



Coatema research & development centre

Coatema

29/03/2023

MEMBER OF ATH

Agenda

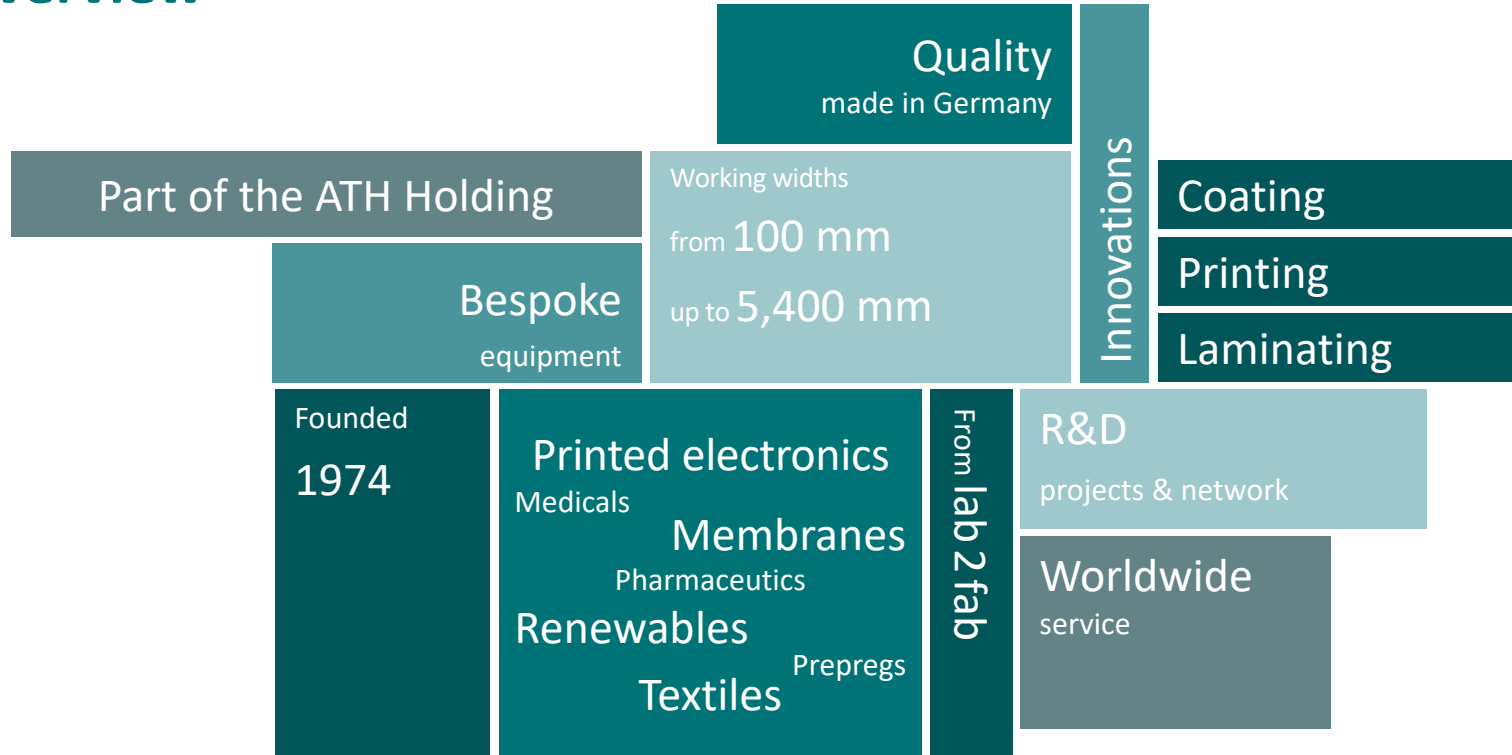
1. Introduction
2. The Coatema R&D centre
3. R&D centre equipment



