CASE STUDY

FTC Strata® 740 Emerald Series delivers first-of-its-kind solution for refinery amine system

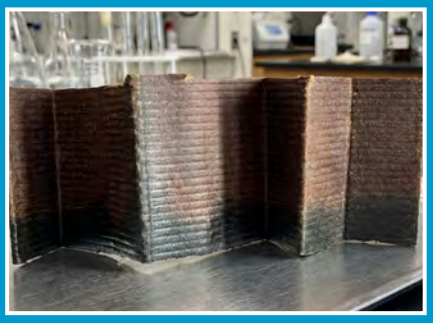
STRATA®

PROBLEM

A refinery customer faced recurring instability in its amine loop. Although the refinery had operated for decades without major issues, filter usage steadily increased, and the unit lost stability more frequently for one to two weeks at a time. FTC's quarterly amine sampling and the refinery's internal testing confirmed elevated total suspended solids and significant increases in hydrocarbon content across several sample points. Rich and lean amine analyses showed high TSS values and post-filter TOG readings that surged from baseline values into the hundreds of ppm. Used filter inspections revealed heavy hydrocarbon loading and contamination dominated by iron sulfide. The refinery had no carbon bed, coalescer, or absorption technology installed, so once oil entered the system, it had no exit path. With a full shutdown on the horizon, during which the refinery would purge and replace more than $1.5 million of amine, it was clear that reloading solvent without addressing trapped hydrocarbon contamination would only reproduce the same performance problems.

ANALYSIS

FTC worked alongside the refinery's engineering team to build a complete baseline of the system. A year of sampling, filter inspections, and laboratory analysis established a correlation between increased levels of hydrocarbons with system instability with frequent filter change-outs. Lab data showed rich amine TSS levels near or above 100 mg/L, while lean amine samples indicated substantial hydrocarbon increases after filtration. Inspection of used filter media showed high levels of oil-laden solids on inlet surfaces. The data demonstrated that hydrocarbons played a critical role in both shortened filter life and the unit's recurring instability. The refinery needed a way to remove hydrocarbons from the amine loop using existing infrastructure, with no capital equipment, no new piping, and no operational disruption.



SOLUTION

FTC recommended deploying the Strata® 740 Emerald Series absorption media, an engineered hydrocarbon removal technology designed with the unique beneficial property of building differential pressure as the polymer media swells from absorbing hydrocarbons from the amine. To maintain particulate filtration, FTC designed a hybrid configuration inside the refinery's existing 13-element rich and lean filter vessels. Half of each vessel was loaded with conventional FTC Clarify 740 filtration elements and half with Strata 740 absorption elements. This approach allowed simultaneous oil absorption and solids removal without modifying the vessel or adding external equipment. Before shutdown, a controlled field trial validated the approach. Mid-run sampling demonstrated approximately 50% hydrocarbon reduction, matching laboratory predictions. Importantly, filter service life was unchanged, confirming that oil-blinding mitigation preserved run length despite the reduced filter count. Following the successful trial, the refinery implemented a simple operating procedure: Whenever hydrocarbon levels rise above baseline, the vessel is loaded half with Strata 740 absorption media and half with filters until TOG returns to target levels, after which it is returned to full filtration mode. This eliminates the need for a carbon bed or capital-intensive modifications.

RESULTS

FTC's implementation represents the first documented full-scale refinery deployment of hybrid filtration and absorption within an amine system. The refinery achieved sustained hydrocarbon reduction of approximately 50% with Strata 740, validated by consistent field and laboratory correlation. Post-shutdown data showed stable TOG values significantly lower than prior operating conditions, and TSS and PSD behavior aligned with expectations for a cleaned system. Most importantly, upset events that historically lasted one to two weeks now resolve within one to two days. The refinery has reduced filter consumption, labor requirements, and operational uncertainty. By maintaining normal operations and avoiding any new capital systems, the facility averted millions of dollars in capital expenditure and protected its new amine inventory from premature contamination and premature replacement. The result is a more stable, predictable amine system with a data-backed operating strategy that improves uptime and overall profitability, delivered entirely within existing infrastructure using FTC-engineered technology.

ABOUT STRATA® 740 EMERALD SERIES

FTC's Strata® 740 coalescing elements combine the effects of adsorption and absorption to enhance oil removal efficiency. Cartridge construction components are polypropylene and a non-toxic, non-hazardous, non-corrosive, environmentally friendly petroleum bonding agent. One 740 "Oil Guzzler" is designed to hold greater than six liters of oil before reaching the maximum differential pressure of 35 psi. The rapid differential pressure increase mechanism provides a positive indication of cartridge change-out time prior to any oil bypass.

ABOUT FTC Since 1987, Filtration Technology Corporation has set the benchmark for filtration and separation innovation across global industries. Through relentless engineering excellence and proprietary technology development, FTC delivers category-leading liquid-solids filtration, gas-liquid and liquid-liquid separation, and gas-solids filtration solutions engineered to elevate performance, protect critical assets, and redefine operational reliability.

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