



Your Chip – Our Fab



Your Chip – Our Fab



Wafer Foundry



Temperature



Packaging



Strain and Torque



Functionalization



Bio Sensor



Technology Service



2412613f

RFID Transponders



SAW COMPONENTS Dresden

- Independent company
- Certified to:
 - ISO 9001
 - ISO 13485

1996

Established

2

Shareholders

36

Employees

400+

Customers

In 59

Countries

1200m²

Clean Room



Bio chip Overview

Optical

- the golden standard in medicine
- Use fluorescence labels to highlight sample
- Used for: i.e. analytic of PCR samples, cell analytic
- Advantage: very biocompatible, selective with labels
- Disadvantage: need for specific labels in liquid sample; automatic analytic equipment often big



Electro-chemical sensors

- Measure the resistance change
- Used for: i.e. Glucose test (blood sugar)
- Advantage: simple, label-free
- Disadvantage: reproducibility fluctuations up to 20%



Impedance Sensor

- Measures the phase and frequency change
- Used for: DNA, Proteins (Antibody, Antigene), PSA, Cells (i.e. heart cells)
- Advantage:
good for strong charge, low mass
label-free
- Disadvantage: surface modification for
selectivity needed; susceptible to changes in
electrical properties of sample and environment

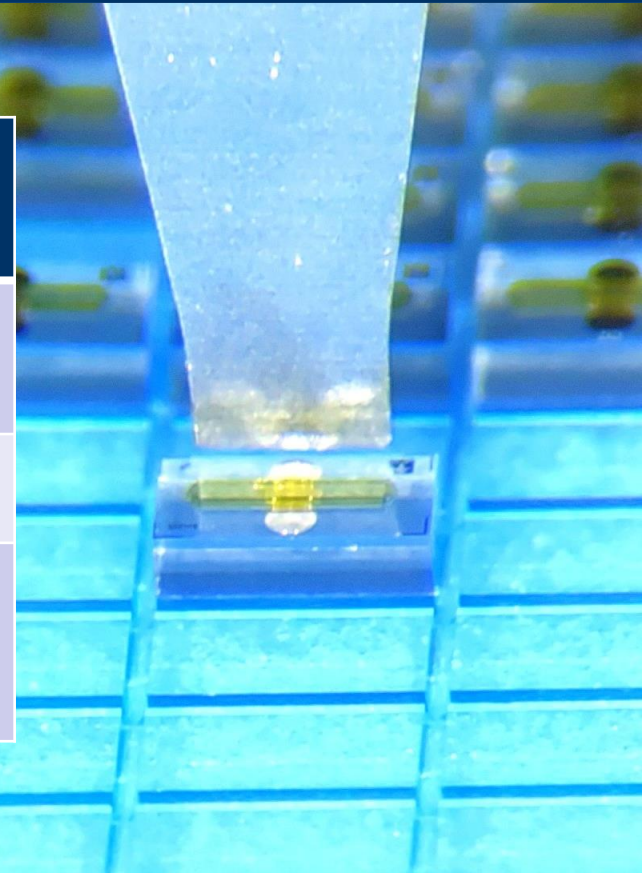


Surface-Acoustic-Wave (SAW) Sensor