Introduction



Overview



Group of companies

ATH ALTONAER
TECHNOLOGIE
HOLDING

 **KROENERT**

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

DRYTEC

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

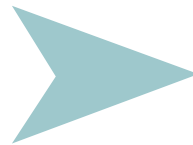
**Coatema**[®]
Coating Machinery GmbH

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

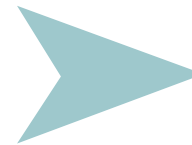
Vision – from lab 2 fab



Lab



Pilot

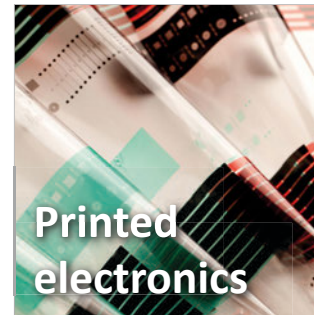
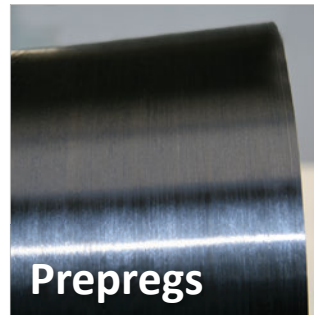
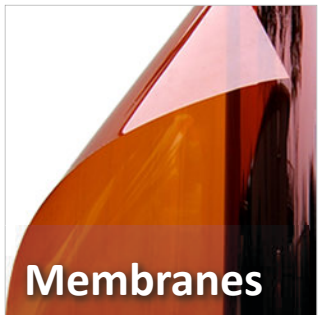
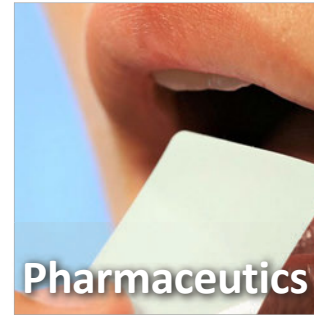
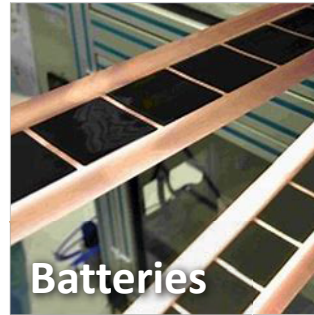
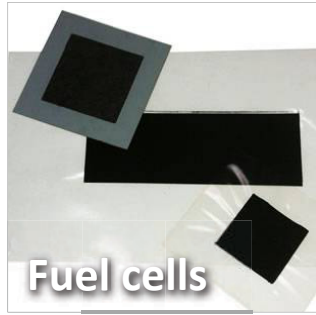


Production

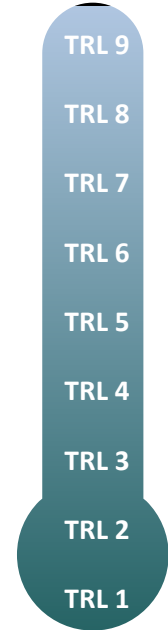


Coatema equipment platform strategy for lab 2 fab

Our markets

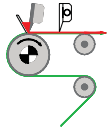


Actual system proven in operational environment

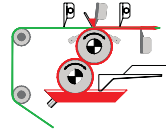


Basic principles observed

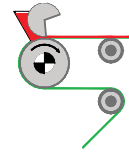
Coating systems



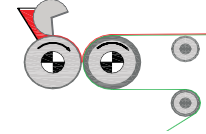
Knife system



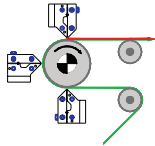
Double side coating system



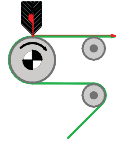
Commabar system



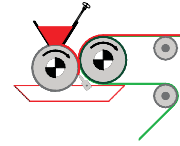
Reverse commabar system



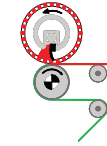
Slot die system



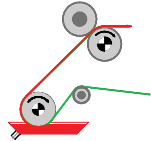
Curtain coating system



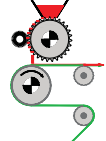
Case knife system



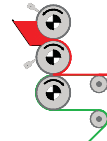
Rotary screen system



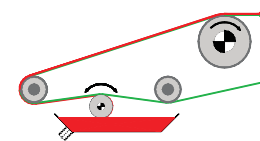
Dipping system (Foulard)



