



16 July 2024

## **ALTECH – UPDATE ON CERENERGY® ABS60 BATTERYPACK PROTOTYPES**

### **Highlights**

- Prototype production is progressing well
- All CERENERGY® cells for the first 60 kWh Prototype completed
- Cell contacting system manufacturing finished and delivered
- Improved cell electrode design showing excellent results
- Cell quality tests by Fraunhofer delivering better than expected capacity
- Welding of cells to cell contacting system underway
- Completed modules will be mounted into ABS60 BatteryPack next week

Altech Batteries Limited (Altech/the Company) (ASX: ATC, FRA: A3Y) is pleased to provide an update on the production of its CERENERGY® ABS60 BatteryPack prototypes. All 240 cells for the first ABS60 BatteryPack Prototype have now been fabricated, assembled and initialized at Fraunhofer IKTS Hermsdorf's pilot plant. To validate a homogeneous cathode material distribution, all cells were cycled through several testing stations at Fraunhofer IKTS Hermsdorf and Arnstadt.

### **IMPROVED CELL ELECTRODE DESIGN**

During the fabrication of the two 60kWh CERENERGY® ABS60 BatteryPack prototypes, the Altech and Fraunhofer team made several design improvements to the cell's positive probe. These enhancements aimed to boost the cell's energy capacity and reduce the nickel content. The "V2" design of the positive probe allows for slightly faster charging and discharging while lowering the unit costs of the battery. Testing revealed that most cells had higher-than-expected energy capacities, an outstanding result that strongly supports the chosen electrode design. With all cells manufactured according to the series design and optimized processes, the best cells to date have been completed. The table below demonstrates that all the cells are meeting the expected specifications.

**Table 1 – Initial Prototype cells testing meeting all expected specifications**

cerenergy® - Cell Level		first tests
Voltage range:	1.7 - 2.8 V	✓
Current Capacity:	100 Ah nominal	✓
Energy Capacity:	0.25 kWh (100 % DoD, <C/10)	✓
Rated energy Capacity	0.23 kWh (100 % DoD, C/8)	✓
Discharge Current:	cont. 25 A/ trans. 33 A	✓
Operational SoC Range:	20%-100%	✓
Internal Ops Temp.:	min. 270 °C – max. 350 °C	✓
Ambient Ops. Temp.:	-20 °C to +60 °C	✓
IP Rating:	IP65	✓
24h cycle capability:	yes, continuous without interruptions	✓



### CELL CONTACTING SYSTEM COMPLETED

The Cell Contacting System (CCS) has undergone stringent testing and has now been completed and delivered by key supplier Hofer AG. The CCS was delivered to Fraunhofer IKTS in Dresden, where all parts of the modules will be collected to assemble each of the five modules. Each module contains 48 cells, that are currently being welded to the CCS by an external service provider. After welding is completed, the ABS60 BatteryPack with its 60 kWh capacity can be completely assembled.

**Figure 1- CCS mounted at Fraunhofer IKTS, Dresden**

### MODULE WELDING TRIALS

To guarantee the most time-efficient welding, a unique tool was designed and built at Xenon, which is responsible for welding and quality control across the 120 MWh battery plant. After completing the welding tool, it was shipped to an external laboratory, accompanied by a test module and several trial cells. The aim was to determine the best working parameters and to proof the handling of certain parts of the module. The trials were successfully finished.



**Figure 2 - Welding tool functionality proven during welding trials**

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## CELL MANUFACTURING PROGRESSING WELL

All 240 cells for the first ABS60 BatteryPack Prototype have been assembled and initialised at Fraunhofer IKTS, Hermsdorf. To validate a homogeneous cathode material distribution, all cells were cycled through several testing stations at Fraunhofer IKTS Hermsdorf and Arnstadt.



Figure 3 - First the cell module ready to be shipped

## INTERIM CELL TESTING

At Fraunhofer IKTS in Hermsdorf, all cells were scanned using a unique X-ray microtomography device that enables the ability to look inside cells after they are hermetically closed. This is required to ensure the most homogeneous material distribution inside the cells as well as the best possible alignment of cell components e.g. electrode. The results have been excellent to date. Another quality assurance procedure involved cycling cells to ensure the electrical requirements and parameters are operating as designed.