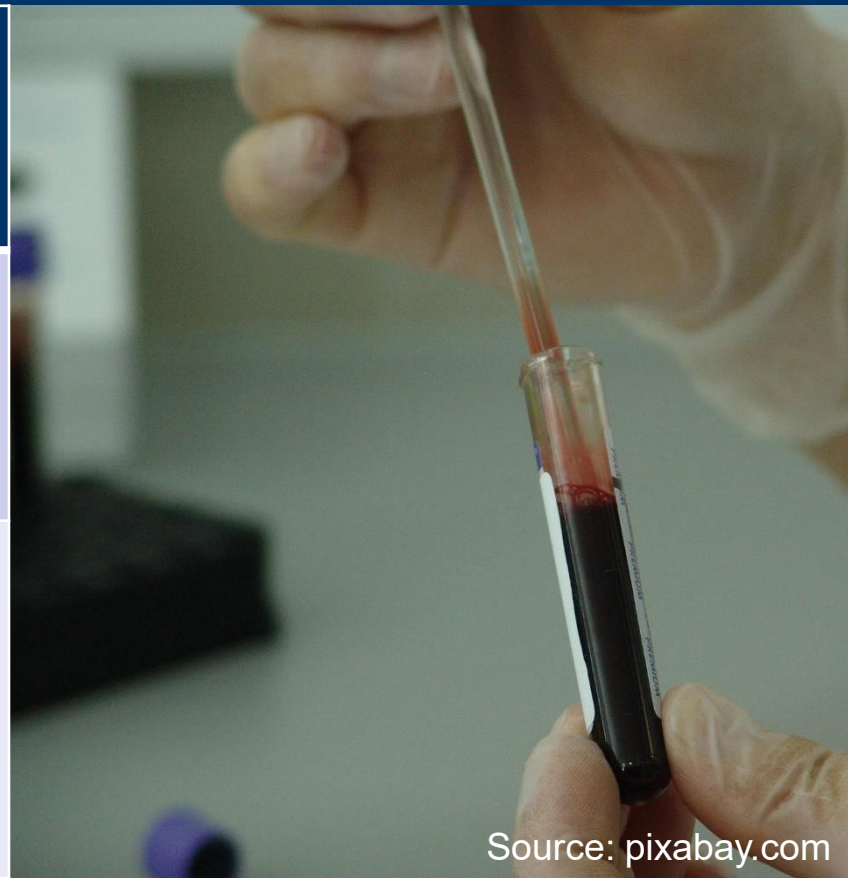
- Measures signal strength + phase in SAW Delay Line
- Measures frequency in SAW Resonator
- Used for: DNA, Proteins (Antibody, Antigen), PSA, Cells (i.e. heart cells)
- Advantage: good for low charge, higher mass, label-free
- Disadvantage: surface modification for selectivity needed

Optical Sensors (cuvettes)	Electro-chemical sensors	Impedance Sensors	SAW Sensors
Glass	Glass	Glass	Quartz
Silicon	Silicon	Silicon	LiNbO3
PMMA	Flexible foils	Flexible foils	LiTaO3
	Ceramics		POI

Optical Sensors	Electro-chemical sensors	Impedance Sensors	SAW Sensors
Laminar flow assay building (i.e. Covid test)	Metal Screen Printing	Thin-film deposition	Thin-film deposition
	Laser structuring	Etching / lift-off for structuring	Etching / lift-off for structuring
	Galvanic	Isolator deposition of capacitive structures	Isolator deposition for passivation



Optical Sensors	Electro-chemical sensors	Impedance Sensors	SAW Sensors
Fluorescent labels added to the liquid sample	No labels needed	No labels needed	No labels needed
	Surface functionalization by liquid or gas phase deposition	Surface functionalization by liquid or gas phase deposition	Surface functionalization by liquid or gas phase deposition





Sensor Examples

INTA

DIAGNOSTICS FOR EVERYONE, EVERYWHERE.