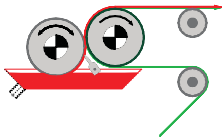
Powder scattering system



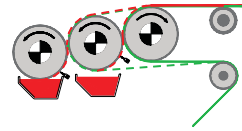
Reverse roll coating system



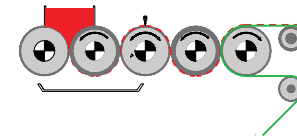
Micro roller coating system



2-roller coating system

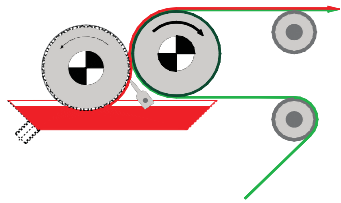


3-roller combi coating system

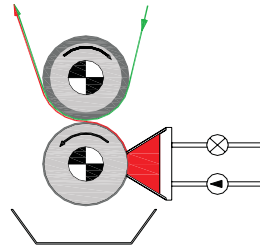


5-roller coating system

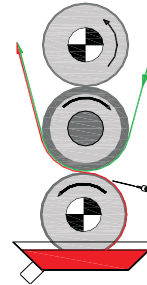
Printing systems



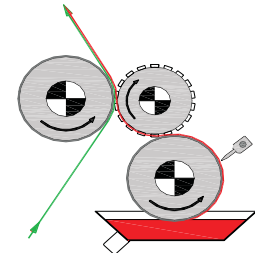
Engraved roller system



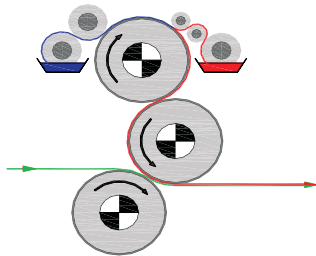
Gravure roller system



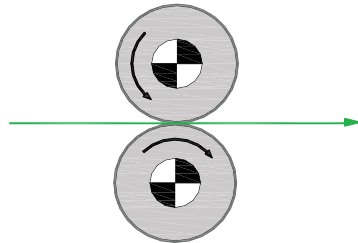
Gravure indirect system



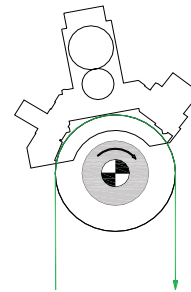
Flexography system



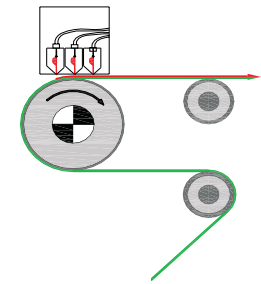
Offset lithography system



Hot embossing system



Nanoimprint system



Inkjet system

Coating parameters

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

Our work in associations – global networking



Board Member:
OE-A

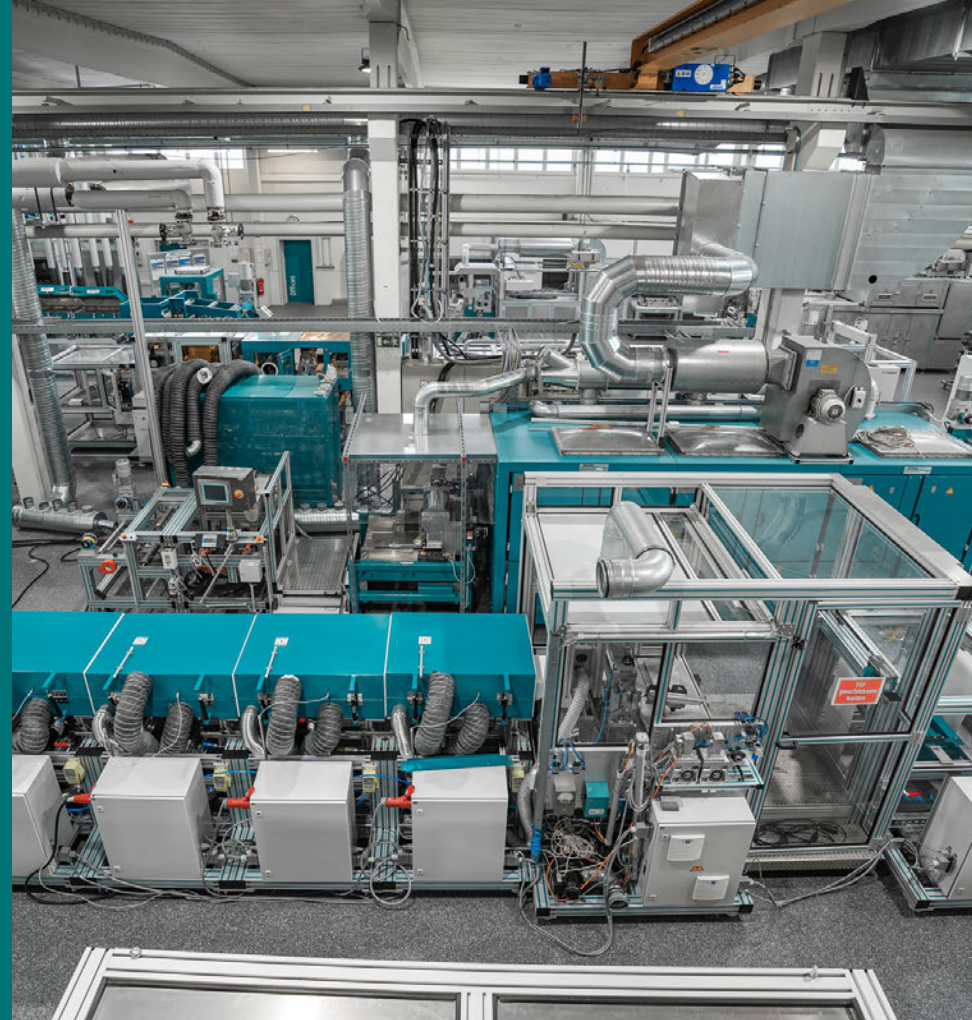
Advisory Board:
Fraunhofer ITA

Coatema customers



2.

