



# Jagenberg Converting Solutions

Company overview

# Agenda.

---

**01** Jagenberg Group

---

**02** Jagenberg Converting Solutions (JCS)

---

**03** JCS Energy

---

**04** Other battery solutions from Jagenberg Group

---

**05** JCS Surfaces

---

01  
Jagenberg Group



# Key facts.

2023: ~370

Turnover in Mio. €

Locations in Europe,  
China, India and the  
USA

Locations

2023: ~1.500

Employees

Klenewefers GmbH  
86 %

Jagenberg AG  
82 %

Equity ratio

100 %

Private ownership

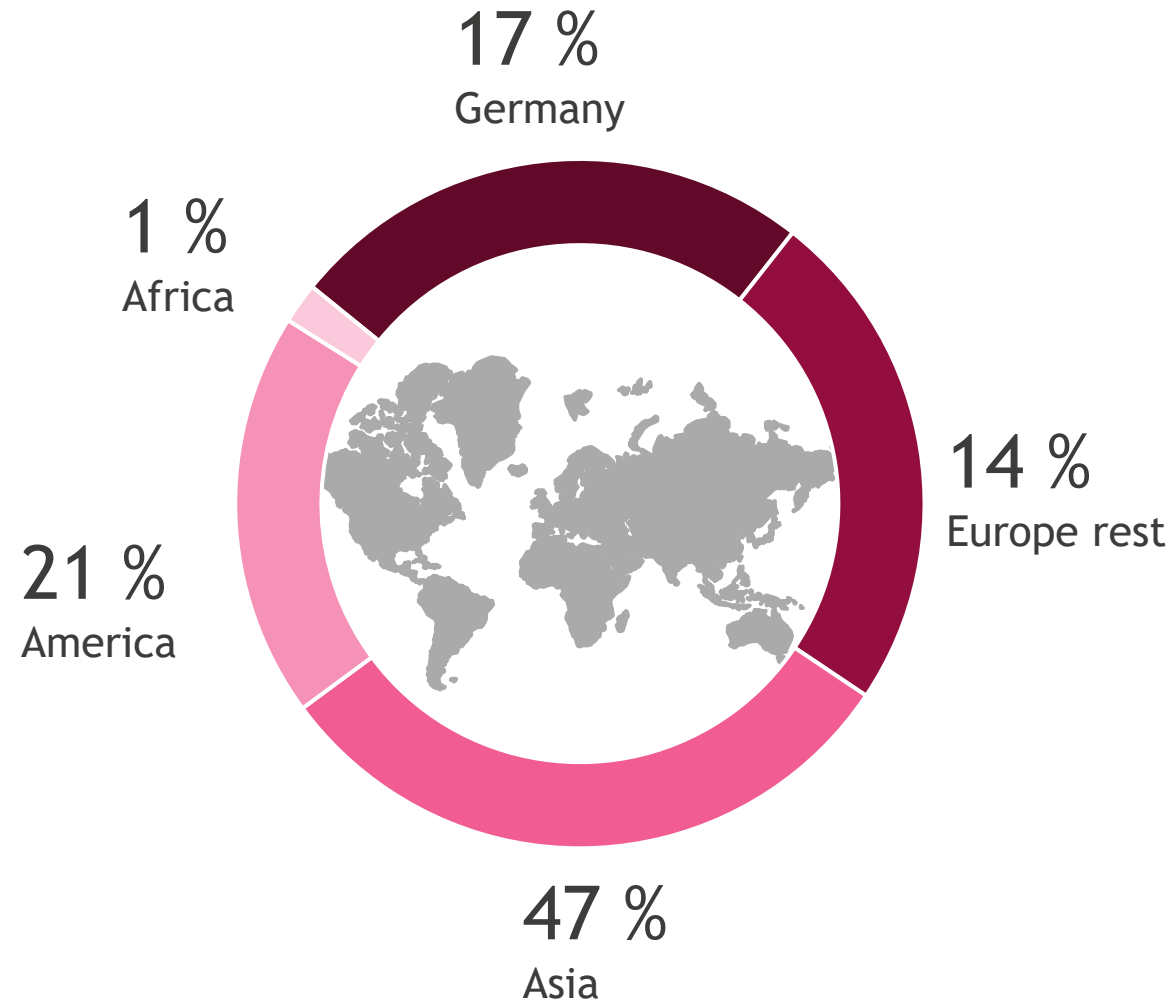
7

Business parks



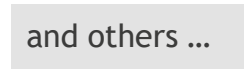
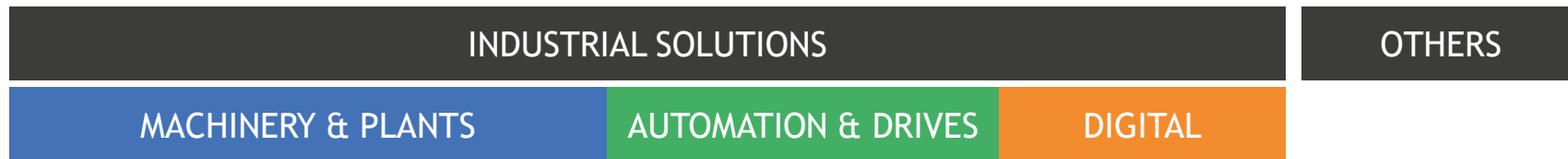
Executive Board  
Dr. Christian Jostes  
Dr. Stephan Witt

# Sales by region.

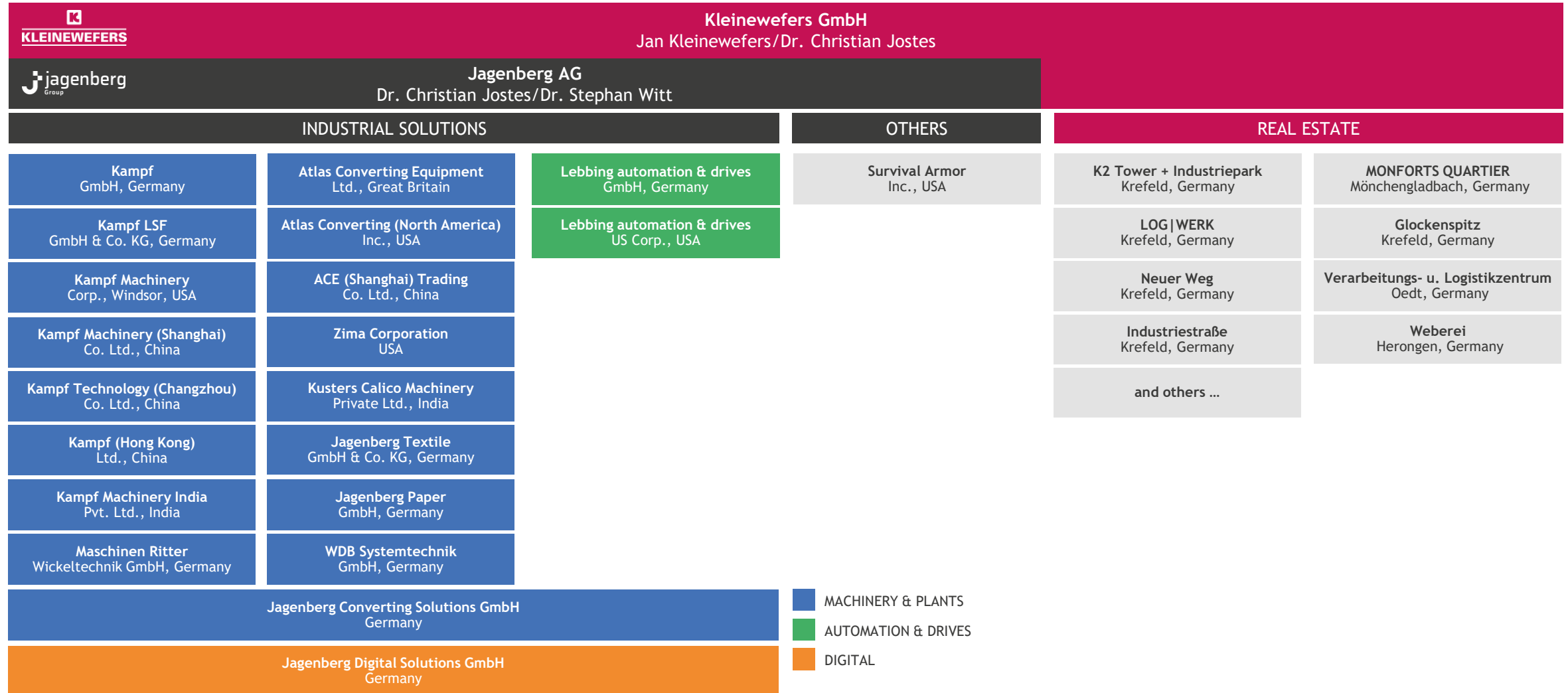


Fiscal year 2023

# Kleinewefers Group



# Kleinewefers/Jagenberg Group



- MACHINERY & PLANTS
- AUTOMATION & DRIVES
- DIGITAL

# Our mission statement. Create.Future.Together.



## Create.

Innovative technologies for processing web-shaped materials are the historically grown core of the Jagenberg Group and have been our focus for over 140 years. We design creative and future-oriented solutions for our customers. Our thinking is entrepreneurial and our culture mid-sized. Short decision-making processes, a high level of action competence and an agile organization enable us to take successful steps into the future quickly and decisively.

## Future.

We are ready to face the dynamic changes that the future holds for all of us - be it technological progress, digitization or climate change. Based on our values, we as a Group are actively working on innovative solutions to harness these megatrends in an economically and ecologically sustainable way for our customers and ourselves.

## Together.

Together we are strong! This motto characterizes the cohesion in our group. We face the future as a strong team of doers and creative minds. Together with our customers, suppliers and partners, we create the future. Through a fair and trusting exchange, we learn from each other and build long-term and reliable partnerships together.



# Our values. What we care about.

Trust.

Integrity.

Reliability.

Fairness.

Respect.

Openness.

Honesty.

# Our fields of application.



Coating/  
Laminating



Lacquering/  
Embossing



Drying



Printing



Calendering



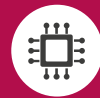
Slitting/Winding/  
Spooling



Handling



Dyeing/Bleaching/  
Mercerising



Automation  
& Drives



Machine safety/  
CE-conformity



Digitization

CARING FOR  
THE FUTURE.



# Sustainability Strategy. Caring for the Future.

Our sustainability strategy systematically signifies our commitment to take responsibility and minimize negative environmental impacts.

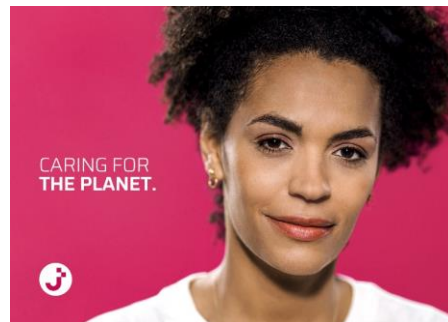
We respond to challenges by making the most of our strengths and skills and sharing our knowledge within the Group and with our suppliers and customers. Our comprehensive approach enables us to adopt new perspectives and develop sustainable solutions.



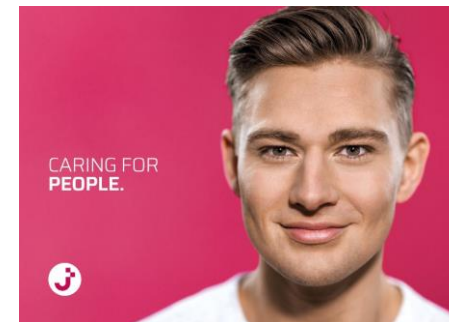
# Sustainability Strategy. Our Sustainability Report.



