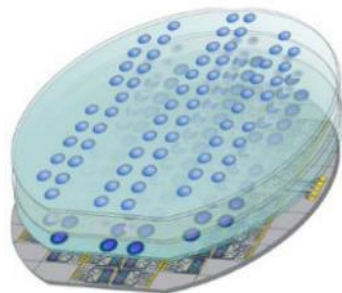
- + Micro-optics is a key technology for sensors, telecom, datacom, SEMI, life science and automotive lighting - **C1**
- + Wafer level optics (WLO) is based on imprint lithography and wafer level packaging (WLP) - **C2**
- + The global Photonics market is expected to growth by 5.9% (CAGR). A significantly higher growth rate is expected for wafer level optics (WLO) - **C3**
- + SUSS MicroOptics is in a leadership position through technological expertise and serial production of microlens arrays (MLA) for automotive lighting applications (IATF 16949 qualification) – **C4**



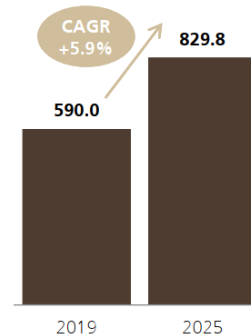
C1: Key markets for micro-optics



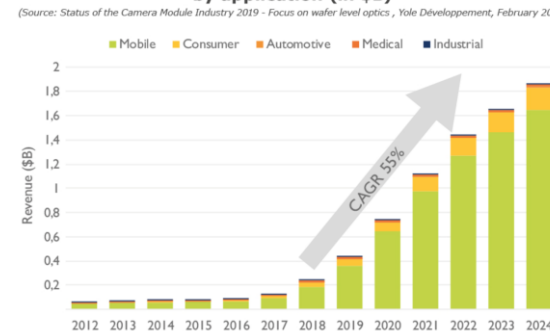
C2: Imprint lithography and wafer level optics (WLO)



Global photonics market growth (\$bn)



2012-2024 Wafer Level Optics revenue forecast by application (in \$B)



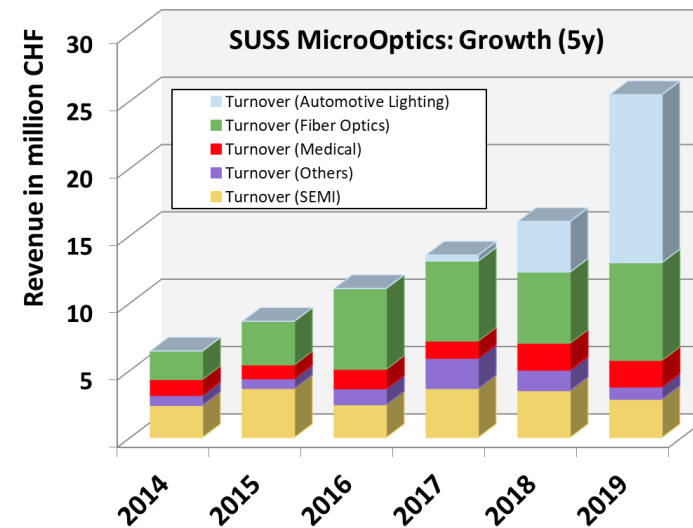
C3: Photonics industry and wafer level optics (WLO) are expected to grow significantly in the next years



C4: SUSS MicroOptics cleanroom fab

MICRO-OPTICS TECHNOLOGY TREND

- + SUSS MicroOptics started wafer level manufacturing in 1999 and experienced strong growth based on two main revenue streams:
 - FSMO: Niche markets for Micro-Optics in **F**iber, **S**emi, **M**edical, and **O**ptics market segments - **C1**
 - Automotive Lighting: Micro-Optics for head lamps, exterior and interior lighting in cars (imprint lithography) - **C1**
- + SUSS MicroTec started to develop equipment for microlens imprint lithography in 1997 - **C2**
- + SUSS MicroTec is in a leadership position through technological expertise and full product suite offering for micro- and nano-imprint lithography and wafer level packaging (WLP) - **C3**



C1: Business Development 2014 - 2019



C3: SUSS solutions for Micro- and Nano Imprint Lithography



C2: Wafer Level Optics (WLO) on SUSS MicroTec Mask Aligner in 1997

WAFER-LEVEL OPTICS FOR AUTOMOTIVE LIGHTING

- + SUSS MicroOptics obtained automotive qualification (IATF 16949) in July 2018 and started serial production with microlens imprint lithography for BMW welcome light carpet in August 2018.