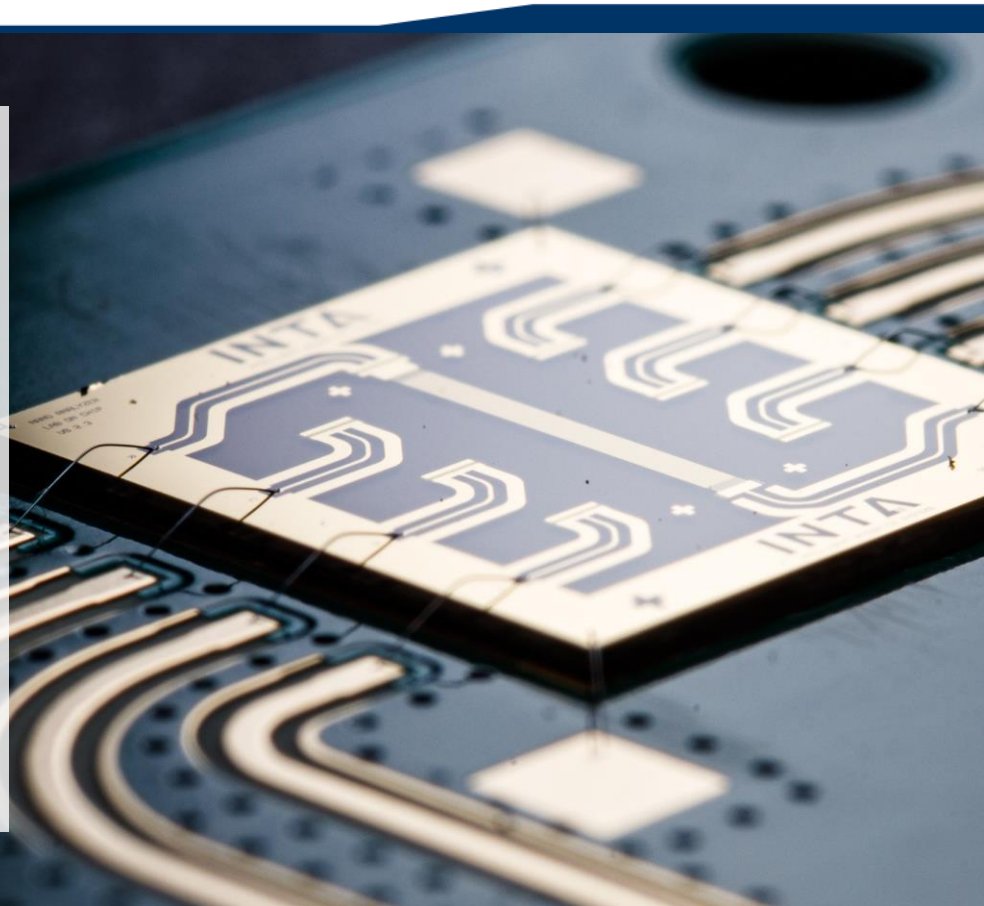
- Tests of blood samples
- Traumatic Brain Injury POC test
- 6 biomarkers simultaneously including GFAP and UCHL1
- Customizable to detect proteins, antibodies, bacteria, virus, nucleic acids



INTA

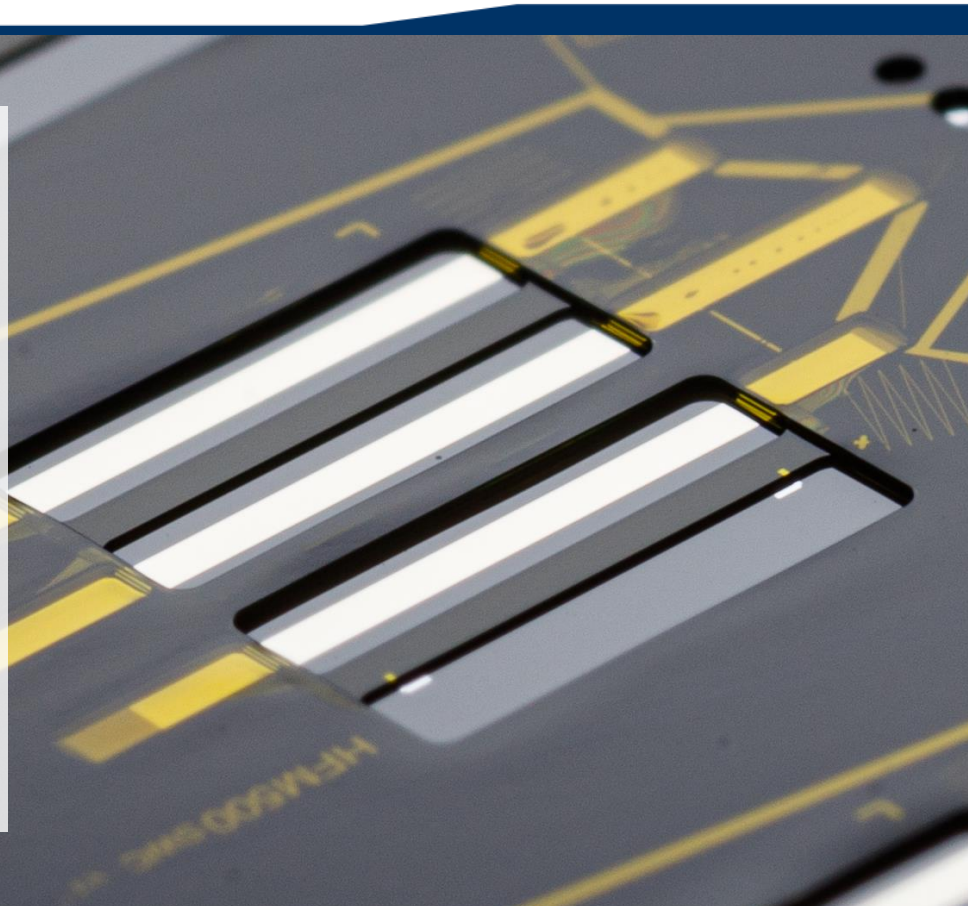
DIAGNOSTICS FOR EVERYONE, EVERYWHERE.

