BUSS ChemTech

FLUORINE TECHNOLOGY

ANHYDROUS HYDROFLUORIC ACID (FROM FLUORSPAR)

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

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 main route for the production of anhydrous hydrofluoric acid is through naturally occuring materials 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.

AHF Plant: Capacity 30,000 mtpy, UK.

OUR EXPERIENCE ALLOWS US TO OFFER PLANTS WITH FULL OPERATING GUARANTEES.

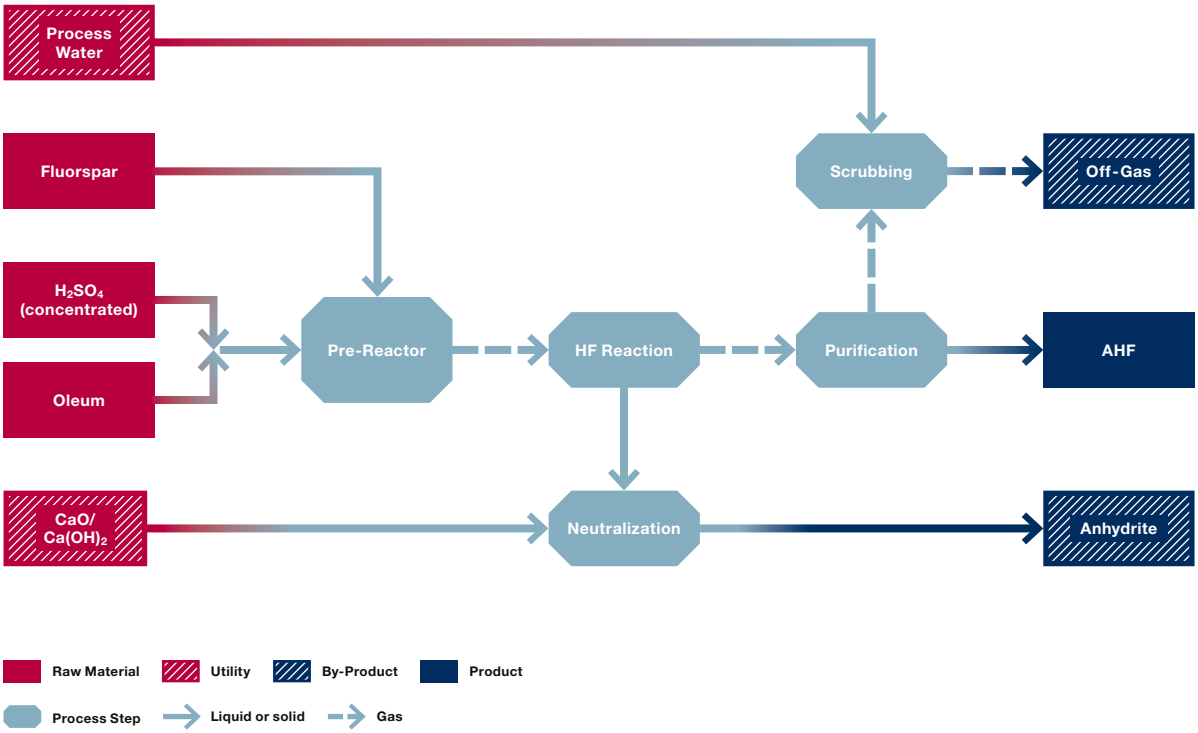
THIS RESULTS IN

- 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

Pre-Reactor ready for shipment



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.

THE AHF PLANT

Gaseous hydrofluoric acid (HF) is produced by the reaction of sulphuric acid with dry fluorspar in the Prereactor and thus 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 thus requires a continuous input of heat for its completion. Dry fluorspar flows from a storage silo through a feed scale to the Prereactor. The 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 equipment to purify the crude HF to anhydrous hydrofluoric acid (AHF).

Hot solid calcium sulphate residues are removed and neutralised at the opposite end of the HF Reactor. Anhydrite is sold to the construction 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.

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.

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 materia

AHF Safety Storage, UAE

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EXPECTED CONSUMPTION FIGURES

RAW MATERIALS[1]	
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[1]	
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		
HF	min.	99.985 wt-%
H_2SO_4-	max.	0.004 wt-%
H_2O	max.	0.008 wt-%
H_2SiF_6	max.	0.001 wt-%
SO_2	max.	0.001 wt-%
P_2O_5	max.	0.001 wt-%

[1] Values are per metric ton of anhydrous hydrofluoric acid produced.

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