

CAPITAL MARKETS DAY 2020

INSIGHTS EXPOSURE

September 24th, 2020

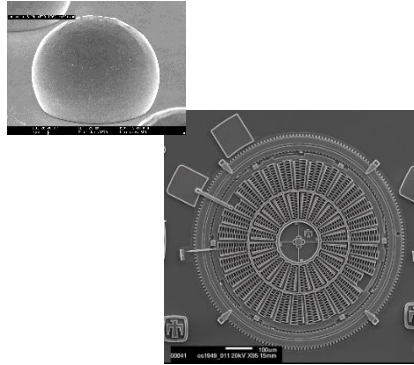
Dr. Markus Arendt, Business Unit Manager Lithography



SUSS EXPOSURE TECHNOLOGIES

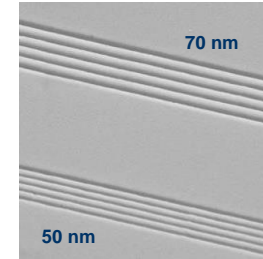
Proximity Exposure

Lithographic Wafer & Substrate Structuring
Micro-bumping, Flip Chip, Wafer-Level-Packaging
MEMS, RF, Power Devices, Photonics, LED

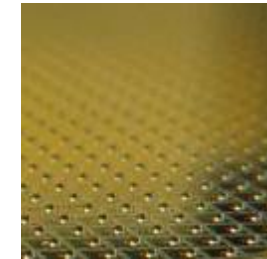


Nano- and Micro-Imprinting

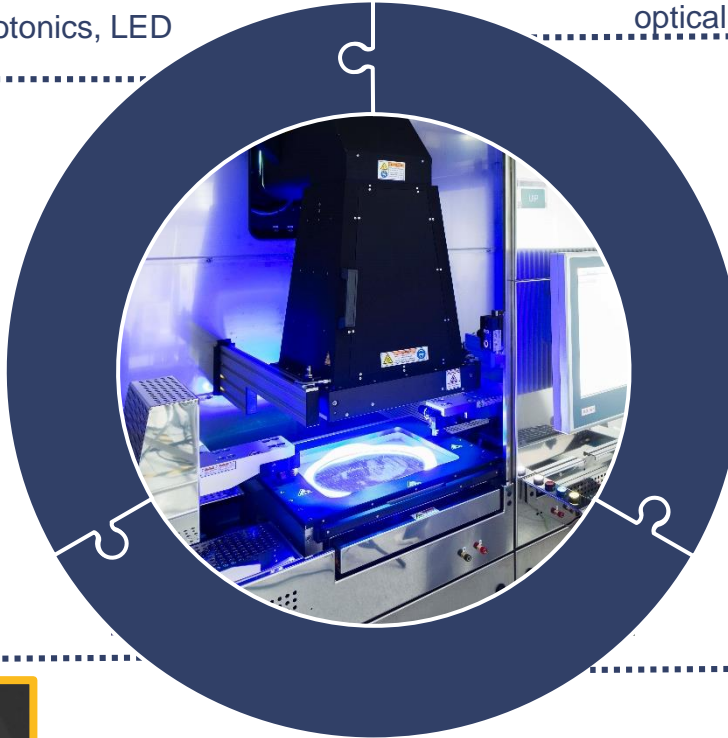
Nano- & Micro-Structuring
WLO, Photonics, ID recognition, AR (DOE,
optical gratings), medical, surface patterning