- 6-channel SAW resonators
- Bio-compatible gold electrodes
- Label-free
- Chip manufacturing and assembly at SAW COMPONENTS



BioSAW

- 3-channel SAW delay line
- Customizable for many bio markers
- Bio-compatible microfluidics
- Label-free
- Chip manufacturing and assembly at SAW COMPONENTS



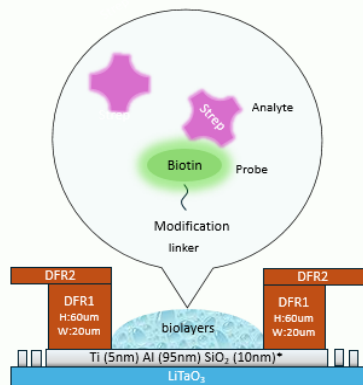
Biotin-Streptavidin Assay on SiO₂-Modified Surface – Label-Free SAW Detection

Alternative immobilization approach without gold – high sensitivity confirmed from fg/mL to µg/mL.

I) Surface preparation

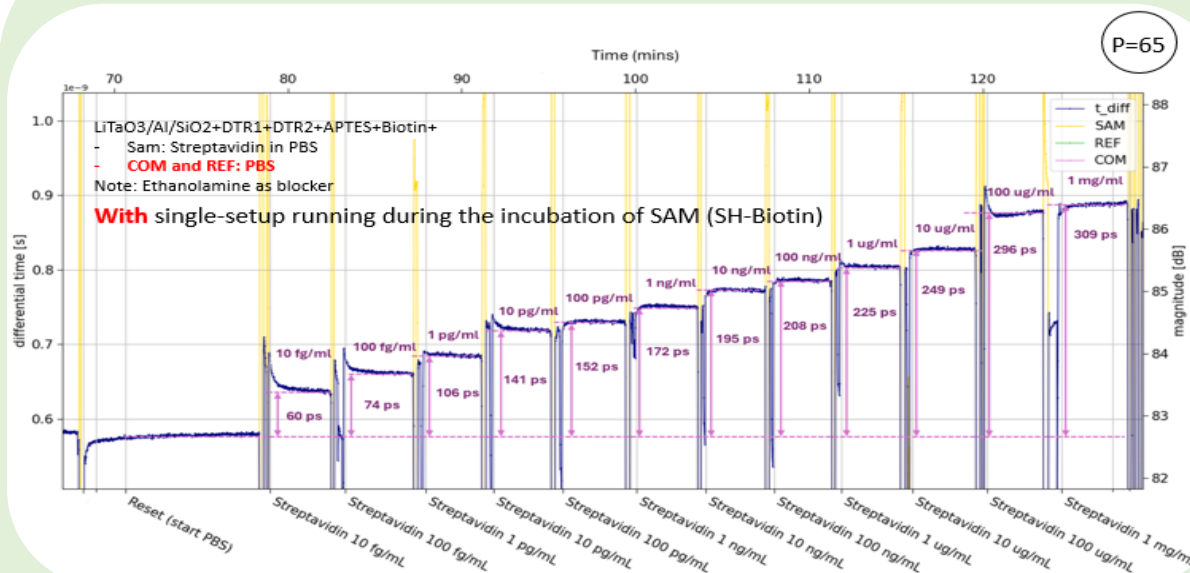
Single-chip setup

Approach 2



SiO₂-coated delay path, modified via Siloxan. Binding between Streptavidin and biotin linker.

