

The Gehring Group

With the Gehring and copperING brands, the Gehring Group offers innovative production solutions for highly efficient conventional and electrified powertrains. In the field of fine machining, the company has been shaping the development of honing technology for more than 90 years and provides the automotive industry with the pro-

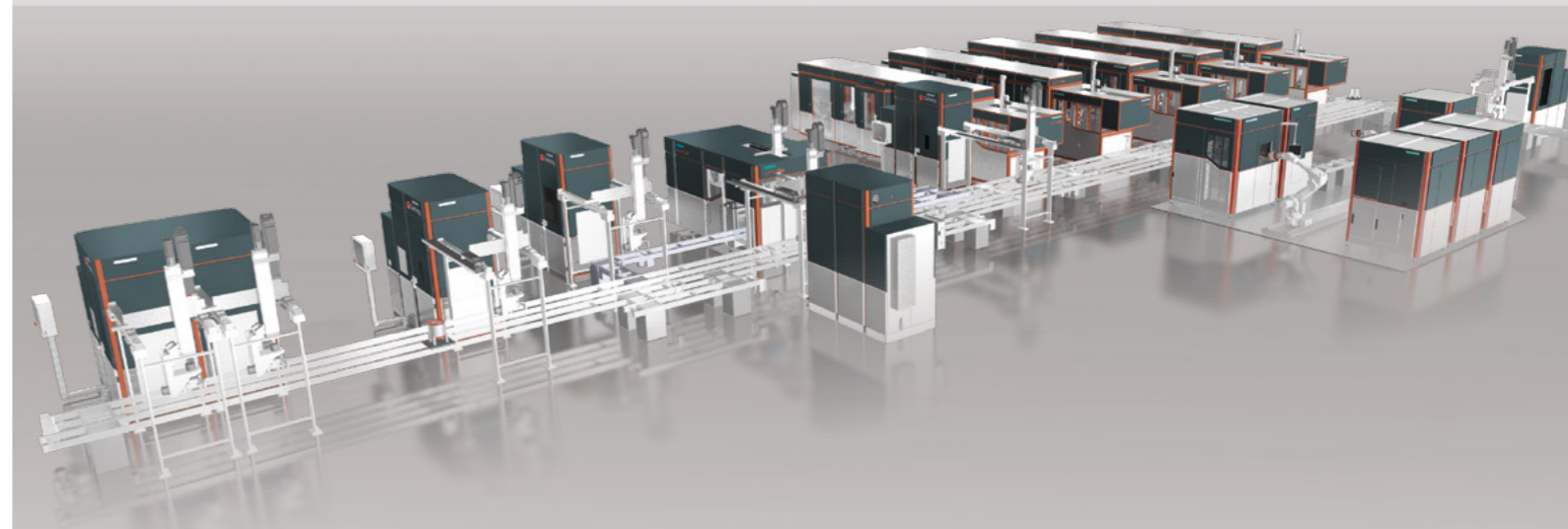
cesses of laser roughening, coating and form honing answers to the current challenges around the combustion engine. The production technology for e-mobility expands the group's portfolio and sets new standards in the flexible series production of electric motors.

Global locations

- Ostfildern (Germany)
- Naumburg (Germany)
- Bridgnorth (UK)
- Paris (France)
- Farmington Hills (USA)
- Livonia (USA)
- Silao (Mexico)
- São Paulo (Brasil)
- Shanghai (China)
- Bangalore (India)
- Wernigerode (Germany)
- Nuvolera (Italy)



Gehring *e-motive* Manufacturing solutions for electric powertrains



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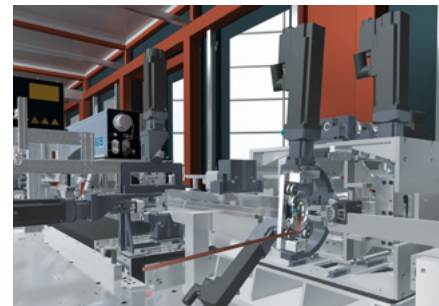
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Machines for Core Technologies in Stator Production

SPR - Pin Production



- Continuous, slip-free coil feed, precise adjustment of length
- Flexible free form bending for complex hairpin geometries with a single tool
- Configurable machines with various forming technologies



SHS - Pin Assembly



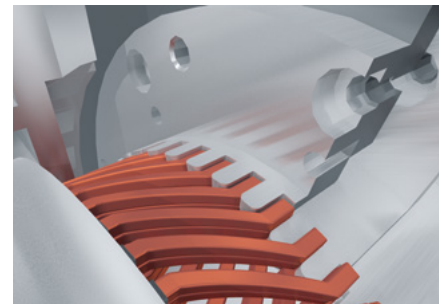
- Robot based assembly process for various winding designs
- Scalable assembly by segmentation of operations
- Human-robot-interaction facilitates programming



