



Industries, Challenges & Flexoo Solutions: PreMoS

FLEXOO GmbH
an InnovationLab company

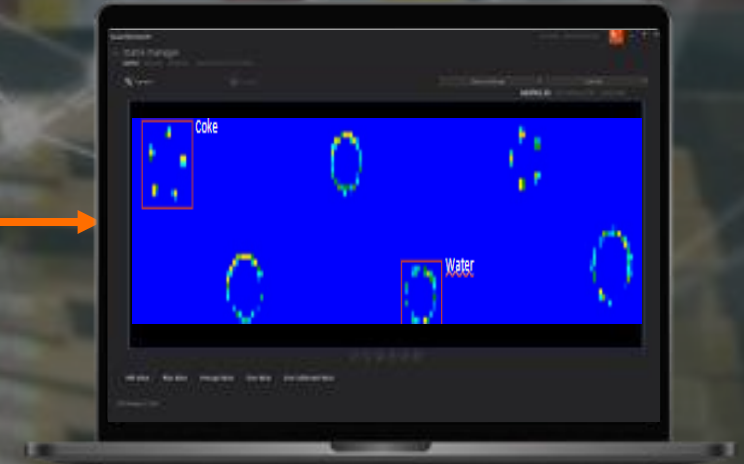
Structure

1. What is Pressure Mapping?
2. Where is it used?
3. How do you get there?
4. What are your Benefits?

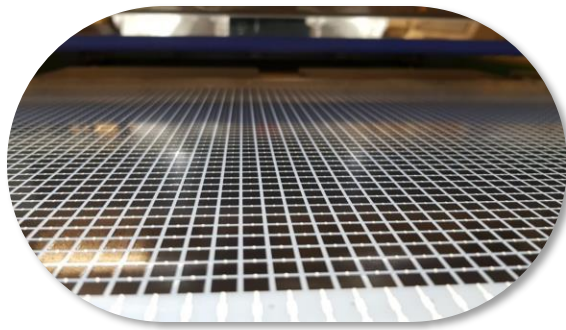
Sensing Surfaces

Imagine...

- there was a possibility to turn numb surfaces into sensitive data generation machines.
- surfaces that you have in your product, your production or facility suddenly can sense and provide you with unprecedented data.
- how this would set you apart from your competition.
- ***this is not a dream but just three steps ahead.***

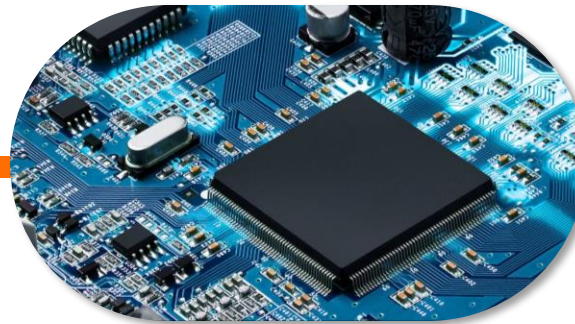


How does it work?



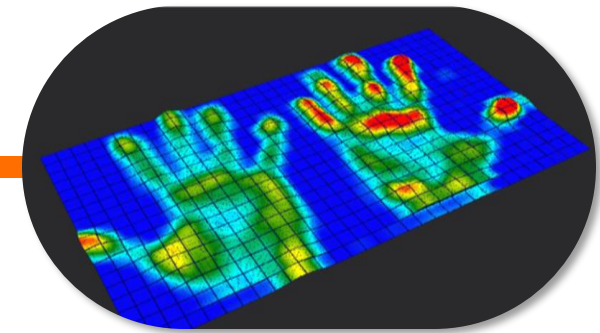
Sensor foils

Thin, flexible foil with printed pressure sensors for spatially distributed measurement of pressure



Read-out electronics

Collects the data from the sensors and sends it to the software



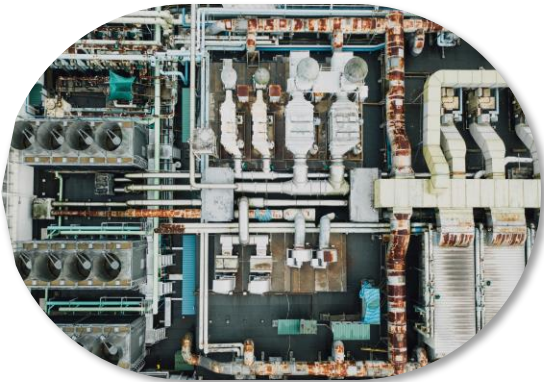
Software

Visual representation, storage and interpretation of data

Where is it used?

