



# Coatema research & development centre

05/05/25

MEMBER OF ATH

***Coatema***

# Agenda

1. Introduction
2. The Coatema R&D centre
3. R&D centre equipment

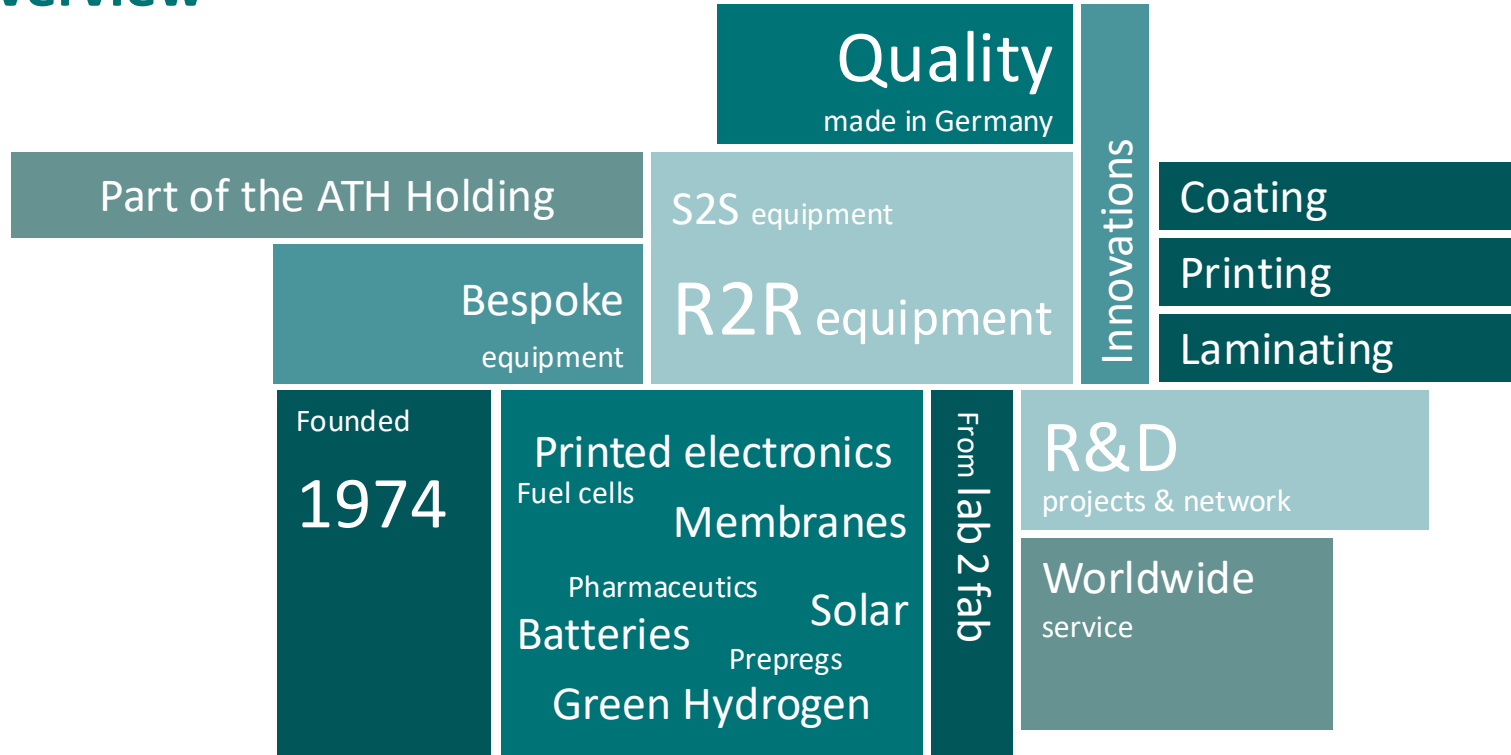




# Introduction



## Overview



## Group of companies

**ATH** ALTONAER  
TECHNOLOGIE  
HOLDING



- ✓ Founded 1903
- ✓ Approx. 200 employees
- ✓ Located in Hamburg

**DRY/TEC**

- ✓ Founded 1995
- ✓ Approx. 50 employees
- ✓ Located in Norderstedt



- ✓ Founded 1974
- ✓ Approx. 50 employees
- ✓ Located in Dormagen

## Coatema equipment platform strategy for lab2fab



Lab

- ✓ State-of-the-art research and development equipment
- ✓ Sheet-to-sheet to roll-to-roll systems on small scale & footprint



