#EmobilityMadeByGrob

ELECTROMOBILITY

This is who we are

GROB-WERKE

Technology at its best

STEP INTO A GREEN FUTURE WITH US

At GROB, we strive for continuous progress and improvement. Not only do we strive to develop outstanding solutions and products for our customers, but we also seek to make a contribution to our environment and future generations. This is firmly anchored in our corporate philosophy and lived every day.

We therefore utilize photovoltaics and geothermal energy in our locations and support a wide variety of social projects. But we also place great emphasis on SUSTAINABILITY in our internal departments. Our products are based on the highest energy efficiency and regenerative drive systems. We integrate our supplier network in reducing the carbon footprint.

Excellence in sustainable technology

OUR PRODUCT RANGE

#MachiningTechnology #UniversalMachiningCenters #AssemblyPlants #Electromobility #Automation #AdditiveManufacturing #Digitalization #NewAndQualityCheckedUsedMachines #Service

Concentrated competence worldwide

INTELLIGENT TECHNOLOGY IS HUMAN

For generations, we at GROB have lived and experienced this principle by making customer requirements the focus of our work. The result is sophisticated technology creating more efficient production processes worldwide and delivering highest quality.

RESEARCH & DEVELOPMENT

With a high degree of creativity and technical intuition, as well as the best engineering expertise, our developers have worked hard to earn the reputation of being a technology leader.

ASSEMBLY

From pre-assembly to machine assembly to process commissioning – our employees demonstrate their expertise with optimally coordinated workflows.

ENGINEERING

With method development and structured problem solving, our employees in Engineering develop innovative concepts representing milestones for precision, dynamics, and reliability.

COMMISSIONING

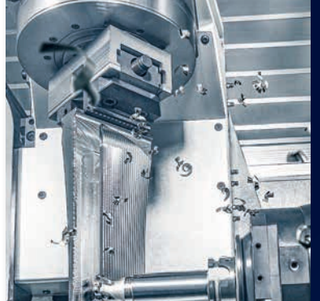
With simulation techniques and virtual commissioning, we achieve the highest adherence to delivery dates and product quality.

PRODUCTION

The high degree of vertical integration along the entire value creation chain, numerous machining technologies and our employees' distinctive specialist knowledge create the best conditions for state-of-the-art production.

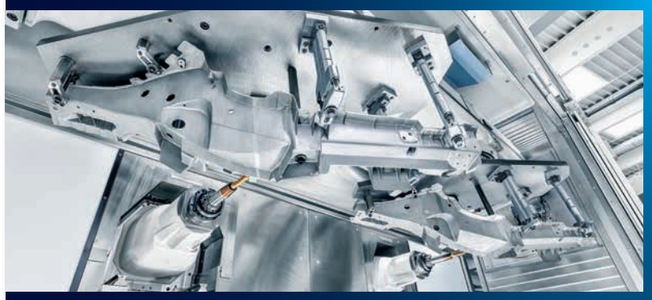
TECHNICAL APPLICATION CENTERS

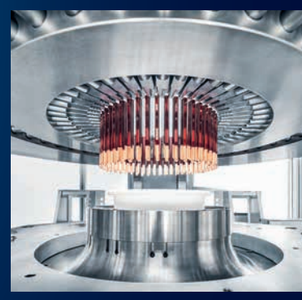
Our production plants in Germany, Brazil, the USA, China, Italy and India have technical application centers for the machining and electromobility sectors, where our customers can experience GROB technologies up close.














Focused on your needs

WE ARE YOUR CONTACT FOR THE ELECTRICAL FUTURE!

With modular, flexible and scalable electric powertrain assembly lines, we offer integrated solutions for the components of tomorrow.

Together, we will develop solutions tailored to your needs and requirements. Our product range spans from stand-alone, semi-automatic machines for prototype manufacturing to fully automated turn-key systems.

We are your central contact for realizing your worldwide projects.

With our complete turn-key solutions, you can rely on high-performance, future-proof, and sustainable plant technology tailored to your needs. Benefit from our many years of experience and our extensive network.

PRODUCTION SYSTEMS

DRIVE SYSTEMS

Stator assembly

Rotor assembly

E-motor and E-axis assembly

ENERGY STORAGE SYSTEMS

Battery cell

Battery module

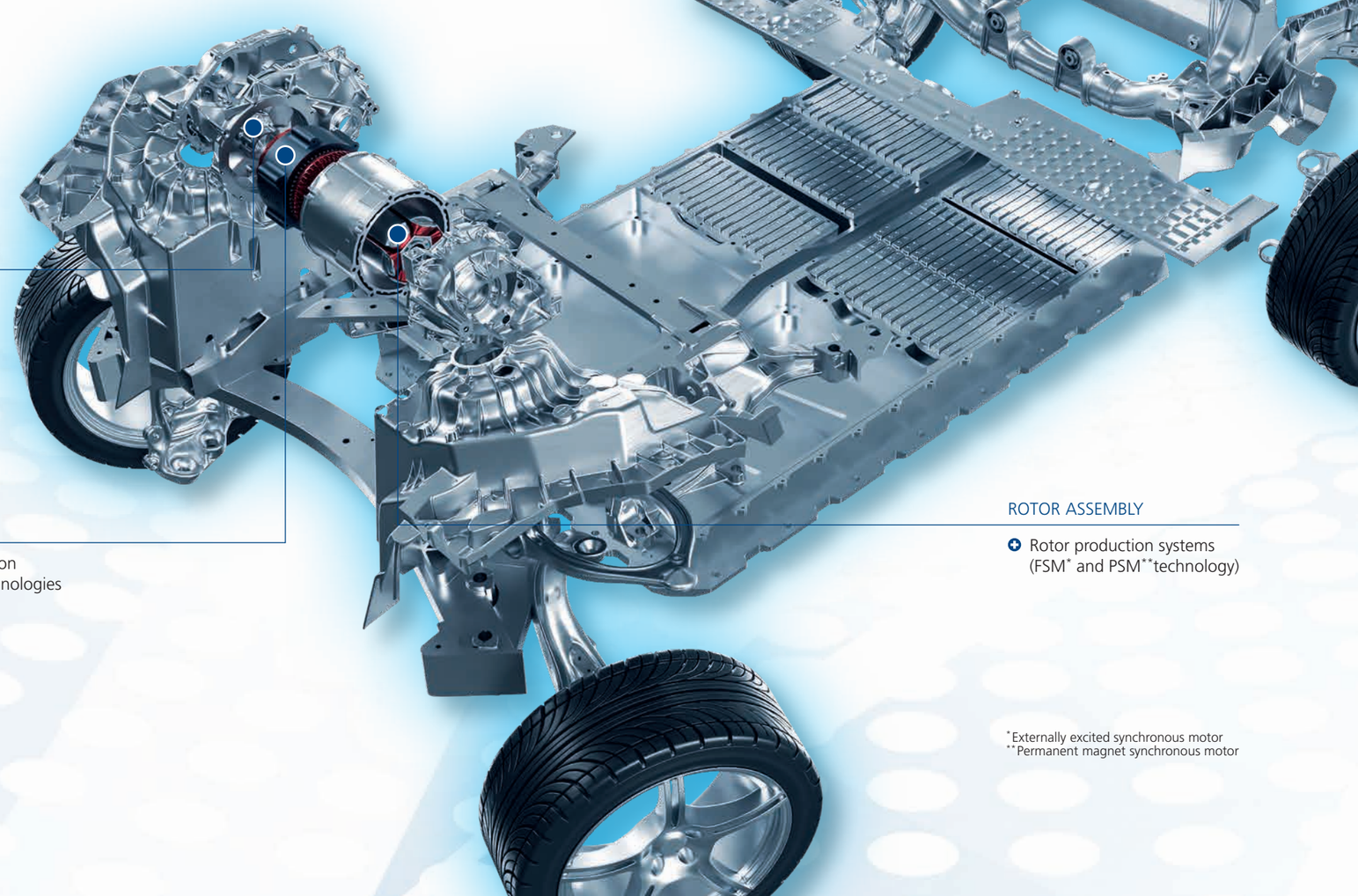
Battery pack

Cell-to-Pack

Fuel cell

ENERGY STORAGE SYSTEMS

- Systems for battery cell assembly, assembly of battery modules and battery packs, and systems for fuel cell assembly



