

ENGINEERING
TOMORROW'S
PRODUCTION



Lithium-ion Battery Technology

Production equipment for battery cells and modules as well as complete battery systems and capacitors

Manz AG - Pioneer for Innovations

For more than 30 years, Manz AG has been setting standards with its efficient machinery and equipment for selected growth industries. Our claim **"engineering tomorrow's production"** underpins our claim as an innovation driver for future markets.

In a challenging and highly dynamic market environment, it is crucial to always be one step ahead. That's why we are constantly evolving as a company and supporting our customers in successfully opening up new growth areas.

With our pioneering ideas, we help key technologies achieve breakthroughs and pave the way for innovative products in fast-growing future markets.

Time for a new promise

Our brand promise "engineering tomorrow's production" sums up our strengths: as a high-tech machine manufacturer, we are working with our customers today to develop production solutions for tomorrow. In this way, we create the basis for a future worth living.

Innovative, reliable and future-oriented

Manz is a leading provider of production equipment for li-ion battery cells, modules, and systems as well as capacitors. With our solutions for high-performance energy storage systems, we cover the entire value chain in battery production.

As a trusted development partner, optimizer and enabler of growth, we offer integrated production solutions for the automotive industry and electromobility, stationary energy storage and electronic products. The basis for innovative battery concepts are in addition to our comprehensive process know-how our proven core technologies such as automation, laser processing, inspection systems and digital printing, which we are continuously developing.



Manz AG

- founded in 1987
- Headquarters in Reutlingen, Germany
- further subsidiaries in Slovakia, Hungary, Italy, China, Taiwan, USA and India
- approx. 1,400 employees worldwide of which around 500 engineers

Core technologies

- Automation
- Laser processing
- Inspection systems
- Digital printing

Industries

- Automotive & Electromobility
- Battery Production
- Electronics
- Energy
- Medical Technology

The Battery of the Future: Megatrends Create Technology Leaps

Energy storage is one of the top issues of the future. A successful implementation of the energy transition and electromobility require efficient storage systems. The demand for high-performance energy storage devices is also growing rapidly in consumer electronics.

» The future is green and electric.
Above all, we need to think
innovatively and push alternative
mobility and energy storage concepts. «



Driven by the expansion of electromobility, global demand for production technology for li-ion battery cells and modules will continue to rise sharply. Studies attest enormous potential for battery production with simultaneously increasing cost pressure in production.

The market needs production solutions for increasingly powerful batteries as well as digital, easily adaptable and traceable processes in production. Scalability and traceability of the production are key success factors for cost-efficient manufacturing and high overall equipment effectiveness (OEE).

Future Battery Technologies

As part of the IPCEI project "EuBatIn - European Batteries Innovation," which is funded by the European Commission, Manz is developing forward-looking and highly efficient machine and system concepts for the li-ion battery factory of the future (LBF) in the Future Battery Technologies division. In the future, cylindrical, prismatic, and pouch battery cells and modules of the next generation will be manufactured fully automatically in the LBF.

Europe delivers: innovation in the battery value chain

The goal is to make an effective contribution to building a sustainable and competitive battery industry in Europe. Here, Manz acts as an important link in the European battery market. As one of the few European engineering companies with extensive experience in the entire value chain of li-ion battery manufacturing, we want to achieve competitive mass production in Europe by eEuropean companies and components.

From Stand-alone Machines to Fully Integrated Plant Concepts

Everything from a single source - our portfolio covers the entire spectrum of production solutions. From individual machines, for example for laboratory production, systems for pilot and small series production as well up to complete assembly lines and turnkey solutions.

Due to the rapidly growing demand for production facilities for powerful and efficient battery systems is the leading solution competence of Manz in different industries in high demand.

With our extensive technology and process know-how, we are your ideal partner for planning and implementing of your individual production solution. Together, we will master the challenges of the markets: reliable, experienced, customer- and cost-focused.

