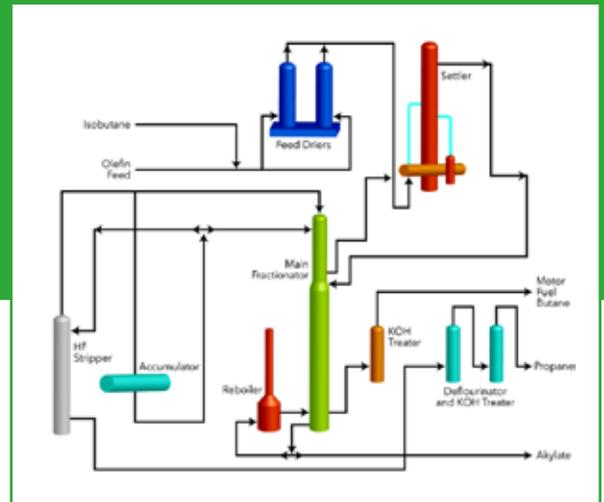


# Foxboro® ACA.HF Acid Catalyst Measurement Solution

The new standard in safety, simplicity, and accuracy for analyzing HF



## ACA.HF Acid Catalyst Measurement Solution

### Breakthrough Technology To Measure Hf Strength, Aso, & Water

The ACA.HF Advanced Measurement Solution from Foxboro® is a non-spectroscopic acid catalyst measurement solution that provides online measurement of all components in alkylation catalyst: hydrofluoric acid (HF), ASO, and water. It employs highly reliable core components, which are long proven in industrial HF service and whose mean time between failures (MTBF) is estimated by established industry methods to exceed 29 years. The ACA.HF exploits differential responses of each individual component to obtain a response “spectrum” directly analogous to that produced by the established, complex online FTNIR method.

With measurement accuracy that exceeds that required for precise process control, the ACA.HF offers additional benefits:

- Lower overall cost of ownership
- Installed cost that is approximately half of the FTNIR-based HF measurement
- Reduced complexity in the installation and sample preparation for improved safety and reliability
- Out of the box calibration eliminating long sample collection and modeling duration

Foxboro developed the ACA.HF advanced measurement solution to provide characterization of acid catalyst with the design objective of making it affordable with reliable accuracy.

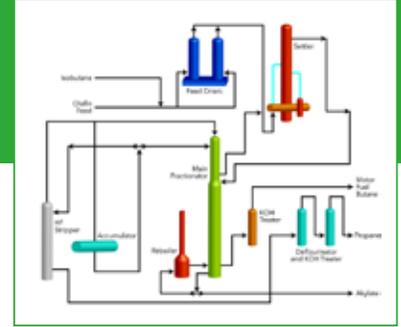
## Summary

The advantages of online alkylation process monitoring are clear. Fine-tuning the concentrations of the key parameters— HF, ASO and water— improves profitability and safety. The Foxboro® ACA.HF Alkylation Solution has demonstrated that continuous monitoring can be achieved with lower installed cost, less maintenance, and higher reliability than ever before.

## Business Value

Safety and profitability of an alkylation unit depend on fine-tuning the controls and are maximized when the net consumption of HF is minimized. Operating at the lowest possible HF concentration, in regards to the lowest amount of HF concentration used per barrel of octane, without risking an out-of-control phenomenon known as “acid runaway” is the optimal scenario— greatest output of octane barrels at a minimum cost.

# ACA.HF Acid Catalyst Measurement Solution



## Features / Benefits

- Non-spectroscopic measurement system designed to measure all components in HF alkylation catalyst: HF, water, and acid-soluble oils (ASO)
- Direct chemical measurement
- An integrated panel-mounted system for installation in the alkylation unit
- All wetted parts associated with the system and sample handling are made with Hastelloy-C, Teflon®, and Kalrez® (Chemraz®)
- Measurement is performed on sample flowing continuously through tubing and components half-inch or larger, minimizing pressure drops that cause may flashing of light hydrocarbons
- Continuous flow and pressure output to indicate proper operation
- Unaffected by sample temperature variation
- Manual valves to isolate the analyzer system and purge with isobutane, alkylate, nitrogen, etc.
- Modular design for easy swap-out of measurement sensors and components
- Utilizes proven measurement technologies with an established history of service in HF applications
- Internal data logging and historizing of KPIs to enable quick and easy diagnostics
- No wear elements requiring preventative maintenance

## Alkylation Unit Optimization Enabled With New Technology To Analyze The Composition Of HF Acid Catalyst

Alkylation unit engineers and operators understand the many variables that need to be controlled for the efficient, safe production of alkylate. Optimizing the alkylation process within unit operating constraints has been limited. Because of this, Foxboro developed a total performance HF solution specifically designed to address all areas of economic benefit:

- Cost effective characterization of acid catalyst with the ACA.HF

- Reliable, easy-to-maintain analysis of feed, recycle, fractionators, and alkylate
- Our Connoisseur™ APC package or ROMeo® RTO software with fully reconciled reactor models from ExxonMobil Research and Engineering (EMRE)

With the ACA.HF solution, Foxboro is uniquely able to offer clients a total performance HF package that leverages our expansive industry experience and know-how with our state of the art solutions.

# ACA.HF Acid Catalyst Measurement Solution

## Advantages Of ACA.HF Over Established Spectroscopic Techniques

Although an optical spectrometer is an extremely powerful analytical instrument, its adaptation to online operation in an alkylation process is a complex undertaking whereas ACA.HF is extremely simple and reliable. The ACA.HF achieves further simplification through elimination of the need to control sample temperature, and through direct installation into the fast loop. Analysis of a continuously flowing sample system obviates the need for a complex sample handling system with a frequently cycling shutoff valves that require maintenance and periodic

replacement. ACA.HF outputs its own set of diagnostic information—flow rate, pressure, and temperature. The cost of an ACA.HF system is about half that of online spectrometer with maintenance a fraction of the effort required to maintain an online spectrometer. Typical startup and commissioning takes only a few days which further proves its simplicity. No special skills to install and operate are required that are not found in every refinery. The components are laid out on an open panel requiring no inert gas purge or HF vapor detection.

## Manual Sampling Of HF Acid

The hazardousness of HF is extreme. Not only is it severely toxic through ingestion, inhalation, or contact with skin, it is highly volatile, permeating, and corrosive. Without a simple online measurement of the HF catalyst, grab samples must be taken in sealed, Monel sampling cylinders by personnel wearing full protective gear and respiratory apparatus. Personnel with special training must carry out analyses in a designated, segregated laboratory area with safety showers

present in the lab and along the transport route. These disadvantages of grab sampling and lab analysis of HF acid cannot be overemphasized.

Utilizing the ACA.HF solution from Foxboro, refiners can reduce the need for manual grab sampling and the inherent risk associated with sampling and handling HF acid. Even with other online spectroscopic techniques periodic grab sampling is required for QA and model updates.