E-MOTOR & E-AXIS ASSEMBLY

- Turn-key systems, tailored to your specific needs

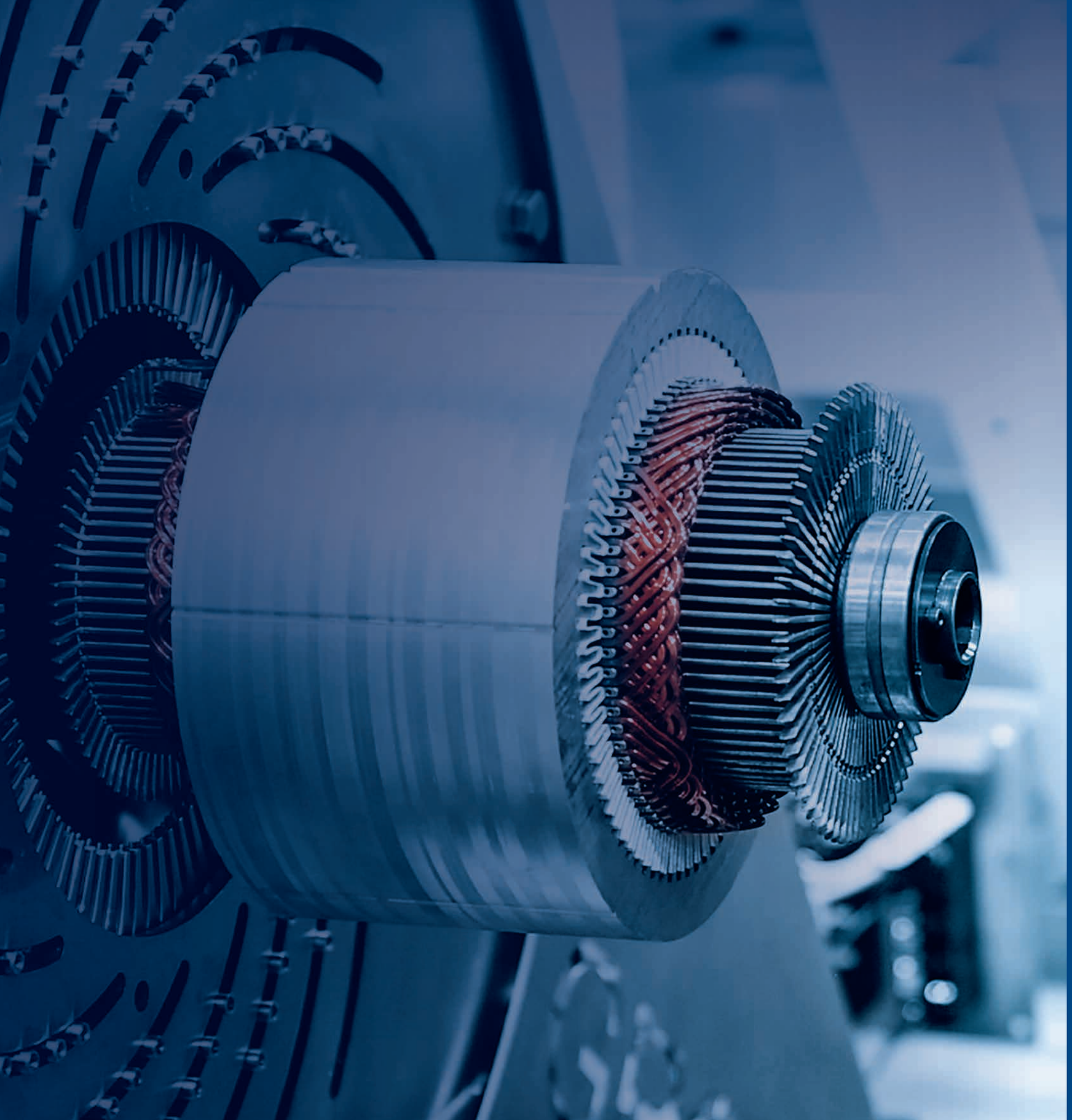
STATOR ASSEMBLY

- Systems for stator production with different winding technologies

ROTOR ASSEMBLY

- Rotor production systems (FSM* and PSM**technology)

*Externally excited synchronous motor
**Permanent magnet synchronous motor



Partnership,
efficiency & flexibility

TOGETHER WITH YOU, WE DEVELOP THE DRIVES OF THE FUTURE!

We support you in each phase of the product development process – from simultaneous engineering and design of the first prototypes to series production and the corresponding assembly line. Our plants in Mindelheim, Bluffton, Dalian, and Turin feature technical application centers for electromobility equipped with state-of-the-art technology. We can therefore map the individual assembly steps close to series production in every phase of product design, verify them by building prototypes and small series, and optimize them for series production – you will benefit from our process and system knowledge.

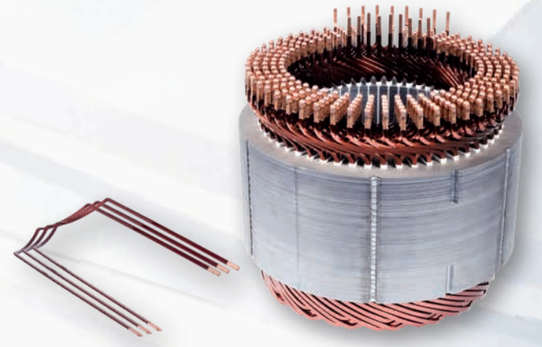
- Suppporting product development with prototype builds, production concepts and equipment
- Expertise for product and process requirements due to the implementation of various high volume production projects
- Development and verification of required production processes

OUR ELECTRIC MOTORS AND E-MACHINES PORTFOLIO

#E-Motor #E-AxisAssembly #StatorAssembly #RotorAssembly

Partnership, efficiency & flexibility

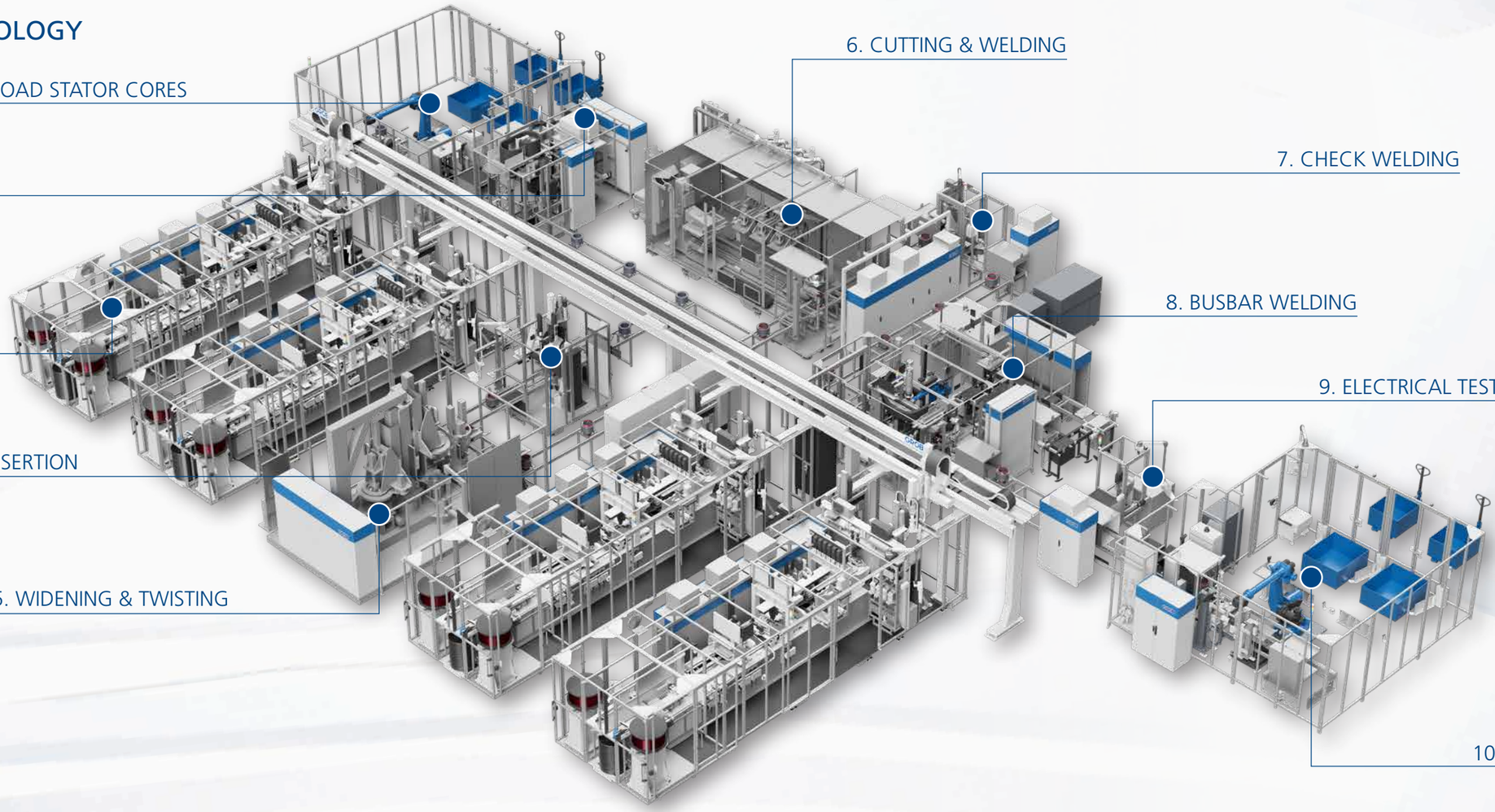
SYSTEM TECHNOLOGY FOR STATOR PRODUCTION



Hairpin technology involves bending flat copper wires into U-shaped hairpins. The hairpins are then pre-assembled into rings. The assembled rings are inserted into the laminated stator core and finally connected in multiple steps according to the winding pattern. This allows the manufacture of high-quality stators with the highest filling levels.

With more than 80 systems delivered worldwide and an estimated market share of almost 70% (Europe and USA), our customers can rely on our expertise and comprehensive process know-how. From system technology and the associated automation to measurement and process technology such as end-of-line testing or laser welding, we are your single-source partner.

