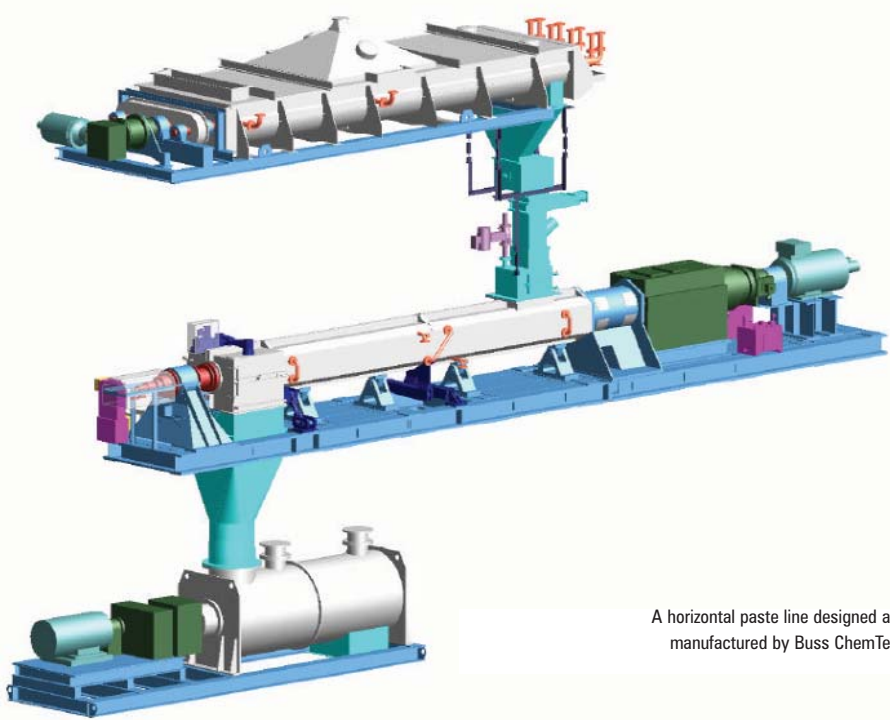


# Buss ChemTech in the aluminium industry – a 60-year success story

This feature provides an insight into the extensive range of equipment and plant manufactured by the Swiss company Buss ChemTech for the primary aluminium industry.

Feature



A horizontal paste line designed and manufactured by Buss ChemTech

Buss ChemTech is a Swiss-based technology provider to the global primary aluminium industry. It was in 1945 that the company invented the Buss kneader. The first model was supplied for anode paste production in 1951, thereby providing the means to impart high energy kneading in the manufacture of paste. This was a much more intensive process than a conventional mixing procedure. In 1991, the company supplied their first complete anode plant to Carbonorca (Venezuela). During the following years, all of Buss ChemTech's efforts were directed towards the further development of the Buss kneader family, carrying out continual improvements in response to the demands of the industry.

As a result of these endeavours, the company was able to complete the development of a horizontal paste line incorporating a coke pre-heater, Buss kneader, and paste cooler units. This was the first solution of its kind to provide complete process control, as a result of horizontal material flow within the units, all lending itself to reproducible and easily-adjustable production.

Today, the company's latest development is focussed on the most important element of an anode plant, the new Paste Reactor K600 CP X. This unit is claimed to be the best available machine of its type in terms of throughput versus overall dimensions. As a result of optimised geometry and design, it is possible to increase throughput by more than 30%, without changing the main dimensions of the machine. The first K600 CP X machine is now in production and will be delivered during the course of this year.

Apart from the development of new kneading technology, Buss ChemTech's Engineers have worked in parallel with the design of complete layouts for the primary aluminium industry, including aluminium fluoride plants; pitch melting facilities, and, once again, complete anode plants.

