



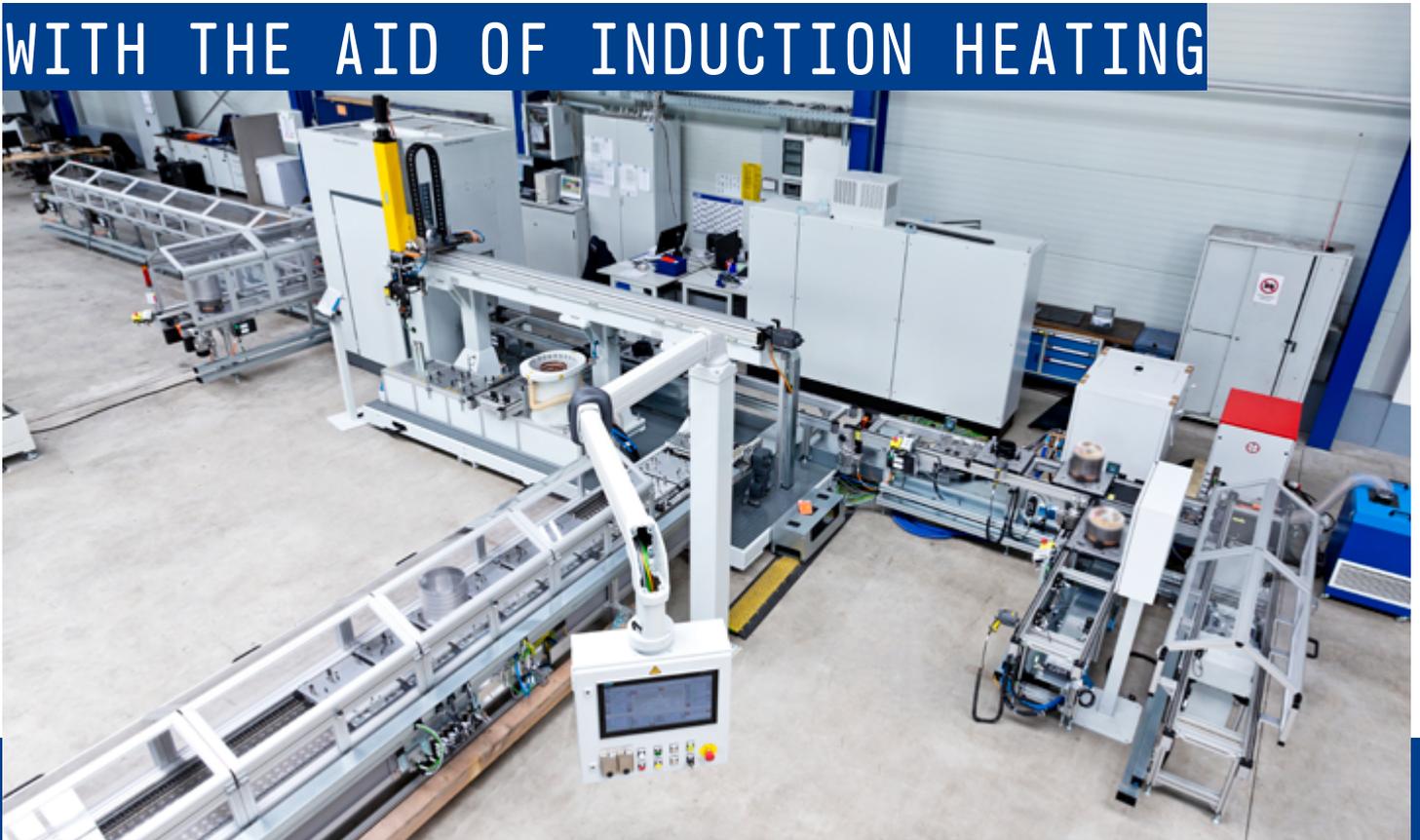
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ASSEMBLY LINE FOR ELECTRIC MOTOR PRODUCTION FACILITY

AN ETERNAL CONNECTION: JOINING

WITH THE AID OF INDUCTION HEATING



At first sight the project task of our well-known customer who operates in the field of Hybrid- and Electromobility seemed to be unspectacular: An assembly machine to automatically assemble a stator into a housing to supplement an assembly line for electric motors at the customer's facility.