STATOR PRODUCTION WITH HAIRPIN TECHNOLOGY



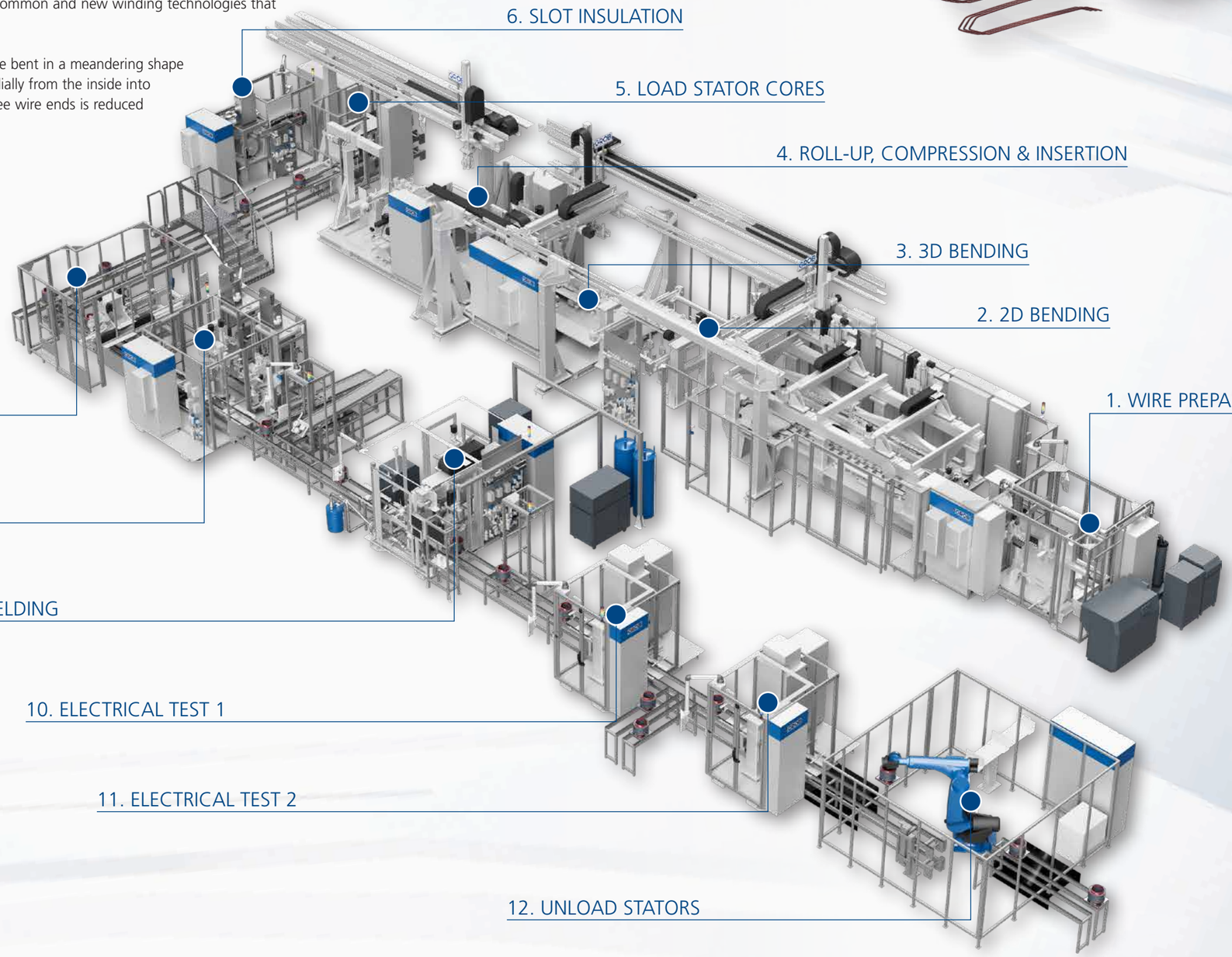
Partnership, efficiency & flexibility

SYSTEM TECHNOLOGY FOR STATOR PRODUCTION

Our product range in the field of stator production is completed by production lines for continuous hairpin technology. Our particularly sensitive wire bending processes and high-quality components set us apart from the competition. This enables us to offer you modular, flexible and scalable system concepts for all common and new winding technologies that are tailored to your technical and economic requirements.

We rely on flat winding technology for continuous hairpins. Flat copper wires are bent in a meandering shape and joined together to form a wire mat. This is then wound up and inserted radially from the inside into the laminated core. By designing the winding as a wire mat, the number of free wire ends is reduced so that only star points and wiring elements remain to be welded.

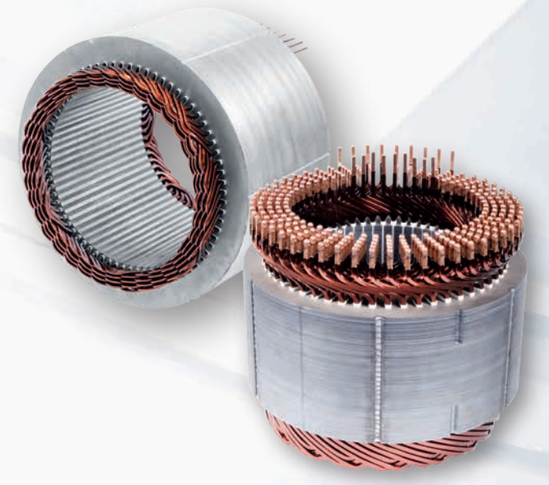
STATOR ASSEMBLY WITH CONTINUOUS HAIRPIN TECHNOLOGY



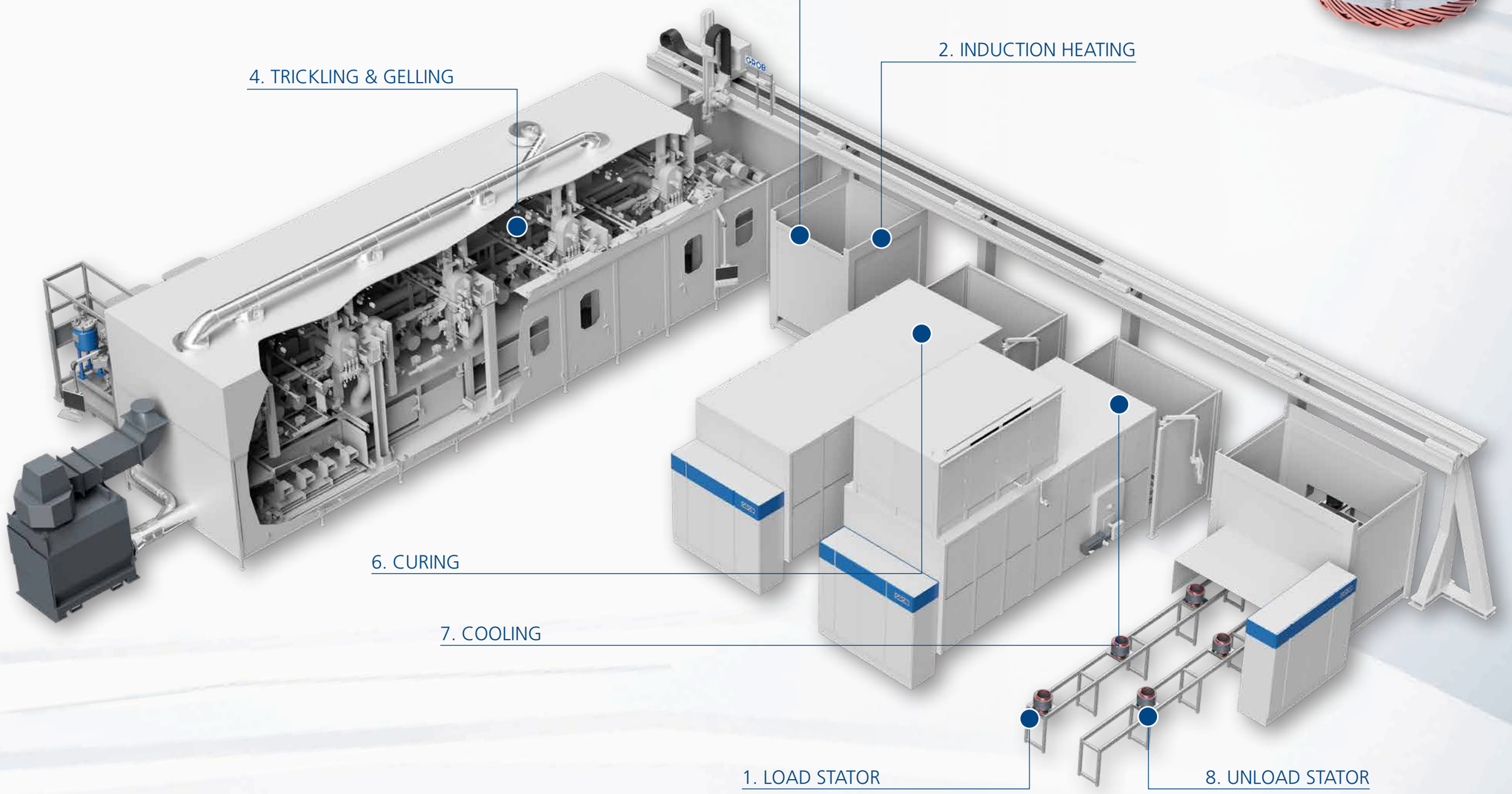
Partnership, efficiency & flexibility

SYSTEM TECHNOLOGY FOR STATOR IMPREGNATION

To fix the winding in position and for better dissipation of the generated heat, most stators are impregnated with a resin. For this purpose liquid resin is applied to the winding head of the preheated stator in a trickling process, and cured in the subsequent gelling process.



STATOR IMPREGNATION



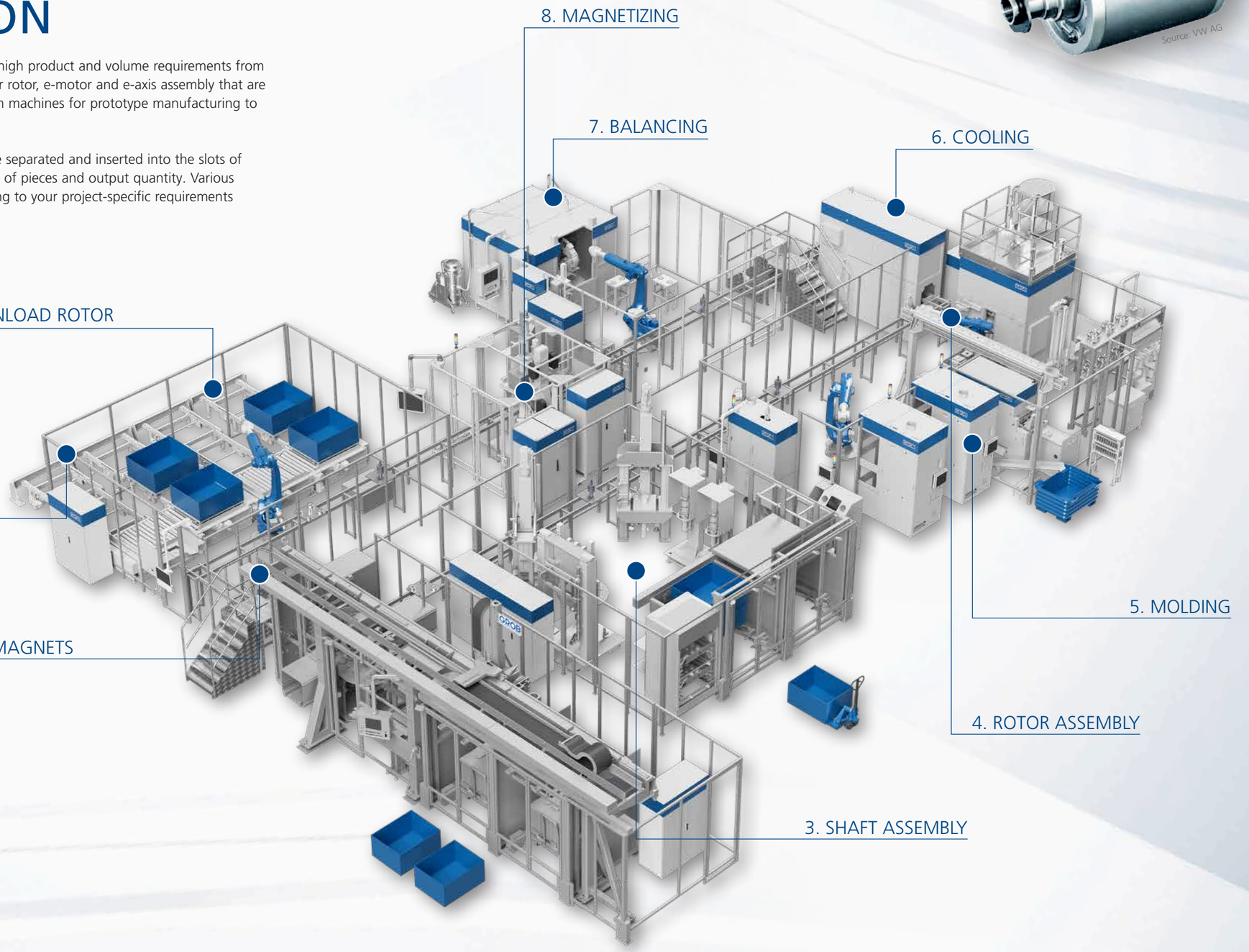
Partnership, efficiency & flexibility

SYSTEM TECHNOLOGY FOR ROTOR PRODUCTION

We have been delivering customized, turn-key assembly lines meeting high product and volume requirements from a single source since 1982. Together with you, we develop solutions for rotor, e-motor and e-axis assembly that are tailored to your needs and requirements. Our product range spans from machines for prototype manufacturing to fully automated turn-key systems.