Climate action



Resource awareness

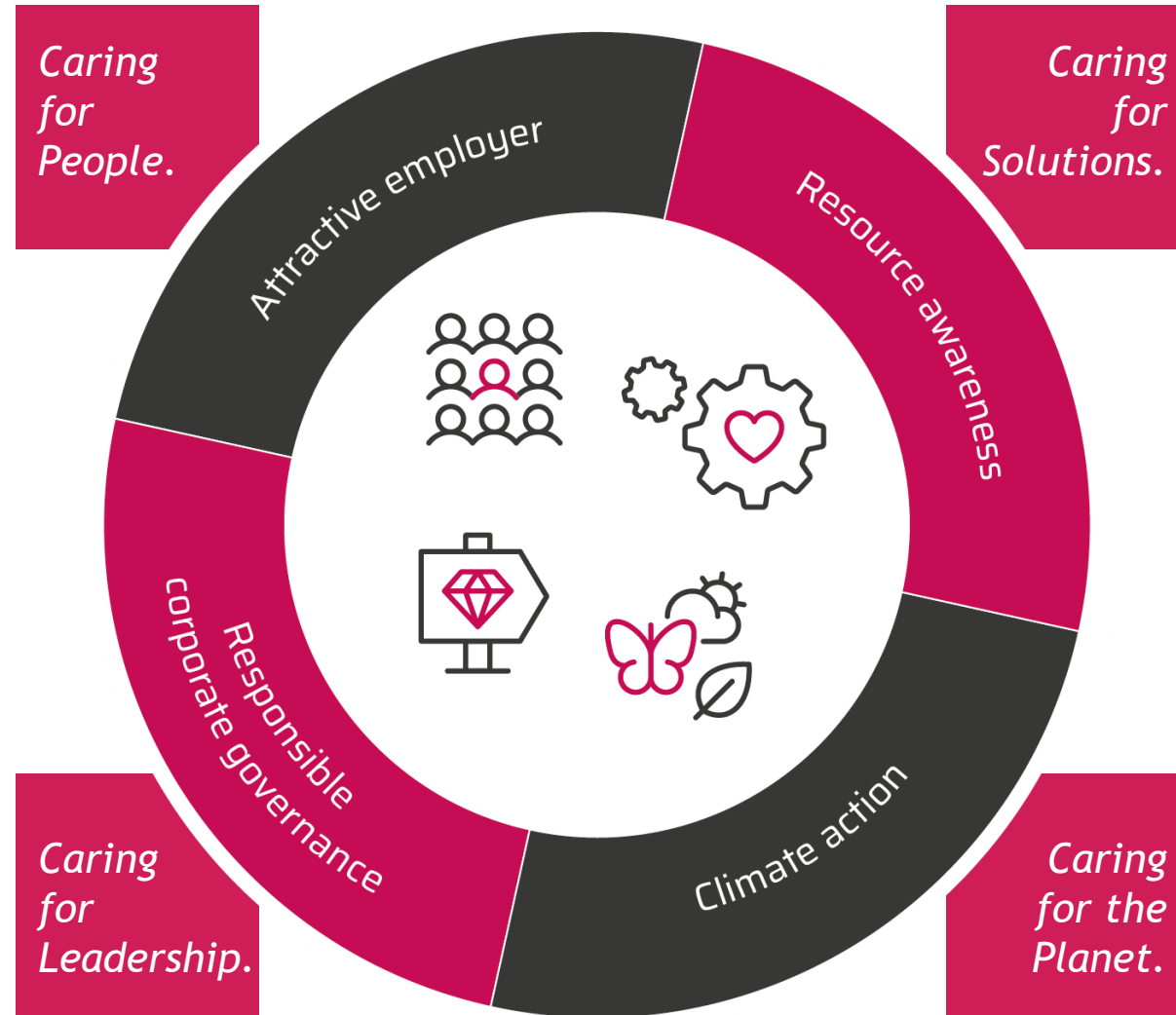


Attractive employer



Corporate governance

# Sustainability Strategie. Guiding themes.



# Sustainability Strategy.

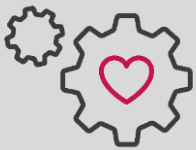
## Our fields of action.

We concentrate on the following action areas:



### *Climate action*

We support the Paris Agreement and are actively helping to reduce carbon emissions.



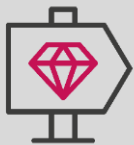
### *Resource awareness*

We establish a responsible approach to the use of resources along the entire value chain.



### *Attractive employer*

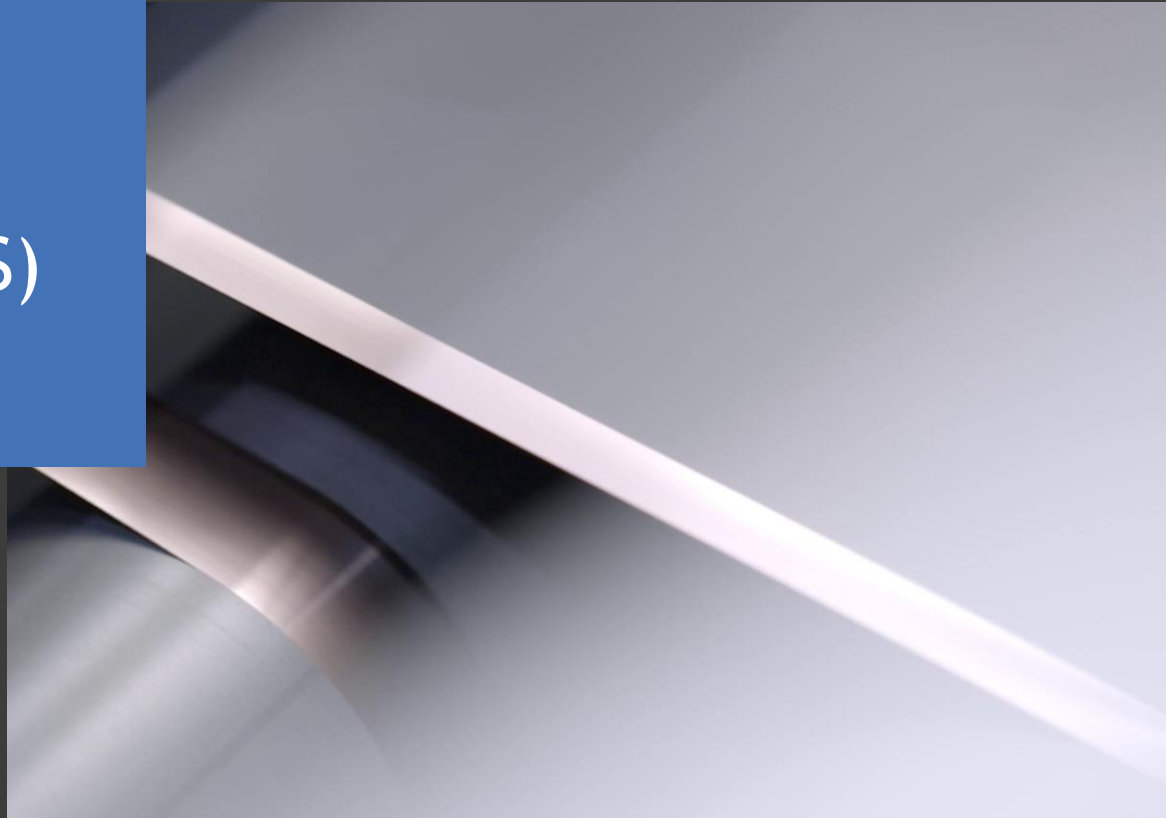
As an employer, we attach great importance to treating our employees responsibly and respectfully. We create attractive conditions to promote personal and professional development.



### *Responsible corporate governance*

In line with our value system, we act on the basis of irreproachable conduct from an ethical and legal perspective.

02  
Jagenberg  
Converting  
Solutions (JCS)







## Integrate.Converting.Competences.

Your turnkey solution for the production of innovative foils for Surface and Energy applications.



# The company at a glance

JCS integrates competences and technologies into a single solution for applications in the Energy and Surfaces industries. We thereby extend our own products with state-of-the-art components and services from other members of Jagenberg Group.

## Purpose

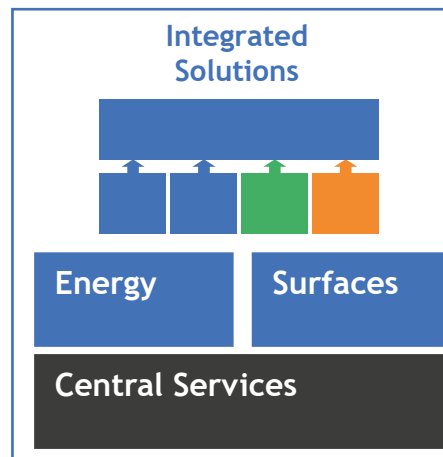
Bocholt  
Krefeld  
Hamburg  
Erlangen  
Ostwestfalen-Lippe

## Locations

**>80 employees**  
and **>500**

located within other  
Group companies

## Employees



## Management Team

Thomas Lebbing (Managing Director)  
Guido Lebbing (Managing Director)  
Steffen Heckmann (Managing Director)

