SUPURIOR

TAILORMADE POLYMERS FOR SEMICONDUCTOR PROCESSING

BACKGROUND

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✓ IN 2017 FRAUNHOFER INSTITUTE LBF DEVELOPEDOWNPROPRIETARYPOLYMERIZATION AND POLYMER WORK UP METHOD TO PRODUCE

TAILORMADE COPOLYMERS/BLOCK COPOLYMERS WITH

A BROADVARIETYOFMONOMERS (UP TO **5 MONOMERS** DEMONSTRATED)

LOW PDI (1.1-1.4 DEPENDING ON Mw)

LOW OLIGOMER CONTENT

✓ COMMERCIAL SUCCESS WAS ACHIEVED WITH PRODUCTION BY A KOREAN INDUSTRY PARTNER

END USE : BUMPER LAYER RESIST
AMOUNT: SEVERALTONS PER YEA

BACKGROUND

✓ IN 2021 SUPURIOR STARTUP JOINED **FRAUNHOFER AHEAD START-UP ACCELARATOR** TO LAY THE FOUNDATION OF A **SPECIALTY POLYMER COMPANY** UTILIZING FRAUNHOFER IP FOCUSING ON THE **SEMICONDUCTOR RESIST MARKET,** IN 2022 SUPURIOR WAS REWARDED FUNDING OF 2ND PHASE
DEVELOPED FIRST LEGACY PRODUCT WITH FIRST CUSTOMER

✓ 2024 FOUNDATION OF SUPURIOR GmbH IN DARMSTADT, GERMANY
FIRST COMMERCIAL PRODUCTION BY GERMAN CDMO PRODUCER
FURTHER DEVELOPMENT OF POLZMERS BY FRAUNHOFER LBF LAB

✓ 2025 SET UP OF OWN LAB, COMMERCIAL SALES

OUR JOURNEY

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2017

Fraunhofer LBF develops a proprietary polymerization and work up technology to combine a variety of monomers with low PDI and low oligomer content

2018

Commercialization in Korea in Bumper layer resist

2021

SUPURIOR start-up project as part of Fraunhofer AHEAD accelerator, Phase I 50 kEUR support granted

2023

Qualification for AHEAD Phase II, 100 kEUR support granted

2024

Formation of SUPURIOR GmbH Limited company

PURPOSE STATEMENT

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DEVELOPS, PRODUCES AND SELLS

TAILORMADE POLYMERS

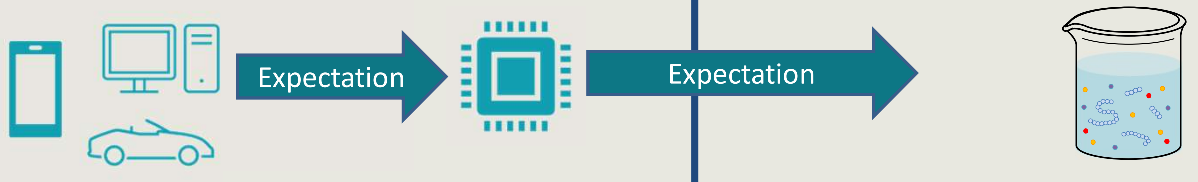
WITH A FOCUS ON

SEMICONDUCTOR INDUSTRY

BY UTILIZING

PROPRIETARY POLYMERIZATION TECHNOLOGY

MARKET SITUATION



Innovation/Design/ Market

IC producer

Photoresist Manufacturer

- New products and new designs (e.g. faster, smaller devices, foldable cell phones, AI …)
- Advanced production technologies (e.g EUV, E-beam, 3D Packaging)
- new communication technology, higher switch rate, frequencies

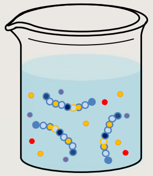
→ **Continuous adaption of photoresist**

- Only off-the-shelf polymers available
- Variance in quality
- Unfavorable polymer properties
  - ➔Phase separation during formulation
  - ➔Incompatibility causes resist separation, short shelf life
  - ➔Processability/viscosity issues of the resist
- No adaptability to customer needs

Market expectations can not be fully met
fast and individual solutions are missing

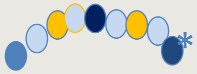
SUPURIOR’S OFFER

Your company



Fast and individual,
tailor-made
cost-effective solutions
for emerging technologies

