

FLUORINE TECHNOLOGY**HIGH BULK DENSITY ALUMINIUM FLUORIDE FROM HYDROFLUORIC ACID FROM FLUORSPAR**

Buss ChemTech is recognized as the world leading technology supplier for fluorine chemicals.

We are able to offer our clients guaranteed operating plants:

Aluminum fluoride is used by aluminum producers to lower the melting point of electrolytes in the smelting process and increase production efficiency.

Our process technology for fluorine chemicals is the result of over fifty years of continuous development linked to direct experience of the design and construction of industrial scale plants.

THIS RESULTS IN

- Plant capacities and products specifications tailored to your requirements
- Critical equipment like the AlF₃ Reactor manufactured to strictly controlled specifications
- Prolonged plant life and high productivity

RANGE OF SERVICES

- Fluorspar reactivity tests
- Conceptual design
- Feasibility studies and plant assessments
- Basic and detail engineering
- Process automation
- Materials or total plant supply
- Project management,
- Commissioning and start-up
- After sales service

FLUORSPAR AND ALUMINIUM HYDROXIDE DRYING PLANTS

Fluorspar and aluminium hydroxide are delivered to the plant complex as a wet cake. Drying is carried out in flash dryers before transport to the respective user.

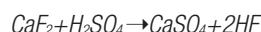


AHF Plant; Capacity 60,000 MTPY; Gulf Fluor, Abu Dhabi

AHF PLANT

Hydrogen fluoride is produced by the reaction of sulphuric acid with fluorspar in the Prereactor and this reaction is completed in an indirectly heated rotary kiln.

The reaction can be represented by the following equation:



Dry fluorspar, oleum and sulphuric acid flow to the Prereactor where the reaction begins and is completed in a rotary kiln.

Hydrogen fluoride flows through gas cleaning equipment, is condensed and distilled to produce anhydrous hydrofluoric acid.

Solid calcium sulphate residues are removed from the HF Reactor, neutralised and is sold to the building industry for use as floor levelling material, building blocks and as retarder in the cement industry.

Tail gases flow to the Central Absorption Section before emission to atmosphere.

AHF SAFETY STORAGE

The storage system consists of AHF Storage Tanks within the AHF Storage Containment Tank at a low temperature and atmospheric pressure.

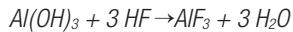


HF Storage, Sao Paulo Brazil

AlF₃ PLANT

Aluminium fluoride is produced by reacting dried aluminium hydroxide with the hydrofluoric acid gas in a fluidized bed reactor.

The reaction can be summarized as follows:



Al(OH)₃ is conveyed to the Al(OH)₃ Silo from where it is fed into the AlF₃ Reactor.

AHF is evaporated and superheated and fed to the lower bed of the reactor.

Aluminium fluoride is fed from the lower bed of the reactor through a product cooler to storage.

Fine solids transported out of the AlF₃ Reactor with the gas stream are recovered in cyclones and solids from them flow to the product stream.

Tail gases from the process flow to the Central Absorption Section.

Aluminium fluoride product is fed to bulk transport tankers or bag filling plant.

KEY FEATURES

- High quality aluminium fluoride
- Reliability in operation
- Environment and high safety record
- Use of fluorspar containing high impurity levels
- Sale of anhydrite as building raw material

EXPECTED PRODUCT SPECIFICATION

(per metric ton of aluminium fluoride)

AlF ₃	91 % wt. min
SO ₄	0.004 % wt. max
SiO ₂	0.025 % wt. max
P ₂ O ₅	0.005 % wt. max
Fe ₂ O ₃	0.020 % wt. max
Na ₂ O	0.050 % wt. max

- white free-flowing solid
- Bulk Density 1500 kg/m³
- Flowability Index <60 seconds for 1 kg
- L.O.I. (one hour at 550°C) 0.5% wt max.
- Granular size < 45 µm 10% max.
- Granular size > 150 µm 3% max.

EXPECTED CONSUMPTION FIGURES**Raw Materials**

(per metric ton of aluminium fluoride)	
Fluorspar	1540 kg
Sulphuric acid / oleum	1850 kg
(calculated as 100% H ₂ SO ₄)	
Aluminium hydroxide	1030 kg
(calculated as 100% wt Al(OH) ₃)	
Calcium hydroxide	30 kg

Utilities for AHF/AlF₃ Plant

(per metric ton of aluminium fluoride)

Steam, Low Pressure	0,8 GJ
Steam, Medium Pressure	1,3 GJ
Process water	3 m ³
Cooling water	3,6 GJ
Chilled water	1,7 GJ
Electricity	215 kWh
Fuel	4,9 GJ

This includes HF production per metric ton of aluminium fluoride



AlF₃ Plant; Capacity 60,000 MTPY Gulf Fluor, Abu Dhabi

