BUSS ChemTech

FLUORINE TECHNOLOGY

ANHYDROUS 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:

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.

The key process technology is the production of anhydrous hydrofluoric acid from readily available feed stocks such as fluorspar. Hydrofluoric acid is an important intermediate for inorganic and organic fluorine compounds, such as aluminium fluoride, cryolite, uranium hexafluoride, fluorocarbons and fluoropolymers.

THIS RESULTS IN

- Plant capacities and product specifications tailored to your requirements
- Critical equipment like the Prereactor 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 DRYING PLANT

Fluorspar is delivered to the plant complex with a residual humidity of up to 10% wt. The residual humidity after drying does not exceed 0.1% wt.

The drying is carried out in a flash dryer. The fluorspar is then transported by conveyors to the Fluorspar Silo.

AHF Plant; Capacity 30,000 MTPY; Mexichem, UK

AHF PLANT

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

The reaction can be represented by the following equation:

$$CaF_2 + H_2SO_4 \rightarrow CaSO_4 + 2\,HF$$

This reaction is endothermic, and so it requires a continuous input of heat for its completion. Dry fluorspar flows from a storage silo through a feed scale to the Prereactor. Liquid reagents, oleum and sulphuric acid, are pumped from stock tanks through preheaters to the reaction section.

Gaseous crude hydrofluoric acid flows to a series of gas cleaning equipment, condensation and distillation to purify the HF to anhydrous hydrofluoric acid.

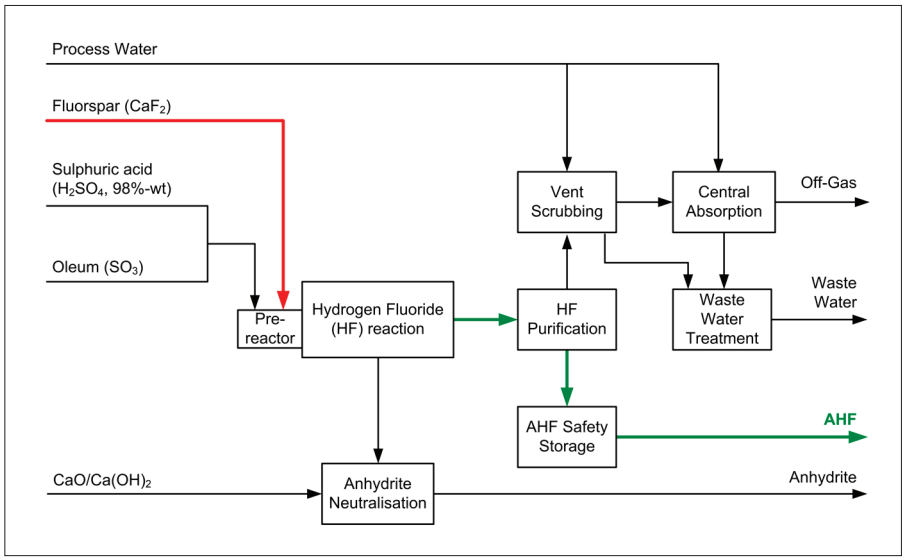
Hot solid calcium sulphate residues are removed and neutralised at the opposite end of the HF Reactor. Anhydrite is sold to the building industry for use as floor levelling material, building blocks and as retarder in the cement industry.

Tail gases leave the plant after final cleaning in the Central Absorption Section before emission to atmosphere.

KEY FEATURES

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

AHF Plant; Prereactor Capacity 53,000 MTPY; Gulf Fluor, Abu Dhabi



EXPECTED CONSUMPTION FIGURES

Raw Materials (per metric ton of anhydrous hydrofluoric acid)	
Fluorspar (calculated as 97 % CaF_2)	2,165 kg
Sulphuric acid / oleum (calculated as 100% H_2SO_4)	2,600 kg
Calcium hydroxide	40 kg

Utilities for AHF Plant (per metric ton of anhydrous hydrofluoric acid)	
Steam, Low Pressure	0,6 GJ
Steam, Medium Pressure	0,5 GJ
Process water	0,7 m^3
Cooling water	1,1 GJ
Chilled water	1,9 GJ
Electricity	210 kWh
Fuel	5 GJ

EXPECTED PRODUCT SPECIFICATION (per metric ton of anhydrous hydrofluoric acid)	
HF	99.985 % wt. min
H_2SO_4-	0.004 % wt. max
H_2O	0.008 % wt. max
H_2SiF_6	0.001 % wt. max
SO_2	0.001 % wt. max
P_2O_5	0,001 % wt. max

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 Dryer. The HF content in the containment is monitored online.

The vent gas flows to the Central Absorption.

HF Storage, Sao Paulo Brazil

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