White Paper: Innovative Power Module Assembly Solutions

Technology Partners

Infotech is a trusted partner for power module suppliers worldwide. Our flexible and customized solutions, built on standard modules, provide an ideal platform for assembling high-quality products. Our strong partnerships with leading German companies, PINK GmbH Thermosysteme and Schunk Sonosystems, position us at the forefront of the power module industry and beyond.

PINK GmbH Thermosysteme

Our collaboration with PINK GmbH Thermosysteme has resulted in innovative and customer-friendly solutions for vacuum soldering and sintering lines, ensuring high-quality and competitive offerings.

Power Module Production Line

Benefits of the Collaboration:

- PINK GmbH Thermosysteme and Infotech AG have fully optimized and synchronized their in-line capabilities, along with the handling, transport, and soldering/sintering processes, offering a comprehensive solution featuring a closed-loop product carrier system.
- The transport process involves no Z-axis movement, and the mass of the product carrier is optimized to eliminate vibrations affecting the assembled parts during transit.
- The product carriers are designed and optimized to remain within the assembly and solder line, thus ensuring the high level of process repeatability.
- The innovative wetting process of the tacking agent firmly secures components onto the substrate during transport to the vacuum soldering oven, ensuring exceptional soldering results.

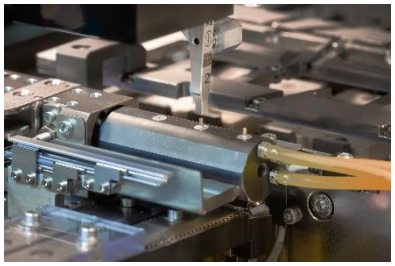
Trends

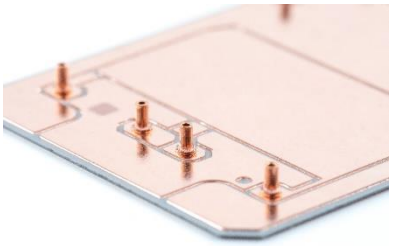
Sinter bonding is a crucial joining technology in the field of electromobility, playing a vital role in enhancing the performance and longevity of power modules. These modules must meet stringent performance and lifespan requirements, particularly regarding temperature tolerance. The exceptional physical properties of the sinter bond, which connects the power semiconductor to the substrate, provide significant advantages over traditional solder joints. Silver is the preferred metal for this sintered compound due to its relatively low sintering temperature, which helps minimize mechanical stress between the bonded components. Achieving a reliable sintered connection requires precise application of pressure and temperature.

Schunk Sonosystems

The Schunk Sonosystems ultrasonic welding process for Pins and Pin-Housing is seamlessly integrated into our production cells. Infotech handles parts with precision and speed, while Schunk Sonosystems performs the ultrasonic welding process. This versatile machine can function as a standalone unit or be incorporated into a production line. The synergy of these processes results in a solution that is both efficient and user-friendly for our customers.

IC-1200 Production Cell | **Integrated Schunk Sonotrode** | **Processed Product**





Infotech's IC-1200 Production Cell with integrated Ultrasonic Welding Technology by Schunk

Benefits of the Collaboration:

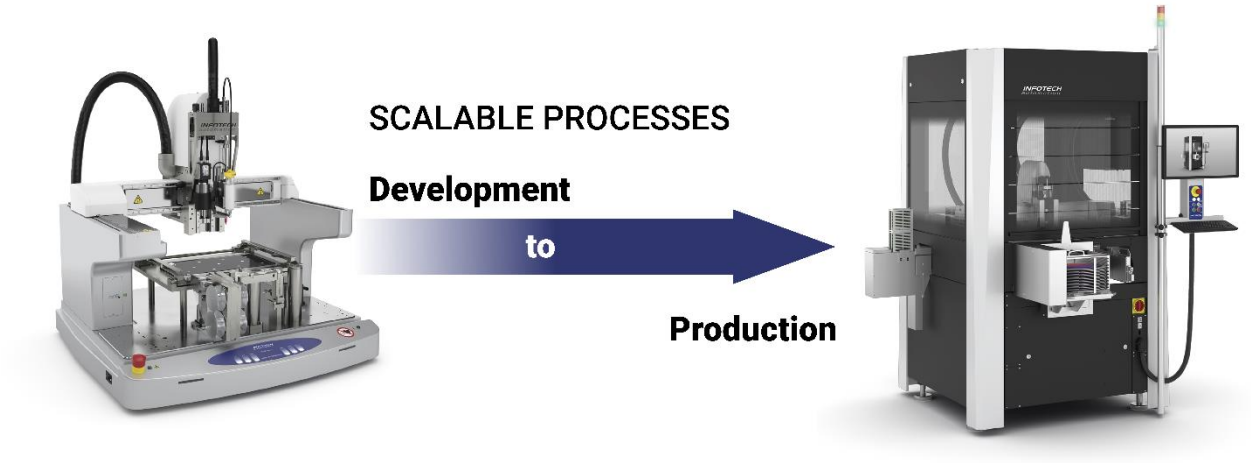
- Multi-flexible design with high adaptability, utilizing the Pick'n'Weld technology.
- Streamlined processes that integrate welding and pin placement into a single, efficient step.
- Very precise placement and positioning of Pins/Pin-Housings.
- Inline dynamic process monitoring for each individual welding point.
- Durable intermetallic copper connects designed for applications requiring high temperature and high-power density.
- Ongoing innovations to meet the evolving demands of the market.
- Continuing improvements to the cycle time for the Pick'n'Weld process.

Excellent solution for Welding of Pins/ Rivets or Pin-Housings

Implementing Pin-Housings enables the welding of connections onto the substrate much earlier in the production process, as opposed to directly welding the pins onto the substrates at a later stage when the power module is nearly complete. This approach allows for comprehensive analysis of the welding contacts alongside other connections at the substrate level. To facilitate the pin insertion process at the final stage of module production, Infotech provides specialized pin insertion machines. If only a round pin or rivet is required, it can be welded directly onto the substrate.

About Infotech Automation Inc.

Infotech Automation, headquartered in Switzerland, specializes in the development, production and maintenance of multifunctional dispensing and assembly machines. Precision, reliability and flexibility are the cornerstones of our products and internal processes. Our success is built on solid, long-standing partnerships with customers, technology partners, suppliers and employees.



Scalable Processes (Development to Production)

2023 - 2024 marked an exciting time for Infotech Automation, highlighted by the October 2023 launch of our new US branch office in Watertown, CT. This strategic expansion is a crucial step towards increasing our market presence in the US and Canada.

The Watertown, CT office is responsible for providing support to our existing US and Canadian customers. The office also focuses on acquiring applications from both new and existing customers. Additionally, Watertown features a demo room designed to facilitate enhanced technical support and offer process development capabilities for customer projects.

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