II) Binding Test: Biotin - Streptavidin



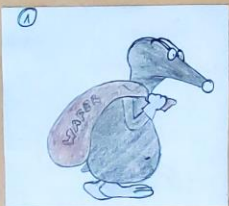
Streptavidin titration from 10 fg/mL to 1 µg/mL → Clear time-delay shifts confirm surface binding

Real-time signal shifts across concentration levels



Process Overview

SAW's selbst gemacht:



Wafereingang



reinigen



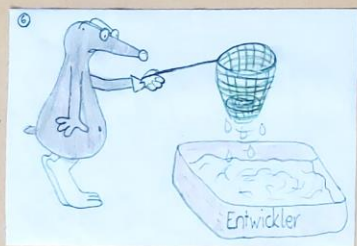
bedampfen



belacken



belichten



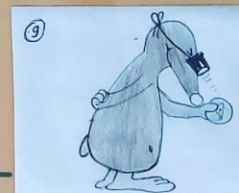
entwickeln



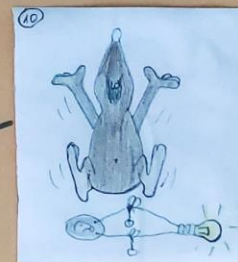
ätzen



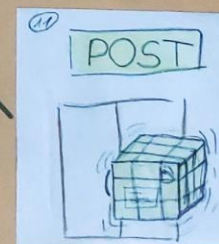
lackenschichten



kontrollieren



messen



Clean Room

- Class ISO 3 1000m²
- Class ISO 5 200m²
- Located in Dresden



SAW Sensors:

- Lithium Tantalate LiTaO_3
- Lithium Niobate LiNbO_3
- Bond Wafer (POI)
- Quartz

Impedance Sensors:

- Silicon, Glass

Sizes

- 4 inch / 100mm
- 6 inch / 150mm
- 8 inch / 200mm
- Special dimensions
(rectangles, blocks, ...)

Resist Coating

- Photosensitive resist is applied to the clean wafer
- Clean room has only yellow lights to protect the resist



Exposure

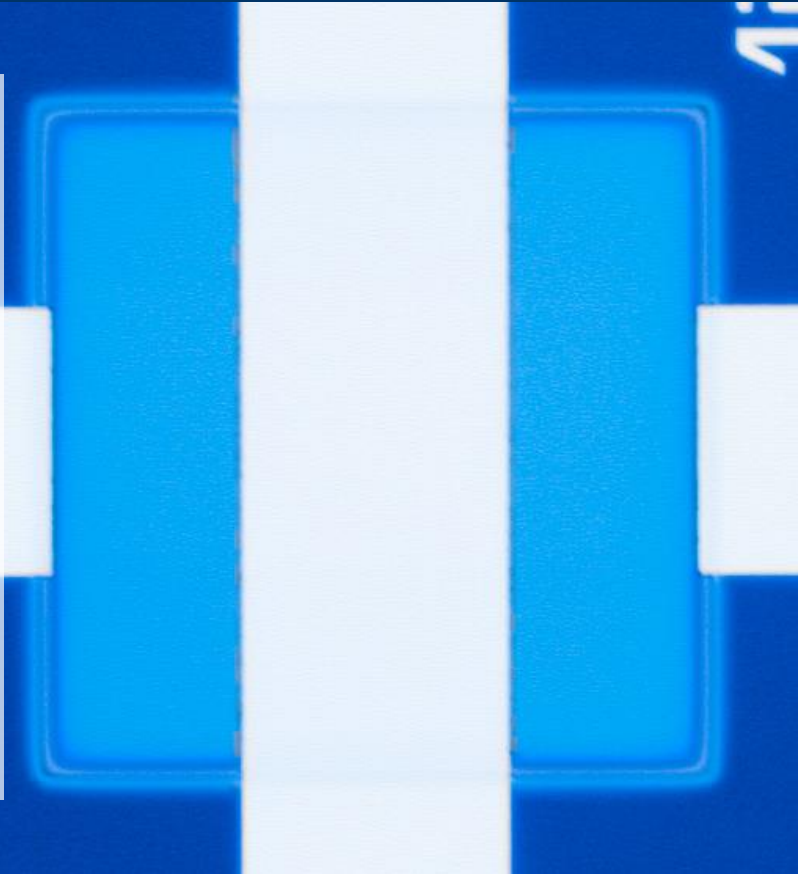
- I-Line Stepper 300nm
 - For fine IDTs or electrodes
- 1:1 Lithography 2 μ m
 - For big structures like microfluidic channels