Industries & Applications

PreMoS technology is highly versatile and can be used in many different industries and areas. Here are some examples:



Industrial & Automation



Consumer & Healthcare



Automotive



Logistics & Retail



Want to increase the lifespan and efficiency of your gear? Let´s look at some references:



Roll tester

Ensuring consistent pressure distribution on press cylinders of all sizes, thanks to large-area sensing and full customization. This prevents defects and optimizes production.



Sand mold monitoring

Monitoring pressure ensures consistent product quality and early detection of potential issues. Predictive mold maintenance reduces downtime and extends equipment lifespan.



Heavy metal nozzle checker

Customized pressure sensor matrices ensure cooling nozzles remain unclogged. Large-area, high-sensitivity sensors optimize cooling processes and alert operators to potential issues.



Valves, flanges & screws

Pressure monitoring ensures the integrity of flanges, valves, and screws in industrial installations. Real-time monitoring alerts maintenance teams to potential issues, preventing costly downtime and safety hazards.



Stamping & press calibration

Even pressure distribution for optimal stamping and pressing. Precise pressure control minimizes waste and maximizes efficiency. Low pixel-to-pixel variation ensures accurate pressure monitoring.



Pressure monitoring is vital in healthcare for various reasons. Let's have a quick look at some examples:



Smart bed

Monitoring pressure in bedridden patients helps prevent pressure ulcers, promotes healing, and improves overall patient comfort and well-being. Real-time monitoring can also trigger alerts for healthcare personnel, enabling timely interventions.



Smart insole

Optimizing comfort and fit by assessing pressure points and gait analysis. This leads to improved foot health, reduced pain, and enhanced athletic performance.



Digital occlusion control

Digitalized occlusion measurement provides accurate and objective data for precise dental treatment planning and monitoring. This leads to improved treatment outcomes, enhanced patient comfort, and reduced treatment time.



Smart scale

Lightweight, flexible sensors enable the creation of discreet, portable, and customizable scales. This opens up new possibilities for measuring weight and pressure distribution.



X-ray patient monitoring

Controlling the position of a patient during the X-ray process with transparent sensor matrix

Innovation is a driving factor of the automotive Industry. See how you can put more sense to your products and bring them closer to passenger:



Sensing Seat

Improving seat ergonomics through passenger age, behavior, and occupancy detection. Integration with airbag deployment systems enhances safety and comfort. High-resolution pressure sensors enable this without compromising passenger privacy.



Next generation control panels

Replacing capacitive touch sensors with resistive pressure sensors improves control and safety by preventing unintended inputs.



BaMoS

Battery pressure monitoring accelerates R&D and improves battery health management. By monitoring State of Health (SoH) and State of Charge (SoC), battery life is extended and historical performance data is collected for analysis.



Tire pressure measurement

Thin, flexible pressure sensors enable easy and accurate tire pressure distribution measurement. This leads to improved fuel efficiency, enhanced vehicle stability, and prolonged tire life.



WaMoS

Pressure monitoring in electrolyzers and fuel cells provides valuable data for optimizing performance, extending lifespan, and accelerating research and development.

Logistic & Retail



If you want to send your logistic processes to the next level, you might have a look at these possible applications:



Smart Cargo Floor

Live monitoring of load distribution and shifts in truck trailers or delivery vans ensures safe and efficient transportation. This helps prevent accidents, optimize load capacity, and reduce wear and tear on the vehicle.



Smart Shelf

Stock monitoring and automated inventory management optimize storage and warehouse operations, reducing costs and improving efficiency. This enables frictionless shopping experiences and ensures product availability.



Package weight categorization

Measuring package weight and footprint beforehand calculates accurate shipping fees, optimizes shipment weight and space, and improves overall shipping efficiency. This data can also be used to optimize packaging materials and reduce costs.