# Where we are active

## Energy

Battery

Fuel Cell



Serial production equipment

*Turnkey*

Components

Process know how

## Surfaces

Décor  
printing

Coating



Décor printing  
product lines

Coating  
modular kit

*Turnkey*

Components

Process know how

# Where we are located

## Energy

Hamburg & Erlangen



Battery

Fuel Cell

## Surfaces

Schloß Holte-Stukenbrock & Enger



Décor printing

Coating

## Central Services

Krefeld & Bocholt



Finance &  
Controlling

Marketing

Human  
Resources

Sustainability

IT

M&A / PMI

# Where you can find us

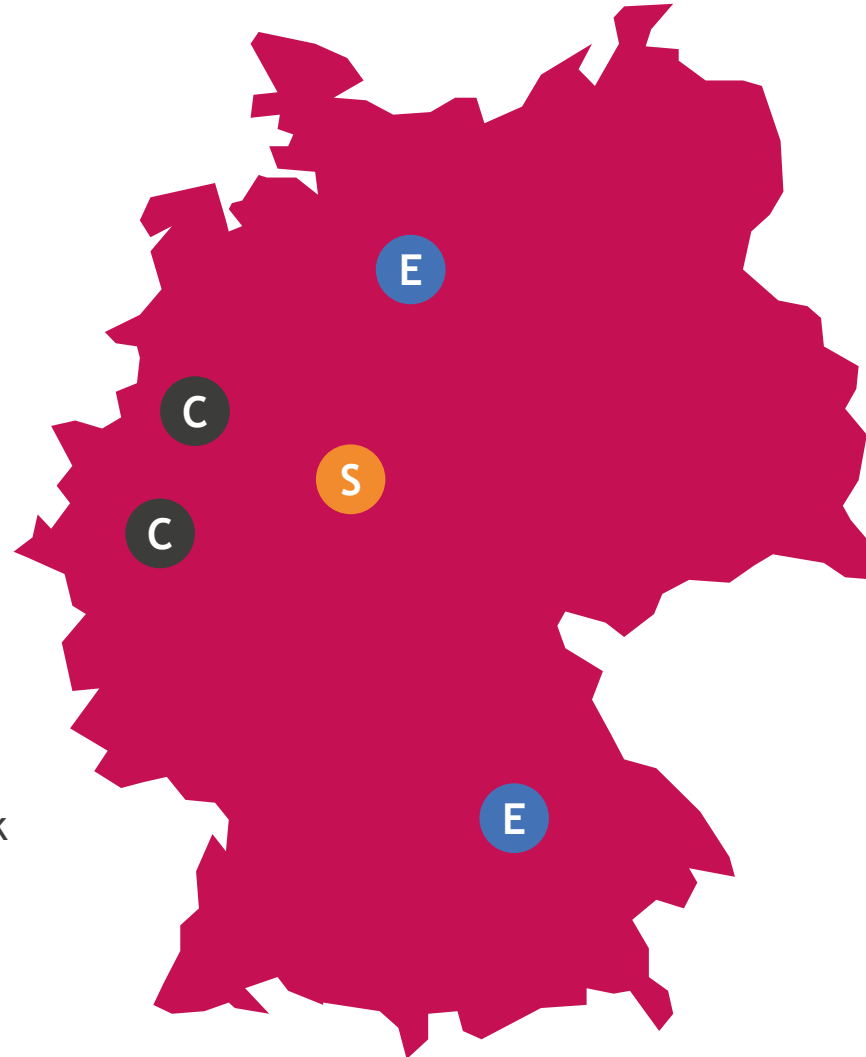
## Energy **E**

Friesenweg 32a  
22763 Hamburg  
+49 40 2285 107-0

Am Weichselgarten 34  
91058 Erlangen  
+49 9131 932 86 80

## Surfaces **S**

Hellweg 130  
33758 Schloß Holte-Stukenbrock  
+49 5207 986 76 02

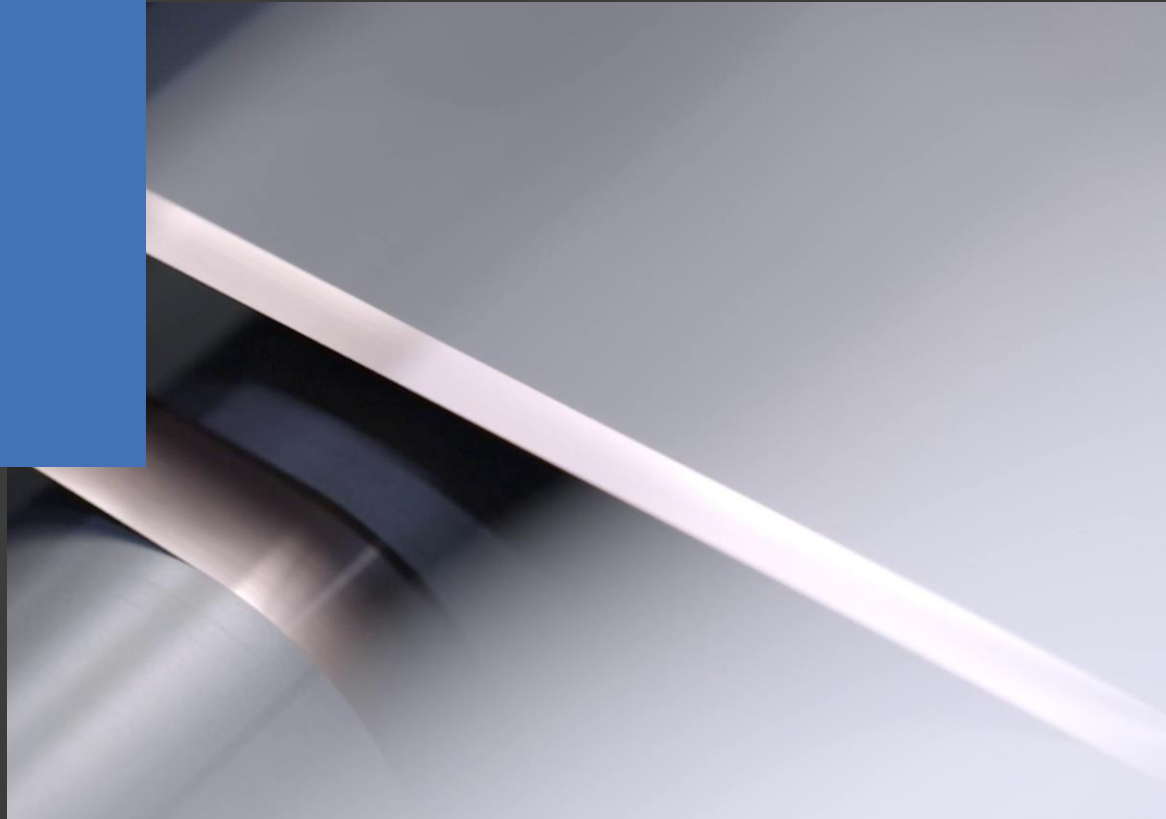


## Central Services **C**

Kleinewefersstr. 1  
47803 Krefeld  
+49 2151 93 40 99-0

Konrad-Zuse-Straße 16  
46397 Bocholt  
+49 2871 2412-500

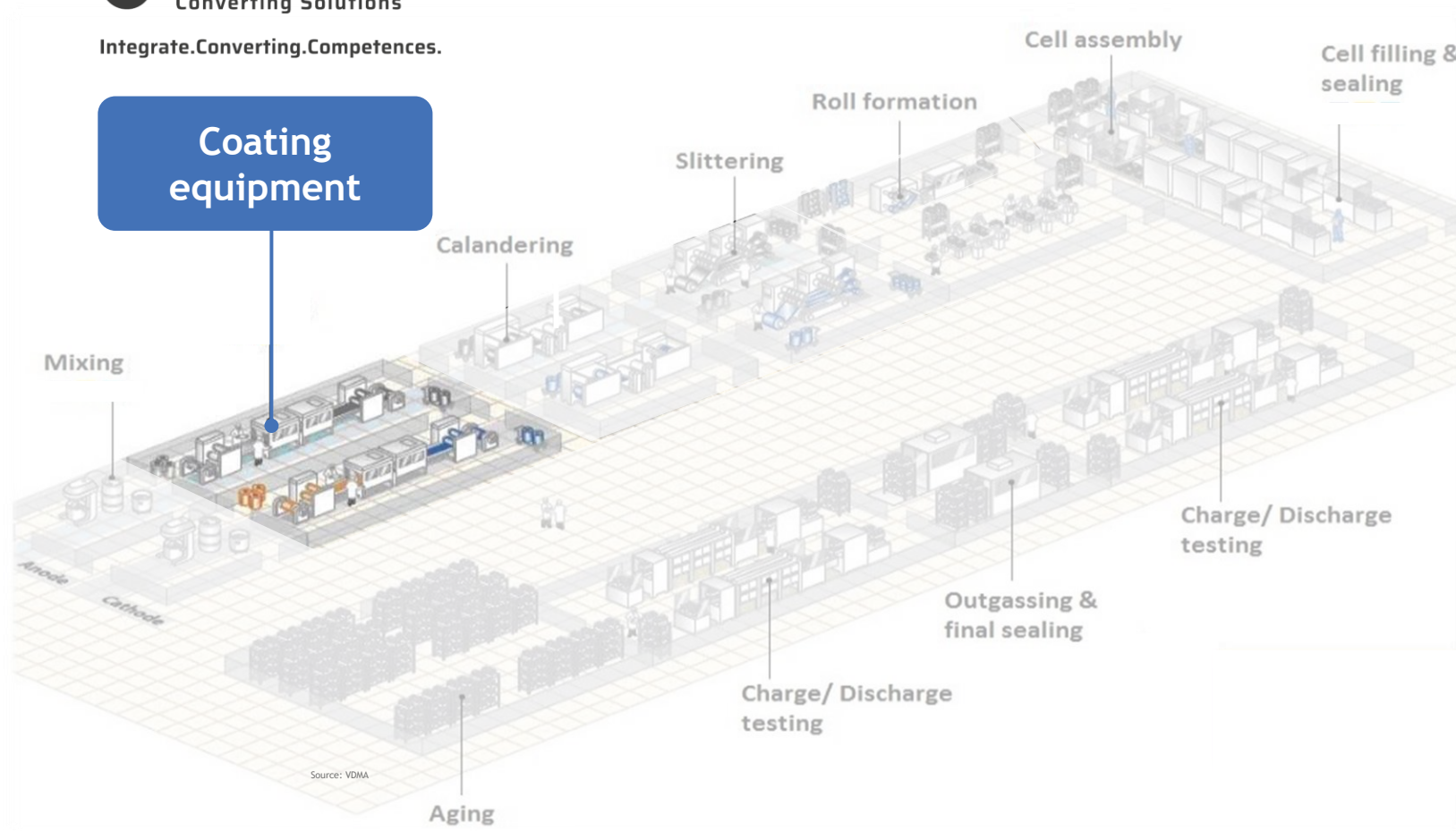
03  
JCS Energy



# Solutions for your battery foil production



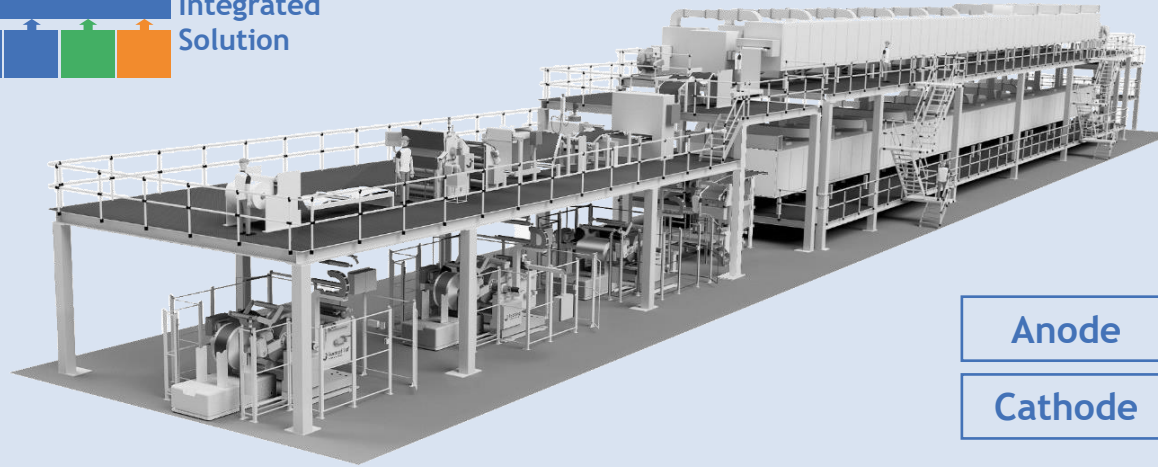
Integrate. Converting. Competences.



# Our product portfolio



Production equipment  
- turnkey



Anode

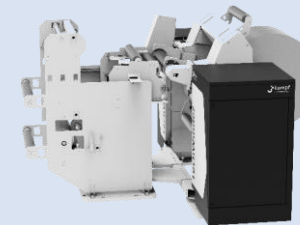
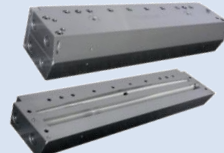
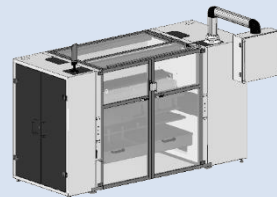
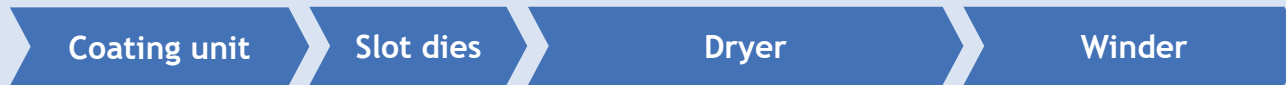
Cathode

## What we offer

- State-of-the-art wet coating equipment - turnkey, suiting your individual needs.
- Integration of components from Jagenberg Group companies and 3rd party suppliers.



