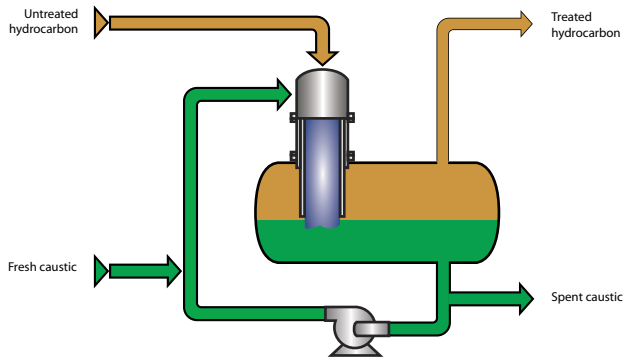
NAPFINING™

Naphthenic Acid Removal

MERICHEM

NAPFINING™ technologies were first licensed in 1977 and to date Merichem has granted 78 unit operating licenses world-wide. The non-dispersive FIBER FILM® Contactor achieves reduced capital expenditure and less plant space requirements compared to most treating alternatives, making NAPFINING™ and NAPFINING™ HiTAN the technologies-of-choice. In addition, onstream factor between routine turnarounds is 100% whereas electrostatic precipitators (ESPs) are much less reliable and incapable of processing high TAN (> 0.1 mg KOH/g) feeds.



NAPFINING™ and NAPFINING™ HiTAN technologies employ the FIBER FILM® Contactor as the mass transfer device and utilize caustic as the treating reagent to remove naphthenic acid compounds mainly from jet fuel, kerosene, diesel, condensate and crude oil streams.

Applications

Downstream	Crude Distillation Unit	Jet Fuel / Kerosene (RCOOH, RSH)
		Diesel (RCOOH)
Upstream	Gas Production Field	Condensate (H2S, RSH)

NAPFINING Technology

There are two important steps in wet treating of jet fuel: total acidity reduction and mercaptan oxidation. The processing step required when total acidity must be reduced is a weak caustic prewash which is designed specifically to extract strongly acidic compounds such as H_2S, but in particular naphthenic acids from the jet fuel.

The typical product neutralization number specifications vary from 0.005mg KOH/g of hydrocarbon to as high as 0.10, depending on the product market or downstream process requirements. In addition, the removal of H_2S and light mercaptans (if any) ensure that the product jet fuel will meet the copper and silver strip corrosion specifications.

The purpose of Merichem's NAPFINING technology is to extract naphthenic acids from distillate fractions, such as kerosene/jet fuel, to ensure that the final product acid number specification will be met. This process not only reduces product corrosivity by also protects the downstream sweetening system.

One of the major problems in operating conventional naphthenic acid extraction systems is the formation of stable emulsions of sodium naphthenate in the treated hydrocarbon. Merichem has demonstrated in many commercial installations that the total acidity can be easily reduced with caustic solutions without creating emulsions when the FIBER FILM Contactor is used.

The conventional mixing/settling mechanism with electrostatic precipitation, historically used for naphthenic acid extraction with caustic, has been one of the major contributors to problematic jet fuel production for many refiners. In fact, it has led some to abandon caustic treating in lieu of the more expensive hydrotreating.

Sodium naphthenate has a great tendency to emulsify with the jet fuel, producing a stable emulsion, sometimes called a rag or soap, which is very difficult to break and certainly not in the time provided in most conventional caustic treating systems. Therefore, entrainment of the caustic phase can be expressive when dispersive mixing devices are used.

If these soaps get into downstream mercaptan sweeteners, they adversely affect their performance. Quite often the system can only be made to work by adjusting operating variables, such as caustic strength, and spending to inefficient set points that substantially increase operating costs. Therefore, the NAPFINING step is critical to successful jet fuel production.

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