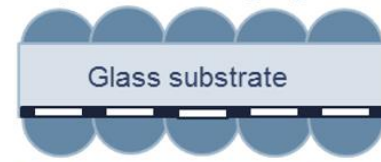
BMW Welcome Light Carpet



GM Buick Avenir



Replicated Imaging lens

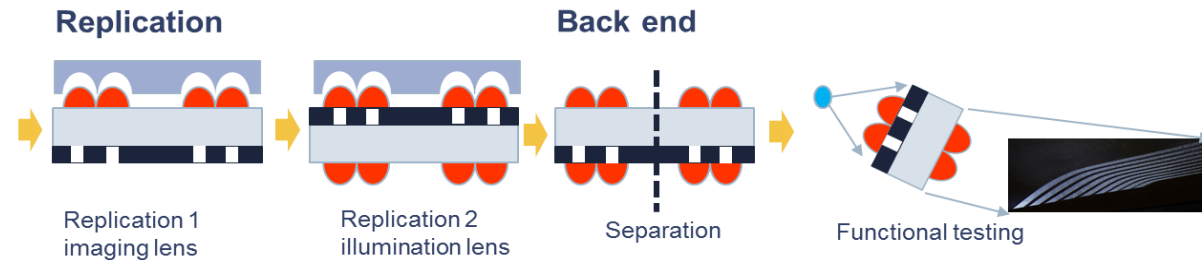


Replicated Illumination (condenser) lens

Microlens Array (MLA)



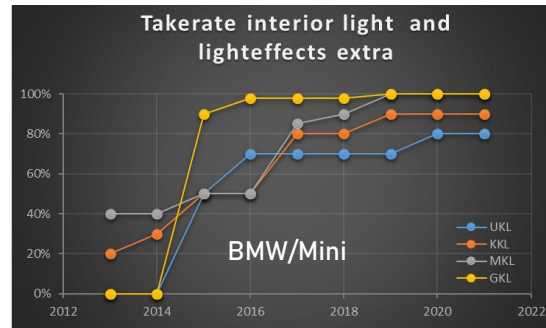
Microlens Array (MLA)



MARKET OVERVIEW AND KEY GROWTH DRIVERS

Micro-Optics for Automotive Lighting

- + Exterior/ambient lights
- + Interior lights – C1
- + Head lights – C2
- + Back lights



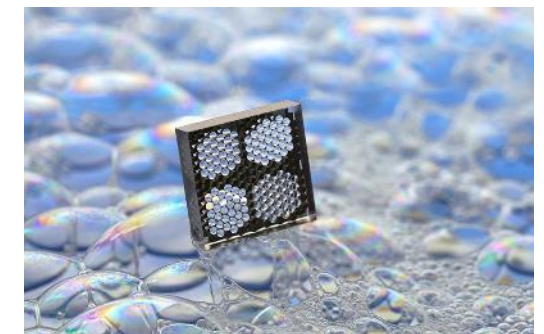
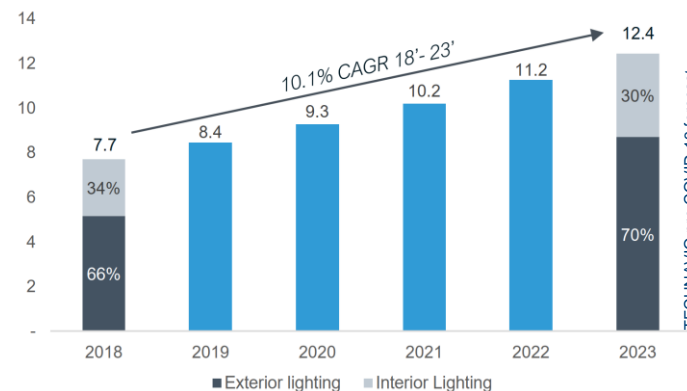
C1: Strong growth for Interior Lighting