Components for  
your individual  
application

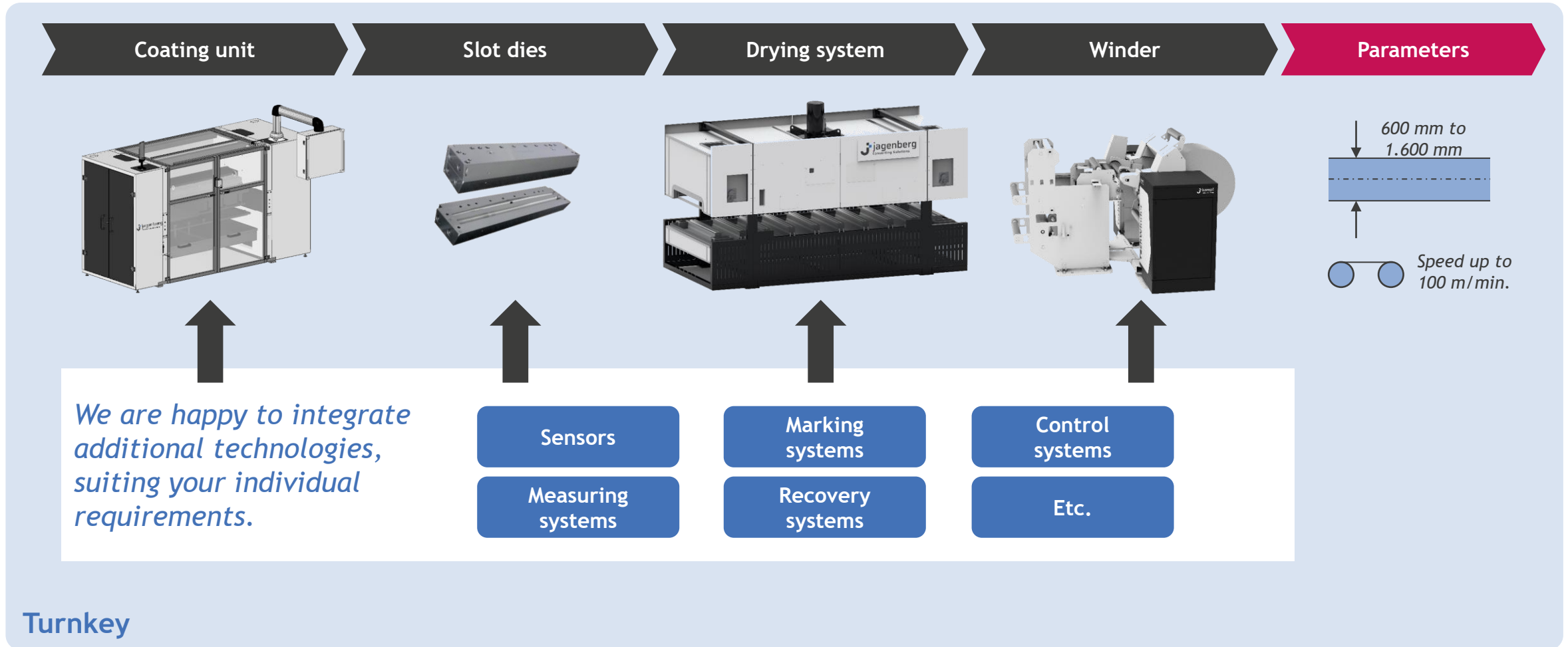


## What we offer

- Components that are made for high performance and high precision.
- Proven technology for the battery industry.
- Made for your individual requirements



# Configure your equipment with our standard components



# We can support you with our process know-how and technologies

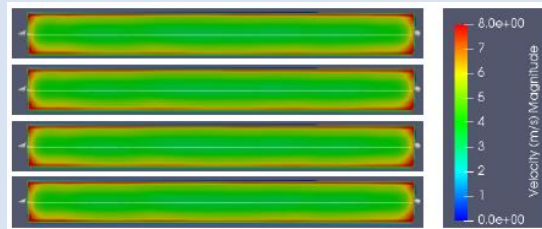
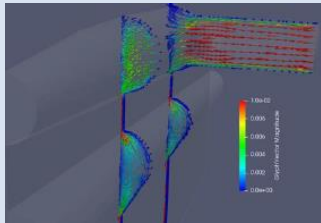
## Coating

Fluid measurements

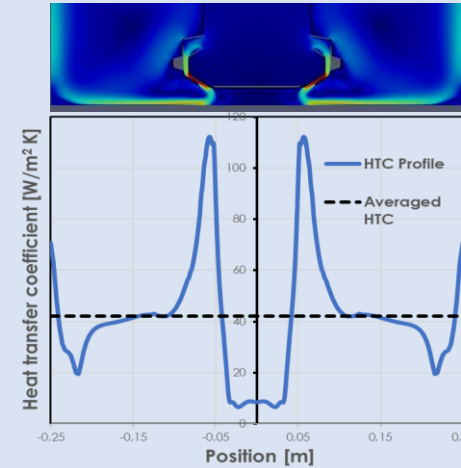
CFD simulations

Process window calculations

Practical feasibility studies (lab scale)



## Drying



Drying optimization

Drying curve calculations

CFD simulations

## High precision Slot Die

Tailor-made equipment that matches the coating process and plant design.

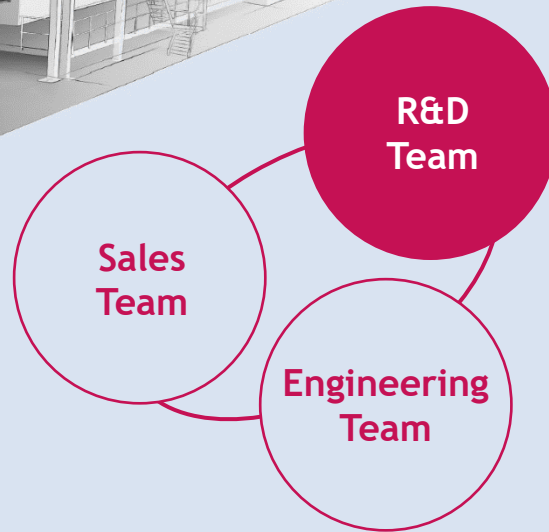
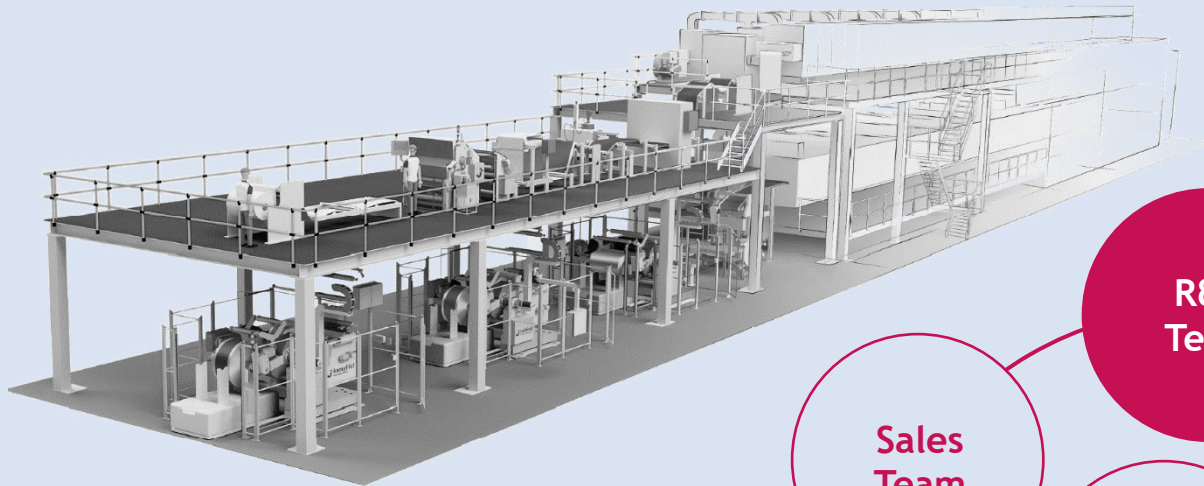


## LamiFlow Nozzle

The patented impingement-free nozzle provides a homogeneous temperature profile at high drying performance.



# We invest in the development of our equipment



## Associations & Research Institutions



# How we can contribute to your success



Integrate. Converting. Competences.

We focus on providing innovative and sustainable solutions for the battery industry.

## Our added value.

Advanced Solutions.



Increasing productivity.



Total cost of ownership.



Reduction of waste.



Carbon footprint.



## Advanced technologies as enabler.

Process engineering

Technology

Automation & Drives

Digitization

Handling systems

Functional safety

Connectivity

# Production equipment - turnkey for electrode production



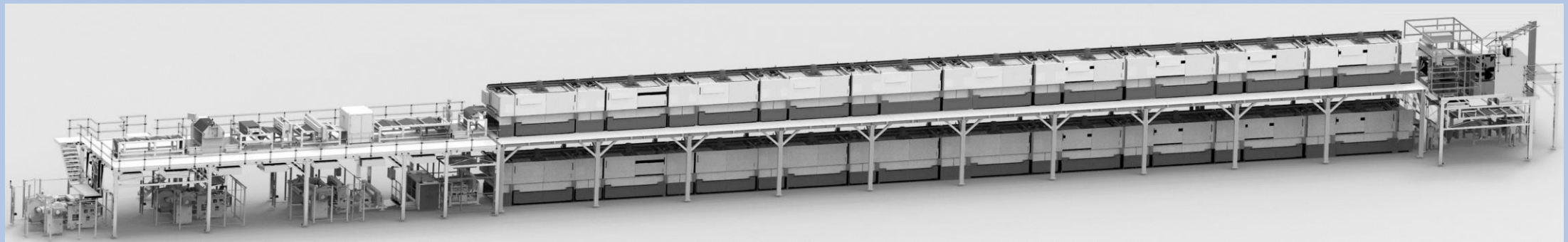
Integrate. Converting. Competences.

- Coating unit
- Slot dies
- Dryer

- Process technology
- Project management
- Site management

- Single point of contact
- Installation
- Commissioning

- Process optimization
- Start-up
- 24/7 hotline



**kampf lsf**  
Jagenberg Group  
Converting.Processing.Unlimited.

- Unwinder
- Rewinder
- Slitter

**kampf**  
Jagenberg Group  
Slitter.Winder.Kampf.

- Slitter

**lebbling**  
Jagenberg Group  
Automation.Drives.Future.

- Automation
- Safety

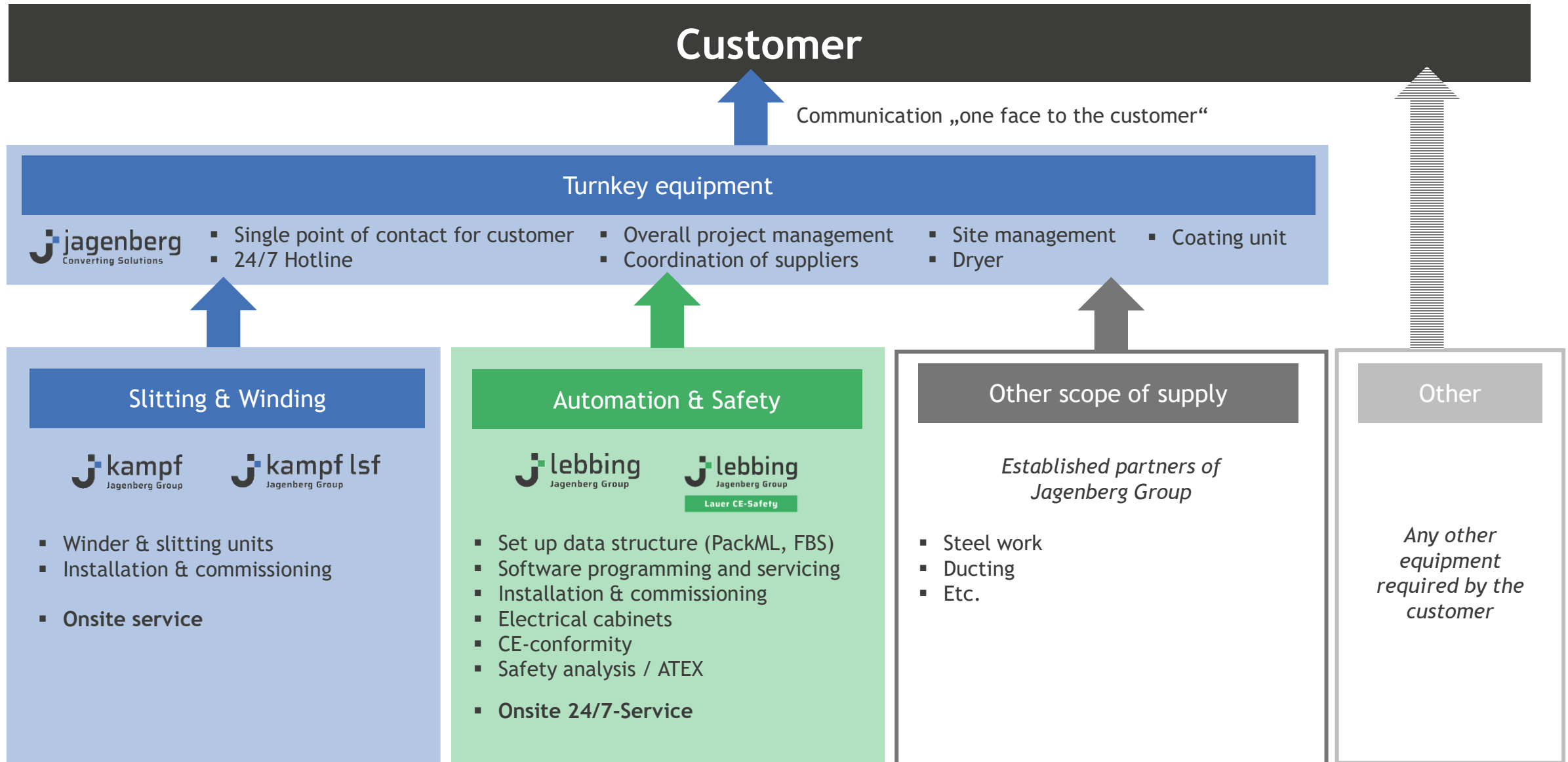
**jagenberg**  
Digital Solutions  
Connect.Develop.Advance.