Pilot Production

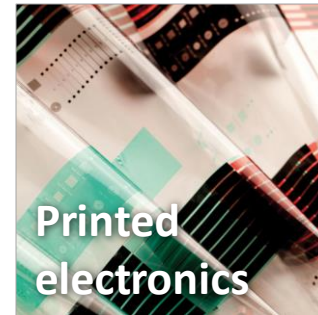
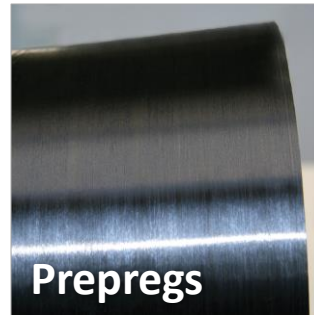
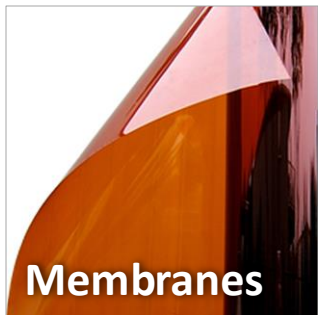
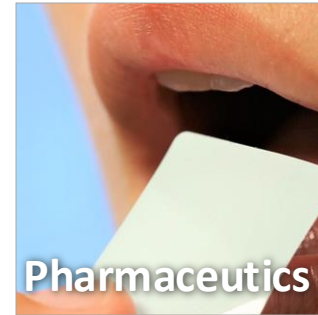
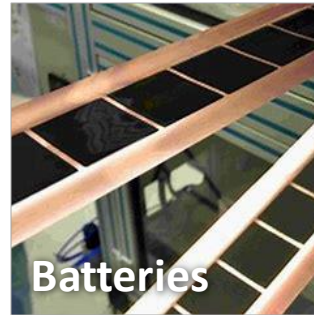
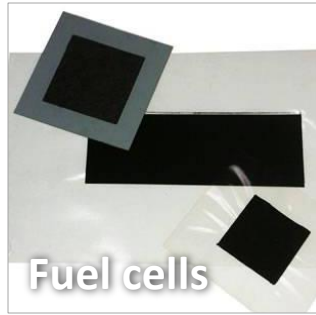
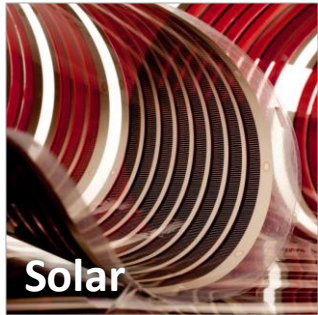
- ✓ Proven processes for printing, coating and laminating equipment
- ✓ Highest-quality pilot lines enable stable pilot production and reduce cost of operation
- ✓ Scaling laboratory equipment to enable pilot production



Production

- ✓ Full-scale production lines
- ✓ Optimize the manufacturing process, including streamlining assembly, reducing material waste, and optimizing the carbon footprint

## Our markets

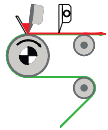


Actual system proven in operational environment

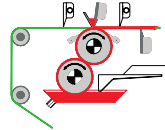


Basic principles observed

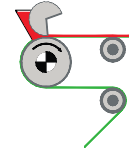
## Coating systems



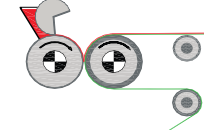
Knife system



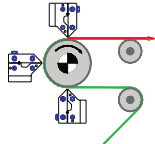
Double side coating system



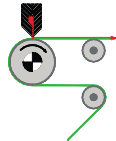
Commabar system



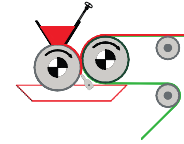
Reverse commabar system



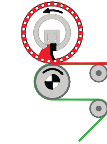
Slot die system



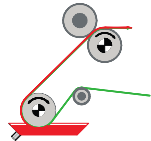
Curtain coating system



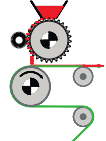
Case knife system



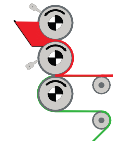
Rotary screen system



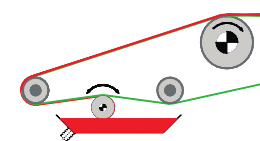
Dipping system (Foulard)