### Aluminium fluoride plants

Buss ChemTech are the market leaders in the supply of plant and technical know-how for the production of aluminium fluoride, a material used as a smelting agent in the manufacture of primary aluminium. Recently, the company commissioned a 30,000 tonnes per year plant for Baiyin Fluorides Com-

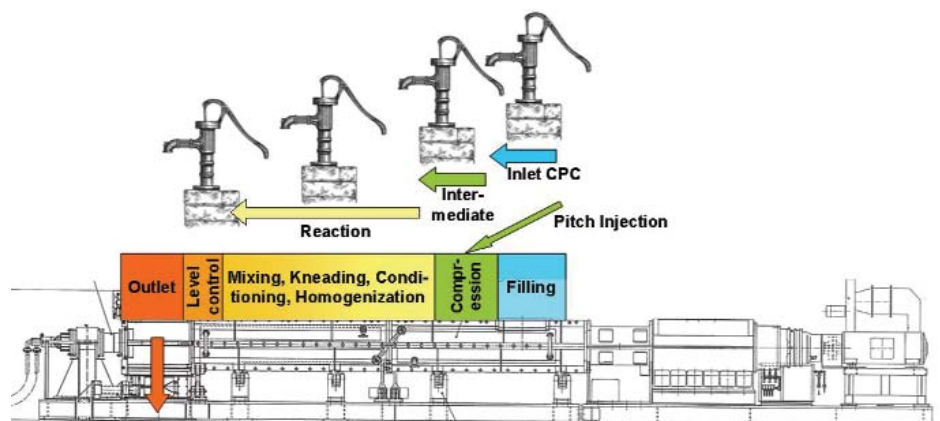
pany, Limited, in the People's Republic of China and they are currently constructing another plant with an output of 20,000 tonnes per year for a client in the same country. Elsewhere, they are involved in the engineering of a project in the Middle East. This will be the largest ever single-line aluminium fluoride plant with an output of 60,000 tonnes per year.

### Pitch melting plants

Buss ChemTech's unique technology combines the melting of solid pitch with liquid pitch, instead of bringing the material into contact with the hot metal surfaces of heating coils or plates. The company's plant operates with almost no maintenance over years of production, providing constant melting conditions, with no degradation of pitch quality. Modular plants are available, in capacities from 5 to 20 tonnes per hour, capable of maintaining constant melting quality, 24 hours per day, 365 days per year.

### Anode plants

From the delivery of raw material from the harbour or other source, through to the emergence of the finished anode, Buss ChemTech has developed a concept to increase availability, throughput and reliability. The major difference to more conventional layouts is the switch from semi-batch to fully-continuous material flow. Storage facilities exist at the beginning and end of the process in-between day bins do not exist. The size of the equipment is tailor-made to meet the requirements of current and future production. The building construction is optimised, being smaller in size than that normally needed to house such a plant. Contributions from first-class technology suppliers provide high availability and excellent product quality. A modular plant with functional units facilitates fast-track planning and project implementation. Recognition that Buss ChemTech's concept meets today's market requirements is reflected in the signing of the first contract for a complete anode plant incorporating these new concepts.



The principle behind the operation of the Paste Reactor



A Buss ChemTech plant for the production of aluminium fluoride

### The "Paste Reactor" K600 CP X

To return to the "Paste Reactor" K600 CP X, the latest version of the Buss ChemTech kneader family. Amongst the advances which set the unit apart from its predecessors is a divided material inlet for the dry fraction and the liquid pitch and different helix angles configured according to the process steps and the relevant anode paste status/density. An increase in the number of helix elements and teeth create a higher number of individual kneading actions. A dynamic throttling element at the outlet to the machine, instead of a stationary flap die, reduces mechanical stresses and increases the outlet compression effect. The filling of the reactor is regulated by the revolution of the main shaft, in combination with specific levels of internal mechanical friction. This results in smooth flow characteristics with optimised material transport at lower revolutions. The lower speed of the main shaft reduces the wear on the process parts, thereby guaranteeing a longer lifetime for the components.

### Innovative products

Buss ChemTech's innovative products for the primary aluminium industry include the following:

- Buss kneader and paste reactor, the heart of anode paste production
- Horizontal paste line, the ideal solution to quality anode paste processing
- Technology and equipment for the complete pre-baked anode plant
- Plant and machinery for the Soederberg anode plant (classical and dry paste)
- Technology and equipment for Buss ChemTech's unique pitch melting plant
- Know-how and plant for coke drying
- Technology and equipment for the complete aluminium fluoride plant

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