When manufacturing rotors with permanent magnets, the magnets are separated and inserted into the slots of the laminated core using different processes depending on the number of pieces and output quantity. Various methods can be used to fix the magnets. Here, we will do this according to your project-specific requirements and support you with our broadly accumulated process knowledge.

ROTOR ASSEMBLY WITH PERMANENT MAGNETS



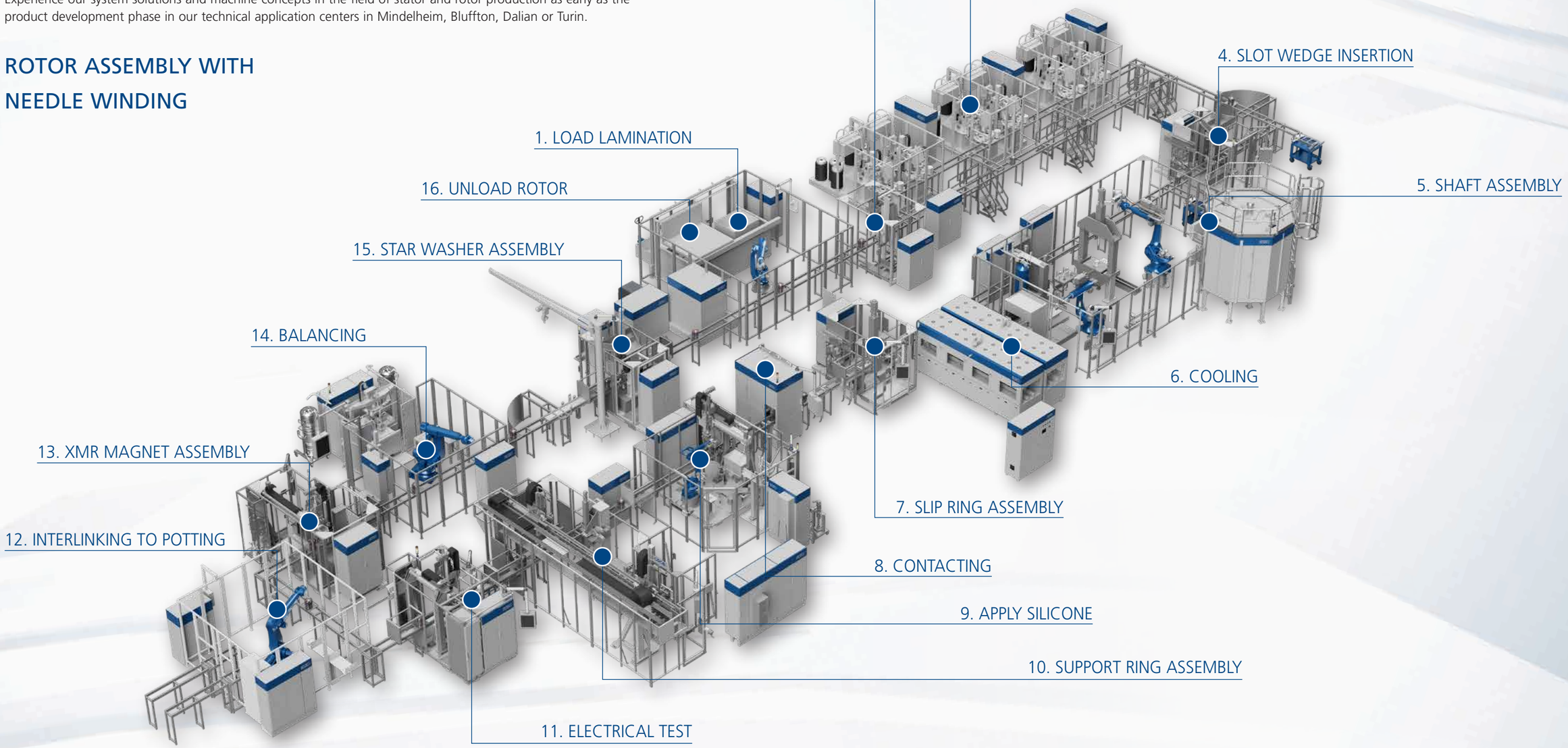
Partnership, efficiency & flexibility

SYSTEM TECHNOLOGY FOR ROTOR PRODUCTION

Needle winding is a complex process for applying round wire to laminated rotor cores. The needle, via which the wire is fed, rotates around the rotor pole and wraps around it according to the winding pattern. Thanks to our holistic understanding of processes and optimally coordinated manufacturing processes, we guarantee you customized, flexible manufacturing solutions.

Experience our system solutions and machine concepts in the field of stator and rotor production as early as the product development phase in our technical application centers in Mindelheim, Bluffton, Dalian or Turin.

ROTOR ASSEMBLY WITH NEEDLE WINDING



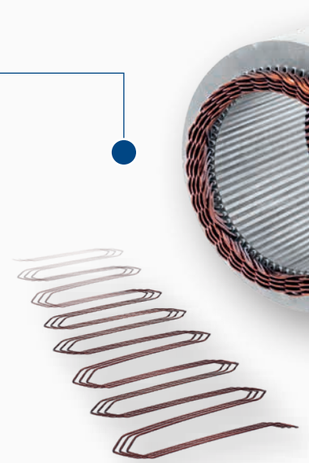
Partnership, efficiency & flexibility

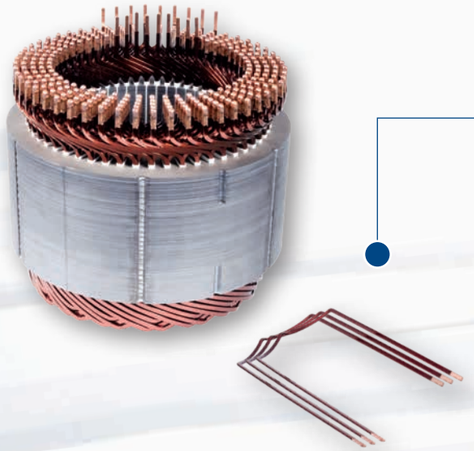
OUR EXPERTISE IN THE FIELD OF ELECTRIC DRIVE SYSTEMS AT A GLANCE

Our machine and system concepts cover all winding and assembly technologies for stator and rotor production. The consistent and continuous further development of our system technology and our global supplier network guarantee you receive innovative, state-of-the-art production solutions.

STATOR PRODUCTION WITH CONTINUOUS HAIRPIN TECHNOLOGY

- Simultaneous bending of multiple wires
- Implementation of complex winding patterns using stacked or inserted wire mats
- Long service life thanks to low-dynamic functional concepts
- High process reliability and machine availability
- Sensitive wire processing by means of flat winding





STATOR PRODUCTION WITH HAIRPIN TECHNOLOGY

- Innovative and flexible bending concept
- Production of all required pins with one bending machine
- Variable slot insulation types
- High in-process flexibility
- Hairpin ring manufacturing using NC technology
- Twisting and widening for up to 12 levels

ROTOR PRODUCTION WITH NEEDLE WINDING

- Reduced wire stress by using a bent winding needle
- ODD (One Drive Direction) winding without wire retraction at the needle
- NC control system with Sinumeric One
- Quick and easy setup thanks to the GROB winding app with graphic support