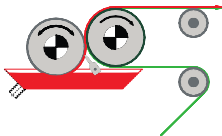
Powder scattering system



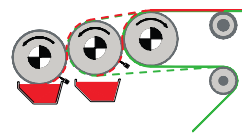
Reverse roll coating system



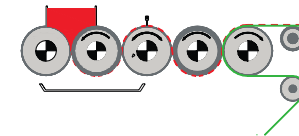
Micro roller coating system



2-roller coating system



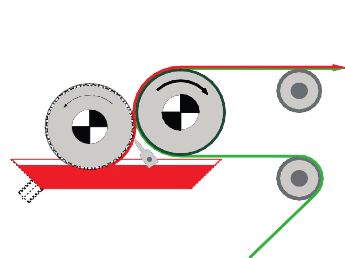
3-roller combi coating system



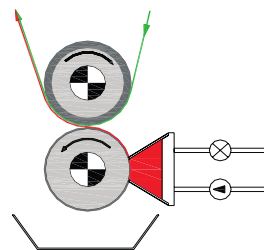
5-roller coating system



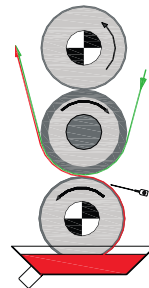
## Printing systems



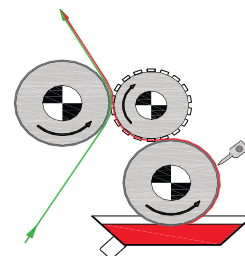
Engraved roller system



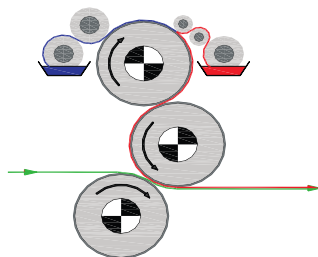
Gravure roller system



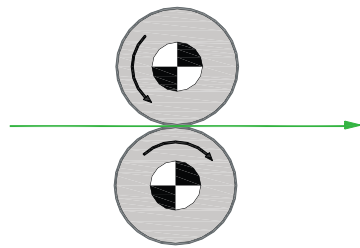
Gravure indirect system



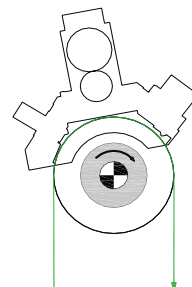
Flexography system



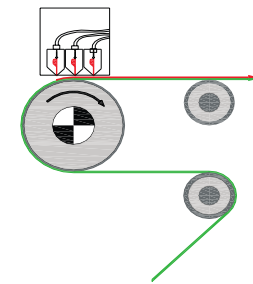
Offset lithography system



Hot embossing system



Nanoimprint system



Inkjet system

## Coating parameters

Coating chemistry	Coating processes	Process control	Drying
<ul style="list-style-type: none"> <li>✓ Rheology</li> <li>✓ Viscosity</li> <li>✓ Viscoelasticity</li> <li>✓ Type of solvents</li> <li>✓ Solid content</li> <li>✓ Van der Waals force</li> <li>✓ Sheer ratio</li> <li>✓ Adhesion/Cohesion</li> </ul>	<ul style="list-style-type: none"> <li>✓ Coating systems</li> <li>✓ Single or multilayer coatings</li> <li>✓ Direct coatings</li> <li>✓ Transfer (indirect) coatings</li> <li>✓ Substrate speed</li> <li>✓ Layer thickness</li> <li>✓ Coating accuracy</li> </ul>	<ul style="list-style-type: none"> <li>✓ Process layout</li> <li>✓ Tension control system</li> <li>✓ Material guiding system</li> <li>✓ Inline parameter control</li> <li>✓ Quality control</li> </ul>	<ul style="list-style-type: none"> <li>✓ Convection drying</li> <li>✓ Contact drying</li> <li>✓ Infrared drying</li> <li>✓ Sintering</li> <li>✓ NIR</li> <li>✓ High frequency</li> <li>✓ UV crosslinking systems</li> </ul>
Substrate	Pretreatment	Environment	Finishing
<ul style="list-style-type: none"> <li>✓ Surface tension</li> <li>✓ Dimension stability</li> <li>✓ Surface structure</li> <li>✓ Contact angle</li> </ul>	<ul style="list-style-type: none"> <li>✓ Corona</li> <li>✓ Plasma</li> <li>✓ Cleaning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Humidity</li> <li>✓ Temperature</li> <li>✓ Inert conditions</li> </ul>	<ul style="list-style-type: none"> <li>✓ Calendaring</li> <li>✓ Embossing</li> <li>✓ Slitting</li> </ul>