## MODULE WELDING AND BATTERYPACK ASSEMBLY

After every cell passed all quality checks, the modules containing the cells were shipped to the laboratory for welding onto the CCS. By using the predetermined parameters for welding, all modules have been successfully welded. After completion, the modules will be shipped to Fraunhofer IKTS, Dresden, where all five modules will then be mounted into the ABS60 BatteryPack and the first Prototype will be completed. This will enable testing and demonstration to potential customers, to prove individual use cases for each customer.

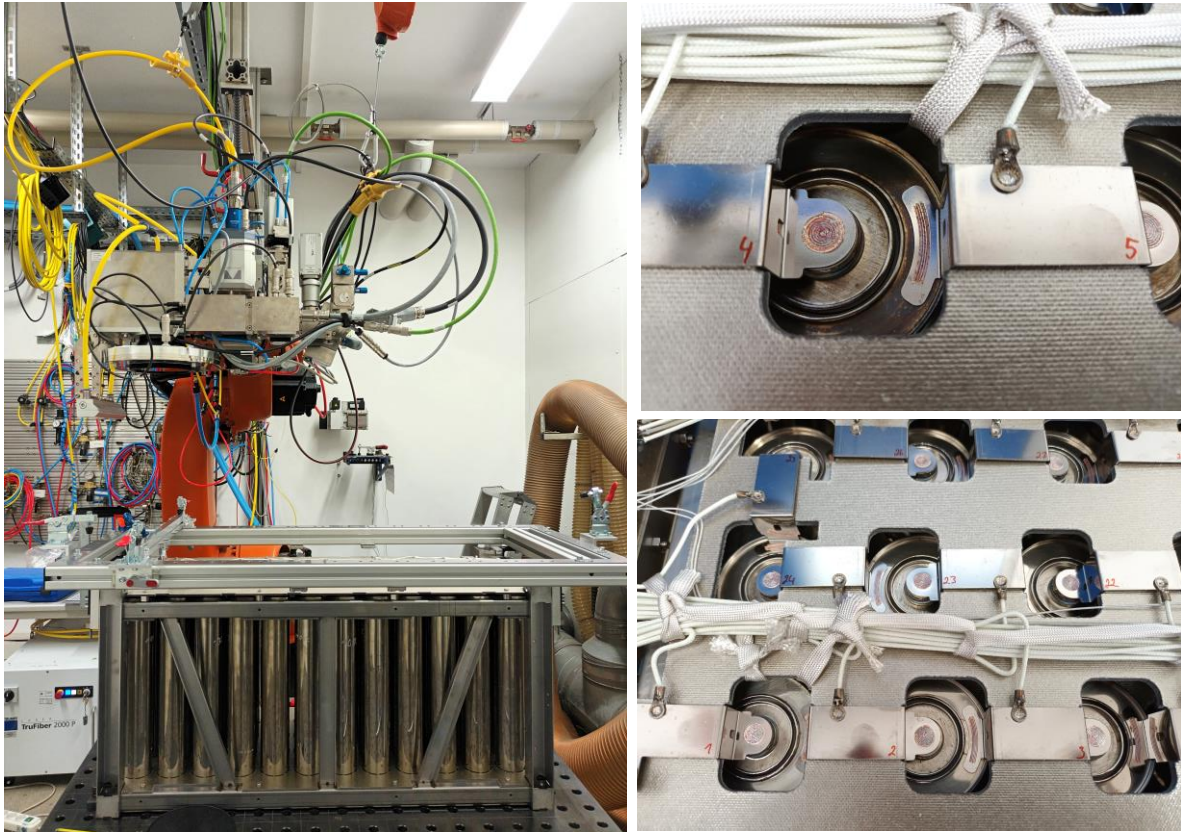
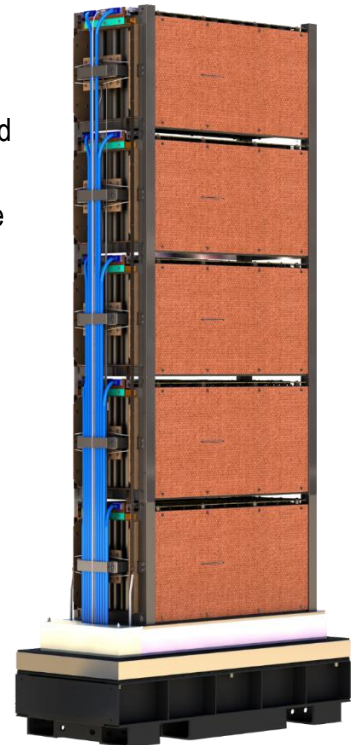
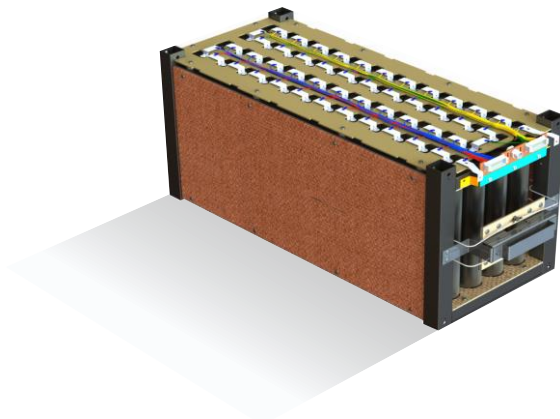
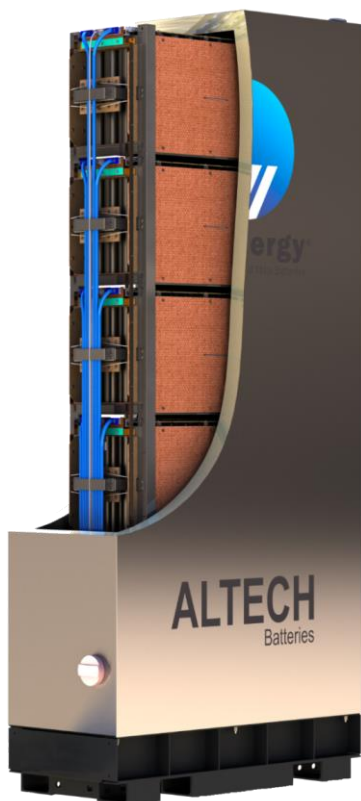


