



ALCORE Limited

AlF₃ for Aluminium smelters & Lithium ion batteries. Corethane: clean as gas, cheap as coal

4th Milestone Achieved. ALCORE Produces Aluminium Fluoride AlF₃

- Australian Bauxite Limited (ABx)'s wholly-owned subsidiary, ALCORE Limited has conducted experimental reactions for the chemical refining of ABx bauxite and its components into aluminium fluoride (AlF₃) and several valuable co-products
- ALCORE has proven it can:
 1. Make aluminium fluoride from aluminium oxides, which is the principle component of bauxite and other aluminium-rich material that is amenable to treatment by ALCORE
 2. Extract valuable silicon oxides by adjusting the reagent mix and processing conditions
 3. Extract valuable titanium oxide from samples tested to date by controlled drying and heating
 4. Manufacture of saleable Corethane gas-substitute by reducing ash content in coal from 28% to less than 4%, thus making an ideal, ultra-clean substitute for metallurgical coal. The ash can be converted into saleable AlF₃ and co-products
- ALCORE's task list includes the following:
 1. Determine the optimum reaction conditions for the complete extraction of iron oxides
 2. Prove that ALCORE can make commercial-grade AlF₃ which involves both chemical and physical parameters
 3. Make commercial-grade AlF₃ from economically attractive waste materials
 4. Make ultra-pure AlF₃ from pure gibbsite (Al₂O₃ · 3H₂O, the main ore mineral in ABx's bauxite) that can be used in special batteries
 5. Create fully-crystallised AlF₃ for testing by prospective customers that are interested in the ALCORE project
 6. Recycling acids recovered from the production of the co-products
 7. Reduce ash content in Corethane to below 1% (and eventually below 0.5%) so that it can be used for heat and power generation (within emission guidelines) in the production of AlF₃ and in nearby industries, thus reducing gas consumption and possibly providing energy security in an emergency
- AlF₃ is an essential electrolyte ingredient in aluminium smelters. Global demand for AlF₃ increases as aluminium smelter production increases and the use of AlF₃ in lithium-ion batteries increases
- Co-products include **Corethane gas-substitute**, which is pure hydrocarbon powder refined from low-value coals that can be used as a gas or diesel substitute (for fuel security in emergencies) and has emissions-reducing industrial applications. It is ideally suited for use as a sulphur-free bunker fuel for shipping under new strict emissions laws
- Discussions continue with governments, agencies and major companies in the aluminium industry

ABx CEO, Ian Levy commented: "The ALCORE Research Centre has created a leading-edge laboratory with the highest standards of safety, equipment and technology. Exciting enhancements of the technology have already been achieved. The mini-production plant at the ALCORE Research Centre will supply test samples to our three prospective aluminium-producing customers.

“ALCORE’s work can lead to Australia’s first production of AlF_3 products to provide security of supply for Australasian aluminium smelters. ALCORE’s production of Corethane gas-substitute hydrocarbon can change the energy supply and fuel security outlook. Its short-term focus is on supplying a cleaner form of metallurgical reductants for reducing costs and emissions in manufacturing in eastern Australia.

“ABx is also progressing its 3 core bauxite projects; the Tasmanian mine, the large Binjour Project in central QLD and the Penrose refractory bauxite project 90km inland of Port Kembla NSW. Bulk sampling and processing testwork at the Binjour Project that was interrupted by rain is being completed in coming weeks.”

Figure 1:
Summary of the ALCORE Business Strategy



Table 1:
Chemical analyses of commercial AlF_3 products and early test samples produced by the ALCORE Research Centre lab

SAMPLES	Al %	F %	Si %	Fe %	Ti %	LOI %
Commercial AlF_3 products						
Supplier 1	34.6	63.0	0.01	0.01	0.01	10.4
Supplier 2	35.3	58.4	0.18	0.01	0.01	4.6
Supplier 3	34.0	61.0	0.01	0.01	0.01	0.6
ALCORE test results - assayed at the same laboratory as for commercial products						
Sample A	35.8	56.0	0.61	0.20	0.01	13.92
Sample B	33.4	60.3	0.12	0.51	0.01	6.31
Sample C	31.1	54.8	0.08	0.39	0.01	13.80
Notes: All chemical analyses by ALS Laboratories, Brisbane						
Si removal is improving with each test						
Fe-contamination is from corrosion of stainless steel valves (being replaced)						
LOI is "loss on ignition" by heating to 1000 degrees C (can be overestimated)						

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Figure 2: ALCORE Laboratory built inside the ALCORE Research Centre



Figure 3: Inside the completed ALCORE Laboratory

About Australian Bauxite Limited

ASX Code ABX

Web: www.australianbauxite.com.au

Australian Bauxite Limited (ABx) has its first bauxite mine in Tasmania & holds the core of the Eastern Australian Bauxite Province. ABx's 12 bauxite tenements in Queensland, New South Wales & Tasmania totalled 719 km² & were selected for (1) good quality bauxite; (2) near infrastructure connected to export ports; & (3) free of socio-environmental constraints. All tenements are 100% owned, unencumbered & free of third-party royalties. The Company's bauxite is high quality gibbsite trihydrate (THA) bauxite that can be processed into alumina at low temperature.

ABx has committed a large proportion of its expenditure into Research and Development to find ways to capitalise on the main strengths of its bauxite type, mainly highly clean, free of all deleterious elements and partitioned into layers, nodules, particles and grains of different qualities that can be separated into different product streams using physical, chemical and geophysical methods. ABx has declared large Mineral Resources in northern NSW, southern NSW, Binjour in central QLD & in Tasmania where 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 has created significant bauxite developments in 3 states - Queensland, New South Wales and Tasmania. Its bauxite deposits are favourably located for direct shipping of bauxite to both domestic 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) has incorporated ALCORE Limited as a wholly-owned subsidiary to manage the ALCORE Project leading to the construction of an ALCORE Production Plant to produce Aluminium Fluoride (AlF₃) and valuable co-products, using patent (pending) new technology. ALCORE is planning to convert low grade bauxite worth \$50 per tonne into a suite of valuable products worth more than \$800 per tonne. Stage 1 of the ALCORE project commenced on 1 July as planned at ALCORE's pre-approved Pilot Plant site in Berkeley Vale, Central Coast NSW.

Stage 1 is designed to produce AlF₃ test samples for pre-qualified aluminium smelter customers & then produce Corethane, which is pure hydrocarbon powder refined from low-value coals and has been used to provide thermal and electrical power with low CO₂ emissions when used as a gas-substitute to fuel large gas turbines. Corethane has also been used as a diesel substitute for fuel security purposes and is ideally suited for use as a sulphur-free bunker fuel.

Directors of ABx

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

Officers

Leon Hawker	Chief Operating Officer
Jacob Rebek	Chief Geologist
Paul Glover	Marketing, Exploration & Relationships