



AUSTRALIAN BAUXITE LIMITED

ALCORE Limited
AlF₃ for aluminium smelters, recycling & lithium-ion batteries

ASX: ABX

ASX ANNOUNCEMENT

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Alcore Achieves Innovative Breakthrough Using Proprietary Technology

Aluminium Fluoride from Dross Waste

Alcore has produced several AlF₃ samples using 100% dross as the source of aluminium, with chemical composition comparable to typical commercial AlF₃ specifications. This is a significant achievement given the level of impurities in the dross and the single-step process used.

Alcore has demonstrated a process step that increases the amount of aluminium recoverable from dross with an associated reduction in production costs.

Australian Bauxite Limited (ASX: ABX) (ABx) provides the following update for its 87%-owned subsidiary ALCORE Limited (Alcore), specifically work being undertaken to produce aluminium fluoride (AlF₃) from aluminium smelter wastes to enhance profitability, environmental excellence and security of supply for Australasian aluminium smelters.

AlF₃ is a strategically important mineral because it is an essential ingredient for aluminium smelting. It is also being investigated for advanced lithium-ion batteries. Australasian aluminium smelters rely entirely on imported AlF₃ and, in 2020, Australian smelters imported from China alone more than 21,000 tonnes averaging US\$1,180 per tonne ex China. There has been no supply from China since January 2021.

Aluminium Fluoride from Dross Waste

Dross is a waste by-product that forms on the top of molten aluminium in casting furnaces. It consists of aluminium oxide, aluminium metal and aluminium nitride, and typically some cryolite and other impurities. Aluminium metal can be physically recovered, but the non-metallic component is sold at a loss, often as an additive for steelmaking. Many smelters have significant stockpiles of dross that represent an ongoing storage cost to satisfy environmental and community standards.

Alcore has been investigating dross as a feed material for its production of AlF₃ because it can be obtained at very low cost and increases the recycling of aluminium smelter wastes.

It is believed that all current commercial AlF₃ production is from aluminium hydroxide. Alcore has previously reported the development of a two-stage process to produce AlF₃ from a combination of dross and aluminium hydroxide. Recently, Alcore has developed single-stage process that allows 100% dross to be used as the feed material to produce AlF₃.

This process is new technology, proprietary to Alcore and will deliver significant economic and environmental benefits.

Alcore recently produced AlF_3 samples using this process with chemical composition comparable to typical commercial AlF_3 specifications (see Table 1). This is a significant achievement given the level of impurities in the dross. In particular, Alcore is pleased to have achieved the following:

- Silicon: Extremely low in the AlF_3 product, despite raw dross containing more than 5% SiO_2
- Sodium: Comparable to specification, despite the raw dross containing more than 5% Na_2O
- Calcium: Comparable to specification, despite the raw dross containing more than 1% CaO

Potential customers are working with Alcore to determine how AlF_3 with slightly higher iron content can be accommodated in the smelting process. The dross used to date has a high phosphorous content which is expected to be significantly lower in future, enabling Alcore to produce AlF_3 from dross with a phosphorous content comparable to or better than commercial specifications.

Mark Cooksey, CEO of Alcore commented, "The use of dross is attractive because it is substantially lower cost, delivers higher operating margins and recycles waste that is produced in the smelting process – ideal for all concerned.

Furthermore, Alcore has now demonstrated that its proprietary process increases the amount of aluminium recoverable from dross and development work is already underway to increase the overall yield of AlF_3 from dross using Alcore's new technology."

Table 1: Recent Alcore AlF_3 samples produced from dross using its proprietary single-stage process (chemical analyses by CSIRO).

Product Properties	AlF_3	Fe_2O_3	SiO_2	Na_2O	CaO	P_2O_5
Raw Dross Feed	0	0.27%	5.3%	5.3%	1.2%	0.37%
Typical commercial AlF_3 specification	>90%	<0.03%	<0.15%	<0.25%	<0.10%	<0.03%
Alcore AlF_3 Sample 1	90%	0.28%	0.011%	0.25%	0.10%	0.08%
Alcore AlF_3 Sample 2	99%	0.48%	0.005%	0.42%	0.27%	0.56%

Current Alcore activities

1. Conducting engineering validation in partnership with international engineering companies, which is likely to include a pilot plant for critical process steps, to:
 - Confirm process and product performance at a larger scale
 - Produce larger samples for evaluation by aluminium smelters
2. Conducting process verification experiments in the laboratory to:
 - Increase the yield and quality of AlF_3 produced from bauxite and aluminium smelter waste
 - Optimise the recovery of fluorine from aluminium smelter waste, including the separation and recovery of co-products with potential commercial value

Government & Industry

Discussions continue with governments, agencies, engineering experts and major companies in the aluminium industry.