35 years of experience with the future

From the idea to series production readiness: we support our customers from the first feasibility study to prototypes of machines that produce smaller quantities under real production conditions in a semi-automated manner to the individual machine or complete production line. Our main focus is on the close integration of machines and technologies with innovative and efficient processes.

With strong partners, we can map fully integrated, turnkey production solutions for the complete value chain in the manufacturing of Li-ion batteries - for all current Li-ion cell concepts.

For customers, this holistic view results in maximum flexibility and cost efficiency combined with high investment security - also in mass production.

» More than 500 engineers, a large number of patents, and numerous cooperations with renowned research institutions stand for Manz's innovative strength based on European standards. «

Future-oriented Production Solutions for Li-ion Batteries

Manz's equipment contains numerous trend-setting processes that enable major improvements in terms of performance, safety, and sustainability, thereby strengthening our customers' market position.

With our globally unique technology portfolio for the production of all current cell concepts - from wound button cells to stacked pouch cells - we play a major role in the further development of Li-ion battery technology.

Thanks to our efficient production processes, increasingly precise and at the same time more stable cell structures can be realized very quickly. The effects on the performance parameters safety and power of the batteries are correspondingly positive.

Highspeed for the battery production of the future

Our modern automation systems make a significant contribution to reducing production costs through high process accuracy and increased throughput.

Our range of services extends from battery cell production (cell assembly) to the assembly of battery cells into a module (module assembly) or system.

Advantages for our customers at a glance:

- Increased process and resource efficiency
- Complete traceability
- Reduced production and unit costs
- Optimized process accuracy
- Investment security
- Shorter Time2Market
- Increase in performance parameters of end products

Markets for our production solutions:

- Li-ion batteries and (super)capacitors
in the field of electromobility
- Li-ion batteries and capacitors
in the field of stationary energy storage for private households and large-scale photovoltaic systems
- Li-ion batteries
in the area of consumer electronics such as tablets, smartphones and laptops



Everything From a Single Source: From Electrode Production to End-of-line Testing

Manz AG is a globally recognized manufacturer of integrated production systems. We set global standards not only in the production of li-ion batteries. There are reasons for this.