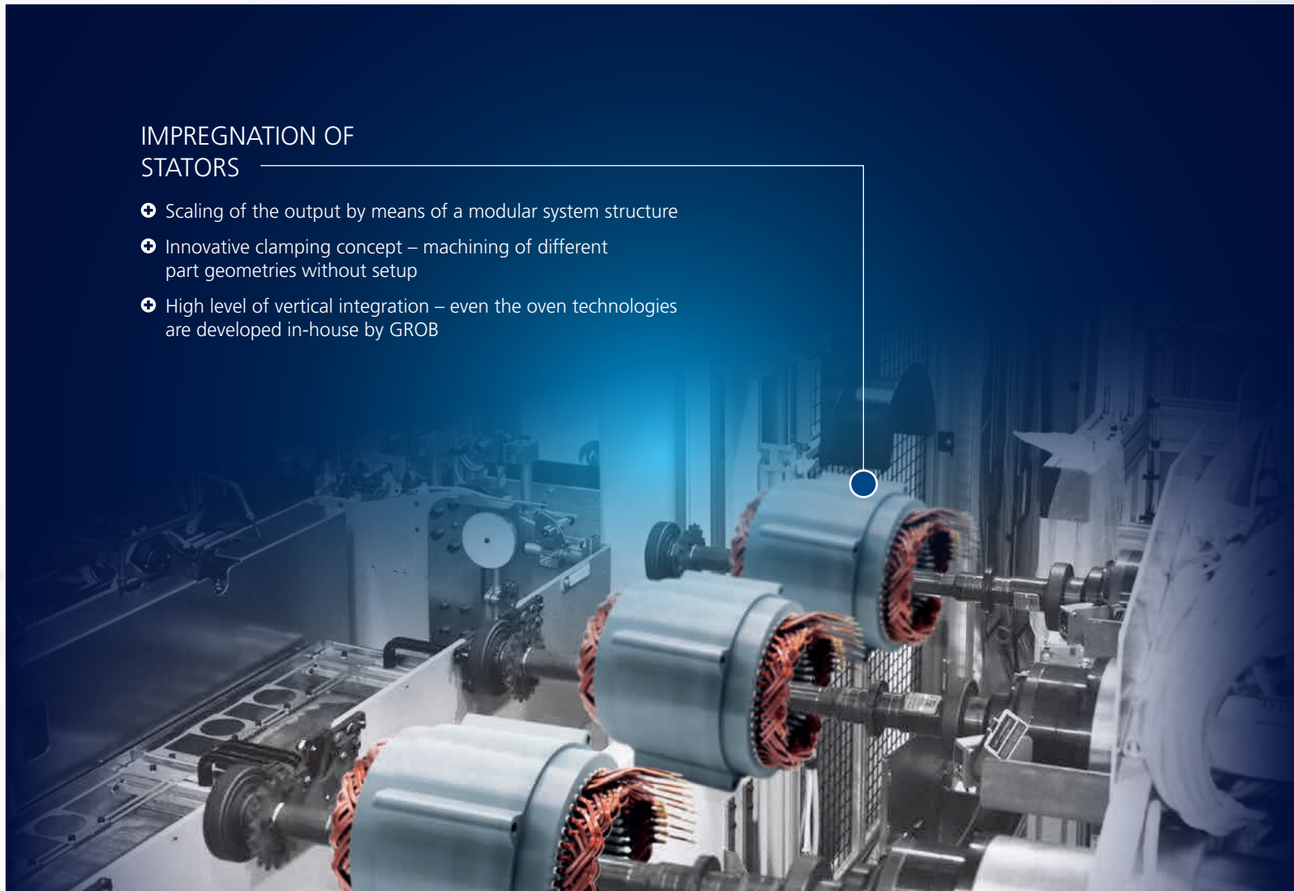
Source: VW AG

ROTOR PRODUCTION WITH PERMANENT MAGNETS

- Pick & Place solution
- High output thanks to patented rotary separation
- Different options for fixing the magnets:
  - press-fitting/clamping
  - dosing of adhesive/resin/silicone
  - injection with EMC (epoxy molding compound)

IMPREGNATION OF STATORS

- Scaling of the output by means of a modular system structure
- Innovative clamping concept – machining of different part geometries without setup
- High level of vertical integration – even the oven technologies are developed in-house by GROB



Innovation, sustainability & flexibility

WITH OUR INNOVATIVE SYSTEM CONCEPTS FOR MAXIMUM OUTPUT

We support you in designing systems for the manufacture and assembly of battery storage systems. With our innovative product solutions providing competitive and sustainable volume production, we cover the entire battery manufacturing process – from battery cell to battery module and battery pack / cell-to-pack assembly.

The focus is always on your requirements – ensuring that degrees of automation, cycle times, and yield quantities are guaranteed! Our systems range extends from individual machines for laboratory and pilot manufacture to fully automated turn-key systems.

- Innovative production solutions
- Modular and scalable system
- Fully automated production lines
- In-depth know-how in battery storage systems

OUR PORTFOLIO FOR BATTERIES

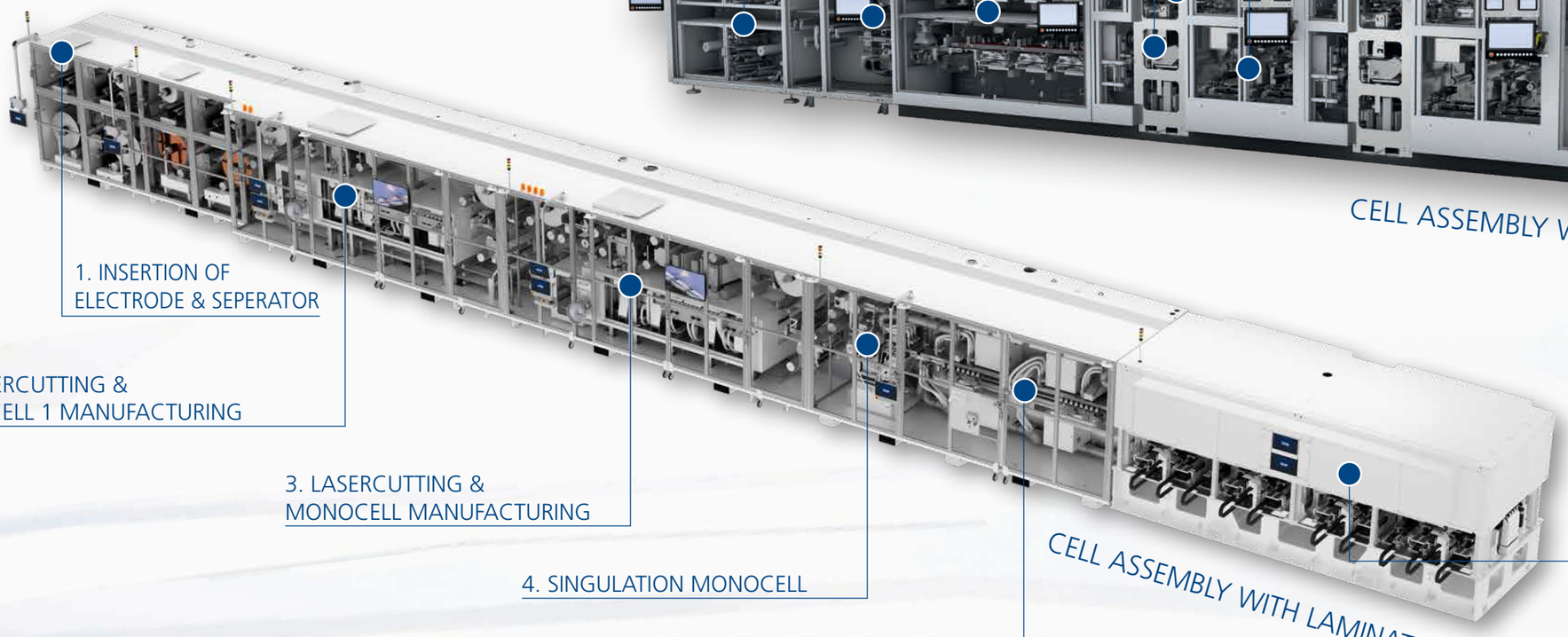
#BatteryCell #BatteryModule #BatteryPack

Innovation, sustainability & flexibility

SYSTEM TECHNOLOGY FOR BATTERY CELL ASSEMBLY

Our state-of-the-art battery cell assembly systems with a focus on the assembly of prismatic and pouch cells offer you highly flexible production. The focus is on the production of cell stacks by means of Z-folding or lamination. Z-folding is a classic cell stacking technology which is already used in most gigafactories today. Lamination is an innovative process for the continuous processing of the electrodes and separators, leading to the production of cell stacks based on laminated monocells.

In our application laboratory in Mindelheim, we can develop the individual production steps from the ground up based on your requirements and verify them. As with stator and rotor manufacturing, we are able to support you at every stage of the product development process for battery cells – from simultaneous engineering and the design of the first prototypes to the series design of the cell as well as the design and manufacturing of the associated production line.

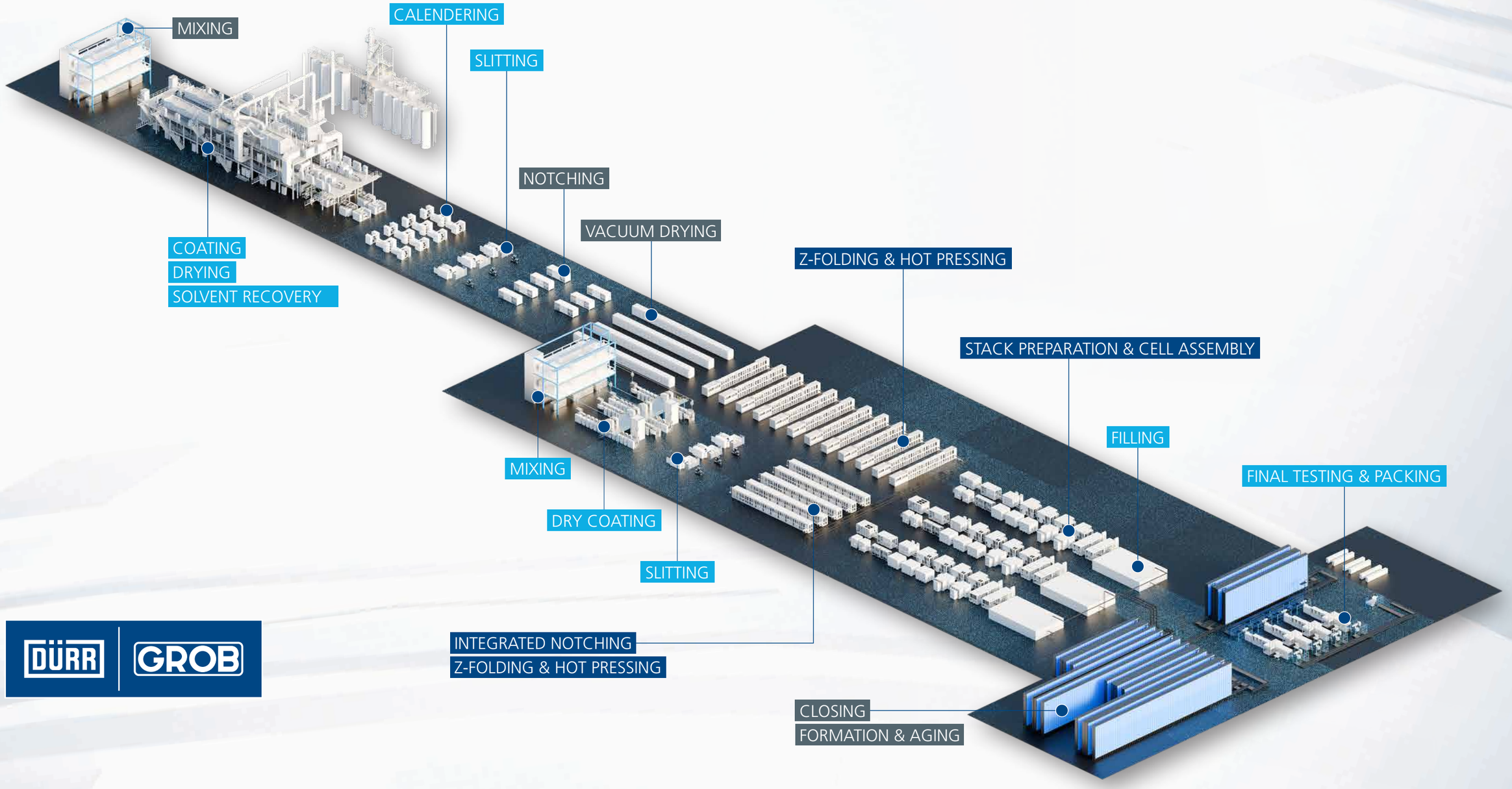


Innovation, sustainability & flexibility

COOPERATION DÜRR-GROB

Thanks to the cooperation between Dürr and GROB-WERKE, we are able to offer the entire value chain from electrode to the production of tested battery cells in perfect coordination. The comprehensive system and process expertise of the individual partners complements each other perfectly and guarantees maximum system availability and excellent product quality.