Metallization

- Electron Beam Evaporation (PVD)
- Al, AlCu, Cu, Ti, Au, Ag, Pt, Cr
- Ultra High Power Metallization (UHPM)
- Film thickness: 3 nm – 2500 nm
- High uniformity: up to 0.5% over whole wafer

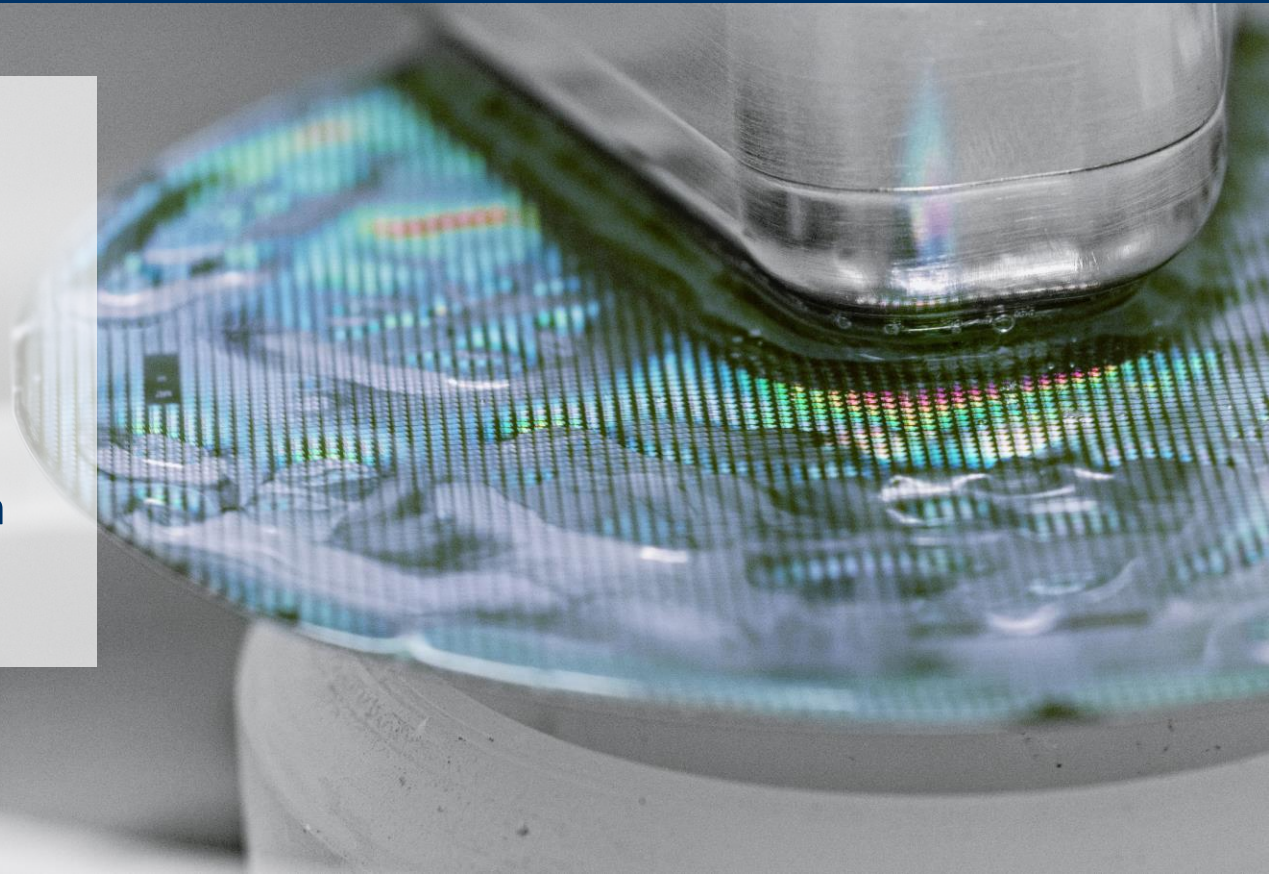
Passivation and Isolation

- Atomic Layer Deposition
Al₂O₃
- Sputtering
 - Passivation
10-50nm SiN, SiO₂
 - Cross-over for metal layers, Wave Guides
up to 2000nm SiO₂



