

Capacity:

- 21,000 BPD Alkylation Unit
- 15,100 BPD Alkylation Feed Hydrotreater

Raw Materials: Olefins, Isobutane, Hydrofluoric Acid

End Products: Alkylate

Process Information

The main purpose of the Alkylation Unit is to produce a highly branched iso-paraffin known as Alkylate. This is achieved by reacting light olefins with isobutane using HF (hydrofluoric acid) as a catalyst. The alkylation unit process can be divided into two main phases, reaction and separation.

Alkylation Unit Major Equipment

- Acid Settler
- Rerun Column
- Alkylation Heater
- Isostripper
- Depropaniser
- Reactor
- Caustic Scrubber
- Acid Regenerator

Alkylation Feed Hydrotreater Process

The AFHT removes diolefins from the Alkylation Unit feed and isomerises certain olefins using a Palladium catalyst. Its function is to reduce acid soluble oil production in the Alkylation Unit, and thus significantly improve throughput. This also results in a higher octane product Alkylate.

Alkylation Unit & Alkylation Feed Hydrotreater for Sale



BRIEF PLANT DESCRIPTION

The Alkylation unit is a Phillips design, which is now licensed by UOP. It boasts a robust, industry leading automated Acid Evacuation System (AES) utilising IMS, laser and electrochemical acid leak treatment. In the reaction phase, the olefin reacts with the isobutane to form alkylate. The reaction takes part in the acid settler riser pipes before entering the acid settler, where the HF settles to the bottom by gravity and hydrocarbon to the top. The HF is then cooled and recirculated. The hydrocarbons enter the separation phase. During the reaction acid soluble oil (or ASO) is formed as a by-product. This is removed from the acid in the rerun column and then burnt in the unit heater. The separation phase splits the hydrocarbons from the top of the settler into 2 streams with one going to the isostripper and the other to the depropaniser. The depropaniser separates the hydrocarbon stream into propane, isobutane and HF, which go back to the reaction phase and alkylate which goes to the isostripper. The isostripper separates its feed streams into isobutane with HF, which goes back to the reaction phase, normal butane that is put into the gasoline pool and alkylate. The most important product from the unit is the alkylate. Alkylate is high octane, low RVP and low sulphur making it an excellent gasoline blending component. There are also propane and butane product streams.

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