## Our work in associations – global networking



Board Member:  
OE-A

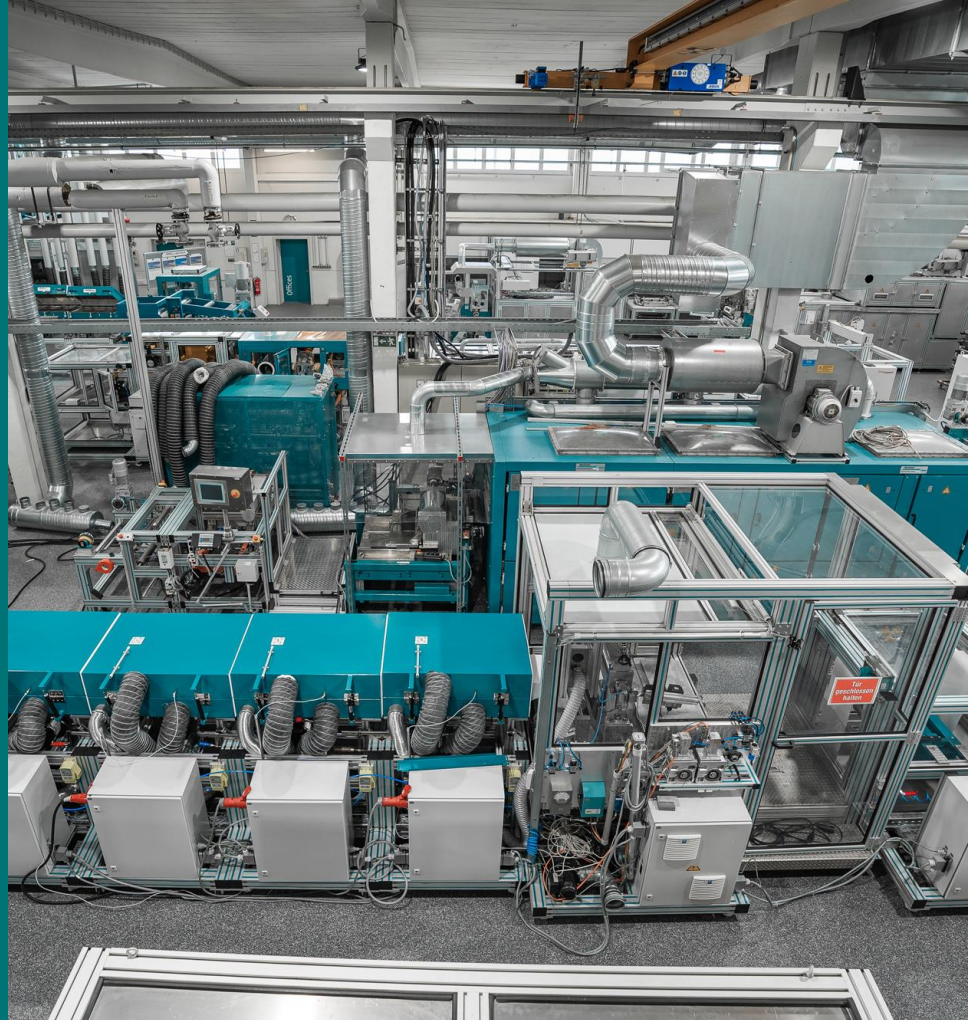
Advisory Board:  
Fraunhofer ITA

## Coatema customers



# 2.

## Coatema research & development centre





## R&D power houses

### KROENERT – Drytec – Coatema

- ✓ R&D space: 2 000 m<sup>2</sup>
- ✓ R&D units: 15
- ✓ From R2R to S2S
- ✓ Working width: 100 mm to 1 300 mm
- ✓ Operation speed: 0.1 to 1 610 m/min.
- ✓ 15 parallel public funded R&D projects
- ✓ R&D staff: 25

### Product portfolio:

- ✓ Basic research, process- and productdevelopment
- ✓ Product improvement
- ✓ Trainings and conferences



R&D centre KROENERT & DRYTEC



R&D centre Coatema

## Want to save resources, money and time

- ✓ We offer access to a wide variety of lab, pilot and production tools
- ✓ We offer immediate exposure to process development and machine operation without long training periods
- ✓ We offer our experience and skills to cut down lead times for your product development
- ✓ We offer the full support and participation in funded R&D projects for process and machine related challenges

## R&D centre USP



### Process development

- ✓ Feasibility study
- ✓ Ink – process study
- ✓ Process analysis
- ✓ Slot die coating simulations
- ✓ Proof of concept
- ✓ Small scale prototype



### Test production

- ✓ Prototyping
- ✓ Near to market testing