- Digitization

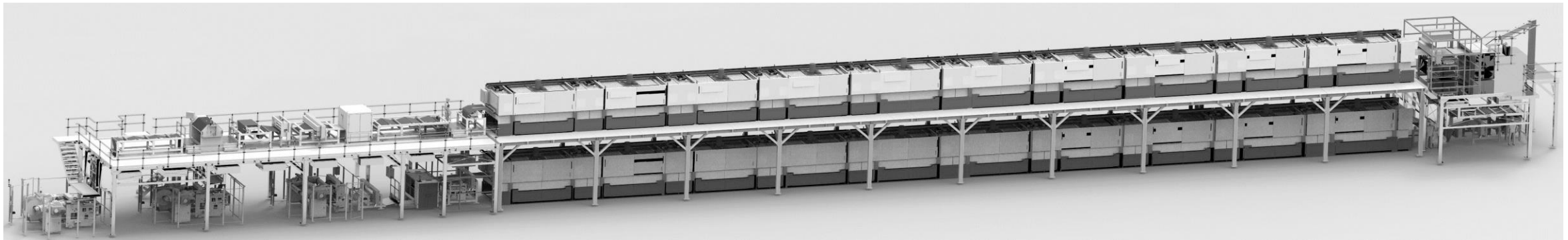
From our network of partners

- Measurement systems
- Steel work
- Others

# Turnkey equipment - scope and contractual setup



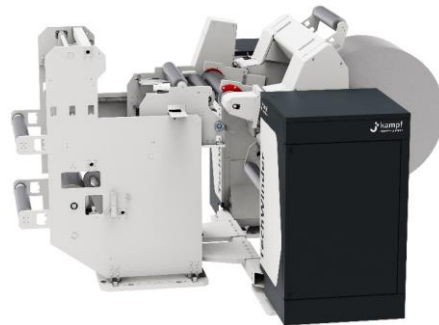
# Our offering



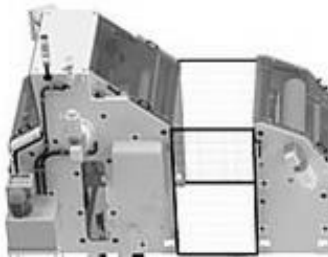
Converting.Processing.Unlimited.

Special machine engineering company which develop special solutions for processing and finishing of web-shaped materials

Turret rewriter



Slitting unit



Turret unwinder with auto-splice



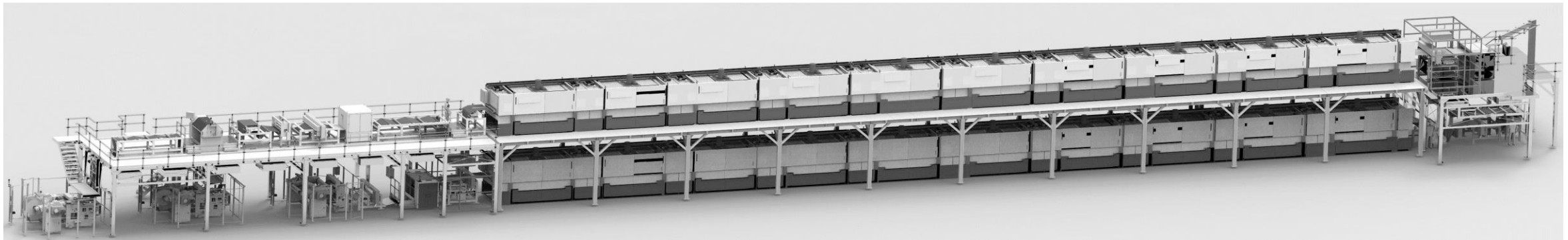
Slitter.Winder.Kampf.

The world's largest manufacturer of winders and slitters for demanding web materials and technological leader for 100 years

## Rewinder, slitter, unwinder.

In the manufacturing processes of cathodes and anodes for Lithium-Ion Batteries, turret unwinder and turret rewriter type EvoWinder are used before and after coating lines and calender systems. The specially designed turret systems enable continuous operation without any restrictions in speed and productivity.

# Our offering

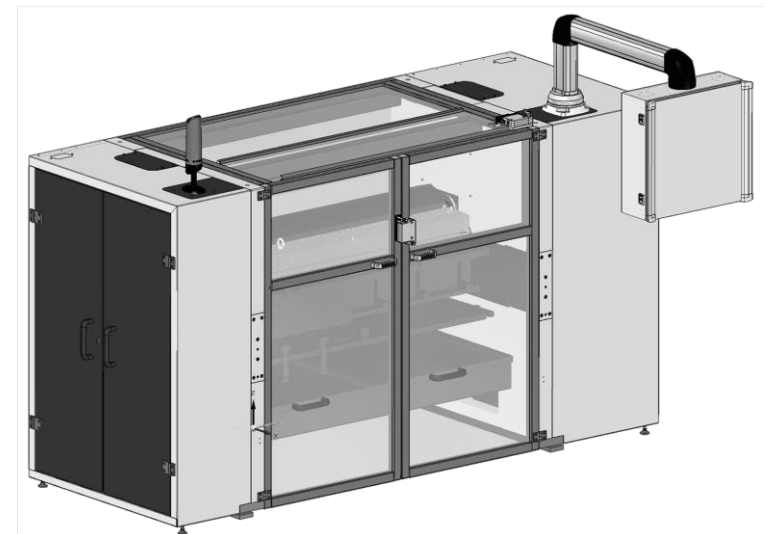
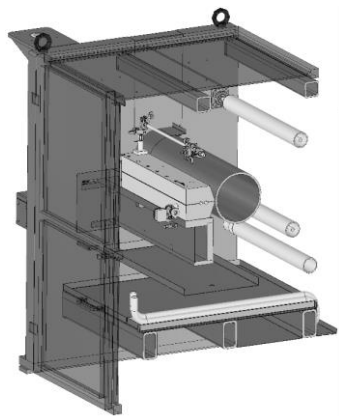


Integrate. Converting. Competences.

Specialist for coating technologies that develops and engineers the right solution for your individual application.

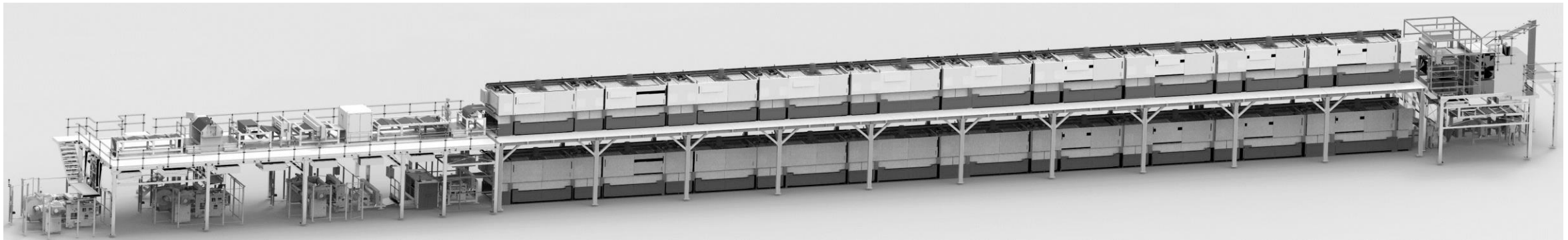
## Coating Unit

High precision die coater.  
High speed coating from pilot- to large-scale production.





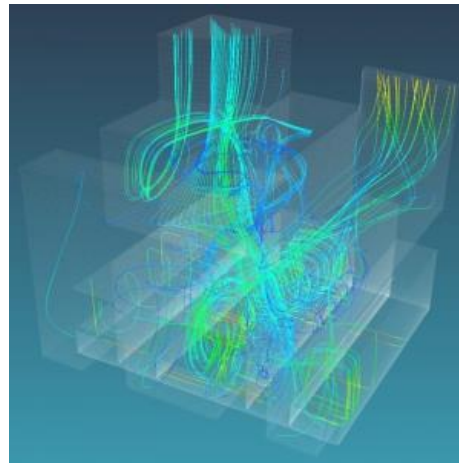
# Our offering



Integrate. Converting. Competences.

Partner for state-of-the-art drying technology engineered and built in Germany

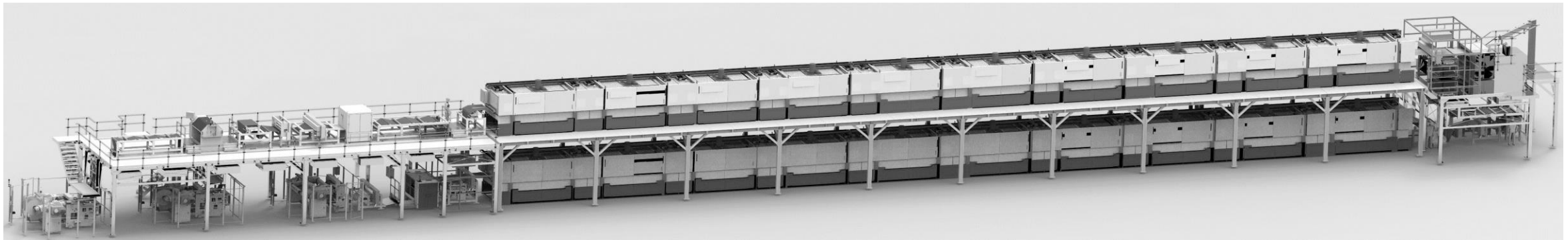
**Advanced drying technology.**  
The drying process affects the final battery performance to a large extent. We fit the best dryer for your requirements.



## Dryer



# Our offering



Jagenberg Group

Automation.Drives.Future.

Partner for all questions concerning drive and automation technology. Conceptual design, construction and production of electrical and switchgear systems

### Drive technology

**Mechatronic drive concepts.**  
From operating units to cabinet rows or complex switchgear containers for large systems.

### Control technology

**PLC & HMI operating and monitoring systems.**  
Pioneering technologies for operation and monitoring and for process visualization.

### Data systems

**Software development/ visualization systems.**  
Development of comprehensive visualizations with maximum transparency across all layers.

### Panel shop

**CE and UL certified panel shop.**  
With our own panel shop, we provide highest reliability for your delivery schedule.

### Start-up & Service 24/7

**Electrical installation / commissioning.**  
Team of globally experienced professional technicians and engineers for the installation and commissioning of systems “on-site”.



# Our offering

Unwinder

Coating Unit

Dryer

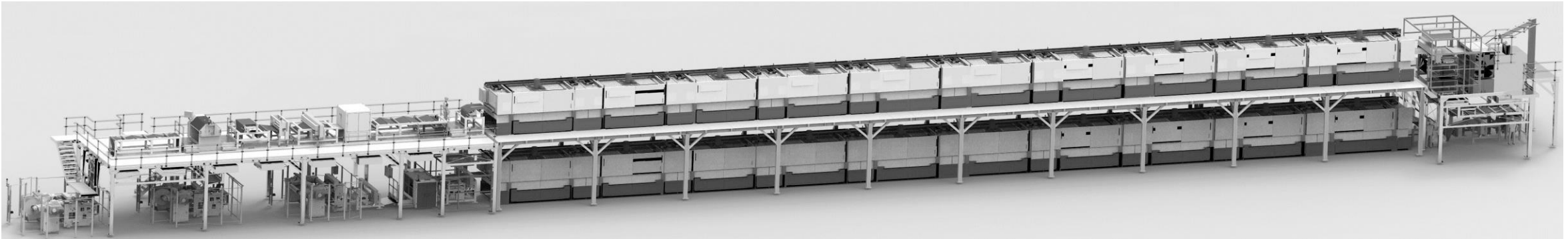
Slitter

Rewinder

Automation

Safety

Digitization



Lauer CE-Safety

Expert in all issues relating to CE marking, risk assessment, functional safety, assembly instruction and machine safety

## CE Marking & Risk assessment

### CE compliance.

From precise risk analysis and risk evaluation following the applicable directives to comprehensive research and analysis of standards (i.e. DIN EN ISO 12100) as well as safety-related review of machinery under construction.

