

Catalyst & Technology

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News

Continued Improvement in
FCC Pretreatment Catalysts:

Catalyst Life Cycle Value Improves with DN-3551 NiMo

Criterion Catalysts & Technologies research & development program continues to develop leading edge products that play a key role in helping refiners meet current and future demands on fuels specification challenges and refinery profitability.

A targeted FCC pretreatment catalyst R&D program has recently produced a new Nickel Molybdenum catalyst, specifically designed for processing severe FCC feeds, that surpasses performance achieved with previous generation Nickel Molybdenum catalysts. DN-3551 NiMo catalyst for FCC Pretreat application continues to build upon Criterion's reputation as a leading innovator in FCC pretreat catalyst technology.

Catalyst life cycle value, when applied to FCC feed pretreatment, may be measured by a key set of factors, including:

- Maximum FCC Conversion
- Flexible Feed Stock Capability
- Cycle Life vs. Severity Economics
- Multi-cycle Catalyst Usage Capabilities
- Handling and turnaround costs

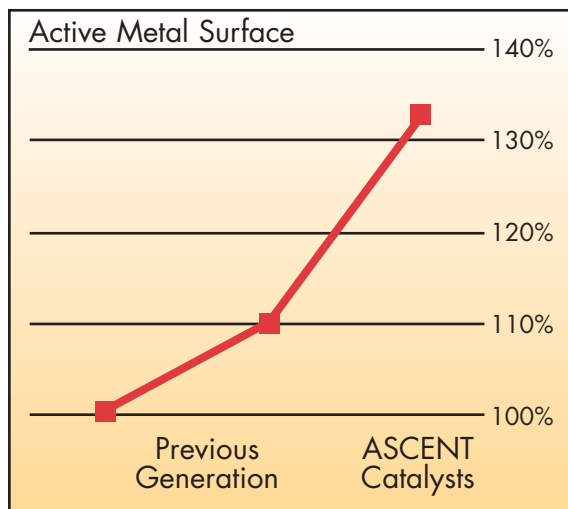
**DN-3551 NiMo catalyst
for FCC Pretreatment
achieves the highest
score in the life cycle
value equation.**



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Figure 1

Increased # of Active Sites



DN-3551 NiMo achieves industry leading HDN and aromatic saturation performance. As seen in Figure 1, activity enhancement is achieved by application of the ASCENT

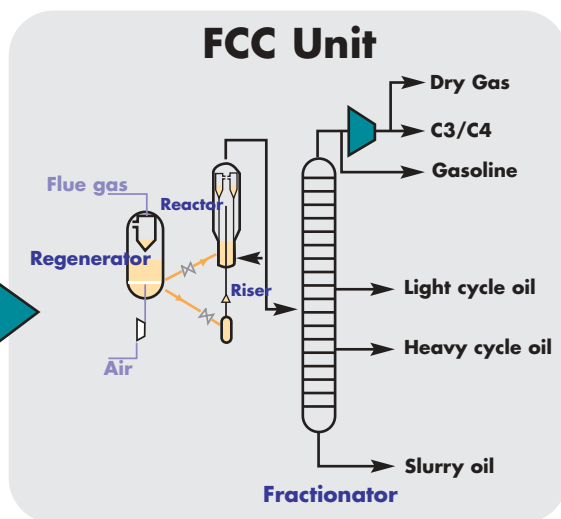
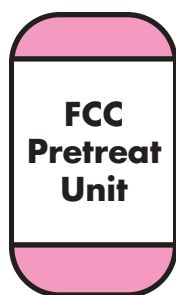
manufacturing process, which leads to an increase in the number of active sites in the reactor. Significant improvement in HDN and aromatic saturation leads to FCC conversion benefits as demonstrated in Figure 2 below.

Cycle life economics are driven by a catalyst's ability to tolerate high feed contaminant metal and con-carbon levels encountered in typical FCC pretreat services while achieving the desired cycle length. As shown in Figure 3, the stability of Criterion FCC pretreatment catalysts is built on our knowledge of optimised catalyst pore structure. This results in providing industry leading contaminant metals uptake capacity and feed con-carbon tolerance. DN-3551 NiMo continues this heritage.

Figure 2

DN-3551 Performance Delivers Greater FCC Conversion DN-3551 vs. Prior Generation NiMo

