



# Refiner maintains production and profitability with ExxonMobil's catalytic lube dewaxing technology

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By relying on MSDW™ technology-based catalytic isomerization, a refiner retains high-quality base stock production with extended run length.

## Challenge:

**Avoid production shutdown due to feed contamination and operational issues**

A base stock manufacturer was experiencing poor lube plant feed quality stemming from refinery equipment problems. The hydrocracker producing the feed to the lube plant had developed a leak in the high pressure feed-effluent heat exchanger. The Unconverted Oil (UCO) was therefore contaminated with raw feed containing vacuum gas oil and coker gas oil causing high nitrogen, sulfur, aromatics and poly-nuclear-aromatics in the UCO.

This situation could have diminished production capacity and/or undermined the quality of the base stocks. The manufacturer was concerned about maintaining product quality and production rates, which directly impact profitability, while avoiding a costly shutdown.

## Solution:

**Exploit the high activity and robustness of the MSDW™ catalyst**

ExxonMobil engineers worked closely with the operator to assess options and identify the most effective solution for maintaining production rates at the same yields and quality. As an owner-operator, ExxonMobil has a lot of experience and understands how to address similar operational issues.

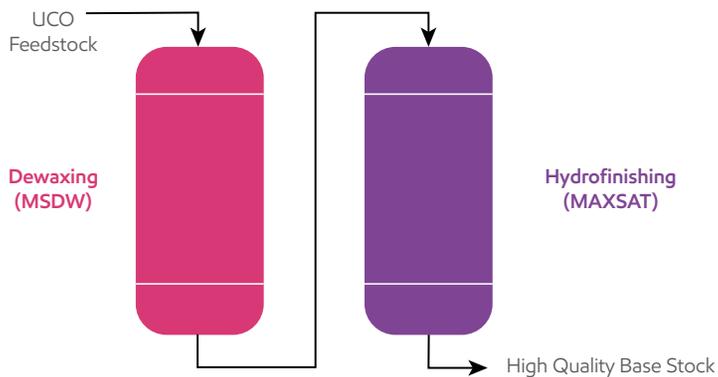
An analysis of the situation indicated that ExxonMobil's robust MSDW technology could easily withstand the increased contamination levels with simple operational adjustments that would not affect production rates nor yields.

MSDW technology indeed handled the refiner's feed quality issue thanks to its very high tolerance to contamination even when the nitrogen feed content approached 50 wppm.

MSDW technology uses proprietary catalysts to hydro-isomerize n-paraffins and saturate aromatics for maximum yields of very high quality base stocks.

Over 20 years of operating experience and continuous R&D advances, the performance of the MSDW process has progressed to offer outstanding catalyst activity, yield, and stability. The process is very simple, and utilizes two temperature stages (Figure 1). The first stage contains the MSDW selective hydro-isomerization catalyst, and the second contains the MAXSAT hydrofinishing catalyst that removes poly-nuclear aromatics for outstanding thermal and oxidative stability, and color.

Figure 1:



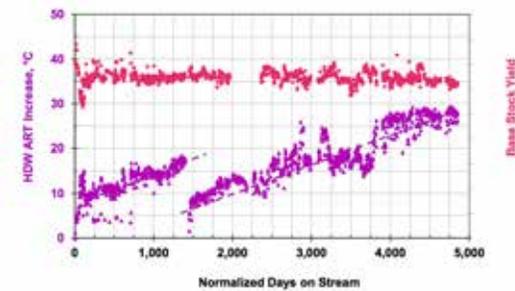
## Result:

### Maintained production ensuring continuing profitability

The refinery continued to operate the lube plant with nitrogen contamination much higher than 10 wppm for over two years, at full rate and unchanged yields (Figure 2). A shutdown to resolve the issues in the hydrocracker was not necessary.

The company estimated the cost savings resulting from the ability to maintain rate, yields, and avoid a shutdown at approximately \$75M. Moreover, the company's reputation for reliable supply of high quality base stocks was maintained.

Figure 2:



Estimated savings to refiner:

\$75<sub>M</sub>

Continued customer satisfaction



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