



The Manager Companies - ASX Limited 20 Bridge Street Sydney NSW 2000 ASX Announcement 26 March 2024 (8 pages)

PROJECTS UPDATE

HPA FIRST PROJECT STAGE 1

- HPA circuit reaching stable production
- HPA production at >500kg per week at >99.995% purity
- HPA disc production for sapphire growth underway
- Boehmite and alumina tri-hydrate circuit in commissioning

ALPHA SAPPHIRE

- Initial 2 sapphire growth units (Phase A) near completion
- Successful multi-boule synthetic sapphire growth in Austria
- Joint marketing with Arctic Sapphire (Ebner-Fametec) commenced
- Mutual site visits across Alpha Sapphire and Arctic Sapphire sites
- Final layout configurations established for shortlisted Alpha Sapphire sites

PRODUCT MARKETING

- Increased momentum for Al-Nitrate based LiB anode coating (UltraCoat)
 - LiB sector interest driven by focus on battery fire prevention
 - Engagement both with LiB anode manufacturers and battery makers
- 43 product test samples delivered in CY2024 to date
- 11 small volume sales in CY2024 to date (average US\$75/kg)
- Expanding semi-conductor sector interest for HPA in thermal interface and packaging

HPA FIRST PROJECT STAGE 2

- Stage 2 Integrated Owners Team (IOT) established
- Appointment of General Manager Projects
- Project team offices leased
- Long lead item vendor engineering advanced



PROJECTS UPDATE

Alpha HPA Limited (**Alpha** or **the Company**) (ASX: A4N) is pleased to provide an update on project activities for both the HPA First Project and Alpha Sapphire.

The Company's Stage 1, Precursor Production Facility (PPF) in Gladstone, QLD has established small scale commercial production for its 5N purity aluminium nitrate (Al-nitrate) precursors and is now in production of high purity aluminas (HPA) and in final commissioning of additional process equipment to provide expanded capacity for the production of the full range of Alpha's high purity aluminium products.

In addition, Alpha is close to finalising the Definitive Feasibility Study (DFS) and financing arrangements for Stage 2 of the HPA First Project, representing the full commercial scale implementation of Alpha's proprietary aluminium purification process technology.

Alpha's Managing Director, Rimas Kairaitis said, "We are very pleased to have also established stable production of high purity aluminas, with Stage 1 now producing over 500kgs per week of HPA at >99.995% purity. Alpha's process technology advantage is considered unique, with this purity capability probably only replicated using a higher cost and higher carbon process in 2 or 3 other manufacturing sites globally. This capability is increasing our ability to deliver larger volume testwork and to facilitate small scale sales to customers, which we can now build into commercial scale contracts."

Further details on these activities are outlined below.

HPA FIRST PROJECT - STAGE 1

HPA circuit expansion

The HPA circuit is the new process circuit within Stage 1 and expands the capability of the Stage 1 PPF to span Alpha's full high purity aluminium product range to include:

- High purity aluminas, including nano HPA
- High purty alumina hydrates (both boehmite (Al-O-OH) and alumina tri-hydrate (Al(OH)₃))
- High purity aluminium sulphate

The HPA circuit is now in stable operation producing both gamma and alpha phase alumina, with production reaching >500kgs per week at >99.995% purity.

The jet mill is also in final stage commissioning, allowing Alpha to customise HPA orders to match customer requirements for:

- High purity alumina phase (alpha or gamma)
- Specific surface area
- Particle density
- Bulk density

The high purity alumina hydroxides circuit, producing both boehmite (Al-O-OH) and high-purity alumina trihydrate (Al(OH)₃) is still undergoing commissioning.





Stage 1 spray dryer under commissioning used for final processing of high purity alumina hydrate

ALPHA SAPPHIRE

Initial 2 sapphire growth units (Phase A) near completion

Alpha is in the final phases of assembling the initial 2 (Phase A) sapphire growth units, with the assistance of on-site Ebner-Fametec technical personnel.

