ALBATROSS

Advanced Light-weight BATteRy systems Optimized for fast charging, Safety, and Second-life applications

NEWSLETTER

June 2025

🔋 Innovative Battery Module Subsystem for Enhanced Manufacturability ⚡

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This project received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No 963580- ALBATROSS

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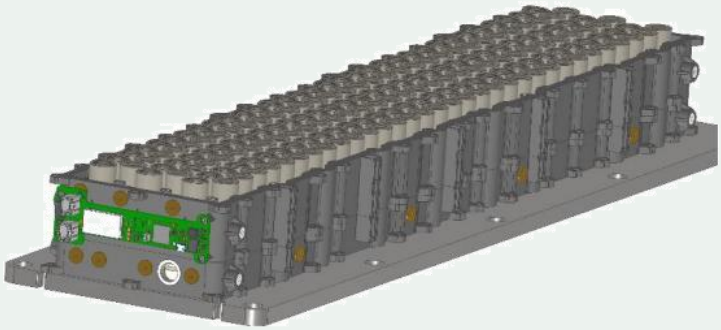
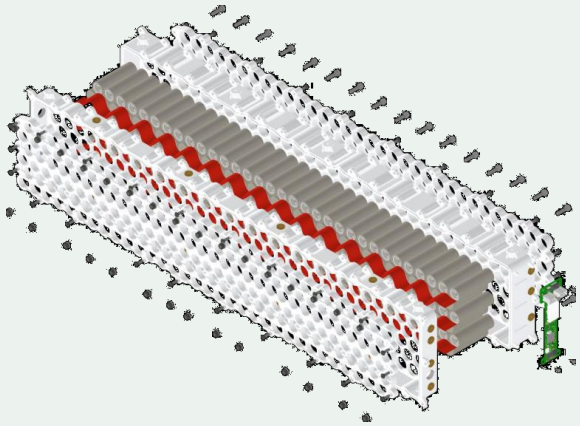
Innovative Battery Module Subsystem

ALBATROSS has successfully designed and produced battery modules optimized for manufacturability. This newsletter highlights the final design, production procedures, and validation results, demonstrating the achievement of key performance indicators (KPIs) and readiness for integration into real-world applications.

Battery Module Production

- **Final Parts List:** The ALBATROSS battery module consists of 192 LG 21700-M50LT cells, plastic stops, screws, sensor/heating foils, and cell holders. These components were carefully selected to ensure high performance and reliability.
- **Design Drawings:** Detailed drawings and exploded views of the module showcase the assembly procedure and orientation of the modules. The design includes two orientations (A and B) to create a continuous pack.
- **Assembly Procedure:** Step-by-step instructions for assembling the modules were created, including mounting plastic stops, inserting foils, building cell rows, and applying sealing resin. The procedure ensures that each module is assembled with precision and consistency.





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Cell Interconnections

- **Busbar Production Parameters:** Laser cutting and gas-assisted processes were used to produce busbars, ensuring precision and stability. Despite initial challenges with DLIP texturing, the revised approach improved production reliability. The gas-assisted laser cutting process employed optimized parameters, including 2-kW laser power and 8-bar nitrogen gas pressure.
- **Cell Joining Parameters:** Extensive laser welding trials were conducted to optimize parameters for positive and negative terminals, ensuring reliable connections without electrolyte leakage. The trials highlighted the importance of accurate height setting and clamping. Parameters for positive terminals included a 500 W single mode beam scanned six times at 320 mm/s, while negative terminals required a faster speed of 450 mm/s.
- **Cell Joining Procedure:** A detailed procedure for welding the modules, including safety measures and quality checks, was developed. This includes steps like power checks, alignment verification, and pressure testing. The procedure ensures that each weld is performed accurately and consistently.

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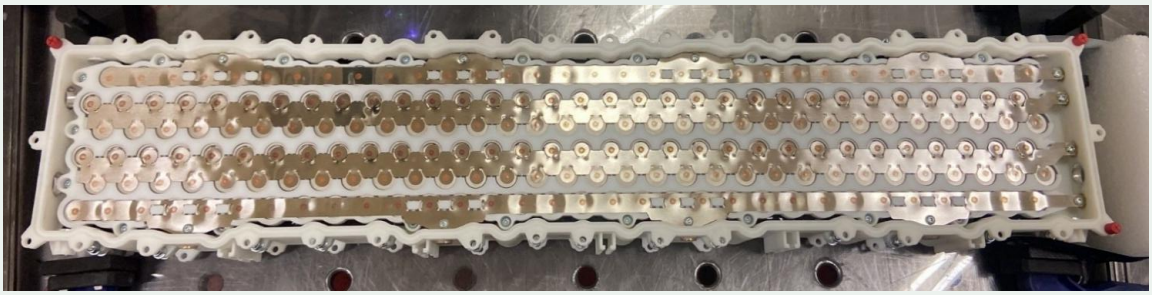
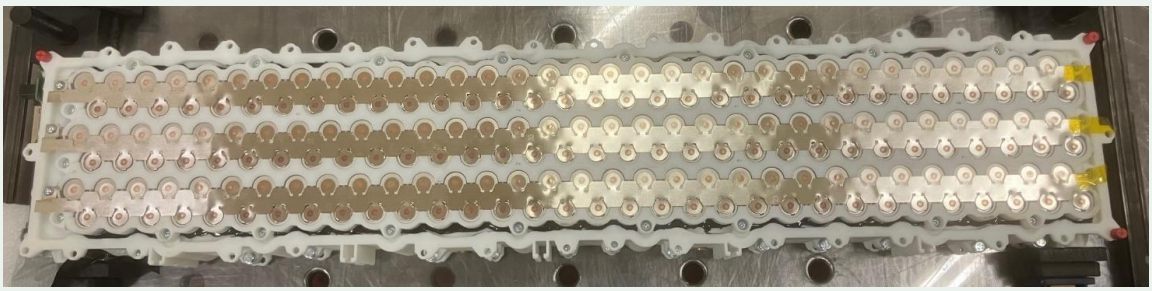
Module Validation

- **Design Validation:** The module design meets objectives such as integrating thermal management, selecting appropriate materials, and achieving robust welding. The design also supports scalable production and reliable electrical connections.
- **KPI Validation:** The module achieved a 20% weight reduction and increased energy density, meeting the set KPIs. The use of high energy density cells and innovative design choices contributed to these improvements. The module's weight was reduced by rethinking the structure and removing unnecessary elements.
- **TRL Validation:** The module has been validated at TRL6, being integrated into a BMW i3 for real-world testing. This validation confirmed the module's readiness and provided valuable data on the module's performance in real-world conditions.





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