Figure 4 - Module welding at Laboratory

## ABOUT THE ABS60 - BATTERYPACK

The 60kWh Altech Battery Pack consists of five 12kWh modules with 48 cells each, mounted on top of each other and sealed in a thermal isolated stainless steel hood housing. The Battery management system is mounted at the base. To maintain thermal self-sufficiency, an insulation hood was designed, where the required heat of the system can be maintained inside the BatteryPack as long as possible, although the outer surface only has ambient temperature. This was achieved by using vacuum insulation. The base of each module is designed to accommodate forklift transport for easy mounting into the GridPack.





**Figure 5 – ABS60 60 KWh BATTERYPACK**

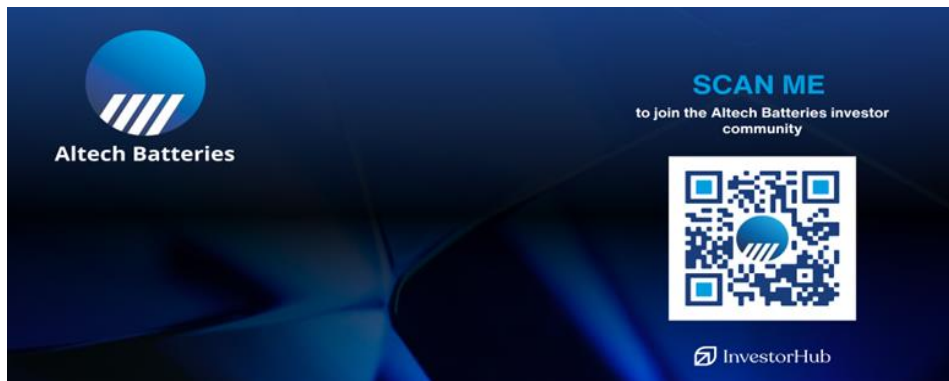
Commenting on the progress, MD and CEO Iggy Tan stated “Altech’s team in Germany, together with its joint venture partner Fraunhofer, and with the assistance of key suppliers, have made excellent progress on the fabrication of two 60kWh CERENERGY® ABS60 BatteryPack prototypes. All components for the first BatteryPack have now been fabricated. Altech is now completing the welding of the cells to the Cell Contacting System, after which the five completed battery modules will be delivered to Fraunhofer IKTS in Dresden, where all five modules will be mounted into the ABS60 BatteryPack and the first ABS60 Prototype will be completed. The BatteryPack will then be available for testing and demonstration to potential customers, thereby assisting Altech in securing offtake and finance for the 120MWh CERENERGY® battery plant to be constructed on Altech’s land in Germany”.

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Authorised by: Iggy Tan (Managing Director)

### Altech Batteries Interactive Investor Hub

Altech's interactive Investor Hub is a dedicated channel where management interacts regularly with shareholders and investors who wish to stay up-to-date and to connect with the Altech Batteries leadership team. Sign on at our Investor Hub <https://investorhub.altechgroup.com> or alternatively, scan the QR code below.



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## **About Altech Batteries Ltd (ASX:ATC) (FRA:A3Y)**

### **CERENERGY® Batteries Project**

Altech Batteries Ltd is a specialty battery technology company that has a joint venture agreement with world leading German government battery institute Fraunhofer IKTS (“Fraunhofer”) to commercialise the revolutionary CERENERGY® Sodium Chloride Solid State (SCSS) Battery. CERENERGY® batteries are the game-changing alternative to lithium-ion batteries. CERENERGY® batteries are fire and explosion-proof; have a life span of more than 15 years and operate in extreme cold and desert climates. The battery technology uses table salt and is lithium-free; cobalt-free; graphite-free; and copper-free, eliminating exposure to critical metal price rises and supply chain concerns.

The joint venture is commercialising its CERENERGY® battery, with plans to construct a 120 MWh production facility on Altech’s land in Saxony, Germany. The facility intends to produce CERENERGY® battery modules to provide grid storage solutions to the market.



### **Silumina Anodes™ Battery Materials Project**

Altech Batteries has licenced its proprietary high purity alumina coating technology to 75% owned subsidiary Altech Industries Germany GmbH (AIG), which has finalised a Definitive Feasibility Study to commercialise an 8,000tpa silicon alumina coating plant in the state of Saxony, Germany to supply its Silumina Anodes™ product to the burgeoning European electric vehicle market.

This Company’s game changing technology incorporates high-capacity silicon into lithium-ion batteries. Through in house R&D, the Company has cracked the “silicon code” and successfully achieved a 30% higher energy battery with improved cyclability or battery life. Higher density batteries result in smaller, lighter batteries and substantially less greenhouse gases, and is the future for the EV market. The Company’s proprietary silicon product is registered as Silumina Anodes™.

The Company is in the race to get its patented technology to market, and recently announced the results of a Definitive Feasibility Study for the construction of a 8,000tpa Silumina Anodes™ material plant at AIG’s 14-hectare industrial site within the Schwarze Pumpe Industrial Park in Saxony, Germany. The European silicon feedstock supply partner for this plant will be Ferroglobe. The project has also received green accreditation from the independent Norwegian Centre of International Climate and Environmental Research (CICERO). To support the development, AIG has commenced construction of a pilot plant adjacent to the proposed project site to allow the qualification process for its Silumina Anodes™ product. AIG has executed NDAs with German and North American automakers and battery material supply chain companies.