## Functional Safety Engineering (FSE)

### EN ISO 13849 application.

Our specially trained control engineers support machinery constructors by designing, verifying and validating safety functions.

**ATEX 114 Directive 2014/34/EU.**

## User manuals & assembly instructions

### Operating instructions and technical documentation.

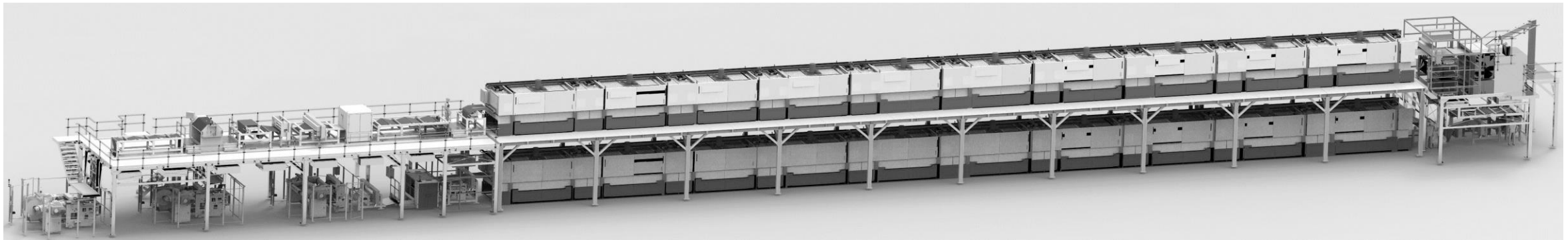
We provide full service in creating complete preparation of operating and assembling instructions or alternatively evaluates pre-prepared technical documentation and supports the creating process at the customers site by training.

## Professional CE-software

### Directives, risks and draw up manuals.

With the right software, these tasks can be completed faster and more efficiently. We offer proven CE-software products that are continuously updated.

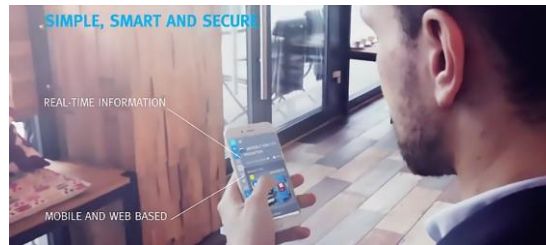
# Our offering



Connect.Develop.Advance.

We focus on improving processes in production and thus optimizing the efficiency of companies across the entire value chain

## IloT platform



**IloT for your equipment.** The platform offers digital intelligence for manufacturing. It connects machines, production and companies. It monitors production and bundles all relevant information for high production quality, resource conservation and low downtimes

## Data management



**Digitized manufacturing.** Manufacturing is brought to a new level. Our solutions enable direct interfaces to ERP-Systems, communication to MES-Systems as well as support traceability through roll protocols

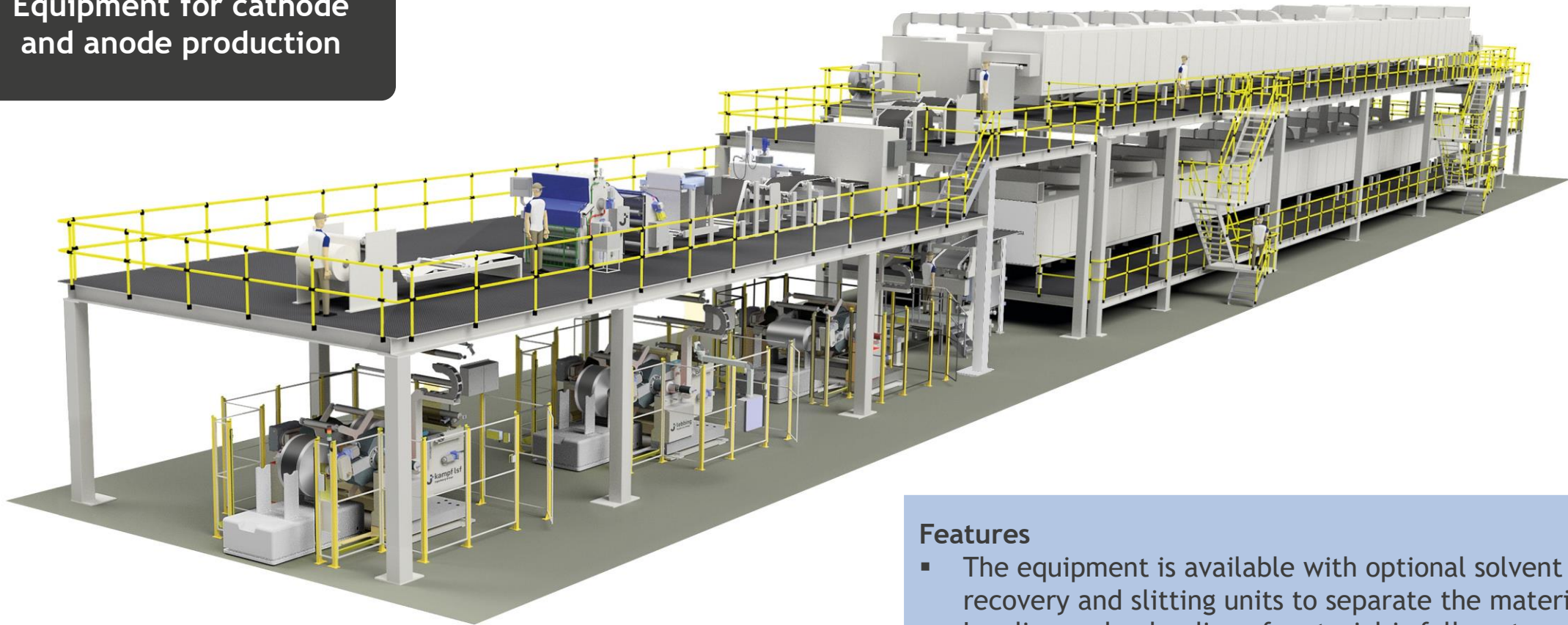
## Smart sensors



**Smart data harvester.** There are many different factors that can influence maintenance cycles and product quality. the@dge unit is simply installed and connected via LAN cable (PoE) and communicates with our IloT platform.

# Turnkey equipment - project example

Equipment for cathode and anode production



## Features

- The equipment is available with optional solvent recovery and slitting units to separate the material.
- Loading and unloading of material is fully automated with Automated Guided Vehicles.
- The equipment is connected to the MES-system.

# References - Tandem coating lines for battery electrodes



# How to reach us

**Thomas Lebbing**  
Managing Director Energy



[thomas.lebbing@jagenberg-converting.com](mailto:thomas.lebbing@jagenberg-converting.com)

04  
Other battery  
solutions from  
Jagenberg  
Group



INDUSTRIAL SOLUTIONS

MACHINERY & PLANTS

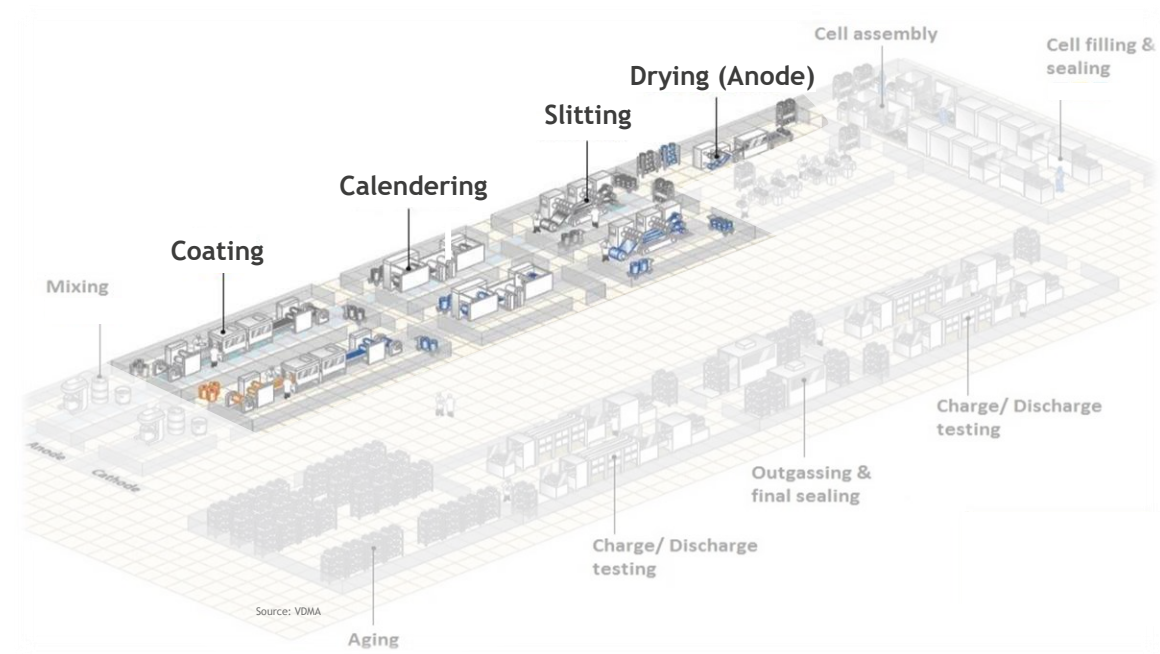
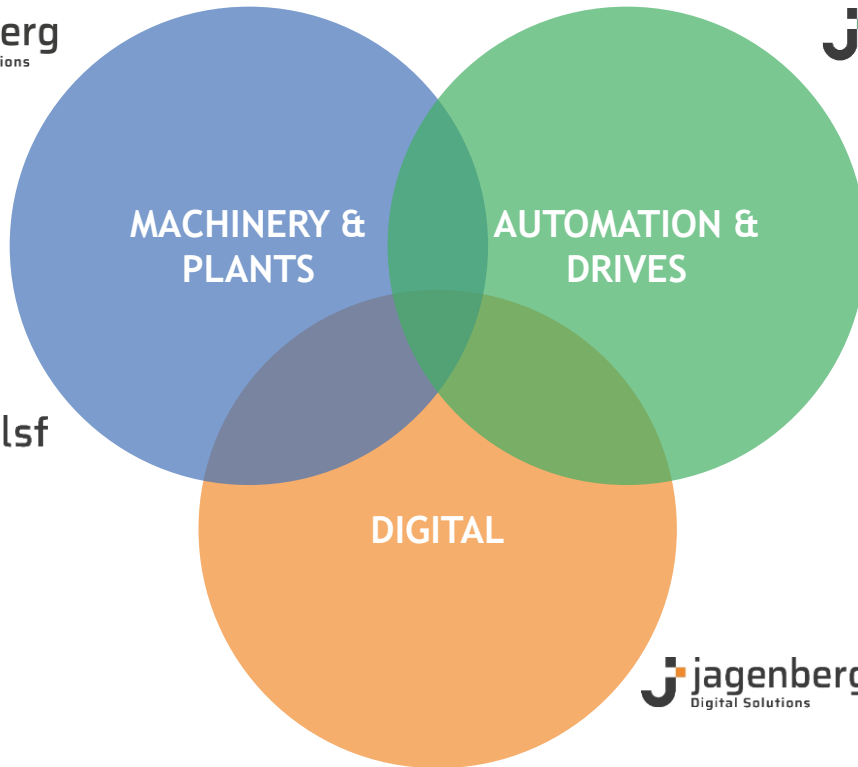
AUTOMATION & DRIVES