STW - Twisting



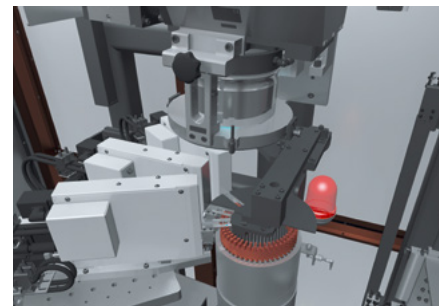
- Multi-layer twisting with freely adjustable backlash compensation
- Axial compensation for all twisting positions
- Force and torque monitoring for process evaluation



SWD - Welding



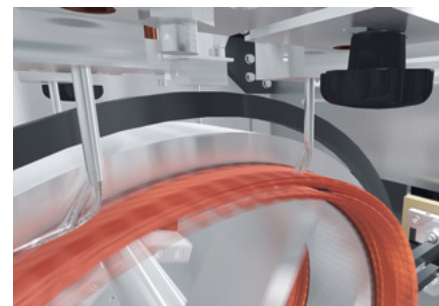
- Automated clamping and masking system
- High output with two work areas using one laser source
- Welding process control optimized for heat induction



STR - Impregnation



- Efficient heating by induction
- Individual recipes possible also for batch size 1 production
- Scalable modular design



Your Design and System Partner for E-mobility

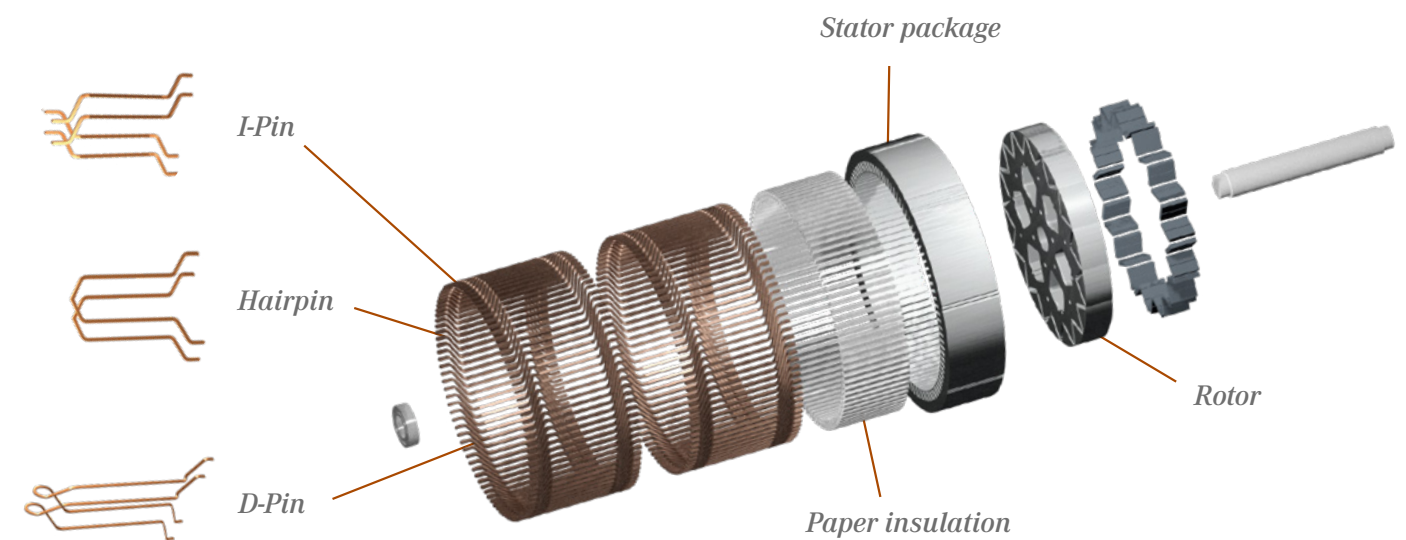
The Gehring Group is a pioneer of technologically innovative approaches and has extensive experience as a production technology manufacturer operating in the field of electric powertrains. The company specializes in production technology for the manufacture of electric motors, based on I-pin, hairpin and D-pin technologies. These designs combine the efficiency of electric motors with high automation capabilities and process reproducibility – all of which are key requirements for series production in the automotive industry. The portfolio ranges from standalone made-to-measure solutions for stator prototype development and small-scale series production to fully automated new system solutions for electric motor production lines.

Product development and prototyping

Developing electric drives and producing electric motor prototypes takes extensive knowledge of the interplay between individual production steps. We pass this knowledge on to our clients and support them from initial product development through to prototyping and all the way to series production. While a product is being developed, we incorporate our knowledge precisely where it is needed and assist in the design process, always keeping in mind a high level of production compliance. Investigating different concepts and production processes aids decision-making and makes the transition into series production easier.