Sample development



Commercial supply

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Own lab in Germany

Process development,
upscaling

Raw material qualification,
manufacturing and supply
logistic

Contract manufacturers
in Germany, East Asia

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TECHNOLOGY

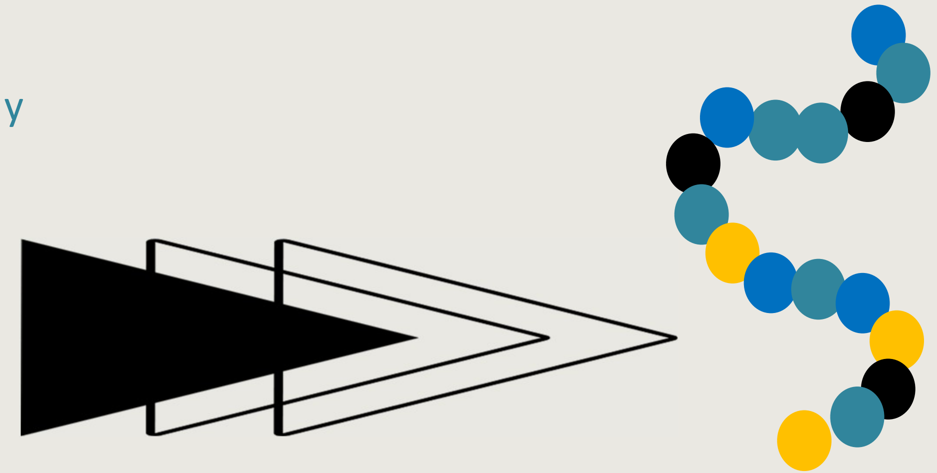
Combining properties……

Monomer A – Polarity, solubility

Monomer B – Reactivity

Monomer C – Adhesion

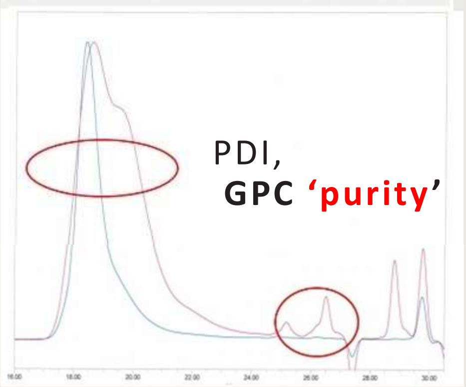
Monomer C – Chemical resistance



Polymerization **Work-up**

Patented Technology by German
Fraunhofer Institute LBF
Darmstadt

in a unique resin:



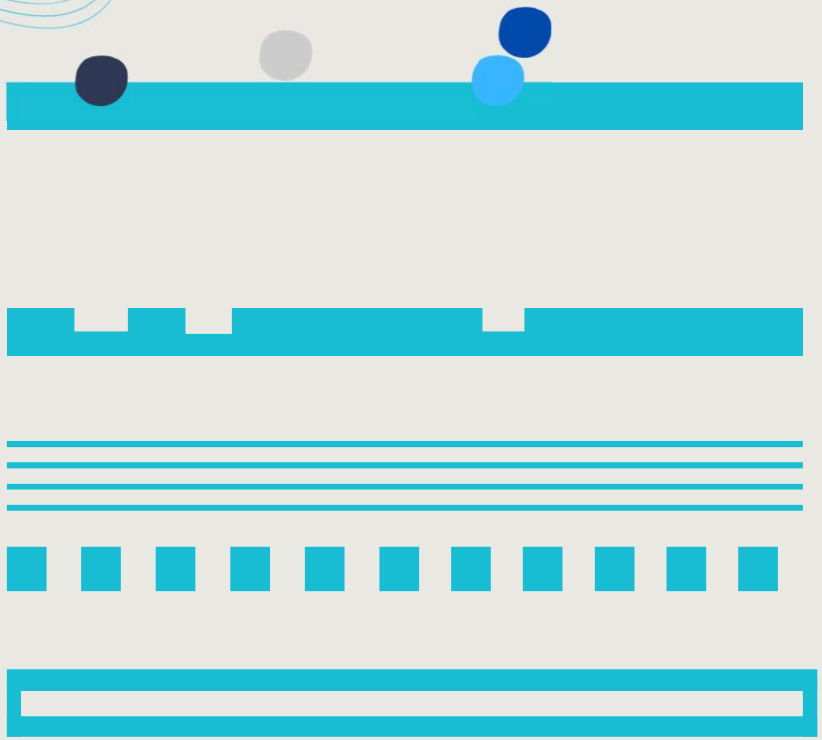
PDI,
GPC 'purity'

Metal-ion purity
Usually <100 ppb
ICP-OES

Particle purity
tbd. by customer

CHALLENGE US !

Potential fields of applications



Cleanser polymer

PHS based copolymer	new (STMicroelectronics)

IC structuring, FOEL resists

KrF resist	existing
EUV resist	new
e-Beam	new

IC Packaging

RDL	new
Bumper layer	existing (Korean producer)

5G CCL, RCC	new

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TAILORMADE POLYMERS
FOR
SEMICONDUCTOR INDUSTRY

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