Pioneering technologies and comprehensive services

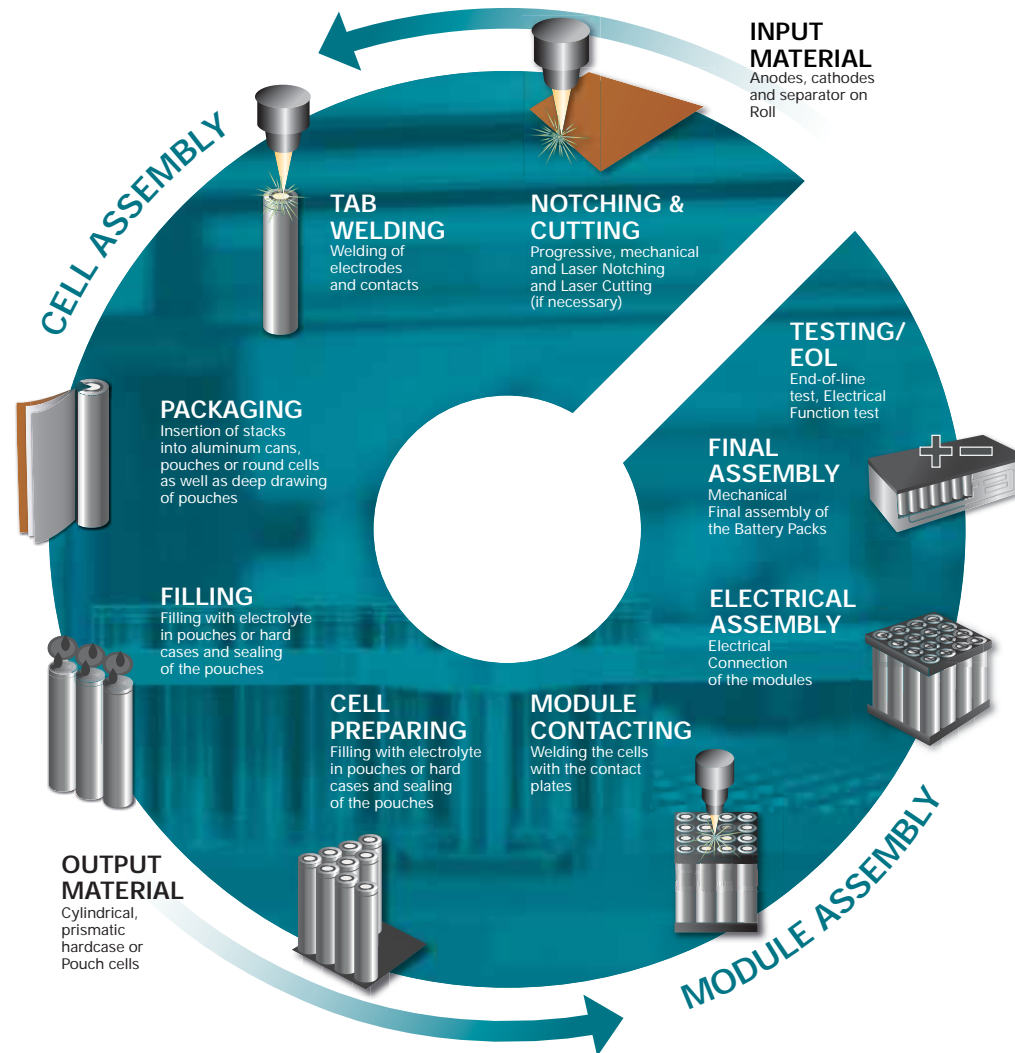
35 years of process know-how, an extensive technology portfolio and numerous state-of-the-art processes make us a pioneer and technology leader in li-ion battery production. We guarantee smooth and efficient production of li-ion battery cells and modules. We bundle our experience in automation, assembly, laser processes and integrated inspection systems into innovative solutions tailored to the customer. Our scope of services ranges from development and design to after-sales service.

Laser competence

Our comprehensive laser expertise is reflected in numerous process steps - from electrode production to module assembly. Our portfolio includes innovative laser technologies and processes such as (zero-gap)welding, laser cutting, partial ablation of materials and coatings, as well as bimetallic welding or laser tab welding for the optimized welding process of cell arresters. The basis for the various laser processes in the production of li-ion batteries is our proven modular Battery Laser System BLS 500.

Highest precision and speed

The production process is continuously monitored, analyzed and controlled by integrated measuring and inspection systems. This ensures a high level of product safety as well as increased throughput and profitability. Manz scores with the in-house developed **smartPRODUCTIONKIT**, which allows production data to be recorded and evaluated across all process steps in manufacturing, thus enabling seamless traceability of the parts produced in real time.



Project support

We accompany our customers from the first idea to the finished product and beyond. From planning, project engineering, construction to the implementation of the production line and its maintenance, we stand by our customers. Our customers benefit from our extensive experience from numerous customer projects.

To support and accompany the process, we offer numerous digital services such as tracking data in production, product traceability and services such as virtual commissioning.

Technology leadership

The key to success lies in the automation, digitization, integration and scalability of our production processes. These are precisely the levers we use to continuously improve the performance of our production equipment and thus make our customers' manufacturing processes systematically more efficient.

Thanks to the experience gained from numerous simultaneous engineering projects for well-known customers, we are able to map the entire manufacturing process with customized machine and system technology within a short time. Our complete offer for our customers is called Total Fab Solutions. Planning, simulation and implementation of fully automated manufacturing processes in different industries. Manz knows all about it.

From planning to installation and commissioning of the system, user training and remote maintenance to after-sales service - everything from a single source!

Our Locations



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