



## How Dax Oil used magnetic separation to prevent their crude unit heat exchanger from plugging off

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### Problem

The quality of crude oil feedstock is an ongoing issue for refiners. A common form of particulate contamination found in crude is black powder – an erosive mix of ferrous and non-ferrous metals, minerals and compounds such as iron sulfides and iron oxides. It originates in producing formations and continues to build all the way downstream through the crude value chain. It is typically costly to remove, or not removed at all due to its small size, and is damaging to all types of equipment that it comes in contact with.

A Brazilian refinery receives trucked-in crude oil from 3rd party producers in the Reconcavo basin. The crude is heavily contaminated with black powder that accumulates in the tank farm and continues downstream into the heat exchanger before their crude unit.



## CASE STUDY

### Solution

Dax Oil installed a magnetic separator system on 1 of the 2 low-pressure outlet lines from its raw crude tankage to the heat exchanger.

The system flows ~3,750 barrels per day, operating with minimal flow restriction.

Cleaner feedstock would not only improve the efficiency of the heat exchanger and reduce its maintenance requirements, but it would improve their refining processes and reduce facility-wide operating costs.



### Results

The magnetic separator was run over an initial calibration period to determine the average volume of contamination in the crude. Since then, the magnetic separator is cleaned weekly after ~15,000 barrels of crude flow through it. The average amount of black powder captured each week is 10-15 lbs (4-6 kg).

Dax Oil has determined that further mitigation of black powder will ultimately improve refining processes, which will result in significant operating and maintenance cost savings.

The next steps are to deploy magnetic separator systems upstream of the tank farm and on the feed stock to the refinery to (1) reduce buildup of black powder in the tanks, allowing them to maintain their storage capabilities; and (2) improve the quality of crude feedstock, resulting in reduced facility downtime.