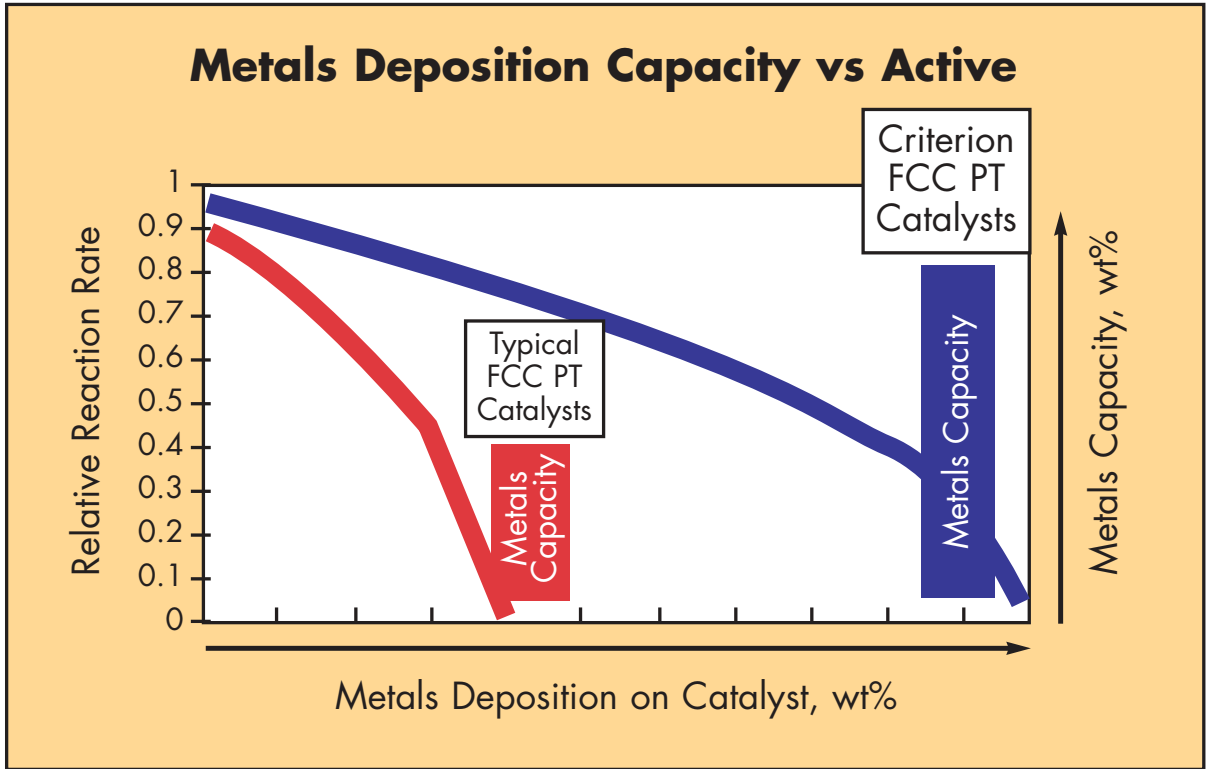
FeedRate: 63 MB/D
S wt%: 2.4
N ppm: 2700
Aro wt%: 13
API: 21



	H2 Cons SCF/BB1	Product S	Product N	Product Aro	FCC Conversion	Econ \$MM/yr
Prior Gen NiMo	Base	0.22	1569	7.44	Base	Base
DN-3551 ASCENT CATALYST TECHNOLOGY	+31	0.19	1300	6.85	+1.50	+12.2

Figure 3

Key to Criterion FCC Pretreat Stability Pore Structure is Designed for Heavy FCC PT Feeds



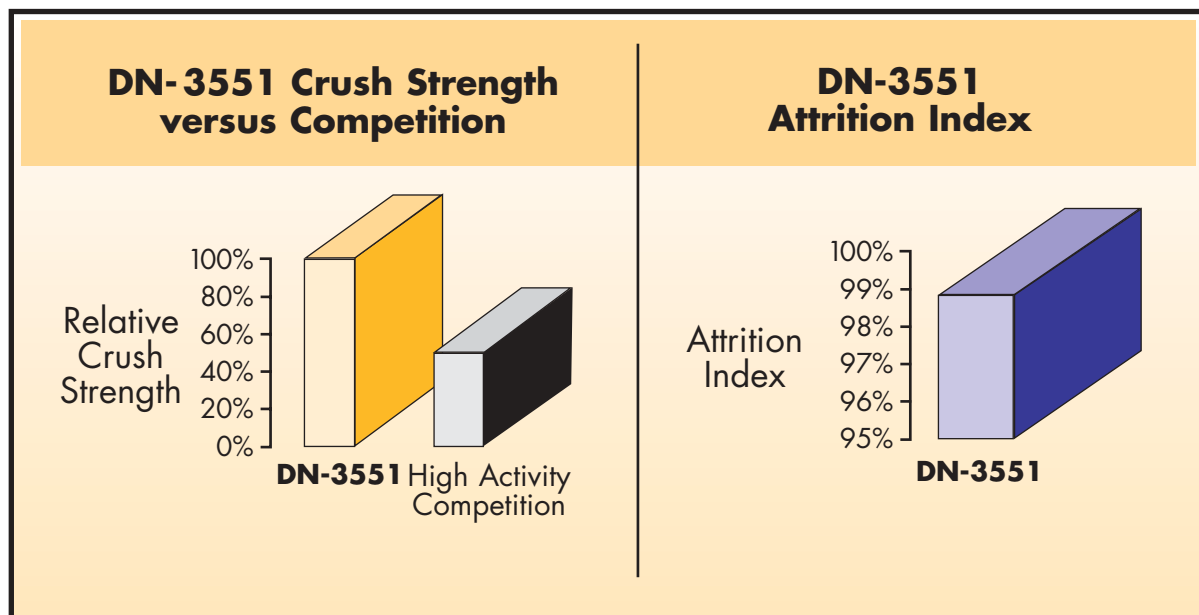
This feature provides the capability to process higher margin opportunity feeds while maintaining catalyst stability.

Innovations in catalyst active site chemistry and configuration have produced substantial activity gains in the last 5 years. Regeneration of these catalysts to 90% of fresh activity has generally required the use of special proprietary regeneration/re-vitalisation processes. DN-3551 NiMo, which retains the activity gains of the past 5 years, is made utilising the ASCENT manufacturing process. The process produces catalysts

that can be regenerated to 90% of fresh activity using conventional regeneration. Additionally, the ASCENT manufacturing process increases catalyst physical strength which has the benefit of increasing yield recovery during regeneration (Figure 4). These features provide the opportunity to generate significant multi-cycle use economics.

DN-3551 NiMo is provided to our customers in an oxide form. This may have the benefit of reduced turn-around costs associated with transportation, storage, loading and general handling when compared to other

Figure 4



high activity catalysts. In one case, this extra cost was determined to be in excess of \$400,000.

Criterion Catalyst & Technologies' latest innovation in FCC Pretreat Service, DN-3551

NiMo catalyst, not only caters to more severe operation but also continues to improve the life cycle value equation. Contact your Criterion representative for more details.

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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