- ✓ TRL evaluation
- ✓ Training of staff



### Education

- ✓ Coating conference
- ✓ Partner trainings
- ✓ Education of students
- ✓ Workforce training



### Development of custom-made design for equipment

- ✓ Prototyping
- ✓ Proof of concept



### Public funded research projects know-how

- ✓ German funded
- ✓ Horizon 2020
- ✓ Global 2+2 projects
- ✓ B2B projects

## Process and technologies



### Technologies

Coating, printing, laminating,  
imprinting, pretreatment, drying,  
curing, cross linking, cutting

### Number of units available

10 – 12 units on 1 200 sqm

### Sheet-to-Sheet – S2S

up to 300 mm x 500 mm

### Roll-to-Roll – R2R

up to 500 mm width

### Operation speed

0.1 to 100 m/min

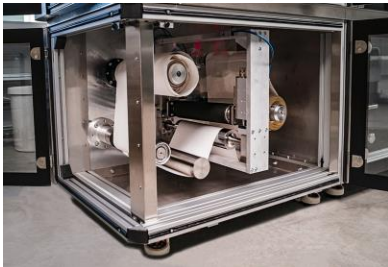
## Benefits



With Coatema application experts and interdisciplinary expertise.

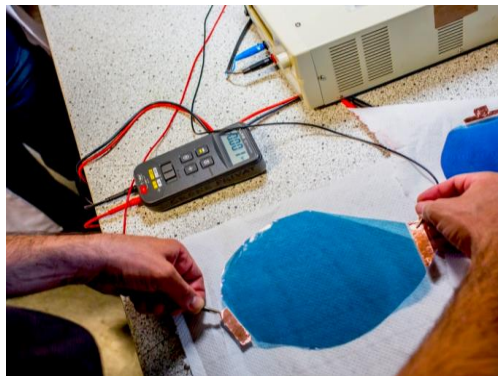
### You will be able to:

- ✓ Validate your process
- ✓ Check your line layout
- ✓ Run your R&D trials in lab2fab environment
- ✓ Scale up your process
- ✓ Run your products





## R&D services



### Services include:

- ✓ Technical briefing & brainstorming
- ✓ Trial planning & preparation
- ✓ Choice of unit & layout
- ✓ Support in logistics
- ✓ Training programs for staff

## Cutting edge technology



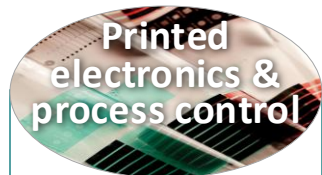
### Services include:

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- ✓ Choice of unit & layout
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- ✓ Training programs for staff

## R&D customers



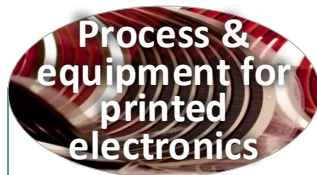
## R&D projects overview 2022 – 2025



In-line and real-time digital nano-characterization for flexible organic electronics



The NOUVEAU project will develop solid oxide cells (SOCs) with innovative La- and PMG-free electrode materials



R2R production line for OPV solar with integrated backend



Upscaling and development of EC based switchable films to decrease energy use in buildings



Implementation of laser drying processes for lithium-ion battery production



R2R process optimization for solid state batteries



Plasmonically enhanced photocatalysis for wastewater treatment



R2R nanostructuring of functional films



The WaterProof project aims at developing an electrochemical process that converts CO<sub>2</sub> emission



Creating an open-innovation testbed for sustainable packaging



# Coatema research & development centre



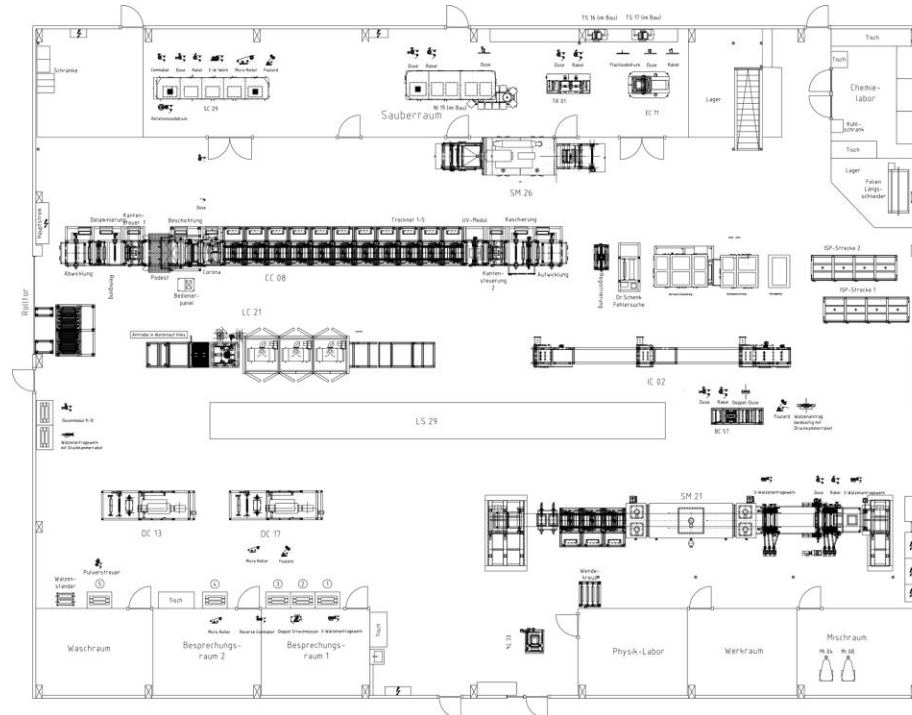