Automated replenishment

Never run out of critical parts. Our retrofit solution for c-parts storage eliminates downtime risk and reduces costs by optimizing your existing storage system.

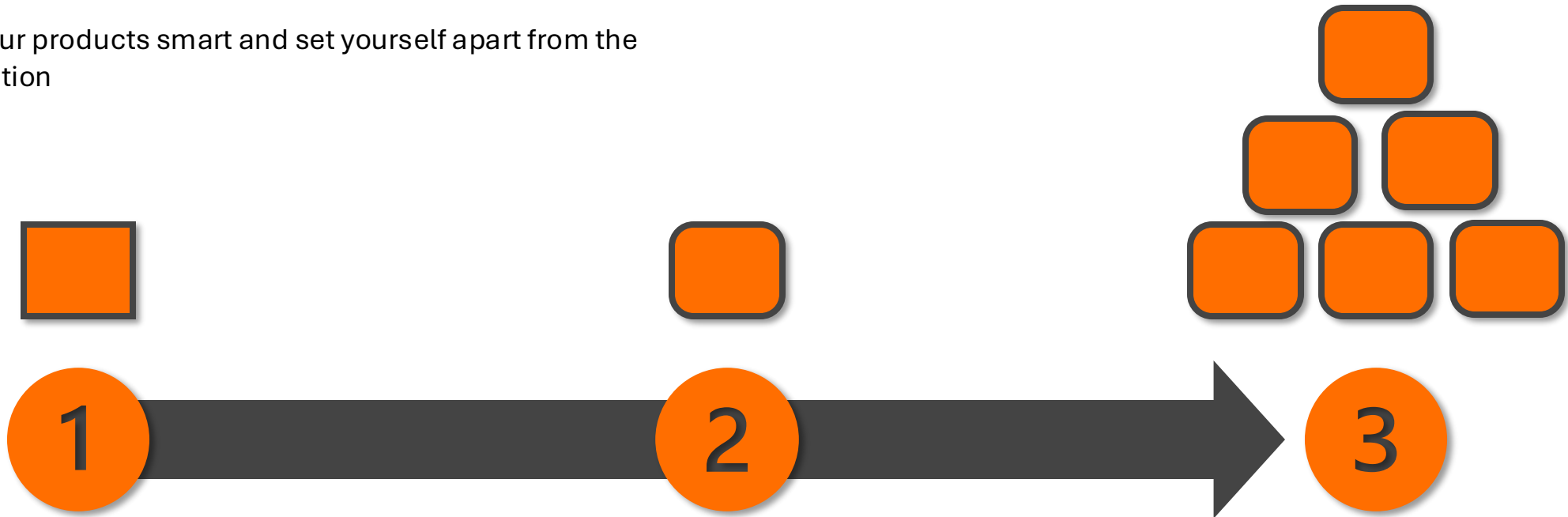


Smart Floor

Floor-integrated pressure sensors detect occupancy, enhancing safety, efficiency, and energy conservation. By optimizing heating and cooling based on occupancy, significant cost savings can be achieved.

How do you get there?

Make your products smart and set yourself apart from the competition



Standard PreMoS System

- Standardized pieces ready to be ordered and used
- Quick, cost-efficient & easy Introduction

Customized System

- Customized foils and electronics fitted for your needs
- Creation of high-fidelity prototype

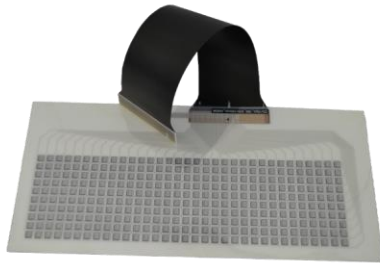
Customized Mass Production

- Mass production of your customized foils and electronics

1. Standard PreMoS System

Standard PreMoS System

First you can simply start with buying our “off the shelf”-Solution with prepared standard Pressure Matrices with different Sensor Architectures, Sizes and Resolutions. This way you will get a better Knowledge of what you need.