Highest resolution patterning for Research

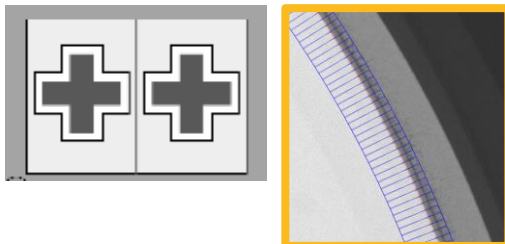


Wafer level lenses on glass substrate



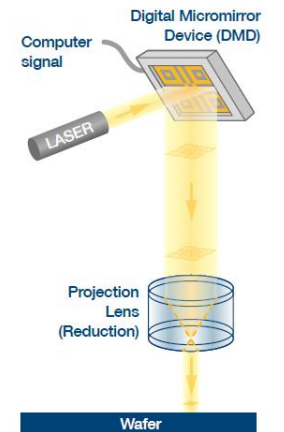
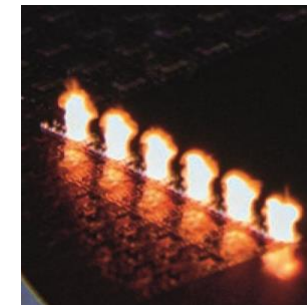
Metrology

Image Processing
Smart Manufacturing Solutions



Direct Write Projection

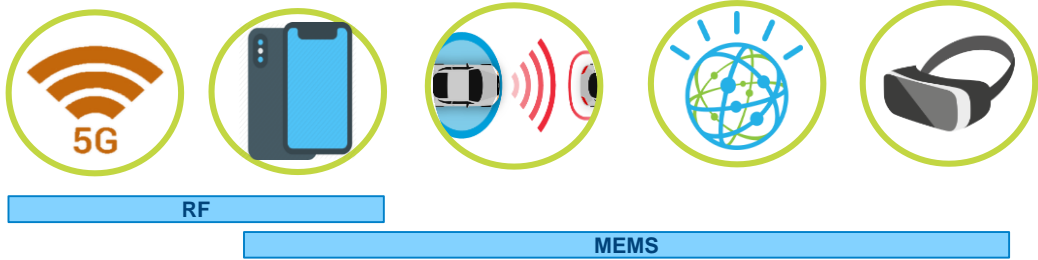
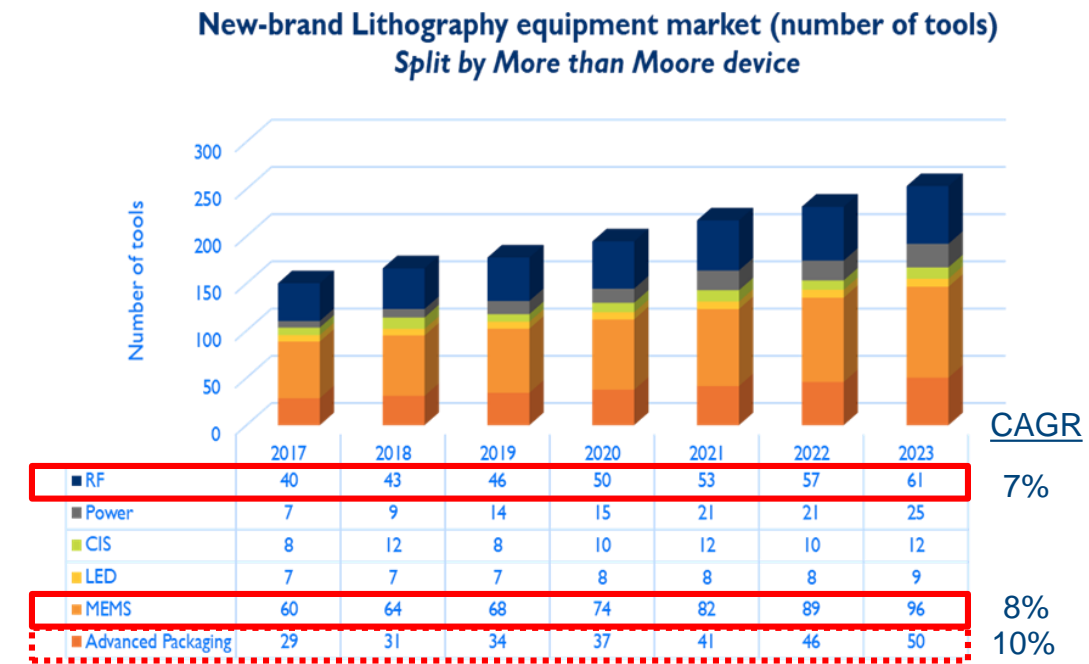
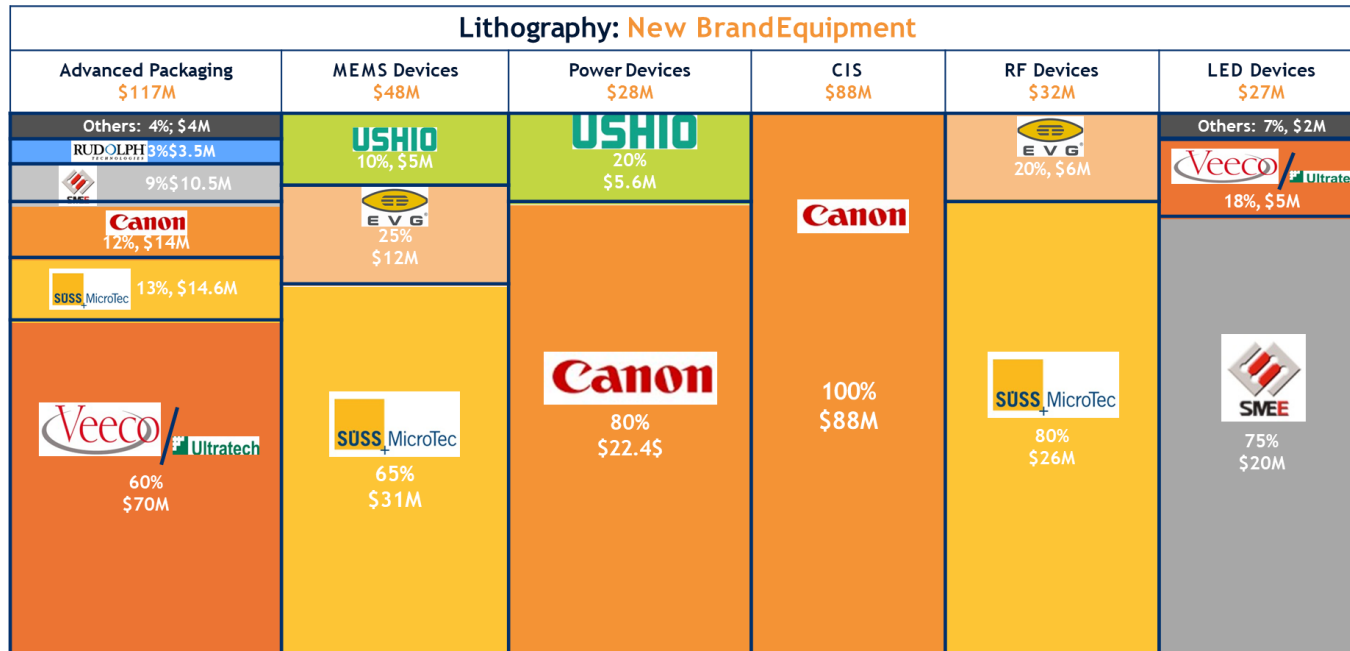
Individual Die Processing
Highly flexible patterning



MORE THAN MOORE MARKET AND TECHNOLOGY TRENDS

– APPLICATION DRIVERS FOR SUSS EXPOSURE TECHNOLOGIES

- + Demand for “More than Moore” equipment is expected at CAGR of 7%-10% by Yole Développement
- + SUSS Exposure solutions have a dominant share for MEMS and RF devices
- + Target to expand share in Advanced Packaging with Direct Write Projection



Source: Yole (2018, 2019)