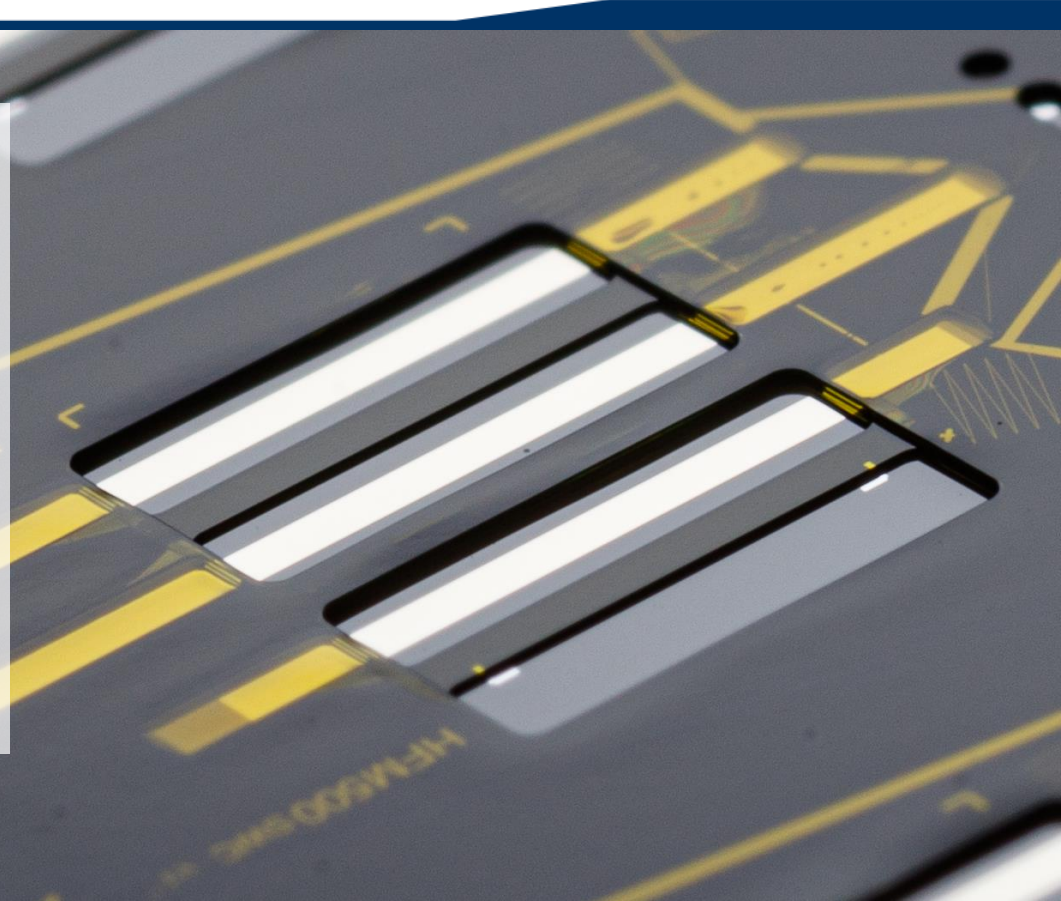
Lift-Off / Etching

- Remaining resist and metal removed
- Only the desired structures remain on the wafer surface



Dry Film Resists

- Lamination technology for DFR
- 10, 20, 50, 90 μm films
- Multi layer stacks
- For microfluidic systems
- For protection



