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Breakthrough Catalyst Technology: Tackling the Clean Fuels Challenge

By Carol Cole, Editor, Octane Week

While Criterion Catalysts & Technologies has assembled a wide range of tools, experiences and alliances to help its customers meet the Clean Fuels challenge, catalysts are still the heart of the solution. A year after their introduction, it's clear that no heart beats stronger than the catalysts in the CENTINEL family.

Determined to create a real answer to the Clean Fuels mandate, Criterion researchers took a radically different approach to the way catalysts were made. The result? A new type of catalyst whose performance in pilot plant tests exceeded conventional catalysts' activity by 30-50% while maintaining the lowest deactivation rates ever achieved.

But what about commercial performance? Now that a year has passed since the technology was introduced, CENTINEL catalysts have definitely proven to be more than just a laboratory curiosity. Today, more than 12 million pounds of CENTINEL catalysts are operating in 45 units around the world. Applications span distillate hydrotreating, FCC pretreating and hydrocracker feed pretreating. In many cases, these customers chose a CENTINEL catalyst based on their independent tests, which demonstrated that this technology provided the best way to achieve their operating goals. The results from these commercial operations have met or surpassed the customers' targets and Criterion's expectations for this technology (see insert).

So, commercial operation has demonstrated that CENTINEL catalysts can be the heart of the solution for tomorrow's Clean Fuels requirements:

- In the distillate hydrotreater, to achieve reasonable run lengths at significantly higher sulfur removal rates;
- In the FCC pretreater, to reduce sulfur in the FCC gasoline stream and to reduce volume and improve quality of the LCO stream;
- In the hydrocracker pretreater, to process cracked stocks like LCO and coker gas oils more effectively and improve the hydrocracking catalyst's performance.

CENTINEL's Performance Claims

General	Commercial Finding
Step out performance in DHT, FCC PT, HCPT	TRUE
Easier start up compared to conventional catalysts	TRUE
Allow processing of more refractory feeds in hydrotreaters	TRUE
In Distillate Hydrotreating:	
Highest deep and ultra deep HDS activity	TRUE
Highest stability, equal to or exceeding that of Century catalysts	TRUE
Improved performance over conventional catalysts	TRUE
In FCC Pretreating	
More nitrogen removal and aromatic saturation in FCC Pretreat	TRUE
DN-3110 significant improvement in aromatic saturation and HDN vs DN200	TRUE
Increased FCCU conversion and lower sulfur in FCC gasoline	TRUE
In Hydrocracker Pretreating	
Improved hydrocracker yields	TRUE
Easier processing of more, lower quality feedstocks	TRUE
Longer catalyst life cycle	TRUE

Will CENTINEL catalysts eliminate the need to invest to make Clean Fuels? No, but this breakthrough technology can likely reduce the amount of capital required. Combining CENTINEL, which effectively expands reactor volume by 30-50%, with new reactor internals, such as Shell Global Solutions' HD trays, could potentially be like adding a whole new reactor, but for a lot less money. Criterion can help customers evaluate what opportunities there are to use existing equipment to make clean Fuels. Talk to the Criterion Clean Fuels Team to find out what the latest catalyst, process and hardware technologies can do to help you meet the Clean Fuels challenge.