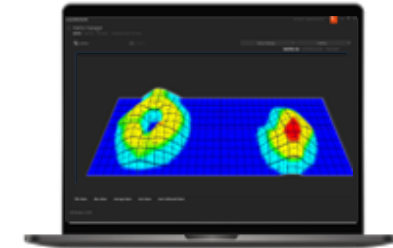
Different Sensors

- Pressure distribution
- Different: sizes, spatial resolutions, sensor architectures, foil materials and thicknesses



Read-out Electronics

- State-of-the-art with reduced cross-talk
- 12-bit digital resolution
- Electro-magnetic interference protection
- Several communication interfaces








Software

- Live 3D/2D data visualization, storage and analysis
- Data filtering
- Real-time streaming via API
- Calibration option

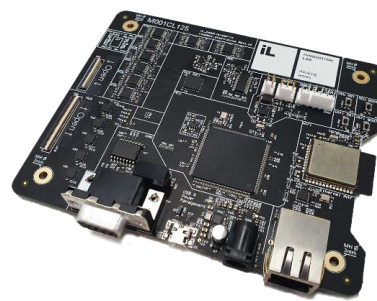
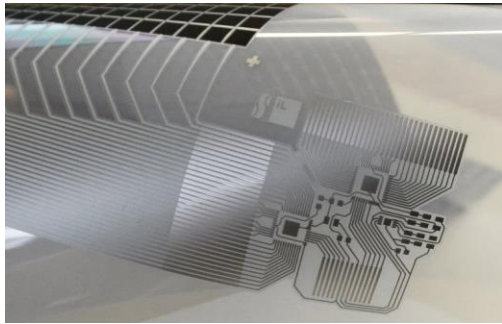
Variety of PreMoS Standard Sensors

Formatting. Table is too large
Sensor foils look messy

Sensor					
Measurement Mode	Thru	Thru	Thru	Shunt	Prime
Resolution (# of Pixels)	29 x 17	64 x 20	64 x 20	32 x 10	32 x 10
Active Area (cm ²)	15 x 9	33 x 10	53 x 11	32 x 10	32 x 10
Pixel Size (cm ²)	0.32 x 0.32	0.30 x 0.30	0.50 x 0.32	0.62 x 0.57	0.5 x 0.5
Foil Material	PI (2 x 50 μm)	PI (2 x 50 μm)	PI (2 x 50 μm)	PET (2 x 75 μm)	PET (2 x 100 μm)
Suitability for • Low Pressure • High Pressure	+ +	+ +	+ +	++ +	++ ++

A quick overview to give you a feeling of our capabilities:

2. Custom System Engineering



Custom System Engineering

With the knowledge from the initial tests, we prepare a customized foil for you - with the sensors your application needs and with perfect layout.

This way you will receive a product fully adapted to your purposes. In addition, we will prepare a read-out device ready for your needs. We are expert in tailoring our sensors foils and according read-out electronics to your needs.

3. Customized Mass Production

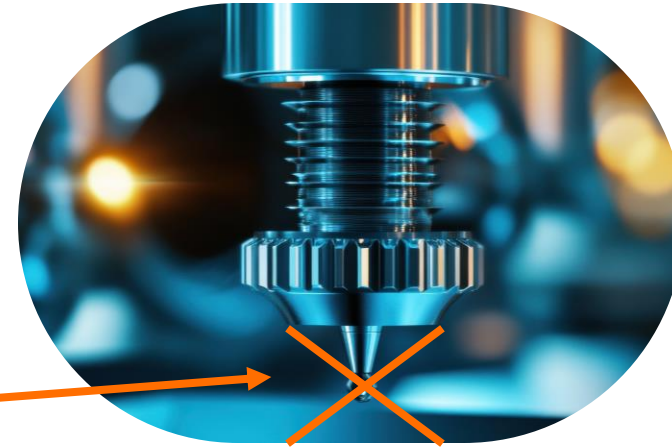


Mass Production of your Products

The last step is to prepare the full Mass Production that will deliver the constant Quality and Quantity you demand.

With FLEXOO you have a seamless Transition from the Customization Step to the full Mass Production of your Sensors - even if you need Millions of Sensors a Year.

