

# Boiler Feed Water Filtration Solution for Texas Refinery

## PROBLEM

A major Texas refinery was renting multiple RO units to treat their boiler feed water, which originated from more than a dozen wells located in proximity to the plant. The plant collected the feed water in large open-top tanks, then pumped it to the RO trailer units. Each of the RO trailers featured built-in pre-filtration units. As originally supplied, these pre-filtration units were undersized and provided insufficient solids loading capacity and RO membrane protection. Costly pre-filter changes at the rate of two to three times per day and the lack of sufficient RO membrane protection were having a dramatic negative impact on operational efficiency.

## ANALYSIS

The plant requested a rental filtration solution to protect the RO trailers from solids and biofouling, a natural by-product of the open-tank well water storage. Three 36" pre-RO filtration vessels (holding 25 filters each) were installed to handle the 1,000-1,100 gpm flow rate required at the plant. This system allowed the plant to change filters every four to five days instead of every eight to 12 hours. In 2012, the plant upgraded to FTC Clarify 500 cartridges for the pre-RO filtration vessels and extended their change out interval to a full week. As 2018 came to an end, the plant was looking to replace the three pre-RO filtration vessels that were exhibiting normal signs of wear. FTC's distributor suggested the new Invicta® system, which in addition to offering advanced efficiencies was also able to operate within the existing vessel footprint, requiring no piping changes.



## SOLUTION

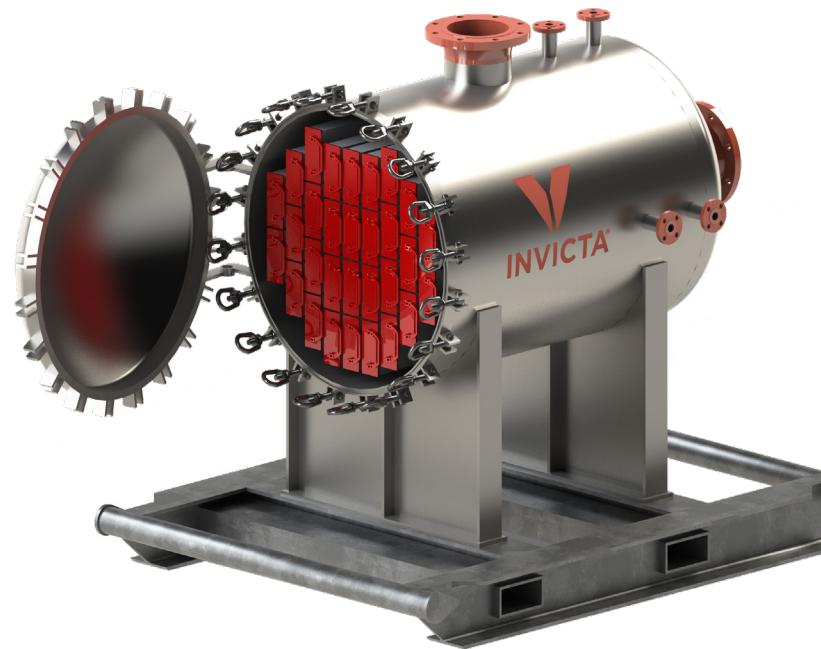
The refinery decided to go with FTC's Invicta® vessels and filters. The same reliable filtration media they had come to trust with the Clarify 500 series would be available in the new Invicta® system, with the added benefit of a coreless, trapezoidal filter cartridge design that increased overall vessel efficiency through significantly improved filter media packing density. Plant officials saw the benefits right away. They could replace their old vessels with identically sized vessels, improve filter life, reduce long term consumable and labor costs, while avoiding completely the costs associated with engineering, new piping, and construction. Invicta vessels and filters were delivered in late 2018 and installed in the spring of 2019.

## RESULTS

The refinery has been thrilled with the results! First and second quarter data from 2018 and 2020 tell the story. In 2018, using the previous vessels and Clarify 500 elements, the plant conducted 157 changeouts with 3,920 total elements replaced during the first six months of the year. At the end of Q2 2020, the plant has conducted just 30 changeouts with 924 total elements replaced. After the switch to Invicta® vessels and filters, the refinery has saved 39% in direct consumable costs, which, when projected through the end of the year would represent an annual savings for the plant of over \$280,000.

## INVICTA® LIQUID-SOLIDS FILTERS

Invicta® liquid-solids filter cartridges are designed to provide the most cost-effective filtration solution on the market. This innovative, patent-pending 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.



FTC Invicta® offers improved filter media packing density within the same vessel footprint

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## 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.