Alpha is targeting the start of first on-site crystal growth in Gladstone in April.



Assembly of the first 2 (phase A) sapphire growth units at final stages



Successful multi-boule synthetic sapphire growth in Austria

Ebner-Fametec have now advised the successful growth of sapphire boules, using Alpha's HPA tablet feedstock material within a multiple-boule growth furnace, being the precise set-up for the units that Alpha Sapphire is installing in Stage 1.

Five x 32kg boules were grown together, with one boule (position 1) cracking on cooling (software error). The remaining four boules were good body crystal with good clarity and no colour tinting.

Ebner-Fametec have now advised the Alpha HPA tablet is qualified material for Fametec's sapphire product.



High quality sapphire boules from most recent multiple boule growth using Alpha HPA feedstock material

Alpha is now completing a further 300kg of densified HPA disc tablets for Ebner, as well as now building a tablet stockpile for Alpha Sapphire production (see below)



. Densified HPA disc tablets, customised for both Ebner-Fametec and Alpha Sapphire growth

Alpha Sapphire and Arctic Sapphire – mutual site visits and joint marketing

Alpha Sapphire has now commenced joint product marketing activities with Ebner-Fametec's sapphire growth division, Arctic Sapphire (Norway), with both companies sharing costs and resources. The intent of both companies is to establish full marketing capability combined with the ability to offer customers a geographically diversified production base.



In connection with this arrangement, mutual site visits to Arctic Sapphire (Norway & Austria) and Alpha's Stage 1 facility (Gladstone) were recently completed by the respective senior management of both companies.



Alpha hosting senior Ebner-Fametec management at the Stage 1 PPF facility in Gladstone



Alpha visit to the Arctic Sapphire facility in Norway

Final layout configurations established for shortlisted sites

Alpha's engineering team have completed final layout configurations for the shortlisted sites to house:

- Phase B (48 additional sapphire units) and
- Phase C (50 additional sapphire units).

Subject to finalisation of power pricing and connections, Alpha expects to finalise Phase B and Phase C project site selection in the June quarter.



PRODUCT MARKETING

Alpha continues to service a wide range of product orders across a number of high-technology sectors, namely:

- Lithium-ion battery (LiB) sector: With a focus on cathode coating and dopants and anode coatings
- LED Lighting sector: With a focus on HPA for synthetic sapphire LED substrates and LED phosphors
- **Semi-conductor sector:** With a focus on materials for Chemical Mechanical Polishing (CMP) and thermal interface materials for semi-conductor packaging

Alpha is utilising capacity in both the Stage 1, PPF in Gladstone and the Company's product development facility in Brisbane to service various stages of its expanding market outreach, which includes:

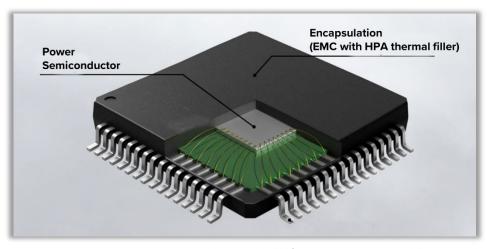
- servicing existing sales orders;
- delivering into tonnage scale orders for end-user production testwork;
- servicing technical qualification, usually involving multiple test orders; and
- delivering initial production scale orders to demonstrate product suitability.

This calendar year, Alpha has delivered 43 separate test samples, totalling 425kg, to multiple end-users, including a number of second and third round test sampling. The degree of engagement and activity from end-users continues to signal building demand and positive customer intent.

In parallel, Alpha has also delivered into multiple small volume product sales across the full range of its products, in many cases to end-users with growing future product demand, and has placed 301kg of product, comprising of 11 separate product sales and sales orders of all products at an average of US\$75/kg. Forming a base of small scale sales with target end-users is extremely encouraging for the conversion to high volume sales contracts.