TARGET APPLICATIONS FOR MICRO-IMPRINT

confidential

Micro – Imprint

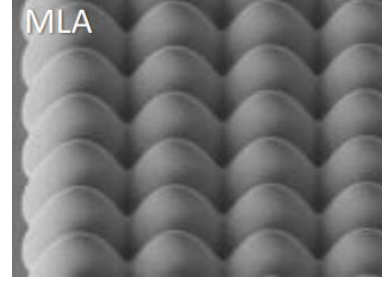
UV - stacking



Light carpets



Camera modules



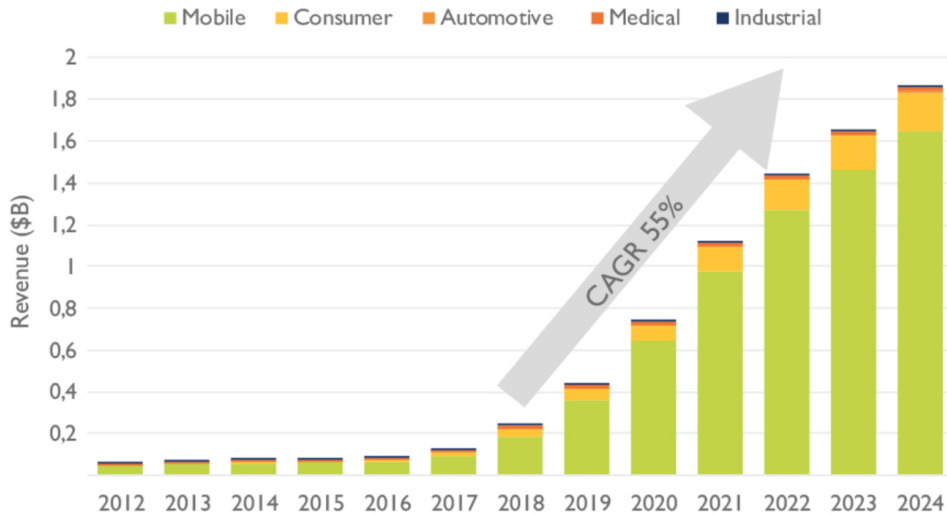
Fingerprint sensors



Face ID optics
Time of Flight sensors

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

(Source: Status of the Camera Module Industry 2019 - Focus on wafer level optics, Yole Développement, February 2019)



CAMERA MODULE - VOLUME FORECAST 2015 - 2025

Average number of cameras per end-product (in units/unit)

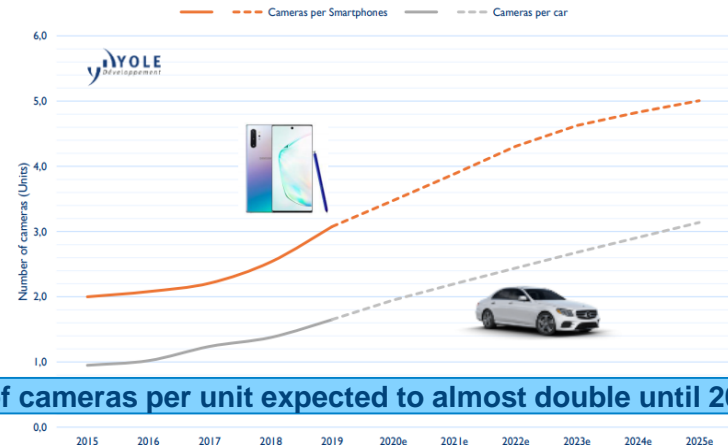
The average cameras per smartphone is higher than car by 2025

There are roughly ~1,300M smartphones produced each year, and ~80M light vehicles

The main factor governing the number of cameras produced worldwide is the average number of cameras per end-product - mainly in smartphones and light vehicles

In 2025, it is expected that mobile markets will have an average number of « cameras per end-product » around 5.0, while automotive will go beyond 3.0

2015-2025 average number of cameras per end-product (in units/unit)