BATTERY CELL PRODUCTION FROM THE ELECTRODE TO THE FINISHED CELL

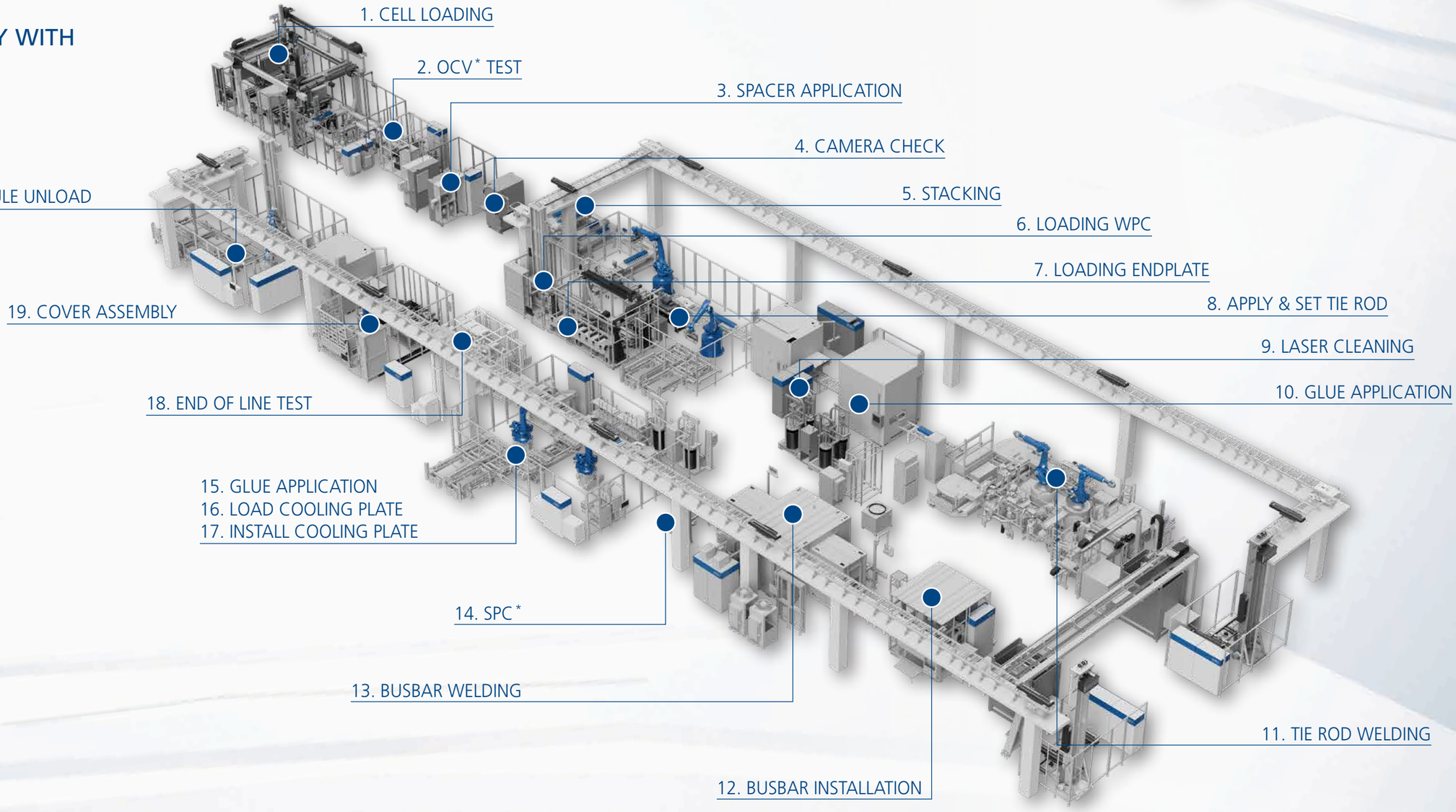


Innovation, sustainability & flexibility

SYSTEM TECHNOLOGY FOR BATTERY MODULE ASSEMBLY

In our fully automated and highly flexible GROB production lines for battery modules, your prismatic cells or pouch cells are stacked to different size battery modules, geometrically fixed, and linked with one another via cell contacting systems. Test systems at the beginning, along, or at the end of the line ensure the highest product quality and safety. Perfectly coordinated assembly processes, your product requirements and economic constraints such as cycle time, output and availability are our top priorities.

MODULE ASSEMBLY WITH PRISMATIC CELLS



*Open Circuit Voltage
**Statistical Process Control

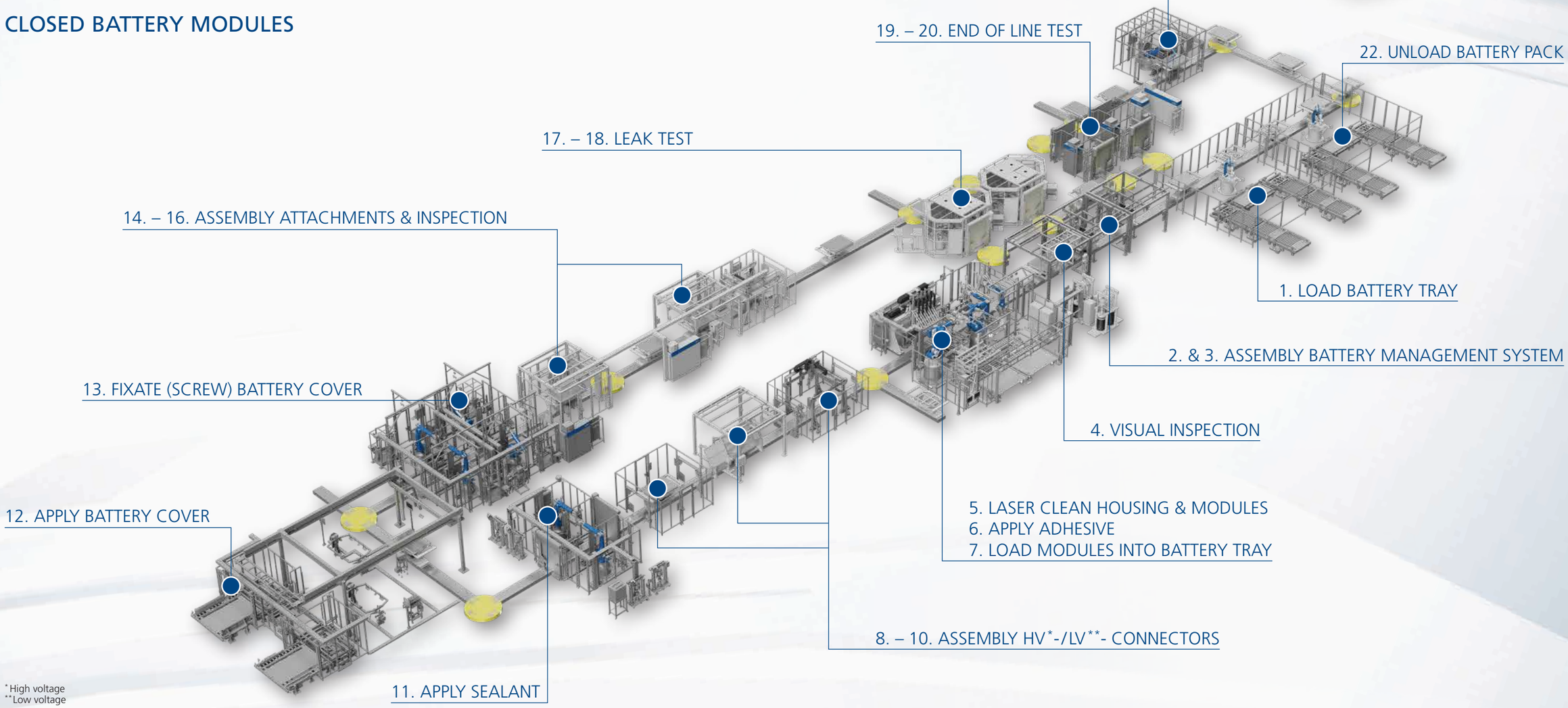
Innovative, sustainable & flexible

SYSTEM TECHNOLOGY FOR BATTERY PACK ASSEMBLY

Our system solutions for the final assembly of complete battery pack systems round off our comprehensive portfolio in the field of battery systems. Finished battery modules are automatically placed, fixed and interconnected. The assembly of attachments such as cooling systems, connector plugs, cable harnesses, etc. is carried out manually or automatically, depending on requirements. Test systems such as those used in battery module assembly ensure the highest product quality and safety.

