

# CATALYST & TECHNOLOGY

April/May 2009

NEWS

## INTRODUCING

### CENTERA™ Catalyst Technology

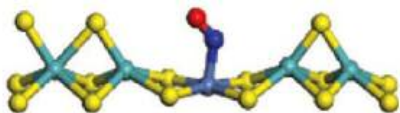
Get more from your hydroprocessing assets now – thanks to nanotechnology advancements in catalyst active site assembly.



#### Criterion's New Generation of Catalyst Is Here: CENTERA Technology

It puts nanotechnology to work for your hydroprocessing operations – optimizing performance at a time when you need processing flexibility.

Ni-NO



NiMoS Edge Structure

#### Innovation

Key improvements integral to the CENTERA technology enable the assembly and preservation of the individual catalyst active sites. This technology ensures the optimal transformation of oxidic metal nano-particle precursors to sulfided, active sites. The CENTERA process then locks these distinctive sites in place to ensure their high activity is retained.

#### Higher Activity – More Flexibility

CENTERA technology's highly active nano-structures create exciting new opportunities for refiners to capitalize on hydroprocessing opportunities, providing the flexibility to increase run length, process more difficult feedstocks or increase through-put. The higher activity offered by CENTERA can also be used to reduce the base catalyst volumes required to meet processing targets. In ULSD, this provides an opportunity to incorporate catalyst for cetane improvement, density reduction, cold flow improvement or conversion to naphtha.

#### Broad Application

CENTERA technology is applicable across most of Criterion's hydroprocessing catalyst portfolio. In the ULSD application, CENTERA technology enhances performance of a broad range of ULSD scenarios, from the low-pressure CoMo catalyst regime of revamped units to the higher-pressure NiMo catalyst environment of grassroots units processing a high percentage of cracked feedstocks.



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## Impressive ULSD Performance

With CENTERA, performance improvements of up to 50% in volumetric activity are possible. In fact, the first new CENTERA ULSD products provide measurable improvements of up to 25°F over earlier generation products (see Figure 1).

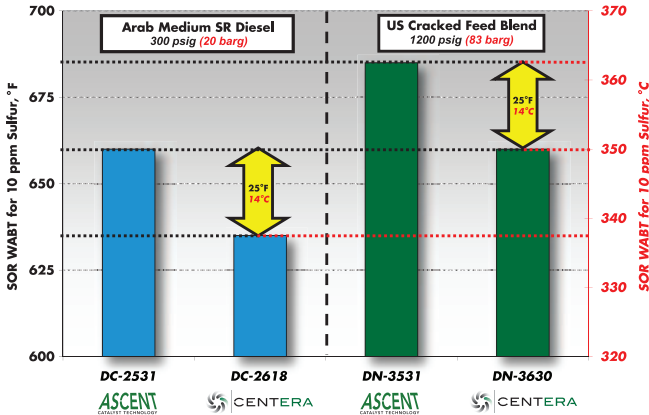


Figure 1 ULSD Catalyst Performance Comparison

## Enhanced Retention of Activity (ERA)

In addition to higher initial activity, CENTERA technology preserves activity during the initial catalyst operational period, the point where typical Type II catalysts have been shown to lose activity. CENTERA generates higher activity – then locks it in.

## A New Generation – A Strong Legacy

CENTERA technology is the culmination of years of in-depth research on the fundamental structure of active sites combined with commercial experience with our proven CENTINEL, CENTINEL GOLD and ASCENT platforms (see Figure 2).

Through CENTERA, Criterion brings you the value of more than eight years and nearly 300 cycles of commercial ULSD operations with customers around the world.

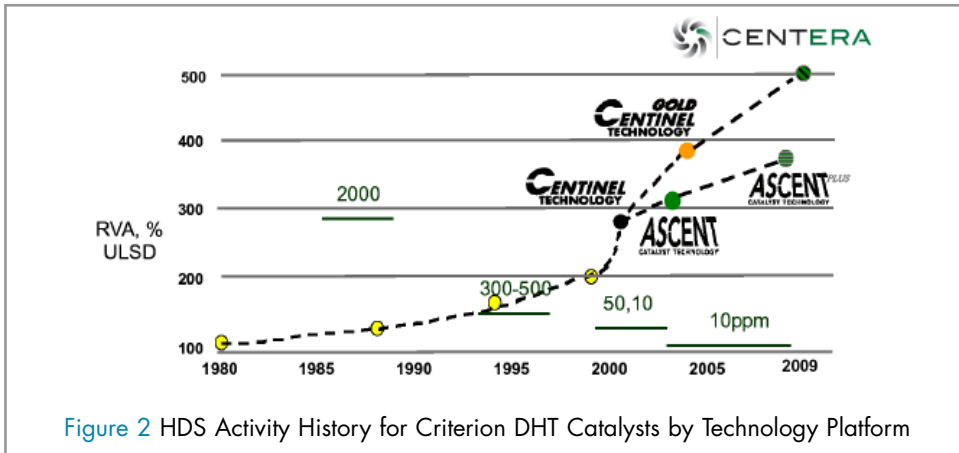


Figure 2 HDS Activity History for Criterion DHT Catalysts by Technology Platform

Call your Criterion sales representative for more information about how the CENTERA Technology can benefit your operations.

### Important:

All information contained in this document is considered accurate at the time of the testing, based on the equipment, and specific conditions and other limitations during the testing process. It is being furnished upon the express condition that the user will make its own assessment to determine the accuracy and applicability for the user's particular purpose.

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