C2: Lucid – Intelligent Micro Array

Automotive Lighting Key Market Drivers

- + Design flexibility
 - Size, weight and color saturation
- + Higher efficiency
 - Lower energy consumption (EV)
- + Visible innovation and uniqueness
 - Premium cars, individualization
- + Cost reduction



PRODUCT PORTFOLIO FOR IMPRINT LITHOGRAPHY





+ SÜSS MicroOptics Core Competence:

- 20+ years experience in production of micro-optics on 8" wafers
- > 180 customers worldwide
- Preferred supplier for major companies like, Carl Zeiss SMT, Intel, Finisar, Lumentum, ... in high-quality niche markets
- Leadership position in design and technology, excellence in production and testing (ISO 9001, IATF 16949)
- Serial production for microlens arrays (MLA) used in cars.

- *Competitor A:*
 - + Global leader in micro-optics and high-performance optical packaging
 - + Wafer level optics (WLO) for sensors in smart phones
 - + Manufacturing in Asia

- *Competitor B:*
 - + Europe based with Chinese mother company
 - + Cleanroom production Europe and China

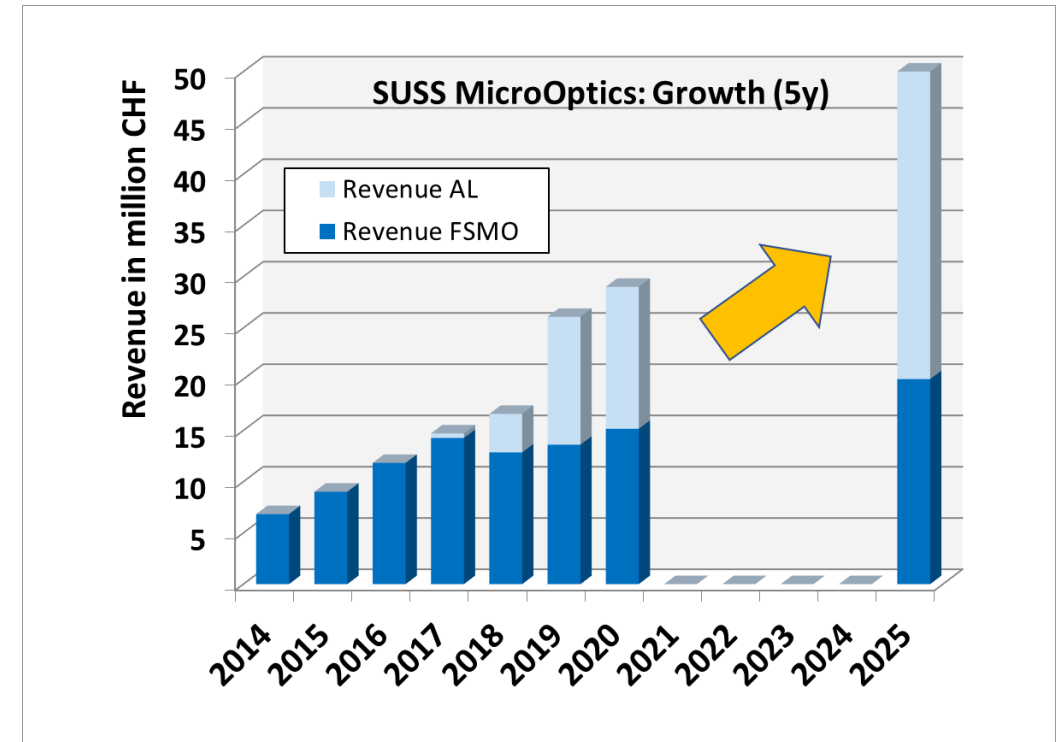
STRATEGY AND GROWTH EXPECTATION

Business

- + Growth in micro-optics for automotive lighting
- + Sustain market position in telecom and datacom
- + New cleanroom fab in operation in 2021

Technology

- + Qualification of micro-optics for next generation automotive lighting
 - Head lamps for electric vehicles and high-end cars
 - Personalized light carpets
 - Miniaturized projectors for interior lighting
- + Support SUSS MicroTec in the development of Imprint 2.0, the next generation imprint lithography tool platform.



A close-up photograph of a hand holding a black marker, writing the words "Thank you!" in a cursive script on a white surface. The hand is positioned on the right side of the frame, and the marker is angled towards the text. The background is plain white.