PACK ASSEMBLY WITH CLOSED BATTERY MODULES


Battery pack

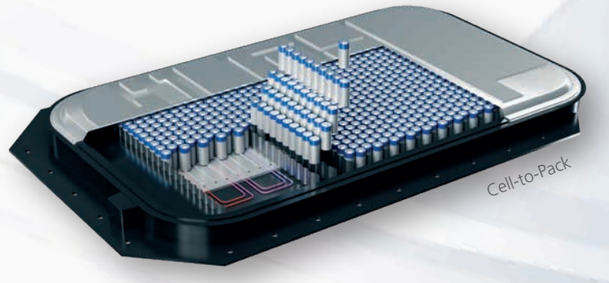


*High voltage
**Low voltage

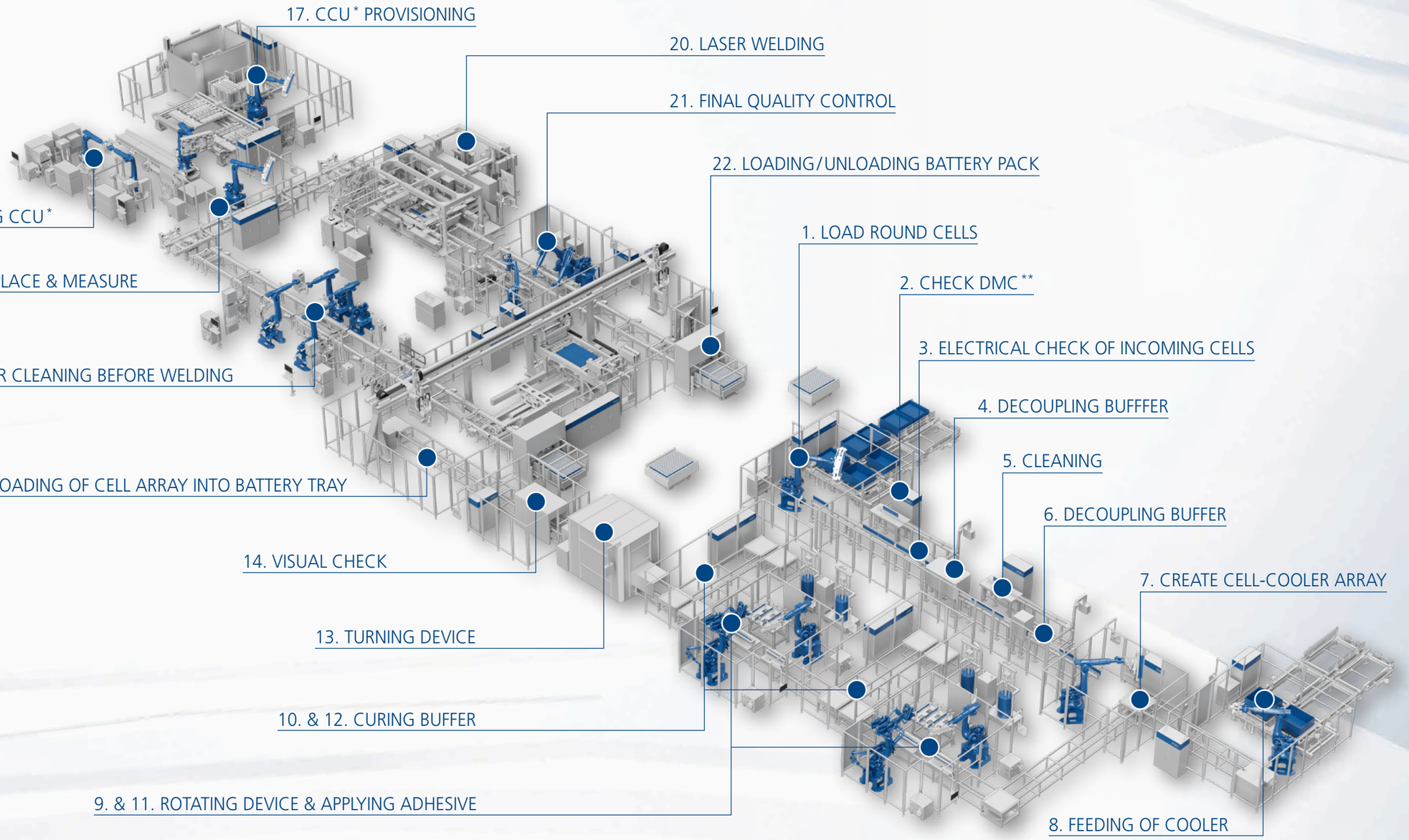
Innovation, sustainability & flexibility

SYSTEM TECHNOLOGY FOR CELL-TO-PACK ASSEMBLY

In our partially or fully automated GROB CTP assembly lines, the battery cells are integrated directly into the battery housing without the intermediate step of the module. Thanks to the modular design of our systems, the processes can be individually adapted to the product and the requirements. The integration of inline inspection systems ensures production within specified process parameters and guarantees the highest product quality.



PACK ASSEMBLY WITH CYLINDRICAL CELLS

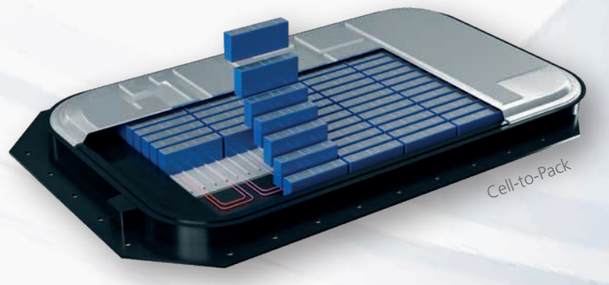


*Cell Contacting Unit
**Data Matrix Code

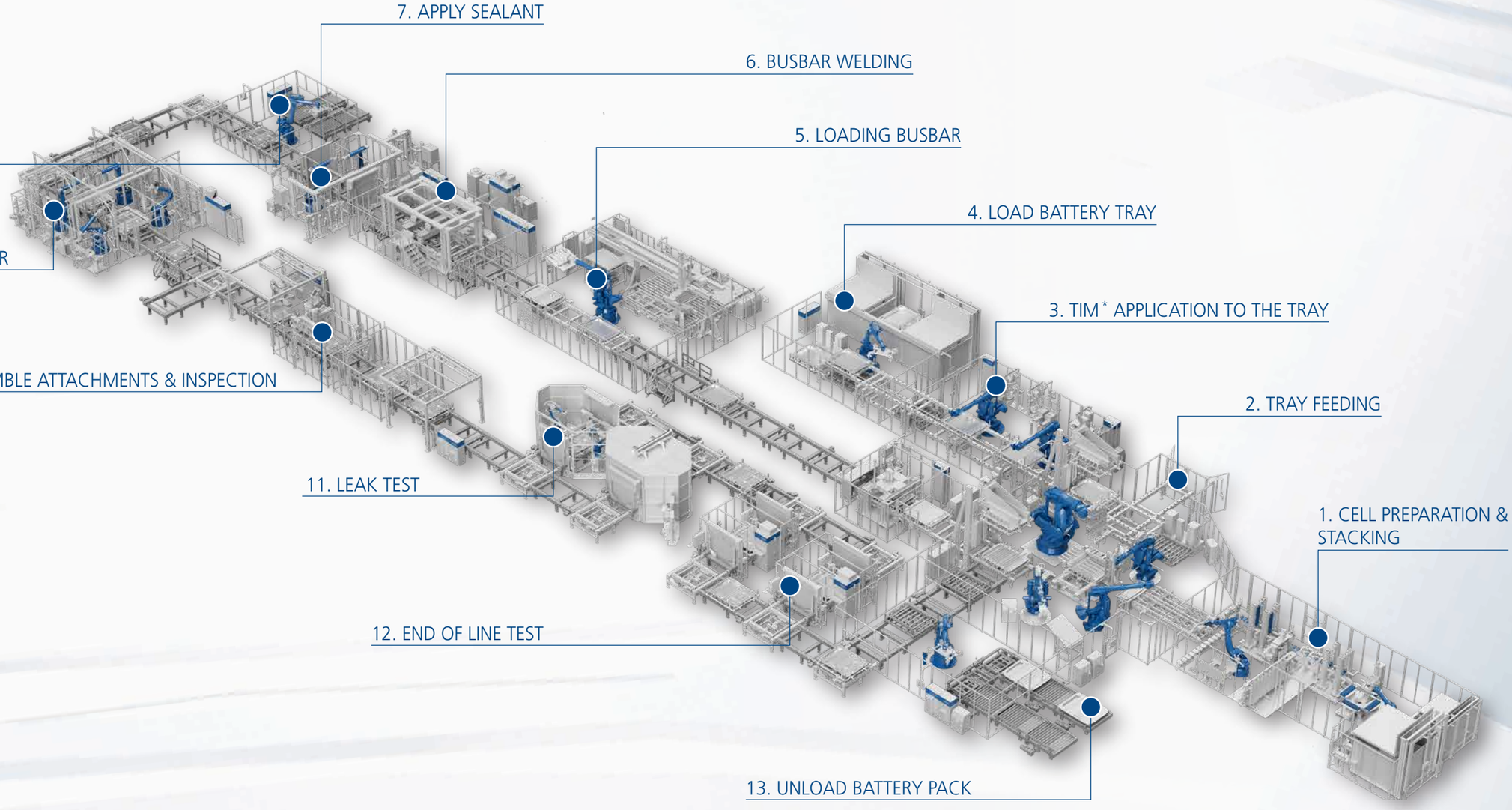
Innovation, sustainability & flexibility

SYSTEM TECHNOLOGY FOR CELL-TO-PACK ASSEMBLY

From pack assembly of the cells to tray pre-assembly and final assembly of the battery packs – we are your partner for cell-to-pack assembly.



PACK ASSEMBLY WITH PRISMATIC CELLS



*Thermal Interface Material

Innovative, sustainable & flexible

OUR EXPERTISE IN THE FIELD OF BATTERY AT A GLANCE

Our machine and system concepts cover a wide range of assembly technologies for battery cell, battery module and battery pack manufacturing. The consistent and continuous further development of our system technology and our global supplier network guarantee you receive innovative, state-of-the-art production solutions.