Coatema research & development centre



R&D power houses

KROENERT – Drytec – Coatema

- ✓ R&D space: 2 000 m²
- ✓ 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 services

Process development

- ✓ Feasibility study
- ✓ Ink – process study
- ✓ Process analysis
- ✓ Proof of concept
- ✓ Small scale prototype

Test production

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

Education

- ✓ Coatema conference
- ✓ Training of customers
- ✓ Education of students

After sales service and ramp up of processes

- ✓ of Coatema units

Development of custom made design for equipment

- ✓ Prototyping
- ✓ Proof of concept

Funded research projects

- ✓ 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

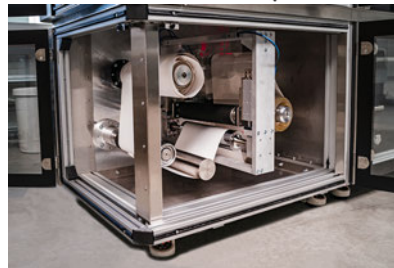
Roll-to-Roll – R2R

up to 500 mm width

Operation speed

0.1 to 100 m/min

Benefits

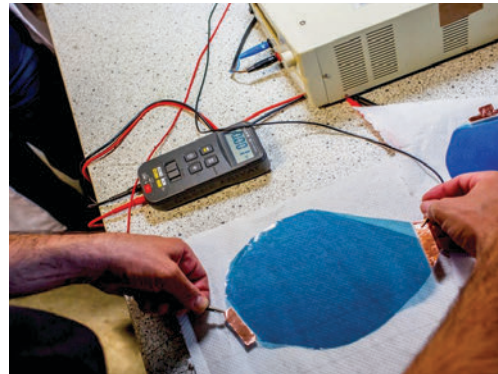


With Coatema application experts and interdisciplinary expertise.

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

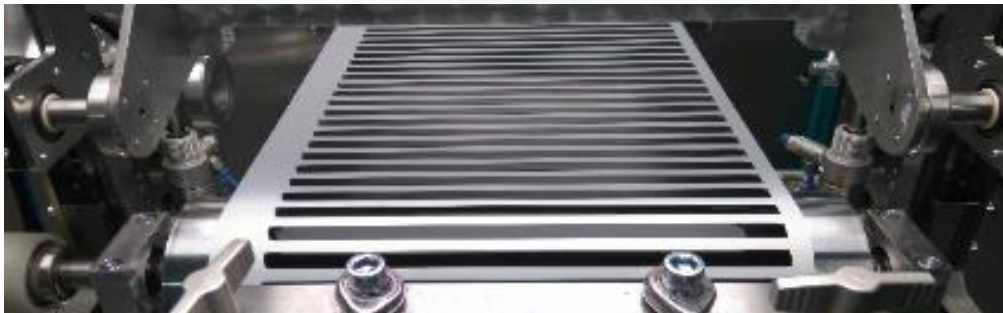
R&D services



Services include:

