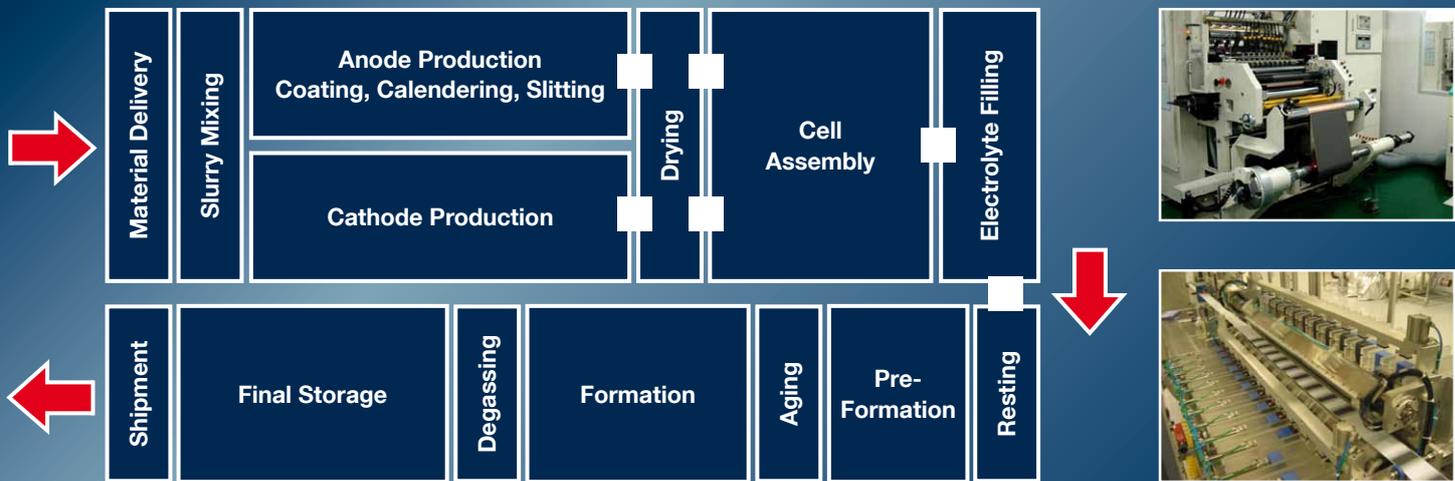




M+W GROUP



Competitive Large-Scale Factories for Lithium-Ion Batteries



The increasing demand of batteries for electric and hybrid vehicles and for stationary energy storage systems, in particular for fluctuating renewable energies, requires growing investment in manufacturing facilities for Lithium-Ion cells and batteries.

M+W Group provides concept development, program management, design-build, construction management, general contracting, equipment installation, and automation services for the international automotive and battery industry as well as for the energy storage industry.

The high manufacturing costs of Li-Ion batteries are a big challenge. Experts believe that the cost per kilowatt hour of battery capacity needs to be drastically reduced in order to become competitive.

It is therefore vital, that the experience gained in other sectors with similar complex requirements for the manufacturing process is utilized to meet this challenge. As an international factory design and construction company with more than 40 years of experience in high-tech facilities, M+W Group is able to contribute its know-how to the design and construction of plants for industrial series production of Li-Ion batteries.

Industrial series production of Li-Ion Batteries

The demands placed on the production environment by industrial mass production of Li-Ion batteries are huge. The issues are not only cost reductions, but must also focus on maximum safety and stringent quality levels during production, which is a major pre-requisite for extending a battery's service life.

A number of examples from the manufacturing process that require particular attention during the design and construction of such manufacturing facilities:

Slurry production: Handling of powder and organic solvents and protection against cross-contamination are especially important in the manufacturing of electrode coating compounds.

Coating: The coating operation for both cathodes and anodes with different drying and compression stages requires complete protection against cross-contamination. Furthermore, the precise monitoring of the ambient humidity, as well as high-efficiency solvent extraction and recovery systems are other pre-requisites.





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Assembly und Packaging: The assembly of electrodes and separators, packaging and filling of the electrolyte are performed in dedicated cleanrooms and dry rooms with a relative humidity of less than one percent.

Formation: The first charging cycle (termed “formation”) is critical for the service life of the cell. This phase takes several days for each battery and also involves not only high power consumption, but also specific requirements for energy management, gas extraction, and protection against fire and explosion.

Finishing: The final phase of the integrated production process requires constant climate control and gas extraction.

Exploiting the know-how of M+W Group

Although the actual process operations of Li-Ion cell manufacture are not overly complex, they must be performed in a number of exceptionally demanding production environments, including strictly separated climatized rooms and cleanrooms, all of which have a decisive influence on the quality, performance and life time of the cells and the final product.

A refined, integrated plant concept, such as that proposed by M+W Group for a wide range of different high-tech plants, is critical for maintaining a stable, large scale production environment or conducting research and development in a prototyping laboratory. Process modules, such as solvent recovery, air dehumidifying, climate control, energy efficiency or protection against fire and explosion are also part of our solution portfolio.

Utilize our expertise in all phases of your project's life cycle. We offer you support for:

- Advanced Factory Design
- Integration of Manufacturing, Facilities & Automation
- Cleanrooms and Dry Rooms for Cell Manufacturing
- Chemical Supply Systems and Solvents Recovery
- Environmental Systems and Air-Lock Separation
- Energy Optimization and Material Recovery
- Factory wide data tracking and automation
- General Contracting for High-Tech Facilities

M+W Group is the leading global engineering, construction and project management company in the fields of Advanced Technology Facilities, Life Science & Chemicals, Energy & Environment Technologies and High-Tech Infrastructure. From concept development to turnkey services the company manages projects of all sizes ensuring rapid realization, high quality standards and cost-effective completion. With its competence to link process and automation technologies and complex facilities to integrated solutions M+W Group primarily focuses on leading companies in the fields of electronics, photovoltaics, life science, chemicals, energy, automotive, security and communication, as well as research institutes and universities.

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