# 3.

## R&D centre equipment



## R&D centre layout equipment



## Systems in the R&D centre

### Coating

Doctor blade

Slot die

Double side

Micro roller

3 Roller

Engraved roller

Powder scattering

Reverse roll coater

### Curing

Hot air

Infrared

UV

UV LED

NIR

Photonic sintering

### Processes

Lamination / delamination

Cross cutting

Web direction cutting

In line rinsing / reaction containers

In line reaction zones

Corona

Nitrogen environment

Quality control systems

### Printing

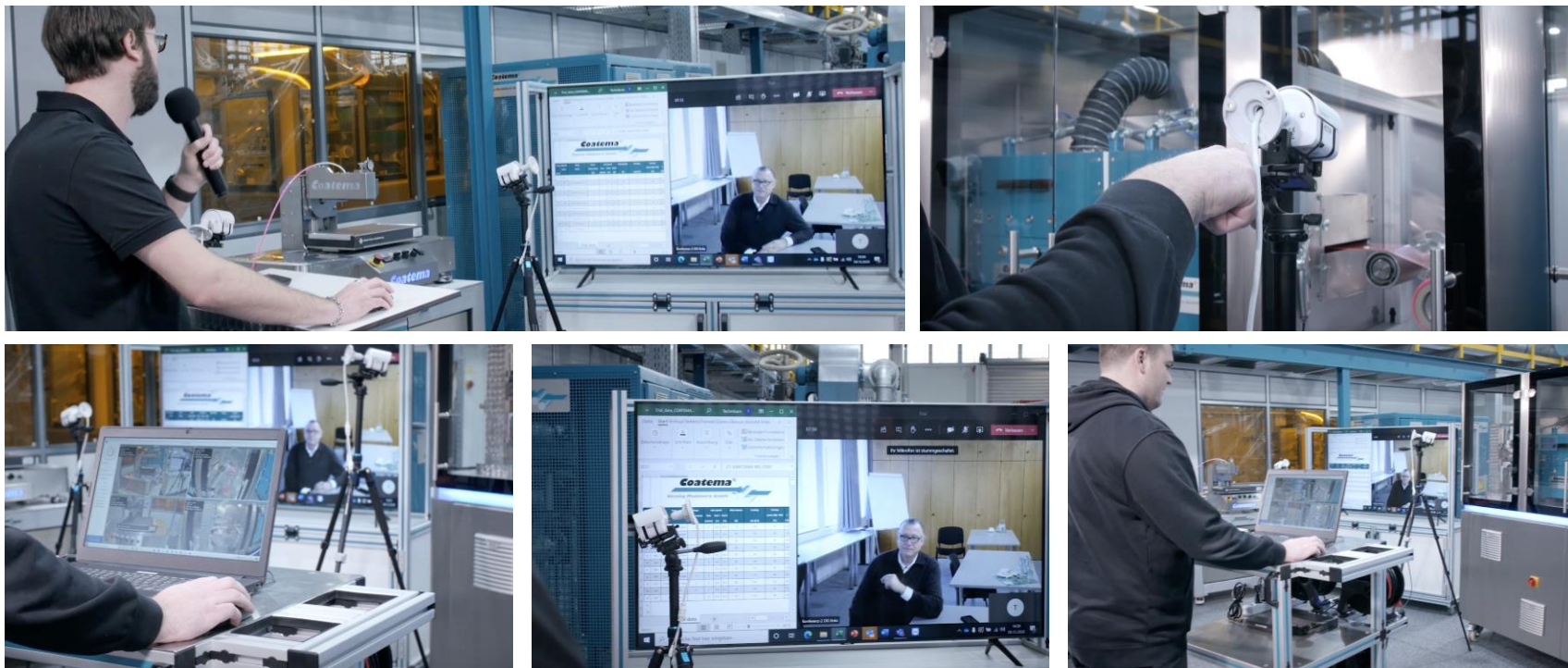
Rotary and flat screen

Gravure / engraved roller

Flexo roller

Inkjet

## Virtual trials





## R&D centre equipment





## Do not hesitate to contact us!



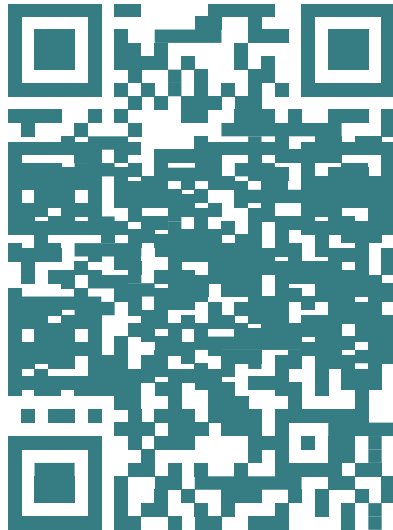
Anything missing?

Let us know and we will make it happen!

Our R&D centre is worldwide the most versatile centre for coating, printing and laminating.

Sales department:  
[sales@coatema.de](mailto:sales@coatema.de)

**Download  
brochures & presentations**



***Coatema***

**Thank you**

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