Our challenge: The stator has to be joined permanently with the component but the clearance was extremely small. At this point our know-how in special mechanical engineering was demanded and we worked out an individual concept. The keyword in this project was induction heating. Thus the housing was heated up to more than 200°C, then joined to the stator and afterwards cooled off. The resulting connection between the assembled part and the stator is not only technically highly interesting but also guaranteed to be durable.

Of course, the whole concept included further functions and details which were linked by state-of-the-art automation. Whether laser marking, an automated counter measuring device for the joining axis, side track for NOK-parts or special, antistatic conveyor technology - every detail was individually coordinated to meet the customer's requirements.

SOME INDIVIDUAL OPERATIONS AT A GLANCE



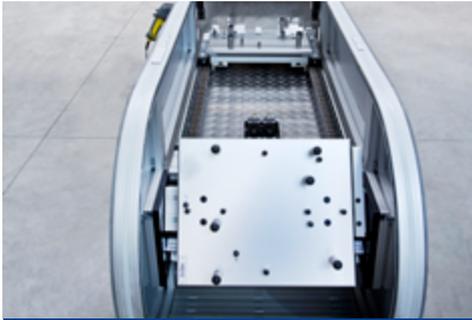
transfer of the component from pre-machine, if necessary merge of rework parts via DMC hand scanner



manual assembly station for cable clips



position control of the stator via camera



supply of the housings via circulating pallet conveyor



induction heating of the housing



following joining process including force/ stroke monitoring



side track for NOK-parts including withdrawal possibility after cooling time



cooling tunnel with covers including access facilities



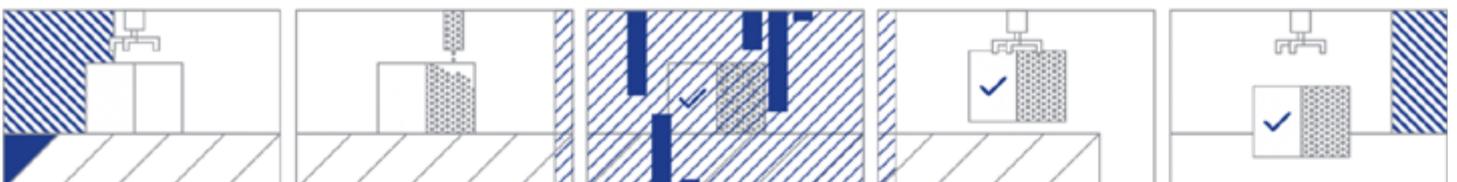
automated counter measuring device for the joining axis

THE PROJECT IN FIGURES

Not only the seamless integration of the assembly machine into the customer's existing production line required a perfect coordination but also the special demands of the component and the related safety aspects for the operators while working with strongly heated components were particularly considered.

Facts

- inductive heating up to more than 200°C
- antistatic conveyor technology
- multitude of components in "Clean Design"
- complete traceability of process steps in the Manufacturing Execution System (MES)



INDIVIDUAL OPERATIONS IMPLEMENTED

Inductive heating was the determining factor in the process of this manifold project by occupying the major part of the cycle time.

Additionally both heating and dilatation had to take place smoothly and the small clearance between stator and housing made this order especially exciting, too. Another important keyword was the implementation of the whole project in „Clean Design“ whereby the high cleanliness requirements for the stator were achieved.

Automation

- conveyor technology stator: Bosch transfer system
- conveyor technology housing: Circulating pallet conveyor
- additional conveyor merge of rework parts
- automatic position control via camera system
- use of X-/Z-handling system
- automated counter measuring device for the joining axis
- extraction point for NOK-parts

Assembly technology

- manual assembly station for cable clips
- joining in an inductively heated component
- force/stroke monitoring of the joining process
- laser marking



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CONTACT

ARE YOU FACING SIMILAR CHALLENGES?

We would be happy to advise you on comparable projects and answer any questions regarding our reference cases.