Alpha also notes recent inbound interest from global distributors seeking new high purity alumina supply to service demand from the semiconductor sector. HPA demand from the semiconductor sector is linked to the increasing adoption of silicon-carbide (Si-C) based power-semiconductors, which requires HPA for:

- thermal interface fillers in epoxy moulding compounds (EMC), and
- abrasives for Si-C polishing slurries.



Schematic showing power-electronic semiconductor with EMC encapsulation, using HPA thermal interface materials



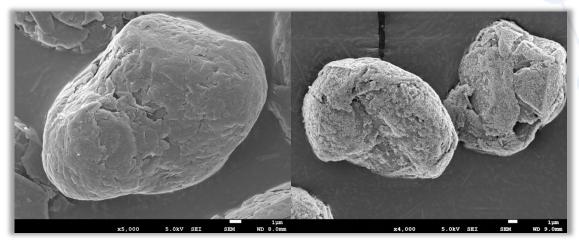
Increased momentum Al-Nitrate based LiB anode coating (UltraCoat)

As set out in Alpha's December Quarterly Activities report, Alpha continues to enjoy very wide engagement across the LiB anode sector for the testing of Al-oxide coated graphite anode materials using ultra high purity Al-Nitrate precursors (Alpha's 'UltraCoat' process), with testing now underway with 15 different end-users.

The UltraCoat process provides for higher capacity, faster cycling LiB cells, and replaces the traditional carbon-pitch coat which is used the incumbent graphite anode coating process.

Alpha can now confirm deepening interest in the technology from battery manufactures, driven by the safety benefits of the process, which is recorded to provide 100% reduction in thermal runaway (battery fires) under nail-penetration testing. The nail penetration test is the industry standard test for battery safety under short circuit/trauma.

The wider regulatory and EV manufacturer focus on Li-ion battery fire prevention is considered strongly favourable for the accelerated testing and adoption of this coating technology, enabled by Alpha's establishment of commercial scale aluminium nitrate production.



SEM imagery showing raw graphite anode particles (LHS) and Ultra-coated particles (RHS).

HPA FIRST PROJECT STAGE 2 – FULL SCALE

Stage 2 Execution readiness

In preparation for the imminent completion of the Stage 2 DFS and Stage 2 Project Financing, Alpha has been advancing a number of key elements of the Stage 2 project implementation, including:

- Key Alpha staff appointed to the Project including General Manager Projects, Mr Brian Pook.
 Brian's initial focus is on building and finalising the Integrated Owner's Team (IOT) structure and makeup
- Key IOT members are onboarded, including site construction manager
 - o Prudentia Engineering engaged for detailed engineering and design
 - Turner & Townsend engaged for project controls and procurement support
 - Other key Alpha staff roles within the project have been filled
- Focus on key long lead vendor package engineering with contracts and vendor engineering already underway where appropriate
- IOT office leased to enable the team to come under one roof and drive engineering and procurement team effectiveness
- IOT Project systems in place

Other workstreams underway:

- Amendments to existing approvals under way to accommodate final project layout
- Federal Safety Commission accreditation in final stages pending audit and final markups



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About the HPA First Project

The Company's HPA First Project represents the commercialisation of the production of high purity aluminium materials using the Company's proprietary, exclusively licensed solvent extraction and HPA refining technology. The disruptive, low-carbon process technology provides for the extraction and purification of aluminium from an industrial feedstock to produce 4N (>99.99% purity) and 5N (>99.99% purity) aluminium materials for sale into high technology markets including the semiconductor, lithium-ion battery and LED lighting sectors.

Alpha is now in production at its HPA First Project Stage 1, Precursor Production Facility (PPF), located in Gladstone, QLD. The Stage 1 PPF has now been expanded to produce the full range of Alpha's high-purity aluminium materials with \$15.5M grant funding from the Australian Government.

The Company is now in the mature phases of market outreach and product marketing and is due to shortly deliver the final Definitive Feasibility Study (DFS) and project financing with respect to the full scale Stage 2 HPA First Project, to be located on the same project site.