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

Cutting edge technology



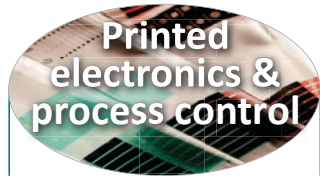
Services include:

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

R&D customers

TECHNISCHE UNIVERSITÄT DRESDEN
KIT Karlsruhe Institute of Technology
Agency for Science, Technology and Research SINGAPORE
THE UNIVERSITY OF ARIZONA
UNSW SYDNEY
Queen Mary University of London
ARISTOTLE UNIVERSITY OF THESSALONIKI
TTRI Taiwan Textile Research Institute
ITA Institut für Textiltechnik und Lehrstuhl für Textilmaschinenbau
RWTH AACHEN UNIVERSITY
NREL Transforming ENERGY
RUHR UNIVERSITÄT BOCHUM
RUB
TECHNICAL UNIVERSITY OF LIBEREC www.tul.cz
hochschule hof University of Applied Sciences
Deutsches Textilforschungszentrum Nord-West German Textile Research Centre North-West
cea Centre for Nanotechnology and Smart Materials
Fachhochschule Kiel Hochschule für Angewandte Wissenschaften
CENTI Centre for Nanotechnology and Smart Materials
FILK Forschungsinstitut Leder und Kunststoffbahnen
Hochschule Niederrhein University of Applied Sciences
Georgia Institute of Technology
UNIVERSITY OF CAMBRIDGE
Neue Materialien Fürth
JOANNEUM RESEARCH
HERIOT WATT UNIVERSITY
ZSW
DITF DEUTSCHE INSTITUTE FÜR TEXTIL+FASERFORSCHUNG
JÜLICH FORSCHUNGSZENTRUM
NATIONAL UNIVERSITY of MONGOLIA
VTT
TNO innovation for life
eurecat Centre Tecnològic de Catalunya
Fraunhofer IMM
Fraunhofer LBF
KITECH Korea Institute of Industrial Technology
Holst Centre Open Innovation by them and THEM
Hochschule Reutlingen Reutlingen University
Fraunhofer IAP
Fraunhofer IAF
Fraunhofer ILT
Fraunhofer IFAM
Fraunhofer ISC
Fraunhofer IFP
Fraunhofer IVV
Fraunhofer ISE
Fraunhofer ICT
Fraunhofer PYCO
Fraunhofer IPT
Fraunhofer IWM

R&D projects overview 2022

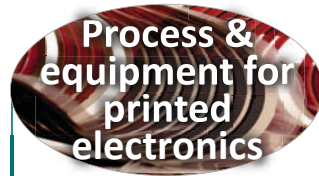


In-line and real-time digital nano-characterization for flexible organic electronics



Oled Solar

Advanced production for opto electronics towards industry 4.0



EffiLayers

R2R process optimization of organic photovoltaic cells



Development of near-field electro hydrodynamic nanowire printing



Implementation of laser drying processes for lithium-ion battery production



R2R process optimization for solid state batteries



Plasmonically enhanced photocatalysis for wastewater treatment

RetroWin

R2R Process and machinery development for retrofit window films for lower production costs

