Electric mobility.

thyssenkrupp
thyssenkrupp System Engineering is an internationally acting affiliate of thyssenkrupp Industrial Solutions, a system partner for all important components of the process chains for car body and powertrain in the automotive industry.

The product range also includes automation solutions for electrical storage and drive systems, solutions for innovative lightweight designs as well as lines and test systems for aviation industry.

thyssenkrupp System Engineering is a strong and reliable partner to its customers, optimizing their value added chain and strengthening their efficiency.

Extensive experience, a global leader with close proximity to the customers.
Low-emission electric propulsion systems will characterize and shape the mobility of the future. Currently, electric powertrains and renewable energies are expanding their market shares.

System Engineering is bringing its extensive experience from production lines of the automotive industry to the manufacturing process of modern energy storage and propulsion systems.

Knowledge and expertise designed to shape the market of the future.

Our product range for the electric mobility:
- Li-ion cell assembly lines
- Cell formation and finishing
- Battery module and pack assembly lines
- Electric motor assembly lines
- End of Line test benches
- Service and support worldwide

Our comprehensive range of services includes the technical consulting for our customers in the development of design-to-assembly components, plant and factory planning. Our main scope of supply is the design, manufacturing and commissioning of turnkey assembly lines out of one hand.
We design and build production lines for the manufacture of large li-ion cells and ultra-capacitors. While being a renowned system integrator in the automotive industry, we use our extensive know-how and proven industrial solutions, e.g. laser welding, automation and IQA to the benefit of our customers. Also, as a flexible partner, we offer tailor-made solutions. While following this competitive approach we supply better quality and cost efficiency in order to fulfill our customers’ expectations.

Battery cells.
The basis for energy storage.

Service portfolio
• Simultaneous engineering
• Equipment planning
• Mechanical design and controls
• Project management
• Installation and commissioning
• Production support

System integrator for scope of supply
• Slurry mixing
• Coating
• Calendering
• Cutting
• Tab welding
• Electrode stacking/winding
• Insertion of electrodes into pouch/can
• Closing of pouch/can
• Electrolyte filling
• Formation and ageing
• Degassing
• Sealing and leak testing

Customer benefits
• Proprietary technical center
• Common R&D activities with renowned Organizations and Institutes
• Network of qualified and Best in Class suppliers worldwide
• Proprietary laser welding equipment and expertise
• Reliable integration into present systems
• Standard automation architecture
• Own solutions for Integrated Quality Assurance and In Process Verification
We design and build assembly lines to process large energy storage cells (round, pouch and prismatic) further into battery modules and packs. All our lines can be semi or fully automatic providing all the necessary safety features for man and machine. For the project realization, our customers benefit from our very long experience in assembly line building.

**Customer benefits**
- Own solutions for cell handling, laser welding, transport and handling systems
- Thermography as inline laser welding control
- Solutions for stacking of prismatic cells
- Solutions for bending and welding of pouch cell terminals

**Detailed overview of our scope of supply**
- Cell and component testing (incoming goods quality inspection)
- Cell and component preparation (plasma cleaning, gluing)
- Cell positioning and stacking
- Stack pressing
- Frame welding
- Connector/busbar laser welding
- Cell and module handling
- Integrated Quality Assurance (IQA)
- In Process Verification

Battery systems. The power source of electric drive trains.
We provide end-of-line test solutions for battery cells, battery modules and battery packs.

Test stand set-up
- Manually or automatically loaded/unloaded
- References for manual and automatic electrical connections up to 400 V/300 A
- Battery load test unit with uninterrupted change between charging and discharging
- Safety concept for your battery test
- Experienced test stand supplier for the automotive industry

Test features include
- Real time open CAN simulation
- HV-test/isolation resistance test
- High current charging and discharging test
- Check of internal safety features
- Monitoring of cell voltages and temperature sensors during entire test run
- Integrated leak test for cooling system and battery pack housing

"We are pleased that our globally already well-known and acclaimed test stands and test software have now been established in the new field of battery technology."

Bernd Becker,
thyssenkrupp System Engineering
Scope of supply and services

- Assembly of coils
- Impregnation
- Assembly of contact ring
- Assembly of magnets
- Stator assembly
- Rotor assembly
- Electrical test
- End of line test

Customer benefits:

- From coil winding up to test - everything from one source
- Flexible production adjustment - investment in several stages
- Attainment of highest product quality

We provide complete assembly systems for serial hybrid, parallel hybrid, range extender or pure electrical drive trains and its components.

Electric drive assembly.

Electric vehicle & hybrid electric vehicle powertrain.
We are developing assembly systems for e-drive trains based on 30 years of tried and tested combustion engine assembly processes.

Ingo Steinkrüger, thyssenkrupp System Engineering
Test systems for electric drives.
Dynamic testing solutions for electric mobility.

Test stand set up
- The tested drive train consists of engine, motor and transmission with clutches in different applications/positions
- Manually or automatically loaded/unloaded
- References for manual and automatic electrical connections up to 400 V/300 A
- Noise insulated cabin
- Data storage concept with measuring PC, repair bay and server application possible
- Use of integrated DC-source instead of original car battery for drive and recuperation

Test features include
- Real time open CAN simulation
- Integrated speed control for hybrid motor
- Integrated Noise Vibration Harshness test (NVH)
- Integrated leak test for water cooling system
- Clutch actuation test
- Integrated test methods (all-in-one software concept)
Why choosing thyssenkrupp System Engineering.

- High engineering competency for planning, designing and commissioning.
- Focus placed on resource efficient and customized production solutions.
- Long-term experience in plant construction.
- Extensive knowledge of OEM standards.
- Certified project management.
- Worldwide presence.