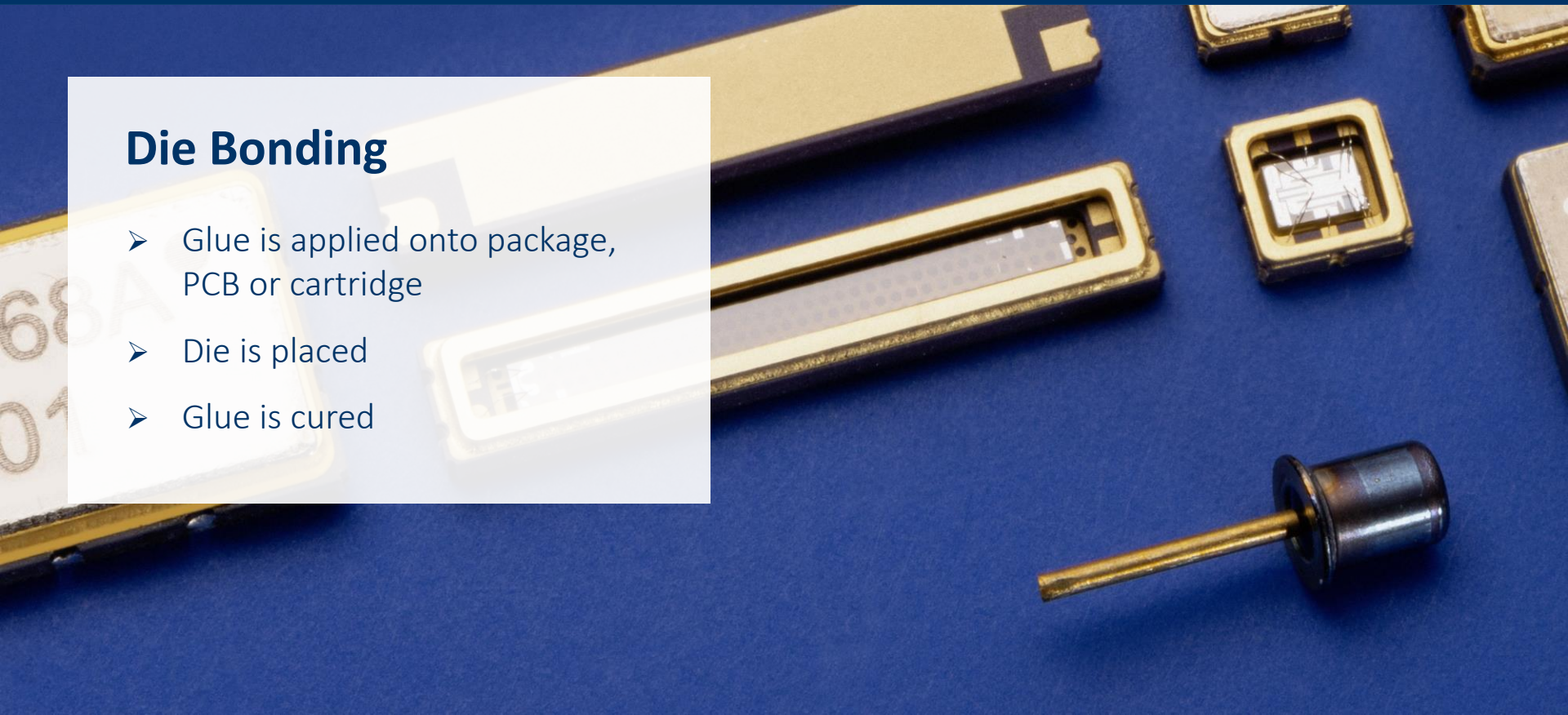
Wafer dicing

- Wafer is put on a sticky tape
- High-speed wafer dice cuts the wafer into the individual dies
- Dies remain on the foil



Die Bonding

- Glue is applied onto package, PCB or cartridge
- Die is placed
- Glue is cured



Wire Bonding

- Wedge-wedge bonding
- 25 μ m aluminum wires
- From 2 – 1000+ wires per chip
- Glob top protection possible

Final Testing and Shipping

- Every module is 100% tested
- ISO 9001 QC system
- ISO 13485 medical product certification
- MIL883K chip assembly testing
- Customized testing procedures





Thank you for
your attention!

SAW COMPONENTS Dresden GmbH

Manfred-von-Ardenne-Ring 7

01099 Dresden

www.sawcomponents.de

0351 / 887 25 10

support@sawcomponents.de