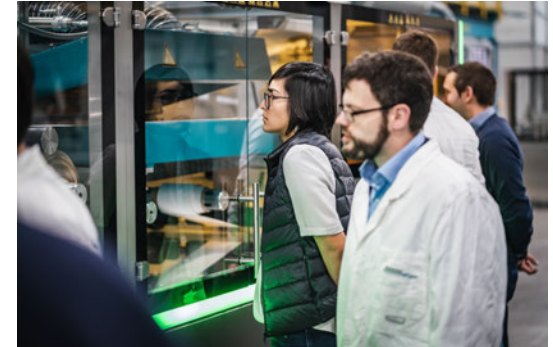


Sustainable paper-based printed electronics and biosensing platform



Creating an open-innovation testbed for sustainable packaging

Coatema research & development centre

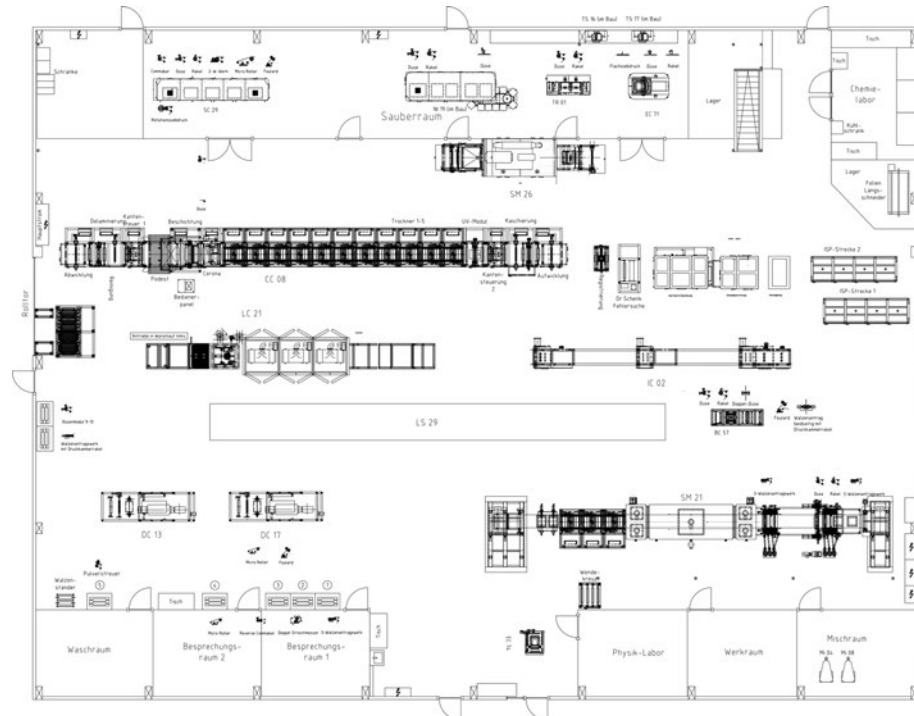


3.

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

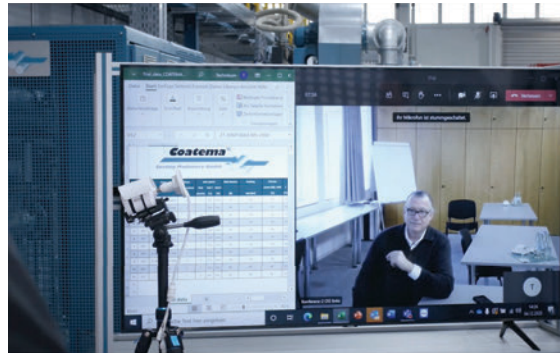
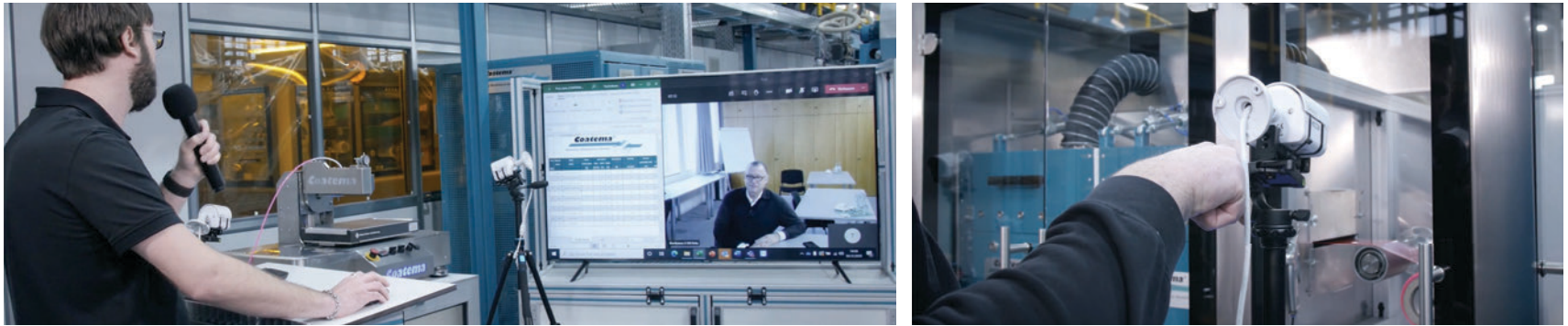
Rotary and flat screen

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

Coatema



Thank you

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www.coatema.com

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