Alcore considers AlF_3 to be a strategically important mineral product for the Australasian aluminium smelting industry, and the Alcore process will contribute to the improving environmental performance of aluminium smelters worldwide.

ABx Strategy

Alcore is technologically the most advanced process being developed by the ABx Group as part of ABx's strategy to seek value-enhancing of the entire aluminium supply chain, from upgrading ABx's bauxite to recycling and refining aluminium smelter wastes and by-products.

This announcement has been approved for release by the Board of Australian Bauxite Limited.

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This ASX announcement (Announcement) contains various forward-looking statements. All statements other than statements of historical fact are forward-looking statements. Forward-looking statements are inherently subject to uncertainties in that they may be affected by a variety of known and unknown risks, variables and factors which could cause actual values or results, performance or achievements to differ materially from the expectations described in such forward-looking statements.

ABx does not give any assurance that the anticipated results, performance or achievements expressed or implied in those forward-looking statements will be achieved.

About Australian Bauxite Limited ASX Code ABX Web: www.australianbauxite.com.au

Australian Bauxite Limited (ABx) had its first bauxite mine in Tasmania & controls the Eastern Australian Bauxite Province with 11 bauxite tenements in QLD, NSW & Tasmania totalling 662 km². All are all 100% owned, unencumbered & free of third-party royalties. ABx's bauxite is gibbsite trihydrate (THA) bauxite that can be processed into alumina at low temperature.

ABx has invested in Research and Development to find ways to capitalise on the main strengths of its bauxite type which is very clean, free of deleterious elements and partitioned so that it can be separated into different product streams using physical, chemical and geophysical methods.

ABx has declared large Mineral Resources in NSW, Binjour in central QLD & in northern Tasmania. ABx's first mine commenced at Bald Hill near Campbell Town, Tasmania in December 2014 – the first new Australian bauxite mine for more than 35 years. ABx aspires to identify large bauxite resources in the Eastern Australian Bauxite Province and has created significant bauxite development projects in 3 states, Queensland, New South Wales and Tasmania. Its bauxite deposits are favourably located for direct shipping of bauxite to both local and export customers.

ABx endorses best practices on agricultural land, strives to leave land and environment better than we find it. We only operate where welcomed.

About ALCORE Limited:



Australian Bauxite Limited (ABx)'s 87%-owned technology subsidiary ALCORE Limited was created to fund and manage the AIF₃ Project, involving the construction of a production plant to produce aluminium fluoride (AIF₃) and valuable co-products using new Australian technology. Alcore intends to convert aluminium smelter waste (and low grade bauxite) worth less than \$50 per tonne into a suite of valuable products worth more than \$800 per tonne. Alcore's testwork commenced on 1 July 2019 at its high-technology Research Centre in Berkeley Vale, Central Coast NSW and is currently focussed on producing AIF₃ test samples for pre-qualified aluminium smelter customers. Its processes can also produce Corethane, which is pure hydrocarbon powder to provide thermal and electrical power with low CO₂ emissions when used as a gas-substitute or as a diesel substitute for fuel security purposes and is ideally suited for use as a sulphur-free bunker fuel. Corethane is also useable as a clean, low emissions chemical reductant instead of imported coke and coals.

AIF₃ is an essential ingredient in aluminium smelters and is currently 100% imported. Alcore will be the first Australian producer of this strategically important mineral product and will provide security of supply to the large aluminium smelting industry in Australia. Alcore will produce AIF₃ from smelter waste materials and thereby maximise the recycling by Australian aluminium smelters.

Directors of ABx

Paul Lennon	Chairman
Ian Levy	CEO & MD
Ken Boundy	Director
Henry Kinstlinger	Company Secretary

Officers

Leon Hawker	Chief Operating Officer
Dr Mark Cooksey	CEO Alcore Limited
Jacob Rebek	Chief Geologist
Paul Glover	Marketing, Exploration & Relationships
Nathan Towns	Operations Manager