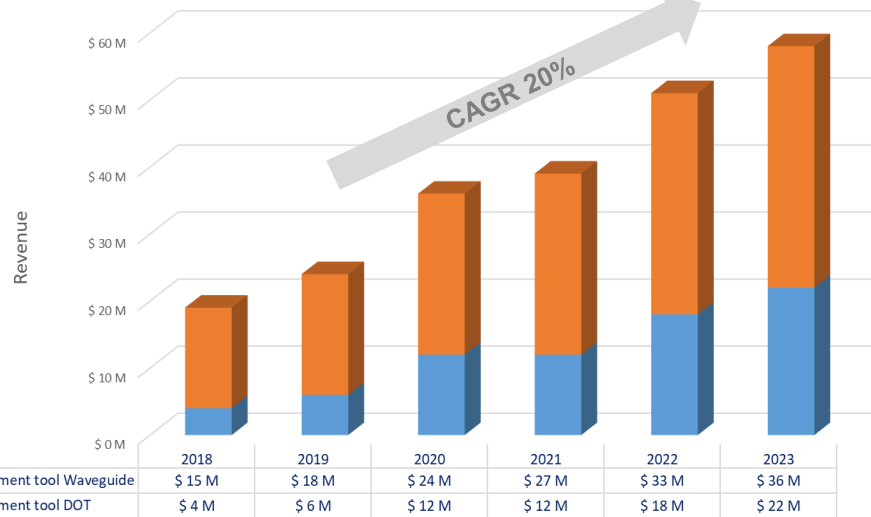


of cameras per unit expected to almost double until 2025

Source: Yole (2020)

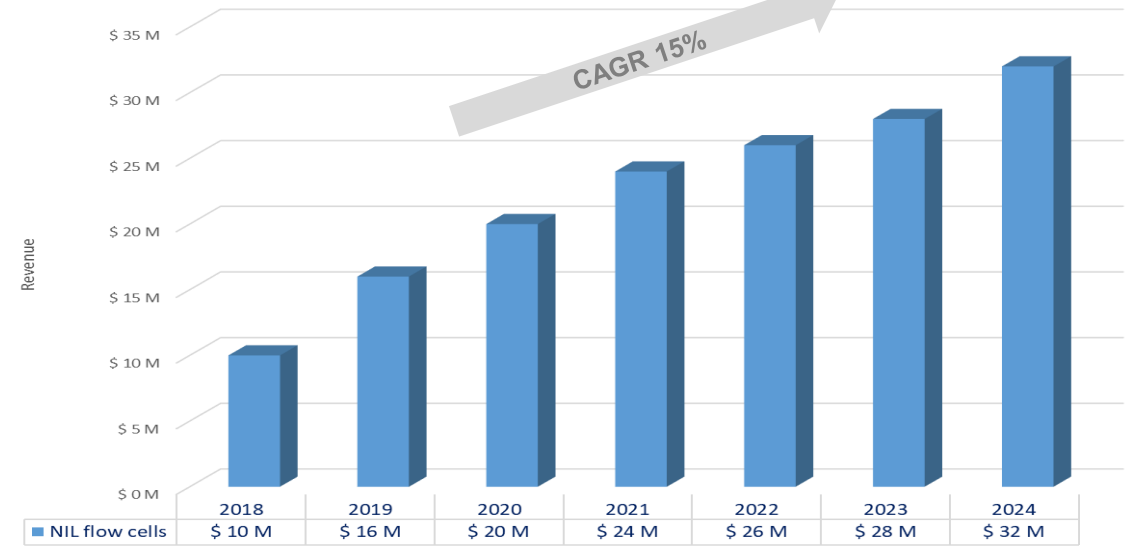
TARGET APPLICATIONS FOR NANO-IMPRINT

NIL for Photonics



Source: Yole (2019)

