

ALCORE Bath Pilot Batch Reactor Update: Latest Test Runs Achieve Higher Fluorine Recovery

Analytical results from further runs using bath pilot batch reactor show higher fluorine recovery

80% fluorine recovery achieved in single stage, with further processing of product material achieving 88% fluorine recovery

Next stage of work planned to involve combination of bath pilot batch reactor and specialised laboratory reactor



Figure 1: Preparing to disassemble bath pilot batch reactor after test run

ABx Group (ASX:ABX) (“ABx” or “the Company”) is pleased to announce independent assessments of several powder samples from further runs of its 83%-owned subsidiary ALCORE’s bath pilot batch reactor have indicated higher fluorine recovery.

The reactor is operating at the ALCORE Technology Centre on the NSW Central Coast and has been designed for the recovery of fluorine from ‘excess bath’ (an aluminium smelter waste) to produce hydrogen fluoride.

At commercial scale, a proportion of the hydrogen fluoride will be further processed via an existing commercial process to produce aluminium fluoride – a high-value chemical essential for aluminium smelting that is currently fully imported.

Since the bath pilot batch reactor was commissioned in October 2023¹, ALCORE has conducted several test runs, each involving approximately 10kg total of bath and sulfuric acid.

ABx has previously reported assay results from the first three test runs, with samples from the third test run consistently showing 70% fluorine recovery.²

To enable ALCORE to prepare bath feed with a narrower range of finer particle sizes – anticipated to increase fluorine recovery – a ball mill and ultrasonic vibrating screen was ordered in November 2023 and received in January 2024.

With this improved bath preparation capability, ALCORE has conducted three further runs since late January. The assay results from these runs indicated significant impacts of feed particle sizes on fluorine recovery, with a maximum of 80% being achieved from a single process stage using the bath pilot batch reactor alone.

A rigorous analysis of the results suggests that a second stage process, using a different reactor configuration, may be required to further increase the fluorine recovery to over 90%. This possibility has been anticipated for some time and has been incorporated into the design of the continuous pilot plant, as some existing analogous commercial processes involve two stages.

Initial investigations, involving further manual processing of some product material from these recent runs in a separate furnace, achieved a maximum of 88% fluorine recovery. These manual tests highlight the necessity but also the exciting potential of a second stage reactor, and provide direction for design optimisation of the second stage reactor.

In addition, separate pilot batch reactor runs were conducted at various temperatures to investigate the effect of temperature on fluorine recovery. This exploration will assist to identify the feasible range of process temperatures for future continuous pilot process operation.

Commenting on the reactor performance, ABx Group Managing Director and CEO Dr Mark Cooksey said:

"I am pleased with our progress and with the ongoing increase in fluorine recovery with each reactor test ALCORE has undertaken. As anticipated, the newly commissioned equipment which allowed bath feed particle size to be optimised has assisted in achieving a higher recovery of fluorine in the latest test runs.

"The next stage of development work is planned to involve using the existing specialised laboratory reactor³ to serve as the second process stage. It is anticipated that the combination of the bath pilot batch reactor and the specialised laboratory reactor can produce a higher fluorine recovery. We are in the process of planning further reactor tests over the coming months. I look forward to keeping investors up-to-date about these future results."

¹ ASX announcement, 8 November 2023

² ASX announcement, 20 February 2024

³ ASX announcement, 18 July 2022

This announcement is approved for release by the board of directors.

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About ABx Group Limited

ABx Group (ABx) is a uniquely positioned, high-tech Australian company delivering materials for a cleaner future.

The two current areas of focus are:

- Creation of an ionic adsorption clay rare earth project in northern Tasmania
- Establishment of a plant to produce hydrogen fluoride and aluminium fluoride from recycled industrial waste, to replace imports (ALCORE)

There is also a legacy business:

- Mining and enhancing bauxite resources for cement, aluminium and fertiliser production

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

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