

Criterion's Catalysts Make Ultra Low Sulfur Diesel



When it comes to making Ultra Low Sulfur Diesel (ULSD) with your existing Diesel Hydrotreater, Criterion has experience which spans the globe. Our catalyst systems have been used over 26 times, beginning in Europe where new

fuels regulations first required <50 ppmw sulfur in the final product. This experience is valuable to refiners in the USA marketing region who now face similar ULSD regulations as early as 2006.

But, making ULSD is not only putting a new catalyst into a diesel hydrotreater. It is a three step process that begins with the selection of a

high activity Criterion catalyst. Catalysts are important, and, our new CENTINEL catalysts meet the challenge of maximizing reasonable cycle lengths while making the new ULSD motor fuels. We are continuing to improve our best catalyst technology which will mean more active CENTINEL catalysts from Criterion in the near future.

The second part of the ULSD question focuses on utilizing the all of the existing reactor volume to maximize efficiency. Even CENTINEL catalyst will not show its true benefits if the reactor internals operate sub-optimally. This is where the Shell Global Solution's reactor internals play a key role in helping solve the ULSD equation. Shell's patented internals ensure maximized use of the existing reactor volume in two ways: optimal oil distribution across the catalyst bed at the top of the reactor ensures efficient use of all the catalyst in the bed, and more catalyst volume in the reactor due to lower axial height. The Shell internals can eliminate normal top bed grading materials, thus freeing up more reactor catalyst volume.

Western Europe	19
Americas	6
Asia Pacific	1
TOTAL	26

Criterion's Catalysts Make Ultra Low Sulfur Diesel – Page 2

The last step concerns operating the unit differently while in the ULSD mode, versus how the unit was previously run. This may mean better attention to unit start-up, or how certain feedstocks are processed. Cracked stocks like LCO or coker materials are more difficult to hydrotreat for a number of reasons. (For example, such feeds may have 70% of the sulfur compounds contained in the upper 50% of their boiling range). Criterion and Shell Global Solutions offer process support to clients based on our ULSD experiences.

As regulations advance, it may be necessary to address more than just ultra-low sulfur levels. This technology is also available via the SYN Alliance. With the right customized “SYN” solution, a unit can be either revamped or built on a grassroots basis to increase cetane, lower density, remove aromatics, lower the 95% boiling point and / or improve the cold flow char-

acteristics of the final diesel product. Each unit is unique as the Alliance has design criteria and the commercial experience to provide a cost-effective “non-regrets” solution. In addition to Criterion, the Syn Alliance includes ABB Lummus Global (counter-current reactor system and licensor of the process technology) and Shell Global Solutions, an advisor to 58 Shell facilities around the world today. This team's expertise can help refiners meet the challenge of future fuel quality with the most cost-effective solutions.

**If you have specific questions,
please call our Clean Fuels team:**

Lee Granniss – 281-876-6071

Kirk Novak – 281-874-2664

or your local Criterion Sales Representative.

We look forward to hearing from YOU!



Shell Global Solutions

Worldwide Offices



Houston
Corporate Headquarters
16825 Northchase Drive
Suite 1000
Houston, Texas 77060-6029
Tel: (1) 281-874-2600
Fax: (1) 281-874-2641
E-mail: publicaffairs@criterioncatalysts.com
Contact: Kirk Novak

Singapore
298 Tiong Bahru Road
#07-03 Central Plaza
Singapore 168730
Tel: (65) 6276-3627
Fax: (65) 6276-7455
Contact: Quah Chee Yong

United Kingdom
1650 Parkway
The Solent Business Park
Whiteley, Fareham,
Hampshire, PO157AH
England
Tel: (44) 489-881881
Fax: (44) 1 489-881882
Contact: Malcolm Robertson



Shell Global Solutions

Houston
Shell Global Solutions (U.S.),
A division of Shell Oil Products Company
16825 Northchase Drive,
Suite 1014
Tel: 281-876-6014
Fax: 281-874-2660
E-mail: shellgsus@shellus.com
Contact Office Manager: Mary C. Medina