Heavy metal nozzle checker



Issue

- Water nozzles made for cooling down metal blocks can fail. This leads to high costs and quality issues

Solution

- Customized PreMoS sensors are implemented into the machine to monitor constant nozzle pressure

Benefits

- Accurate Data
- Digitalized Process
- Automated Protocol
- Cost-saving due to identification of inactive nozzles.

Consumer & Healthcare: Sensing Mat

Applications

- capable of tracking and detecting every move, jump force and height. Therefore, it is a perfectly suited training tool for athletes – private & professional.
- HMI for interactive Games
- Posture correction for Yoga and Physiotherapy
- Control of physiotherapy adherence



Issue

- How can we create a multifunctional Device that is suited for Sports, Health and Gaming?

Solution

- Integrate PreMoS into the Mat Material.
- Adding the sensation to everyday training

Benefits

- Real-Time Pressure Feedback
- No Camera needed
- High Durability
- Comfortable Portability
- Lightweight & flexible



Issue

- Buttons and sliders based on capacitive sensor can be activated by mistake
- Conventional buttons and sliders takes a lot of space and are hard to integrate

Solution

- PreMoS FSR sensor is easily integrated into the car interior and offers a great variety of functions
- Force Sensitive Resistor offers a conventional button and slider usability, with ultra-thin design

Benefits

- No more unwanted activation
- More Stages
- Higher EMC Stability
- Mechanical functionality by force measuring
- Simple resistive read-out

PreMoS in Action: Sensing Shelf



Issue

How to keep track of my inventory and free slots of my warehouse?
How do I know, how many packages are on a pallet?

Solution

PreMoS sensors and read-out electronics will be integrated into your shelf to measure its weight and occupancy.

Benefits

- Stock Monitoring
- Automated replenishment
- Digital twin & inventory
- Object recognition
- Fill level detection

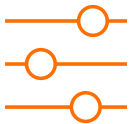


Most accurate pressure sensor on the market

Compared to state-of-the-art product our sensors deliver **3 times more stable signal, 10 times higher repeatability** and **100 times lower hysteresis**. Further benefits and USPs of our system are:



