**RiFT**

The world’s maximum bottoms upgrading FCC catalyst just got better.

**Built upon a Legacy**

Albemarle’s high accessibility, high activity catalysts that employ ADM™-20 matrix are renowned in the industry for their bottoms destruction capabilities and highly olefinic product output. RiFT add-on matrix technology is built upon this benchmark catalyst legacy.

**Resid improvement Fracture Technology (RiFT)**

RiFT – also known as FT – is bolt-on technology that can be applied across feed types and used in conjunction with Albemarle catalysts like UPGRADER™ and ACTION™. Whether a refiner is striving to minimize fuel oil production or is seeking additional bottoms upgrading capabilities when cracking difficult feed, RiFT is the technology of choice. Unlike alternate catalyst technologies, utilizing RiFT does not require a compromise on physical properties.

![Pore Size Distribution](image1.png)

**Expanded Pore Size Distribution**

RiFT matrix delivers enriched PoSD which presents favorable implications for bottoms cracking and hydrogen transfer.

**More Acid Sites, Lower Hydrogen Transfer**

RiFT matrix also delivers supplementary acid sites, increasing total catalyst acidity by up to 20%.

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1 Oxford Dictionaries.
**Reduced Bottoms by 0.8 vol%**

A refiner operates an FCC equipped with high-efficiency combustor regenerator and cat cooler. The unit is processing atmospheric tower bottoms and aiming to maximize LCO and gasoline, minimize slurry and dry gas, all while operating within an LPG constraint.

In the above case, the RiFT catalyst performed superbly, resulting in a 0.8 vol% reduction in slurry, +1.0 vol% extra LCO, and less but more olefinic LPG.

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<table>
<thead>
<tr>
<th></th>
<th>UPGRADER</th>
<th>UPGRADER FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry gas, wt%</td>
<td>Base</td>
<td>-0.1</td>
</tr>
<tr>
<td>LPG, vol%</td>
<td>Base</td>
<td>-0.2</td>
</tr>
<tr>
<td>C3=/C3s</td>
<td>Base</td>
<td>+0.4</td>
</tr>
<tr>
<td>C4=/C4s</td>
<td>Base</td>
<td>+1.0</td>
</tr>
<tr>
<td>Gasoline, vol%</td>
<td>Base</td>
<td>+0.2</td>
</tr>
<tr>
<td>LCO, vol%</td>
<td>Base</td>
<td>+1.0</td>
</tr>
<tr>
<td>Slurry, vol%</td>
<td>Base</td>
<td>-0.8</td>
</tr>
</tbody>
</table>

*Table 2: Commercial results of UPGRADER FT, normalized for feed quality and conditions.*

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**Tried and Tested**

Several trials have either been concluded or are in progress in FCC units processing residue and/or exclusively VGO feeds. These are units of varying design, but without exception are operated by world-class refiners who strive to maximize LCO and gasoline and benefit from increased C4 olefins (Alkyl operations, for example).

**RiFT**-enabled Albemarle Catalysts Deliver:
- Enhanced bottoms cracking
- Improved C4 olefinicity
- Constant delta coke
- Expanded pore size distribution
- Same high accessibility

**World-class Technical Service**

In addition to high performance product offerings, the extended Albemarle technical service team provides rapid laboratory testing of E-cat samples, periodic technical service reviews, as well as advanced assistance in troubleshooting and unit optimization to help refiners maximize margin from their FCC unit.

The Albemarle FCC technical service group consists of global professionals with a variety of experience in FCC unit design, operations and modeling, catalyst research, and manufacturing.