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CASE STUDY

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A LARGE US BASED INDEPENDENT REFINER PROCESSING HEAVY SOUR, LIGHT SWEET AND OPPORTUNITY CRUDE OILS. THEY PRODUCE HIGH VALUE LIGHT PRODUCTS SUCH AS GASOLINE, DIESEL, JET FUEL AND SPECIALITY LUBRICANT PRODUCTS.

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## THE CHALLENGE

The refinery had a filtration application to remove contaminants such as pipe scale, silica and coke particles to protect the downstream Hydro Desulphurization (HDS) unit reactor. The plant was using filter elements from another supplier and experiencing major issues with end caps falling off the elements causing bypass. This led to contaminants plugging the HDS reactor causing pressure drop problems in the reactor. Increased pressure drop in the reactor causes a loss in reactivity, which can lead to off spec fuel products.

Such pressure drop problems can force a refinery to “skim” their reactor to replace the plugged catalyst in the top of the reactor.

This results in a premature process shut down that reduces feed rate during the skim and increased maintenance costs. A skim will typically replace the top layer of the catalyst bed and can take one to two weeks to perform. Costs vary but can be \$1.5 – 2 Million per skim.

## THE SOLUTION

To alleviate the immediate issue, Jonell Systems installed a custom engineered cartridge in a high temperature configuration in the existing housings. These filters can withstand the process temperature above 400 F without degradation or mechanical failure solving the contamination and problem to the HDS reactor.

To optimize the filtration process going forward, Jonell Systems conducted numerous tests including 3rd party tests of both the media and gas oil feed to fine tune the filter elements to the exact process conditions at the customer site. Based on the analysis, Jonell Systems proposed an innovative LiquiPleat JPMGX filter cartridge solution. The custom engineered cartridge design allows the refinery to capture more contaminant between changes by capturing different size particles on multiple filter layers.

As a further service to the customer, Jonell Systems created packaging specific to the customer with multi-piece filter cartons instead of individual boxes to service the change-out needs per vessel. This reduced packing waste and made the cartridge change-outs quicker and easier for the operators.

## THE RESULTS

This overall filtration optimization allowed the refinery to process the gas oil feed at optimal efficiency while protecting the HDS unit downstream and saving maintenance costs associated with fouling an HDS reactor. In addition, the custom-built cartridges delivered 50% longer run time significantly increasing the service interval between change outs, more uptime and lowering the total operational cost.

**This customized approach of creating a filtration solution to address the specific needs of the customer is how Jonell Systems has helped over 100 refineries worldwide optimize their filtration processes.**