Ultra-thin foils for large-area pressure measurements



Plug & Play



Broad range of communication

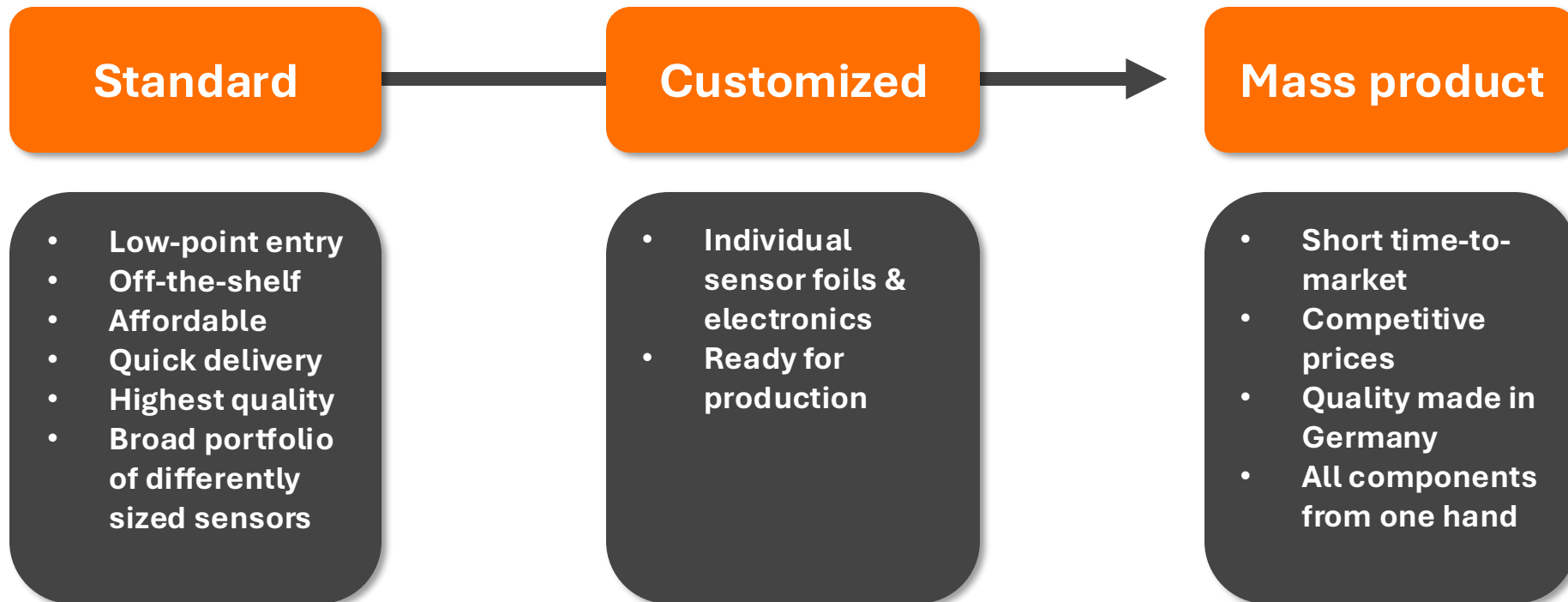


On-board Calibration & Stand-alone Operation



Crosstalk-less read-out

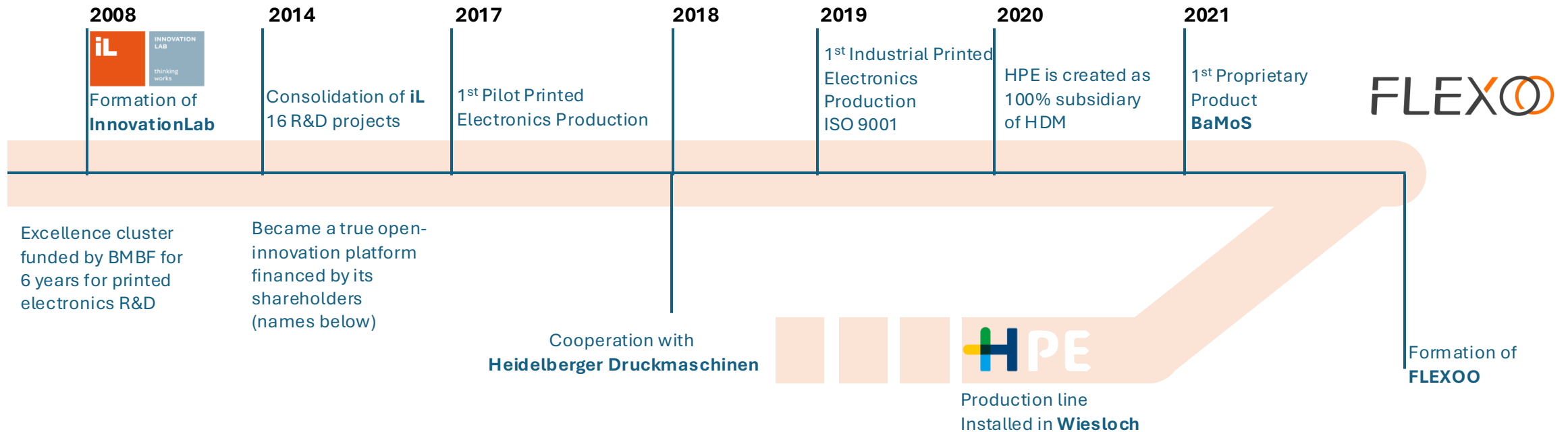
Your benefits: from our standard product portfolio to customized mass production based on your needs



Who is FLEXOO?



R&D leader meets manufacturing excellence



InnovationLab original Shareholders :



Our infrastructure



Development

1200 m² of clean rooms and laboratories

Tailoring the layout and specs of existing sensor technologies

Developing new sensor technologies and sensor systems

Conceiving, **engineering** and **production** of hard- and software components

Embedding of the sensors into hardware, software and cloud systems



Upscaling

Our pilot line is a Gallus RCS 330 **modified specifically for printed electronics** with all type of printing (Flexo, ink-jet, gravure, etc.) and curing methods (IR, heat, UV, etc.)

Used for **process optimization** and **small series production** (<100k pieces) and prototypes.

