Buss ChemTech is recognized as the world leading technology supplier for fluorine chemicals. We are able to offer our clients guaranteed operating plants:

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 product specifications tailored to your requirements
- Critical equipment manufactured to strictly controlled specifications
- Prolonged plant life and high productivity

**RANGE OF SERVICES**
- 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

**AHF PLANT**

Hydrofluoric acid is an important intermediate for inorganic and organic fluorine compounds, such as aluminium fluoride, cryolite, uranium hexafluoride, fluorocarbons and fluoropolymers.

The key process technology is the production of anhydrous hydrofluoric acid from readily available feed stocks such as fluorosilicic acid. Concentrated fluorosilicic acid is decomposed in the presence of sulphuric acid according to the following reaction:

$$\text{H}_2\text{SiF}_6 + \text{SiF}_4(aq) + \text{H}_2\text{SO}_4 \rightarrow 2\text{SiF}_4(g) + 2\text{HF}(g) + \text{H}_2\text{SO}_4(aq)$$

The reaction produces silicon tetrafluoride gas and hydrogen fluoride. The latter remaining mainly absorbed in the sulphuric acid.

This acid is distilled to produce hydrofluoric acid.

Vent gas from the silicon tetrafluoride concentration system is cleaned of hydrogen fluoride and flows to the Central Absorption System before emission to the atmosphere.

The by-product sulphuric acid is dilute at a concentration of 70% to 75%. This acid is pumped back to the phosphoric acid plant to be fed to the reaction system.

Silicon tetrafluoride gas is cleaned in absorption columns to remove hydrogen fluoride and flows forward to the silicon tetrafluoride concentration system where it is absorbed in fluorosilicic acid.

$$5\text{SiF}_4 + 2\text{H}_2\text{O} \rightarrow 2\text{H}_2\text{SiF}_6 + 2\text{SiF}_4 + \text{SiO}_2 \text{ (Hydrate)}$$

A by-product of this system is silica.
KEY FEATURES
■ High profitability
■ Zero cost raw materials
■ Minimum hold-up AHF in the plant
■ High quality anhydrous hydrofluoric acid
■ Reliability in operation
■ Environmental and high safety record

AHF SAFETY STORAGE

AHF is stored at a low temperature in a double containment system with pressure control and safety instrumentation.

The main storage system consists of three AHF Storage Tanks within the AHF Storage Containment Tank. The stored acid can be re-circulated by the AHF Circulating Pump, through the AHF Circulating Cooler, and cooled down to below -5 °C.

The gas inside the outer containment is continuously dried in the AHF Containment Air Drier. The HF content in the containment is monitored online.

The vent gas flows to the Central Absorption.

EXPECTED CONSUMPTION FIGURES

Utilities for AHF Plant
(per metric ton of hydrofluoric acid)
- Steam, Low Pressure: 0.001 GJ
- Steam, Medium Pressure: 0.011 GJ
- Process water: 5 m³
- Cooling water: 24 GJ
- Chilled water: 6.8 GJ
- Electricity: 315 kWh

EXPECTED PRODUCT SPECIFICATION
(per metric ton of hydrofluoric acid)
- HF: 99.985 % wt. min
- H₂SO₄: 0.004 % wt. max
- H₂O: 0.008 % wt. max
- H₂SiF₆: 0.001 % wt. max
- SO₂: 0.001 % wt. max
- P₂O₅: 0.001 % wt. max

Raw Materials
(per metric ton of hydrofluoric acid)
- Fluorosilicic Acid: 1,600 kg (FSA calculated as 100 % H₂SiF₆)
- Sulphuric acid: 30,000 kg (calculated as 100% H₂SO₄)
- Potassium Hydroxide: 14 kg

AHF Plant: Capacity 20,000 MTPY; Wengfu Group, PRC