Turnkey solutions

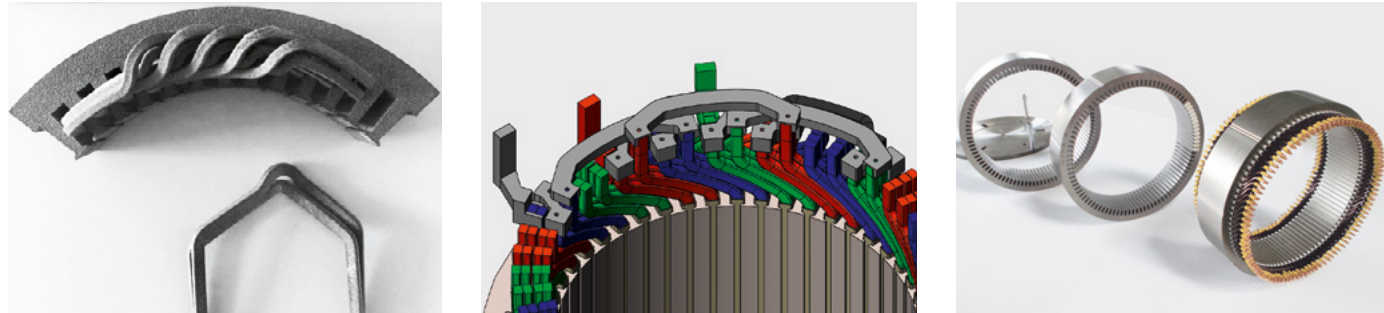
We provide complete system solutions and production lines for the manufacture of electric motors. From producing pins to inserting pins, from twisting and welding pin ends through to impregnating the stators using trickle and powder coating methods, we have every step covered – and all from a single source. The integrated automation guarantees a steady flow of stators along the line. With the benefit of modern simulation procedures and proven skills in project management, we are the go-to partner when it comes to designing new production lines for high productivity. By pooling together all our skills and our extensive knowledge of the individual production steps, and by providing a direct point of contact, we simplify and optimize the execution of project for our clients.



Hairpin technology for electric powertrains

From Design via Prototyping and Small Series to Volume Production

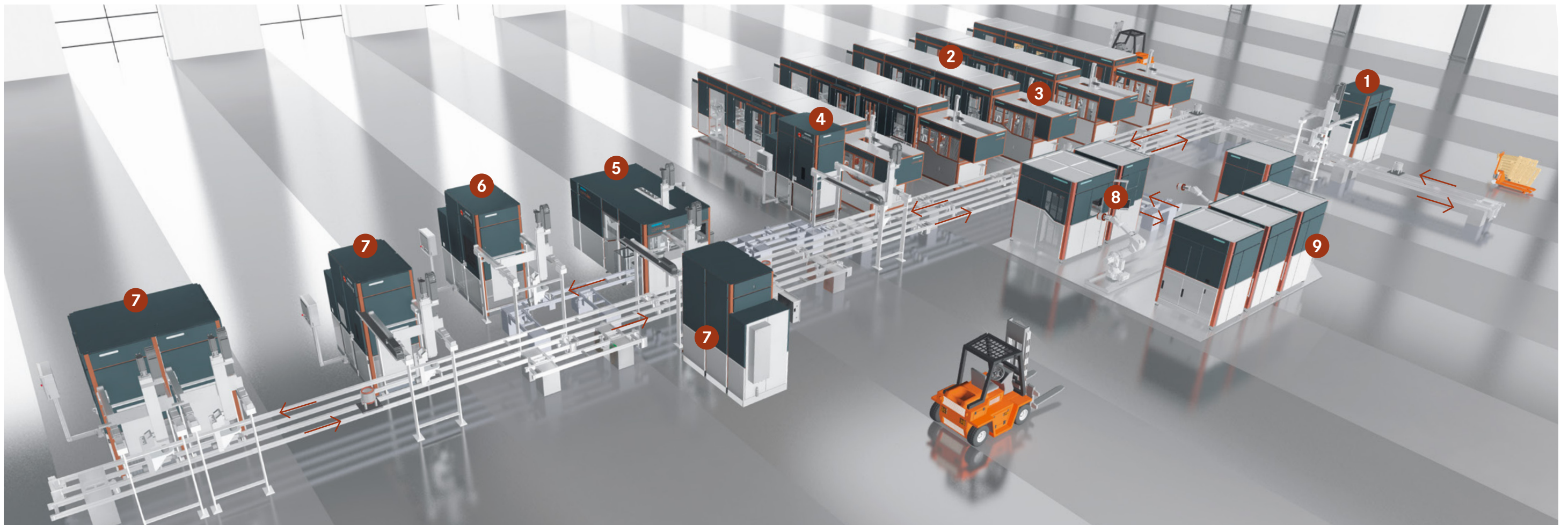
We have been contributing to the development of electric powertrains for many years, supplying the automotive industry with engineering, design and production technology. The resulting expertise makes us a competent partner in the design of stators and the respective machinery equipment, including production of prototypes and small series in our own facilities.



We co-develop stators with our customers, including processes, tools, fixtures and automation.



With our in-house development and production capacities, we are a single source partner.



Production system for hairpin stators

1. Slot insulation

2. Pin production

3. Pin assembly

4. Widening

5. Twisting

6. Pin cutting

7. Laser welding

8. Impregnation

9. Powder coating