NIL Life Science



Nano – Imprint



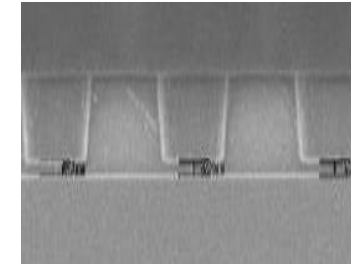
Telecommunication
Optical nano-gratings



Virtual reality visors
Optical gratings

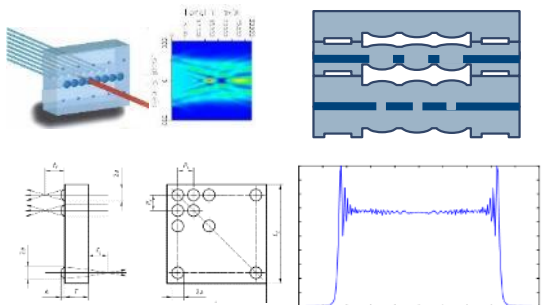


Augmented Reality
Diffractive optical elements

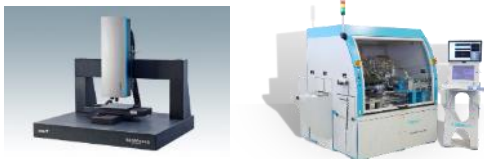


Life science
DNA sequencing, organ-on-chip

IMPRINT EXCELLENCE CENTER FULL SERVICE @ SUSS MICROOPTICS SITE



Optical Design, System Design,
Micro-Optics Simulation



Fully equipped metrology lab for inspection
and sorting of micro-optical components.
(ISO 9001, IATF 16949, Six Sigma)



Optical
Design

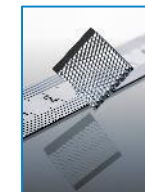
Process
Qualification

Transfer to HVM

Prototyping
Pilot Production



Full access to peripheral tooling
(Master and stamp fabrication,
etching, dicing)



From feasibility studies for micro- and
nanoimprint up to small volume production
Full production environment using the expertise
of SUSS MicroOptics volume fabrication
Start-Up service for SUSS customers

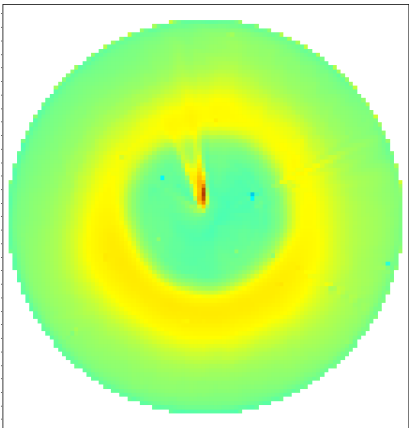
SUSS METROLOGY: ENABLER FOR PRODUCTION TOOLS

Enhance product portfolio with Smart Manufacturing Solutions – Secure the High Wafer Value



- Automation:**
- Adjust Recipe
 - Repeat process
 - Alert host

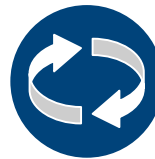
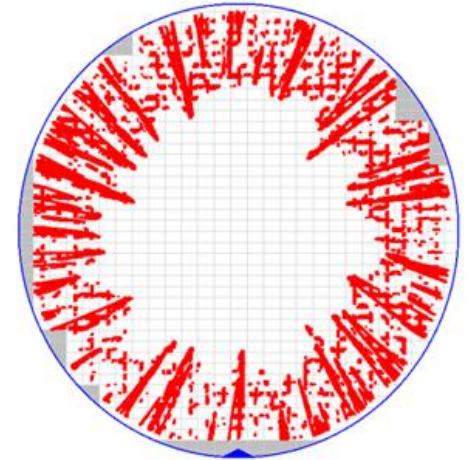
Feedback Loop