BATTERY CELL ASSEMBLY

- Strategic partnerships – Fully automated process chain in perfect coordination
- In-house application laboratory for the development and verification of individual process steps
- Prototype construction with our laboratory equipment
- Mini-environment – Lower operating costs for operators
- High level of vertical integration

BATTERY PACK ASSEMBLY

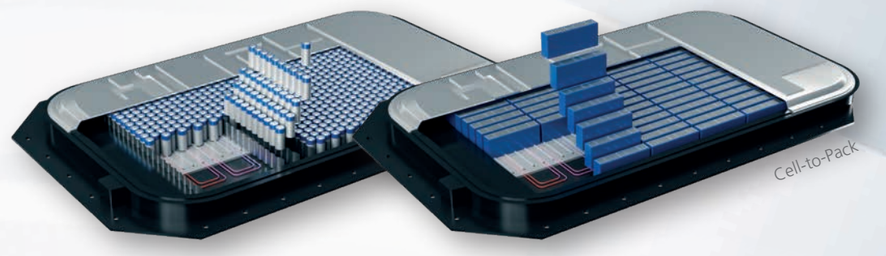
- Innovative production solutions
- Modular and scalable system
- Integration of our partners' acquisitions into the overall system
- Sound process knowledge in the assembly of battery systems

BATTERY MODULE ASSEMBLY

- Battery-optimized logistics solution (patented part carrier technology)
- Product and customer-specific manufacturing solutions to automotive standards
- Turn-key assembly lines from a single source
- In-house experts for all process-relevant topics such as bonding, welding, etc.
- Integrated inline and EoL testing systems to ensure product quality and safety

CELL-TO-PACK (CTP)

- System technology individually tailored to the product
- Scalable system technology
- Type variance within an assembly line
- Innovative on-the-fly welding technology for cell contacting
- Inline test systems guarantee the highest product quality



Variable, precise & pioneering

BUILD FUEL CELLS WITH OUR SYSTEM SOLUTIONS IN MASS PRODUCTION

For the assembly of components for vehicle fuel cell drives, we offer innovative and automatable manufacturing and assembly lines that guarantee a high degree of flexibility, productivity, and reliability. Profit from our expertise and comprehensive consulting service – from the initial idea to the concept and construction of your plant, all from one single source.

- Processes suitable for large-scale production
- Scalable and expandable production lines
- High format flexibility
- Inclusion of interfaces for future connection to BPP and MEA production

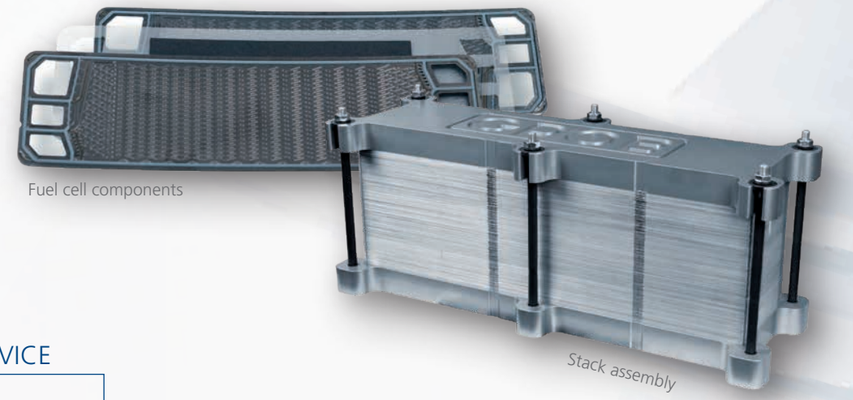
OUR PORTFOLIO IN THE AREA OF FUEL CELLS

#StackProduction #SystemProduction

Variable, precise & pioneering

SYSTEM CONCEPTS FOR FUEL CELL PRODUCTION

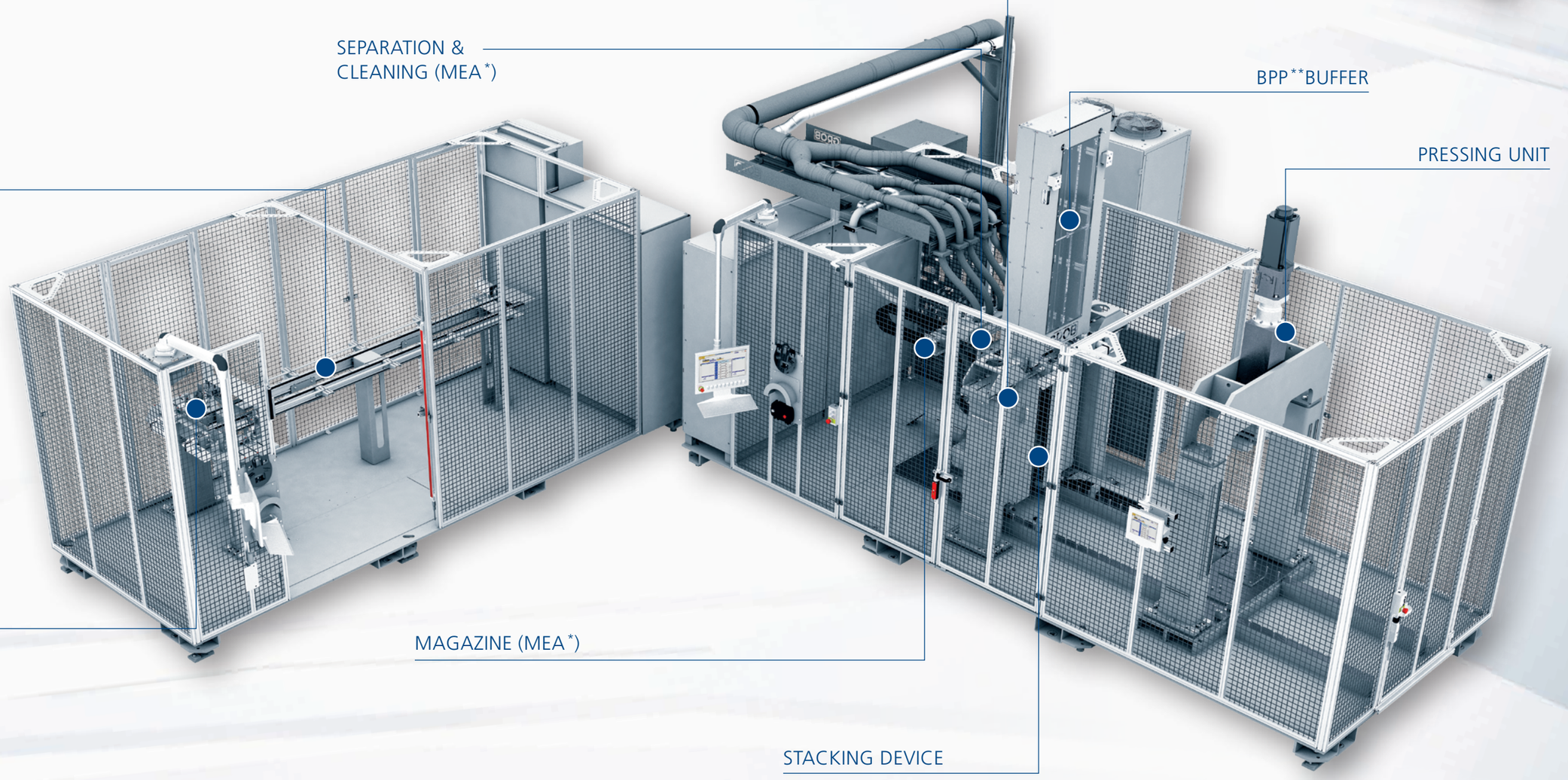
We develop a custom production line design adapted to your individual needs so you can increase capacity from small to large-scale series production. Decoupling of the individual process steps offers you maximum productivity and flexibility for fuel cell production. Our manufacturing solutions already provide interfaces for future connection to BPP and MEA manufacturing.



Fuel cell components

Stack assembly

HIGH-SPEED STACKING SYSTEM FOR FUEL CELL STACKS



*Membrane electrode assembly
**Bipolar plate

Progressive, savvy & adaptable

WE ARE YOUR PARTNER FOR LIGHT E-MOBILITY!

At our plant in Pianezza (Turin), we design and build winding machines for round wires according to the customer's product design. Our product range covers a wide range of options, from stand-alone machines to fully automated systems. Thanks to over thirty years of experience in this sector, we guarantee not only excellent technology, but also an end product that meets the highest demands of our customers in terms of quality and productivity.

- Individually customizable processes
- Turn-key solutions
- Expert knowledge of feasibility studies and prototype production
- Service tailored to your requirements and needs

DOWNLOAD THE E-MOBILITY LIGHT BROCHURE NOW AND FIND OUT MORE!

OUR ELECTRIC MOTORS AND E-MACHINES PORTFOLIO

#E-Motor #E-AxisAssembly #StatorAssembly #RotorAssembly

Friendly,
committed, competent

GROB SERVICE

From 24-hour service and a comprehensive range of spare parts and training courses to professional machine maintenance and analysis: The GROB service spectrum offers you a comprehensive range of products and services and is available to you worldwide thanks to our global production plants and service branches.

- Worldwide service network
- Available 24/7/360
- One hotline for everything
- We are right where our customers are

OUR SERVICE PORTFOLIO

#Hotline #Webshop #ServiceAgreements
#SpareParts #RepairCenter #Overhaul&Optimization
#MotorizedSpindleService #GrobTechnicalAcademy

Worldwide throughout the machine service life

GROB – GLOBAL AND INTERNATIONAL

From Bavaria to the world: Since our founding in 1926 in Munich, we as a global, family-managed company have been on a constant growth trajectory developing and manufacturing systems and machine tools. Our customers include the world's leading automotive manufacturers, their suppliers, and renowned companies from the aerospace, mechanical engineering, and other industries. With our production facilities in Germany, Brazil, the USA, China, Italy and India, as well as 15 worldwide service centers and sales subsidiaries, we are represented around the globe, ensuring the highest quality.

FOUNDED IN 1926

NORTH AMERICA

Bluffton, Ohio, USA
Detroit, Michigan, USA
Querétaro, Mexico

6 PLANTS

15 SALES AND SERVICE SUBSIDIARIES WORLDWIDE

SOUTH AMERICA

São Paulo, Brazil

EUROPE

Mindelheim, Germany
Pianezza, Italy
Stratford-upon-Avon, Great Britain
Hengelo, Netherlands
Lyon, France
Baar, Switzerland
Poznań, Poland
Győr, Hungary
Istanbul, Türkiye
Steyr, Austria

24 / 7 SUPPORT

ASIA

Dalian, China
Bangalore, India
Shanghai, China
Yokohama, Japan
Suwon, South Korea
Haiphong, Vietnam
Bangkok, Thailand

Our global production sites

Mindelheim, Germany

São Paulo, Brazil

Bluffton, USA

Dalian, China

Pianezza, Italy

Bangalore, India

www.grobgroup.com

GROB-WERKE GmbH & Co. KG

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