ALBATROSS

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

NEWSLETTER

APRIL

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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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Regarding the procedure for the module assembly, a sequence of steps has been defined for the pre and post production.

During the pre-production occurring at the partner Cleantron, different steps are taken to ensure that production can continue without any stoppage. First, all parts are inspected for tolerances, and if needed corrected/rejected. Then, cells are tested for a narrow voltage, impedance and capacity spread. Afterwards, the cells are inspected for imperfections.

Before assembly, every part is visually inspected. During the module assembly, Cleantron will be placing the battery cells into the plastic parts of modules along the specified assembly sequency. After assembly, the fitment is inspected again, and a cover is placed over the cells.

During the assembly:

- *The clips are put into the cell holder.*
- *The cell stop is placed in the cell holder and secured with 8 screws.*
- *The cells are placed in the cell holder.*
- *The sensor foil is placed between the cells on the outside.*
- *The second cell holder with clips and cell stop is put on the other side of the cells.*

The joining of the modules will be handled by TWI. The first step is placing the busbars, followed by welding the first side. Then, the battery pack is flipped and the busbars are placed and welded.
For the final assembly,
The Supervisory Control Unit (SCU) is connected to the sensor foils and mounted to the side of the module with 4 screws, as seen in Figure 1. The wiring for the Control Monitoring Units (CMUs) and the coolant connectors are then installed.

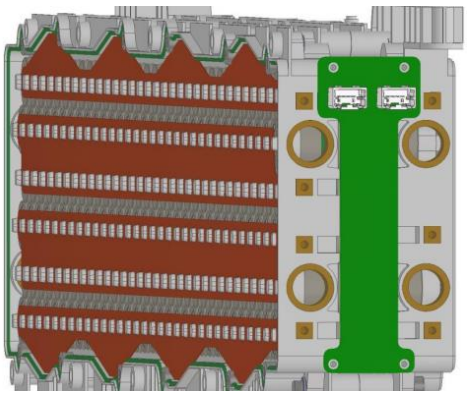

Figure 1. SCU mounting.

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After welding every module is visually inspected, to check the following criteria:

- No visually disconnected welds
- No cells that are misaligned
- No incorrectly placed busbars
- Limited bulging of busbars
- Module impedance measurement has to be within spec
- Isolation measurement between cells and metal parts.
- Covers are installed for safe storage

During the module assembly, the sensor foils are routed between the cells on the outside of the cell holders. The foil starts between cell rows 1 and 2, 3 and 4, 5 and 6. Then, it continues the trajectory path presented in Figure 2.

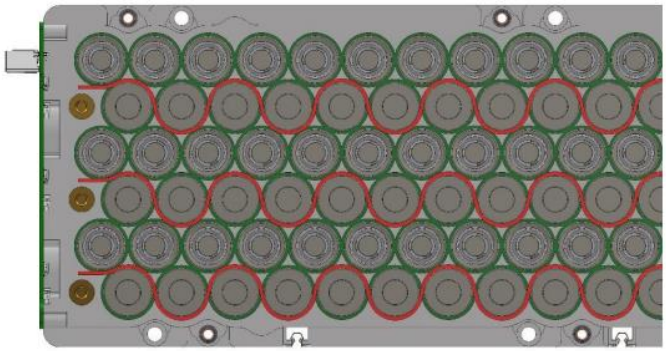

Figure 2. Sensor Foil Routing. The foil routing is depicted in red and its thickness has been exaggerated to improve its visibility in the image.

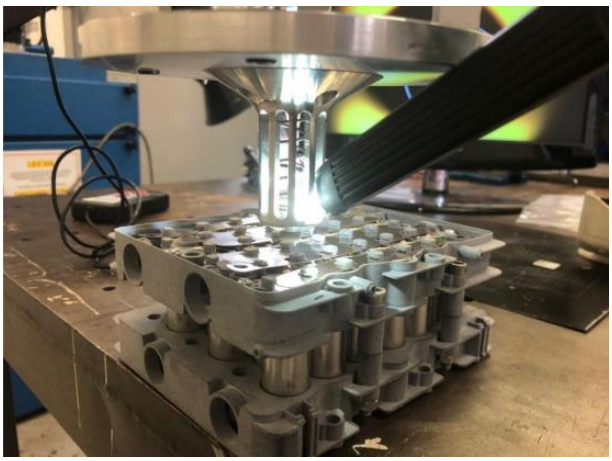

Figure 3. Clamping tool designed by TWI.

According to the experience from TWI, the design of any fixture that could position and (in particular) clamp a set of busbars to an array of cylindrical cells would be quite complex. Therefore, a different approach is being explored in ALBATROSS based on an on-head clamping solution, wherein the clamping tool travels with the welding robot as each busbar-to-cell location is welded.

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The tool itself comprises a number of aluminium parts attached underneath the commercially available laser scanning head used in the welding trials of ALBATROSS performed also by the partner TWI.
A scanned laser beam is projected through the cylindrical axis of the tool, passing through the working end of the tool to arrive at the busbar surface. Although this tool end is also made from aluminium, there is a hollow sprung piece which contacts the busbar's surface and that is made from a semi-consumable ceramic material. This reduces the risk of any accidental short-circuiting of the cells or module.
Examples of module welds made on dummy cells supplied by the partner Cleantron can be seen in Figure 4.

Figure 4. Examples of module welds into the positive and negative terminals of the dummy cells supplied by Cleantron.

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