



6 May 2025

ALTECH – SILUMINA ANODES™ PROJECT UPDATE

Highlights

- Spherisation of coated silicon particles– newest technological development
- Positioned in voids of graphite layer – further reducing impact of swelling
- Optimised 5% silicon content gives 50% capacity increase
- Pilot plant in Germany now operational
- All challenges resolved and ready for customer testing

Altech Batteries Limited (ASX: ATC, FRA: A3Y) is pleased to provide an update of the Silumina Anodes™ Project. 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. The Company's proprietary silicon product is registered as Silumina Anodes™.

SPHERISATION OF COATED SILICON

As previously noted, key challenges in using silicon in lithium-ion battery anodes include particle swelling, first-cycle capacity loss of up to 50%, and rapid battery degradation. Altech's initial approach involved coating individual silicon particles with a nanolayer of alumina to reduce expansion and mitigate first-cycle loss. This method proved effective. Building on this success, the next phase of development involved spherifying the coated silicon particles and applying additional coatings to the spherical structures (refer Figure 1). These spherical, alumina-coated silicon particles can be effectively distributed within the voids of graphite, helping to minimise long-term damage to the electrode layer caused by expansion (refer Figure 2). By residing in these voids, the particles can move without exerting stress on the surrounding graphite sheets. Additionally, the Company's R&D laboratory has optimised silicon content to a 5% addition, which has delivered a 50% capacity performance improvement in battery applications. The improvement in battery anode capacity can be seen in Figure 3 and 4.

Silumina Anodes™ Technology Explanation →
<https://youtu.be/Vc5XcmPSAIs>



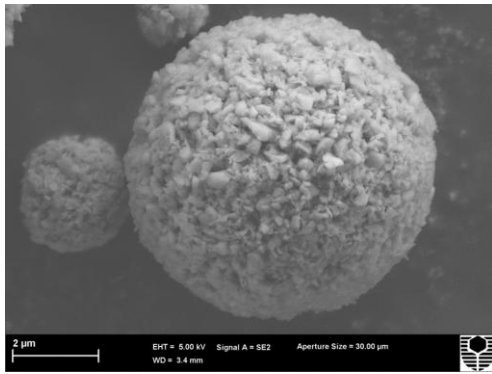


Figure 1 – SEM Image, An Alumina Treated Silicon Sphere

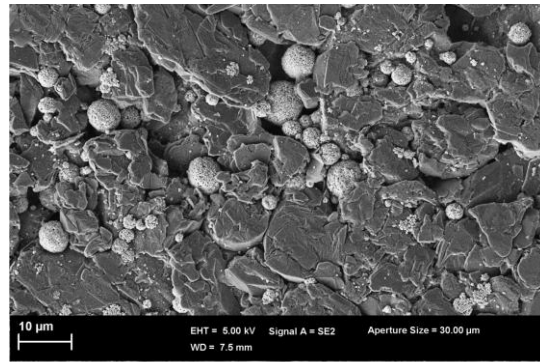


Figure 2 – SEM Image, Silicon Sphere Distributed in Graphite Voids

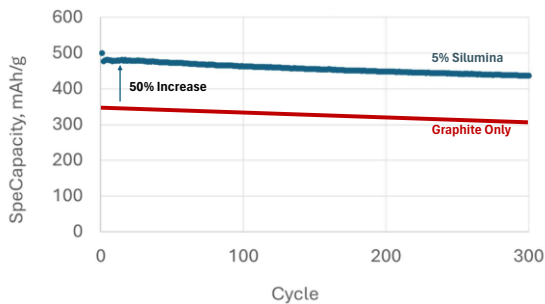


Figure 3 – Anode Capacity with 5% Spherical coated Silumina

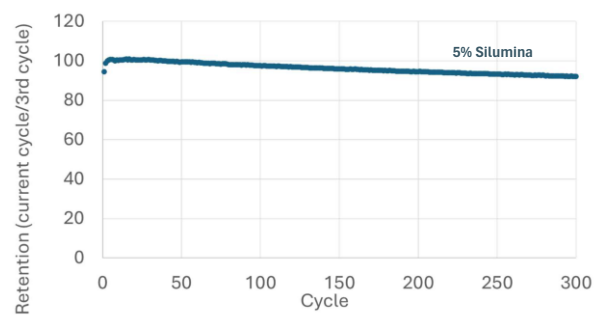
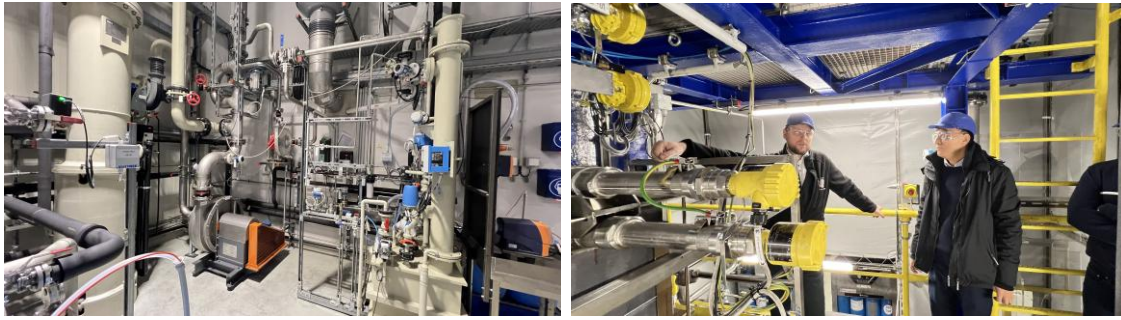


Figure 4 – Anode Retention with 5% Spherical coated Silumina

SUCCESSFUL PILOT PLANT OPERATION

Altech is in a race to get its patented technology to market. To support the development, Altech constructed a pilot plant adjacent to the proposed project site to enable the qualification process for its Silumina Anodes™ product. Coated silicon products are now being successfully produced at the Company's pilot plant located at Dock 3 in Saxony, Germany. The commissioning process presented a number of technical challenges, primarily related to the equipment delivery delays, supply of SiC materials, poor flowability and handling difficulties of the ultra-fine silicon powders used in the process - particles measuring less than one micron in size. These powders tended to cause hang-ups and blockages within the system, complicating consistent material movement and process stability. However, through a combination of engineering adjustments and process optimisations, these issues have now been resolved. The pilot plant is now operational and has produced high-quality coated silicon particles. These products are ready for evaluation and testing by potential customers, marking a key milestone in the commercialisation pathway.





Group Managing Director Iggy Tan said “*The next generation of our development, leveraging spherisation technology, has successfully addressed the long-standing challenges of silicon—namely swelling and rapid degradation. We’ve achieved a battery with 50% higher energy density and enhanced cycle life, all with a modest addition of silicon. Our proprietary alumina-coated, spherical silicon particles represent a breakthrough in battery anode materials. Production at our pilot plant in Saxony marks a significant milestone, and we are actively engaging with potential customers for evaluation. This progress places Altech at the forefront of next-generation battery technology as we move toward commercialisation.*”

Altech Batteries Explained:

An Update on the Silumina™ Pilot Plant

With MD Iggy Tan



<https://youtu.be/A4G9lu9T8OQ>

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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.

