



FTC's Advanced Filtration Solution Extends Refinery Hydrocracker Catalyst Life

PROBLEM

Filtration Technology Corporation (FTC) has been a leader in industrial filtration for nearly four decades, delivering innovative solutions that support sustainability, operational efficiency and compliance in the refining industry—particularly as it adapts to new energy-transition demands. One recent challenge involved a North American refinery's Hydrocracker Unit (HCU) feed filter system, which required frequent filter changes every two weeks, posing safety risks and maintenance inefficiencies. The setup, featuring an 18-inch vessel with 25 non-FTC glass string-wound filters, had several operational challenges, including ineffective sealing and a blind flange closure. This configuration allowed contaminants to bypass the filters, resulting in inadequate protection of the reactor catalyst bed and ultimately pre-mature fouling.

ANALYSIS

The short filter runtimes and maintenance hazards presented a critical need to improve operational efficiency. The catalyst bed required effective contaminant protection to extend its lifespan and avoid costly unplanned

downtime. However, replacing the entire filtration system was not feasible due to time and budget constraints. FTC identified that an upgrade to its advanced Invicta technology would address these challenges, delivering both immediate and long-term operational benefits while fitting within the existing vessel structure.



SOLUTION

FTC implemented a strategic upgrade using Invicta technology, introducing five Invicta elements into the existing vessel (see Figure 1). These filters feature a core-less, trapezoidal design that increases the surface area and optimizes media density, significantly enhancing the capture of solid contaminants. This adaptation allowed for a seamless transition from the previous filters, minimizing downtime. The Invicta filters were also engineered with absolute-rated 99.98% efficient glass media to ensure effective removal of solids contaminants and optimal protection for the catalyst bed.

Although the filter flux rate remained higher than ideal due to the existing vessel being undersized, Invicta technology's unique filter

packing density overcame this constraint. The installation was completed quickly and without the need for significant infrastructure changes, making it both a practical and economical solution for the refinery.

RESULTS

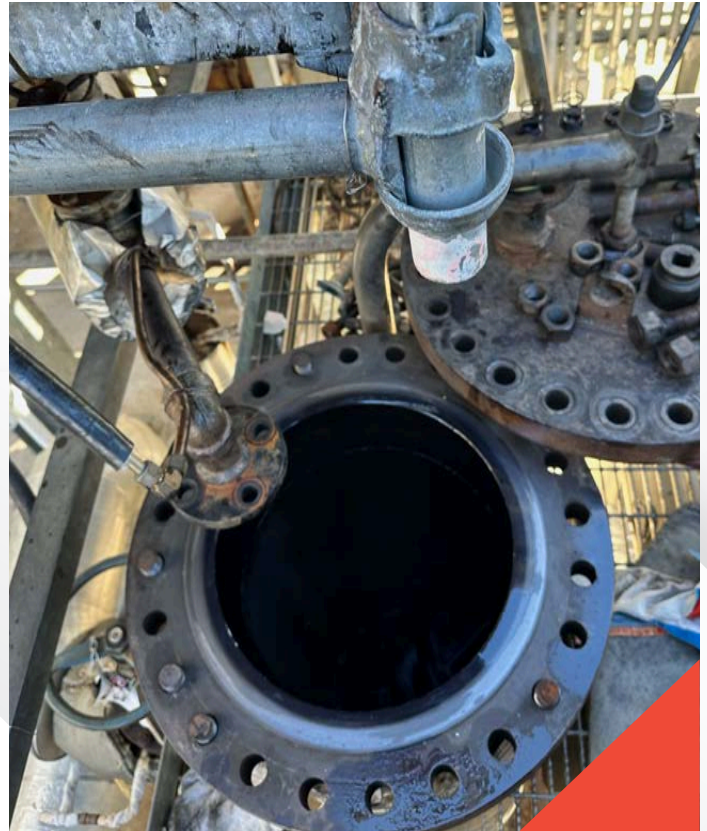
The refinery observed substantial improvements following the Invicta upgrade. Average runtimes increased significantly, with the new filters operating for up to three months before reaching terminal differential pressure. This enhancement allowed for better scheduling of maintenance activities, eliminating the need for weekend and nighttime changeouts and reducing potential safety hazards for the maintenance team.

Additionally, the extended filter life and improved filtration efficiency enabled the refinery to delay a planned catalyst replacement by six months, resulting in significant cost savings. By reusing the existing vessels, FTC's solution not only reduced capital expenditure but also delivered a 25% reduction in filtration-related operating costs.

FTC's innovative filtration and separation technologies are not only solving today's challenges in refining but are also paving the way for greater sustainability in the industry's future. By extending filter life, reducing waste and improving effluent quality, our Invicta technology exemplifies our commitment to supporting the energy transition, providing refineries with the tools needed to enhance efficiency, reduce costs and meet environmental standards.

INVICTA® LIQUID-SOLIDS FILTERS

Invicta® liquid-solids filter cartridges are designed to provide the most cost-effective filtration solution on the market. This innovative, patented technology offers a significant improvement to the conventional filters used today. Because of its revolutionary design qualities, Invicta® can provide up to 176% more surface area in a vessel footprint over conventional cylindrical filters. The trapezoidal, coreless design allows more elements to be placed in a vessel by reducing the amount of wasted space in traditional cylindrical filter designs. This results in lower clean pressure drop, higher solids loading capacity, and longer life which means fewer changeouts and greater overall cost savings.



ABOUT FTC®

Since 1987, Filtration Technology Corporation (FTC) has built a reputation for developing and delivering innovative products at the forefront of filtration technology. We engineer and deliver the highest quality process solutions, training, testing, and cutting-edge technology with unparalleled service and support. Through the ongoing development of new, game-changing products, FTC continually redefines success for our customers.