Thickness Measurement

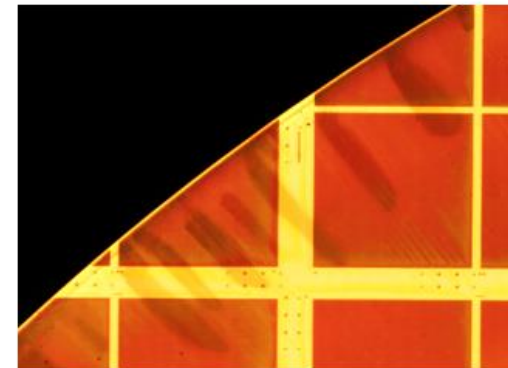


Defect Inspection

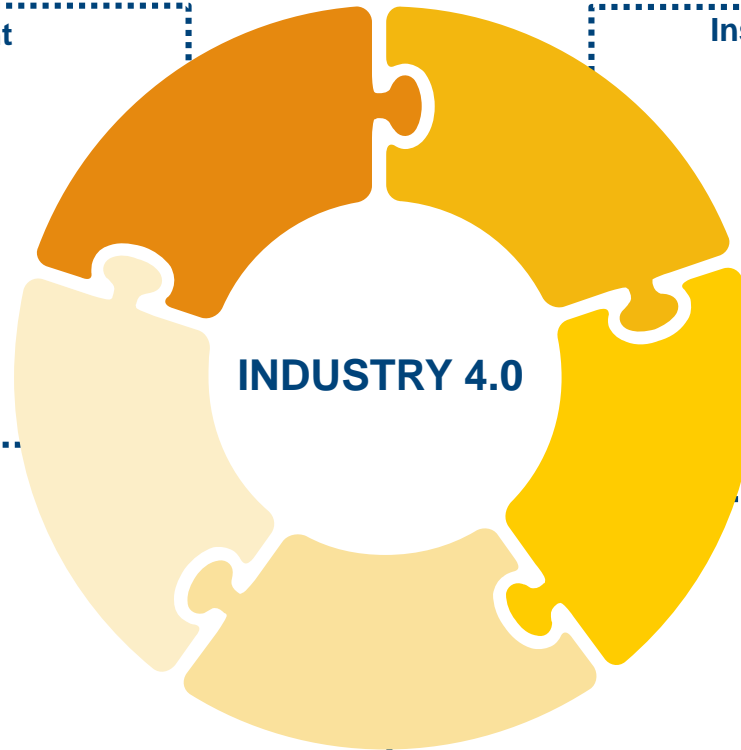


Closed Loop

Exposure Quality



Traceability



PRODUCT PORTFOLIO

SUSS Exposure Systems



Semi-Automated Aligners

Automated Aligners

Imprint

Metrology



MABA Gen4
MABA Gen4 Pro
MABA Gen5



MA12



MA150



MA200



MA300



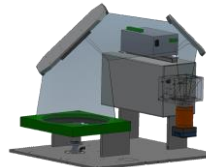
XLC200
(coming soon)



DSM200



TM200



DI200

Comment / USP

Large install base, very versatile

Only offer in the market. Used for special More-than-Moore

Very high throughput, Linear transport, For cost-sensitive applications

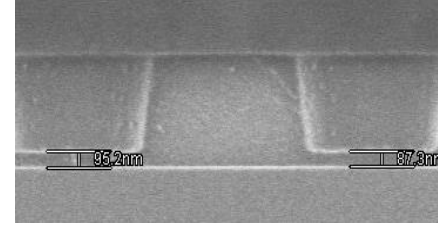
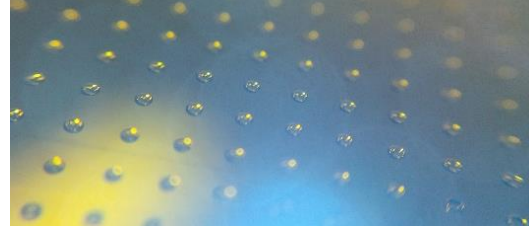
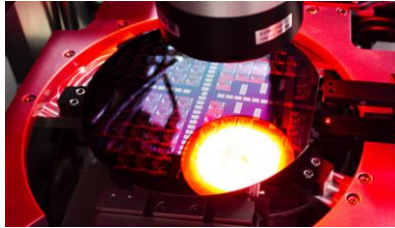
Flagship product. Large install base, very versatile Overlay < 1um