DIGITAL



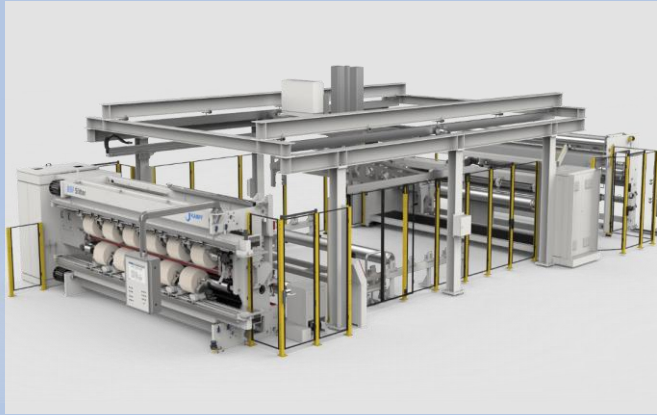


# More solutions along the battery production process



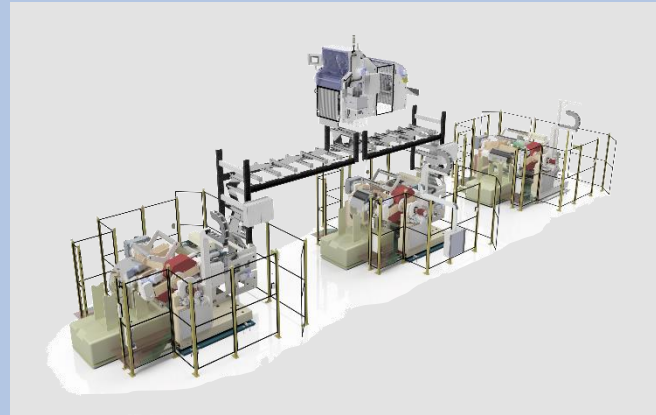
# Slitting & Winding solutions for the battery industry

## Separator



- Full width winder
- Primary slitter
- Secondary slitter

## Anode & Cathode



- Turret re-winder
- Turret un-winder
- Splicing systems, Slitting units

## Anode & Cathode



- Pilot line slitter re-winder
- Production machines

## Automation

Consistent increase in productivity for you:

- Planning
- Simulation (Digital Twin)
- Continuous communication & data flow
- Project management and implementation

Added value  
from a single source.

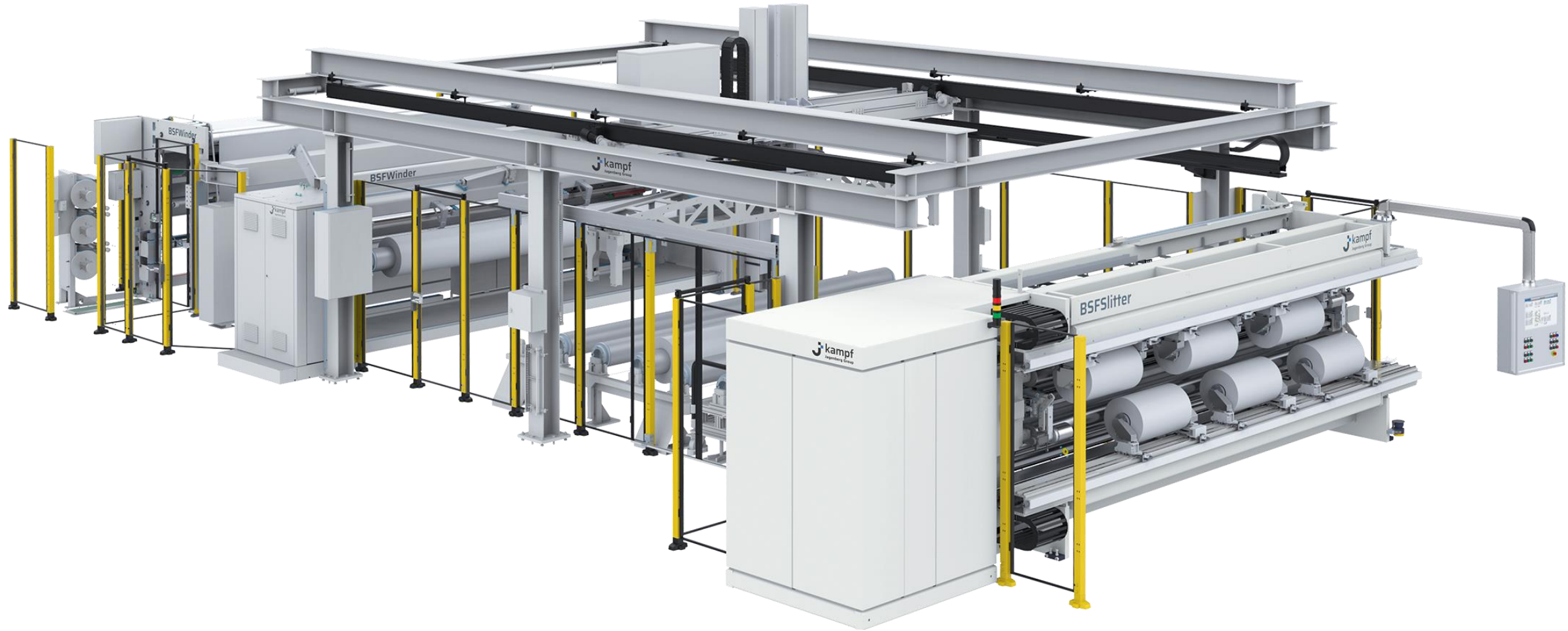


## Digitalization

Integrative digital added value for you:

- Production overview
- Digital roll protocols
- Connectivity
- Data mining

# References - Fully automated slitting cell for BSF



## Machinery scope

- Non Stop turret winder
- Primary slitter

## Automation scope

- Roll storage
- Portal robot

## Digitization Scope

- IIoT Platform
- MES / ERP communication
- Cloud connection

# References - Slitting for Anode and Cathode



Source: BMW Group, Battery Cell Competence Center

# How to reach us

**Thomas Lebbing**  
Managing Director Energy



*“We are happy to connect  
you with our partners from  
Jagenberg Group”*

[thomas.lebbing@jagenberg-converting.com](mailto:thomas.lebbing@jagenberg-converting.com)

05  
JCS Surfaces



# State of the art equipment for printing applications



Production  
turnkey  
equipment



Components for  
your individual  
application

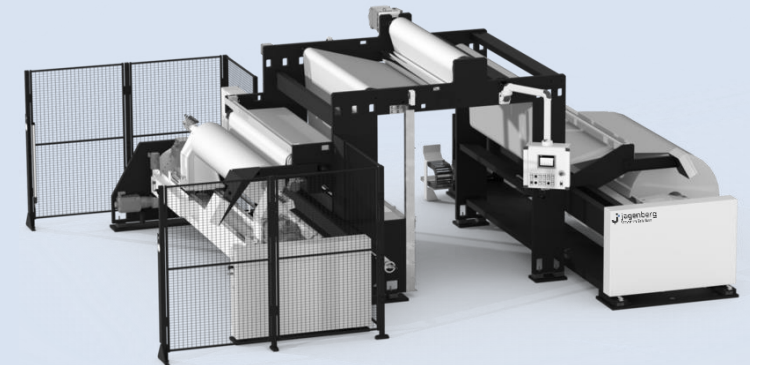
Winder



Printing, Lacquering &  
Coating unit

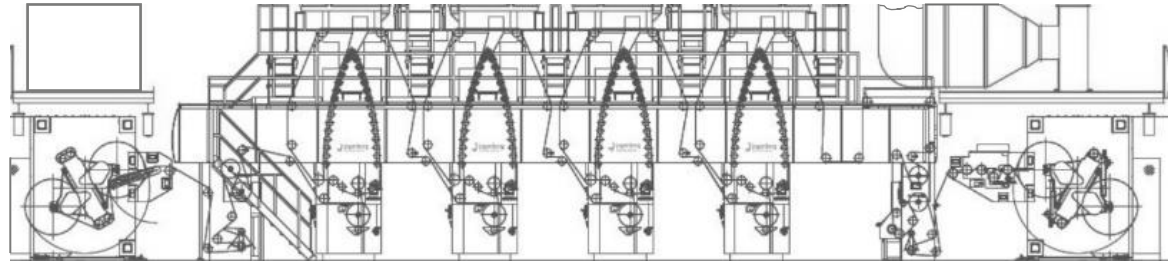


Re-winder



# Product lines for printing applications

## Performance Paper



### Main characteristics

- Higher speed
- Increased efficiency
- Many options
- New technologies

## Performance Film



### Main characteristics

- Optimized for film (PVC)
- Advanced drying technology

## Economy Film & Paper



### Main characteristics

- Moderate speed
- Highly standardized components
- Designed in Germany, built in India



# Our turnkey solutions

Project Mgmt.

Turnkey

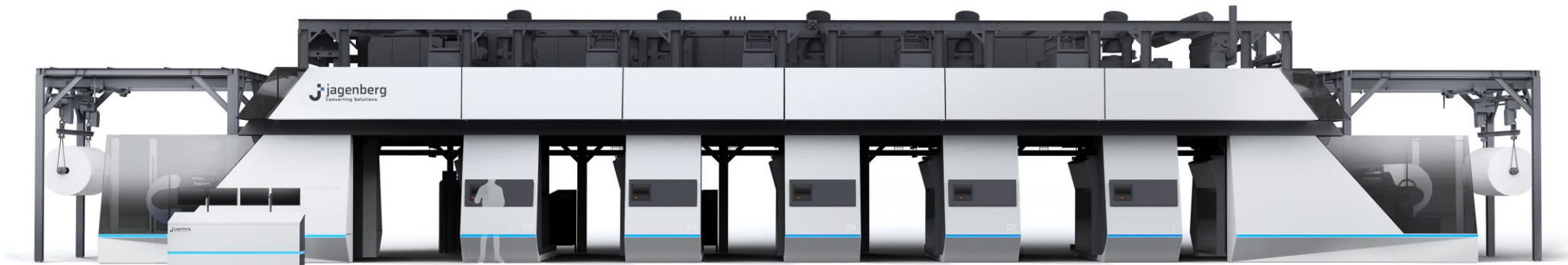


Integrate.Converting.Competences.

Lead  
engineering

Technology

**Your general contractor.**  
Integrates all competences in state-of-the-art  
surface production lines



Converting.Processing.Unlimited.

Unwinder

Rewinder

Coating units



Unique.Surface.Ideas.

Web handling

Printing units

Lacquering units



Textile.Converting.Excellence.

“Neptune”

Standardized  
Components



Automation.Drives.Future.

Automation

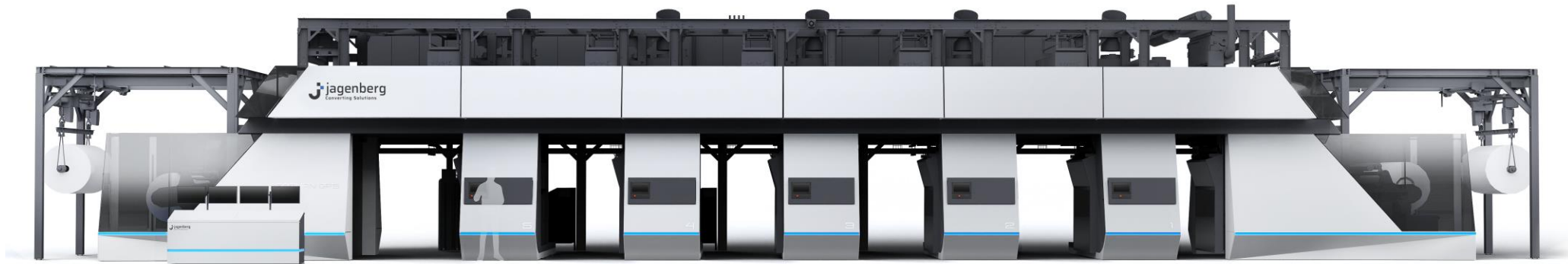
Safety



Connect.Develop.Advance.