Designed for **optimal usage** of ink volumes in order to **limit cost** of process development



Mass production

Manufacturing line: Gallus RCS 430

High precision (20 micron), **high-speed** production (up to 160 m/min), up to **7 different layers** in one run

Easily accessible and exchangeable printing modules and curing units allow for **fast switch between products** (1-7 days vs 2-4 weeks)

Our USPs

End-to-End Realization

We accompany customers from initial development to mass production and ensure seamless integration and success by **reduced time to market**.

High-Volume R2R Manufacturing

Our roll-2-roll printing machines are designed to manufacture complex products with several layers and different types of materials. Our unique manufacturing setup offers **large-scale production** of tailor-made sensors and electronics.

European Manufacturing Excellence

Our manufacturing lines are used to satisfy highest quality standards, established over years of experience by a Swiss leader for manufacturing of graphical printing machines, modified to produce functional prints with **highest quality and consistency**.

Flexibility

Our team possesses extensive expertise in materials and process technology, allowing us to deliver unparalleled **flexibility in designing** sensor and electronics products, setting a new standard in the market.

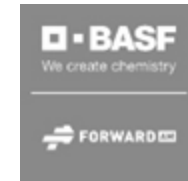
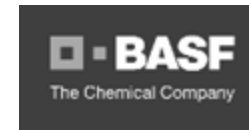
Collaboration & Partnership

Partnership based on bilateral expertise

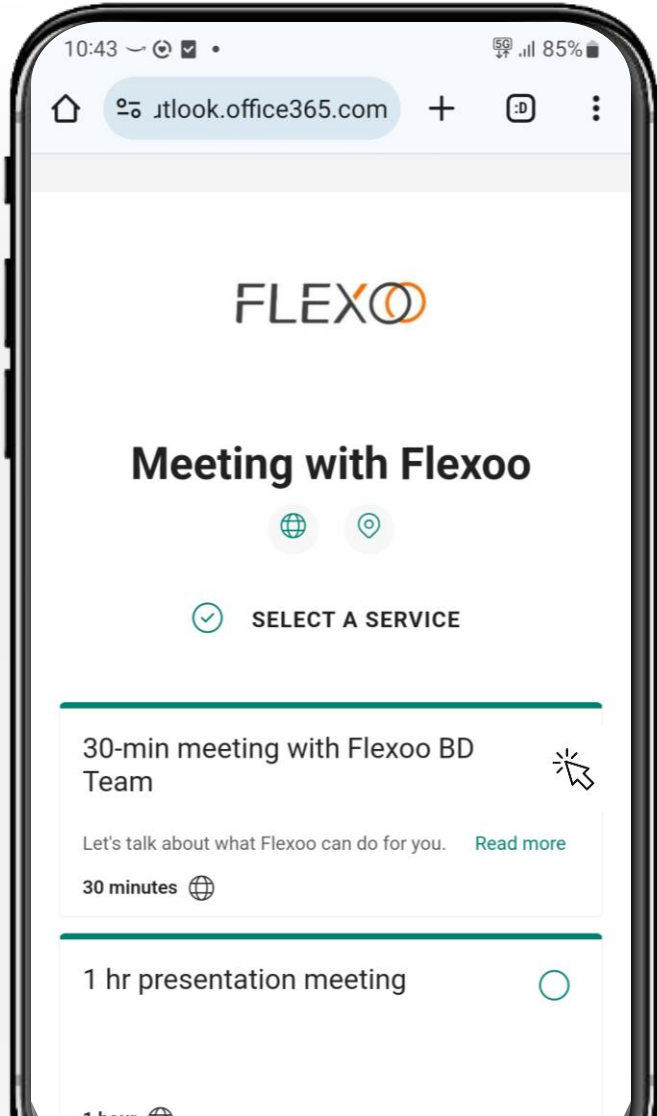
Broad network of leading ink and materials providers to assure consistency in large volume production and bring the best solution to our customers.



Customers who trusted us



 Challenge us!



Bart Jarkiewicz
Technical Sales Manager



Lars Keiz
Product Manager Battery Monitoring
Solutions



Dr. Florian Ullrich
Head of Business Development

[Schedule an appointment](#)