Only offer in market. Used for Advanced Packaging with less challenging requirements

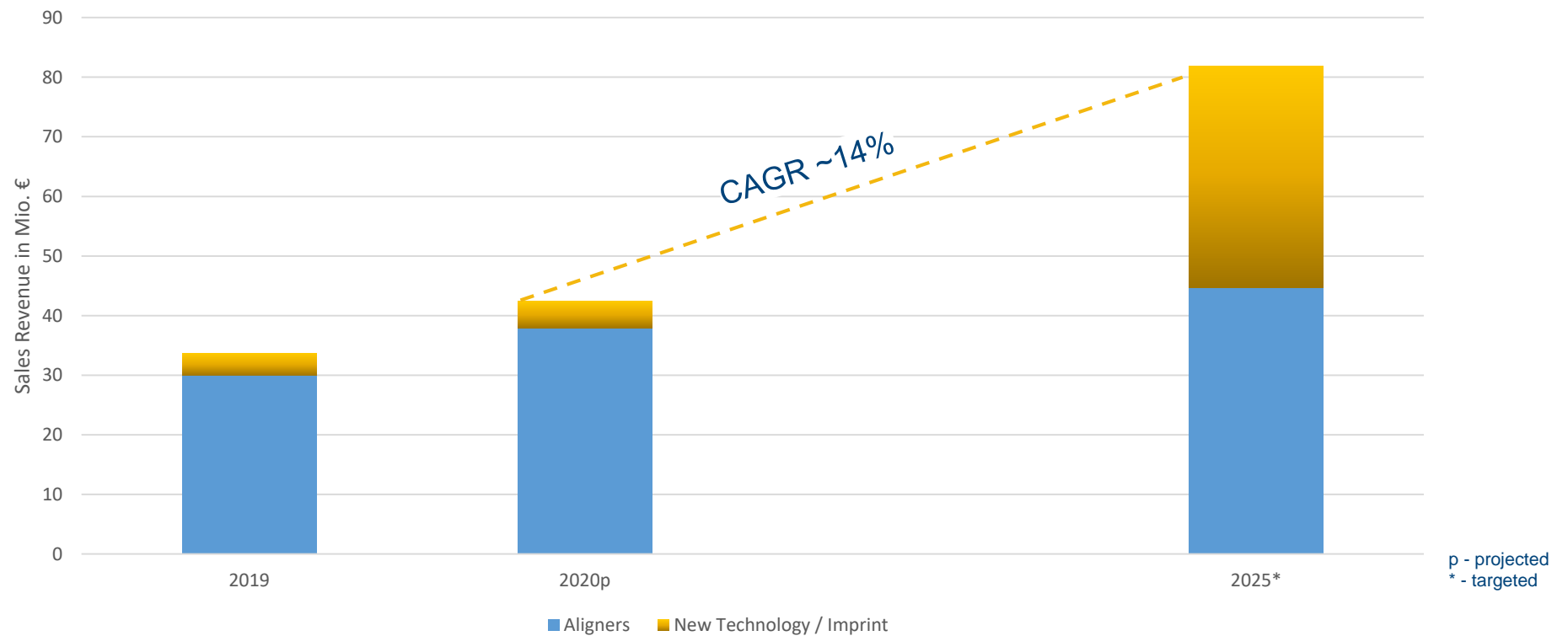
Development targeted for HVM applications in both markets, micro-imprint and nano-imprint. Strong process focus together with SMO

DSM is dedicated offering for back-side alignment processes. Modules integrated in SUSS systems for smart manufacturing control

SUMMARY GROWTH POTENTIAL – ON TRACK WITH SUSS STRATEGY 2025 PROJECTION



Forecast Sales Revenue Exposure €M - most likely scenario



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 in the process of finishing the exclamation point. The background is plain white.