



**Altech Chemicals**  
Limited

## ASX ANNOUNCEMENT AND MEDIA RELEASE

20 October 2017

# ALTECH FINALISES 4,500TPA HPA PLANT DESIGN

### Highlights

- Upgraded 4,500tpa capacity HPA plant design now completed
- Plant process flow sheet optimised and finalised
- Flexible finishing line capable of producing sapphire grade and battery grade HPA

Altech Chemicals Limited (Altech/the Company) (ASX: ATC) (FRA: A3Y) is pleased to advise that it has now finalised the design for the upgrade in capacity of its proposed Malaysian high purity alumina (HPA) plant from 4,000 to 4,500 tonnes per annum.

Working in conjunction with its appointed German engineering, procurement and construction (EPC) contractor SMS group GmbH (SMS), Altech has now completed optimisation of the plant process flow sheet (see Figure 1 below). The majority of the changes compared to the previous flow sheet have impacted the HPA finishing section of the plant. This section now incorporates a flexible finished product line capable of producing HPA for both the synthetic sapphire industry (up to 4,500tpa of high density pellets) and HPA for the lithium-ion battery industry (up to 1,500tpa of powder at sub-micron particle size). Maximum plant output is designed at 4,500tpa HPA, with flexibility to balance the finished product mix.

The flexible product finishing line is designed to initially grind all HPA to an average particle size of less than 1 micron by wet milling using bead mills. Upon the milled HPA achieving the designated particle size range it will be dried via a conventional spray drier. The finely ground, dried HPA will then be aggregated in beads for heat treatment in a tunnel kiln; the finished product being HPA beads for use in the synthetic sapphire industry. Alternatively, the finely ground HPA will be fed to a de-agglomeration unit (microniser) to produce fine HPA powder for use in the lithium-ion battery industry. Both products will be bagged via an automated bagging machine. See Figure 1 for the final flow diagram.

### Altech's Target Customer Base



Sapphire Industry for LEDs



Lithium-ion Battery Industry



---

## Lithium-ion Battery Grade HPA

Consumption of HPA in non-tradition applications such as the lithium-ion battery sector is forecast to experience significant growth. Electric vehicle manufacturers are increasingly demanding lithium-ion batteries with cathode and anode electrode separator sheets coated with 99.99% (4N) HPA for fire resistance. The particle size of HPA used as the coating for this application is ultra-fine, less than 1 micron. Lithium-ion batteries using separator sheets coated with HPA consume between 40-120g of HPA per kilowatt-hour (kWh). With a forecast rapid expansion of the lithium-ion battery market driven by the demand from electric vehicles and green energy power storage (solar and wind), HPA consumption in the lithium-ion battery sector alone is forecast by Altech to rise from around 1,000tpa in 2016 to 15,000tpa by 2025.

Over the last twelve months Altech has been developing a HPA product to meet the requirements of the lithium-ion battery industry. The finishing line of Altech's proposed HPA plant is designed to produce the ultra-fine HPA used in the lithium-ion battery sector; this product may also be sold in slurry form (drums).

Lithium-ion Battery Grade	Chemical Content	Spec Limit
Alumina	Al <sub>2</sub> O <sub>3</sub>	>99.99%
Silica	Si	<20ppm
Sodium	Na	<10ppm
Magnesium	Mg	<10ppm
Calcium	Ca	<10ppm
Iron	Fe	<10ppm
Copper	Cu	<10ppm
Crystal Structure		Alpha
Particle Size	micron	<1.0

\*Dry Basis



- Ends -

For more information, please contact:

#### **Corporate**

##### **Iggy Tan**

Managing Director  
Altech Chemicals Limited  
Tel: +61 8 6168 1555  
Email: [info@altechchemicals.com](mailto:info@altechchemicals.com)

##### **Shane Volk**

Company Secretary  
Altech Chemicals Limited  
Tel: +61 8 6168 1555  
Email: [info@altechchemicals.com](mailto:info@altechchemicals.com)

#### **Investor Relations (Europe)**

##### **Kai Hoffmann**

Soar Financial Partners  
Tel: +49 69 175 548320  
Email: [hoffmann@soarfinancial.com](mailto:hoffmann@soarfinancial.com)  
*Wir sprechen Deutsch.*

#### **About Altech Chemicals (ASX:ATC) (FRA:A3Y)**

**Altech Chemicals Limited** (Altech/the Company) is aiming to become one of the **world's leading suppliers of 99.99% (4N) high purity alumina (HPA) (Al<sub>2</sub>O<sub>3</sub>)**.

HPA is a high-value, high margin and highly demanded product as it is the critical ingredient required for the production of synthetic sapphire. Synthetic sapphire is used in the manufacture of substrates for LED lights, semiconductor wafers used in the electronics industry, and scratch-resistant sapphire glass used for wristwatch faces, optical windows and smartphone components. There is no substitute for HPA in the manufacture of synthetic sapphire.

Global HPA demand is approximately 25,315tpa (2016) and demand is growing at a compound annual growth rate (CAGR) of 16.7% (2016-2024), primarily driven by the growth in worldwide adoption of LEDs. As an energy efficient, longer lasting and lower operating cost form of lighting, LED lighting is replacing the traditional incandescent bulbs.

Current HPA producers use expensive and highly processed feedstock materials such as aluminium metal to produce HPA. Altech has completed a Bankable Feasibility Study (BFS) for the construction and operation of a 4,500tpa HPA plant at the Tanjung Langsat Industrial Complex, Johor, Malaysia. The plant will produce HPA directly from kaolin clay, which will be sourced from the Company's 100%-owned kaolin deposit at Meckering, Western Australia. Altech's production process will employ conventional "off-the-shelf" plant and equipment to extract HPA using a hydrochloric (HCl) acid-based process. Production costs are anticipated to be considerably lower than established HPA producers.

The Company is currently in the process of securing project financing with the aim of commencing project development in 2018.



#### **Forward-looking Statements**

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources are also forward-looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as at the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the Company, the directors and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward-looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed or anticipated in these statements.

Also, there is no certainty that German government project finance export credit cover (ECA) and/or project debt finance will be approved. The Company makes no representations or warranties whatsoever as to the outcome of the ECA application process. In addition, the Company to date has not been provided with any estimates of the capital costs of the project from its appointed proposed EPC contractor, which is still finalising the detailed design of the proposed Malaysian high purity alumina (HPA) plant and has not been provided with sufficient firm quotations of costs to provide the estimate.