Digitization

# Our offering



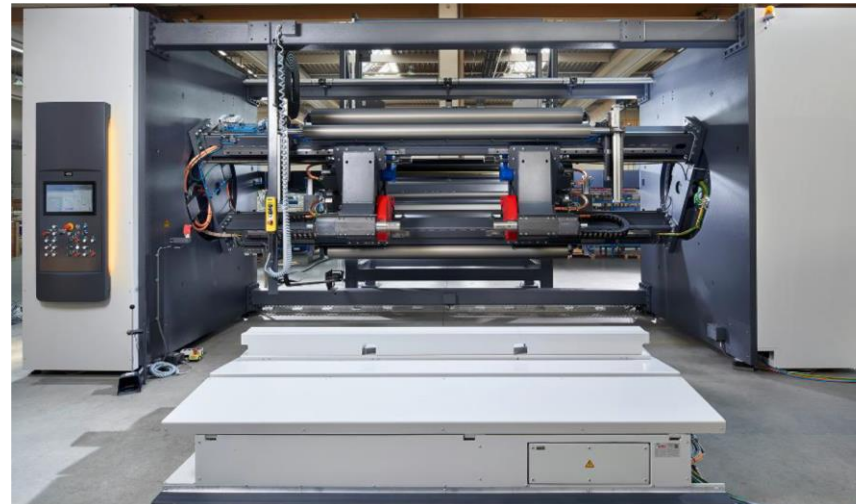
Converting.Processing.Unlimited.

Special machine engineering company which develop special solutions for processing and finishing of web-shaped materials

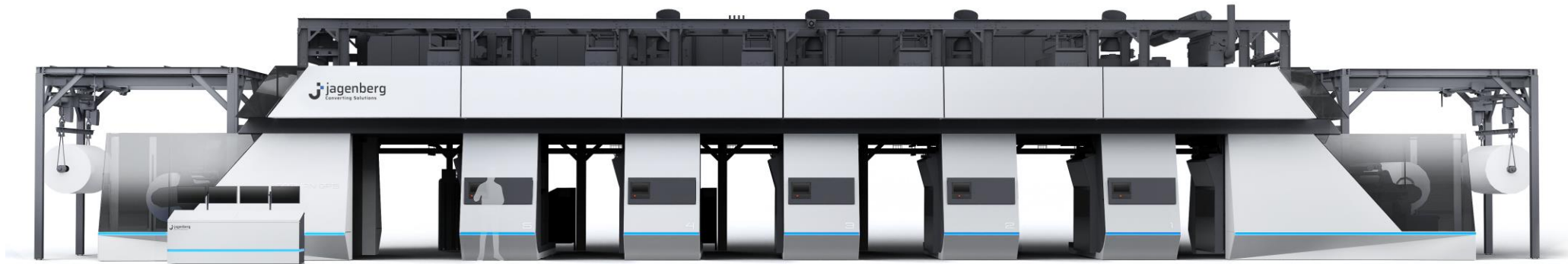
Turret unwinder with auto-splice

Turret rewinder

Coating units



# Our offering

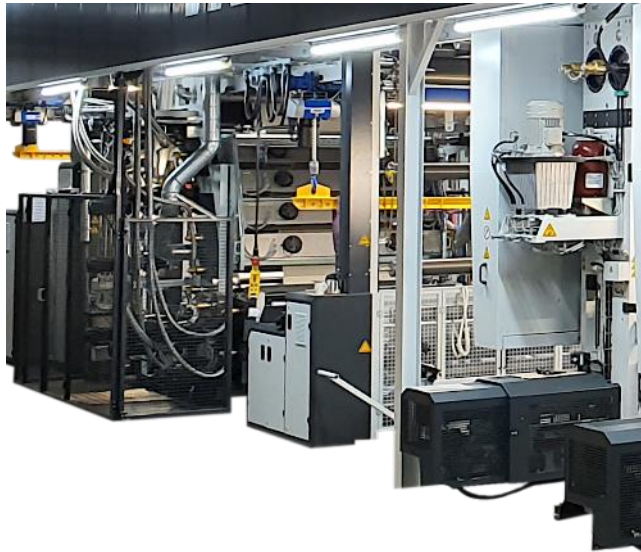


Jagenberg Group

Unique.Surface.Ideas.

Special machine engineering company which develops special solutions for decor applications

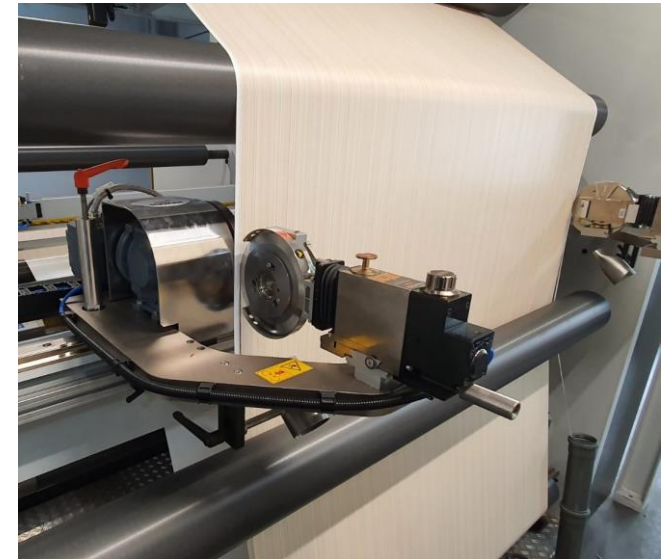
Printing units



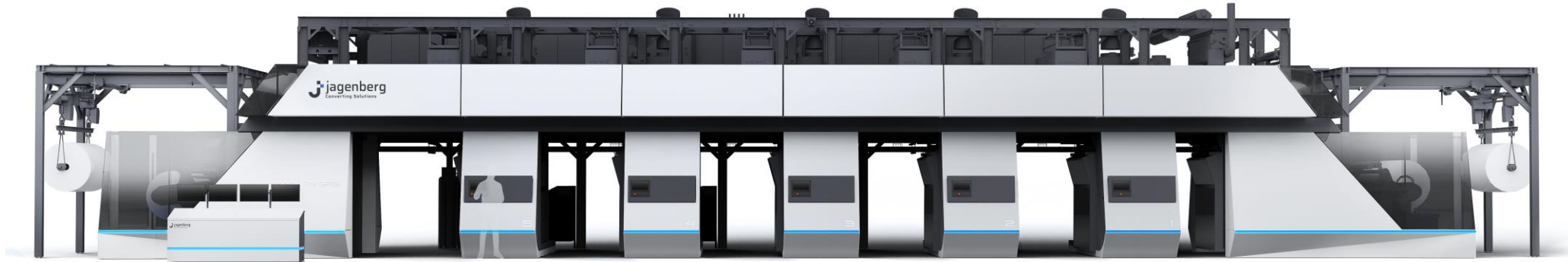
Lacquering units



Web handling



# Our offering



Automation.Drives.Future.

Partner for all questions concerning drive and automation technology. Conceptual design, construction and production of electrical and switchgear systems

## Drive technology

**Mechatronic drive concepts.**  
From operating units to cabinet rows or complex switchgear containers for large systems.

## Control technology

**PLC & HMI operating and monitoring systems.**  
Pioneering technologies for operation and monitoring and for process visualization.

## Data systems

**Software development/ visualization systems.**  
Development of comprehensive visualizations with maximum transparency across all layers.

## Panel shop

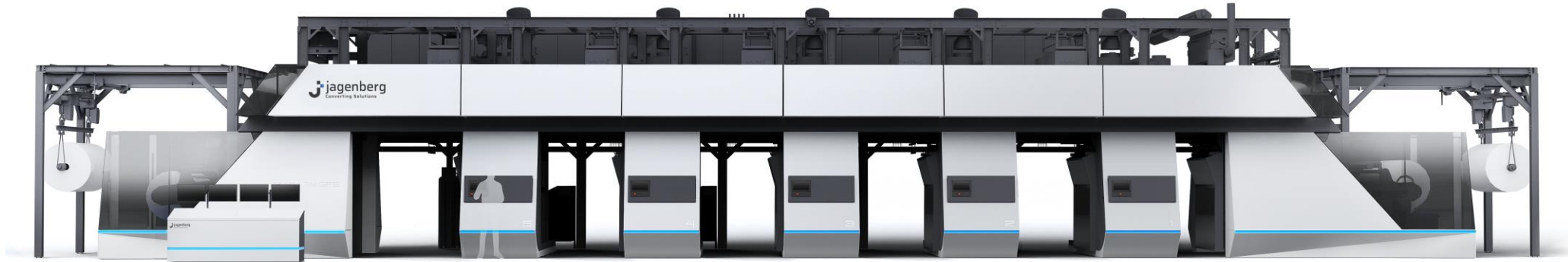
**CE and UL certified panel shop.**  
With our own panel shop, we provide highest reliability for your delivery schedule.

## Start up

**Electrical installation / commissioning.**  
Team of globally experienced professional technicians and engineers for the installation and commissioning of systems "on-site".



# Our offering



Automation.Drives.Future.

Lauer CE-Safety

For more than 25 years an expert in all issues relating to CE marking, risk assessment, functional safety, assembly instruction and machine safety

## CE Marking & Risk assessment

### CE compliance.

From precise risk analysis and risk evaluation following the applicable directives to comprehensive research and analysis of standards (i.e. DIN EN ISO 12100) as well as safety-related review of machinery under construction.

## User manuals & assembly instructions

### Operating instructions and technical documentation.

We provide full service in creating complete preparation of operating and assembling instructions or alternatively evaluates pre-prepared technical documentation and supports the creating process at the customers site by training.

## Functional Safety Engineering (FSE)

### EN ISO 13849 application.

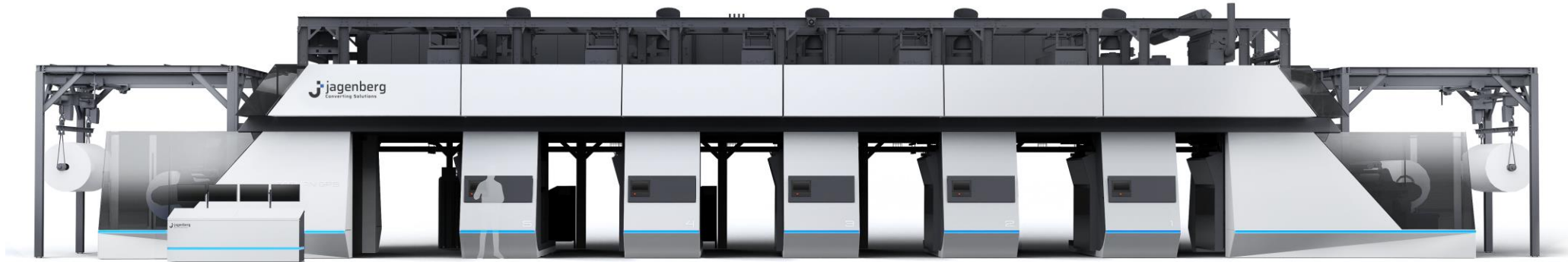
Our specially trained control engineers support machinery constructors by designing, verifying and validating safety functions.

## Professional CE-software

### Directives, risks and draw up manuals.

With the right software, these tasks can be completed faster and more efficiently. We offer proven CE-software products that are continuously updated.

# Our offering



Connect.Develop.Advance.

We focus on improving processes in production and thus optimizing the efficiency of companies across the entire value chain

## IIoT platform



**IIoT for your equipment.**  
The platform offers digital intelligence for manufacturing. It connects machines, production and companies. It monitors production and bundles all relevant information for high production quality, resource conservation and low downtimes

## Data management



**Digitized manufacturing.**  
Manufacturing is brought to a new level. Our solutions enable direct interfaces to ERP-Systems, communication to MES-Systems as well as support traceability through roll protocols

## Smart sensors



**Smart data harvester.**  
There are many different factors that can influence maintenance cycles and product quality. the@dge unit is simply installed and connected via LAN cable (PoE) and communicates with our IIoT platform.

# How to reach us

**Guido Lebbing**  
Managing Director Surfaces



[guido.lebbing@jagenberg-converting.com](mailto:guido.lebbing@jagenberg-converting.com)

**Jagenberg Converting Solutions GmbH**

Konrad-Zuse-Str. 16  
46397 Bocholt

[info@jagenberg-converting.com](mailto:info@jagenberg-converting.com)