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Performance Profile

NaphthaMax® III

Fluid Catalytic Cracking (FCC) catalyst delivers increased gasoline and LPG yields with outstanding coke selectivity

NaphthaMax III, using BASF's Distributed Matrix Structures (DMS) technology, can benefit refiners in need of high bottoms conversion and lower coke make

Introduction

An FCC unit using vacuum gas oil feedstock wants to optimize its operations with increased yields of gasoline and improved coke selectivity. BASF's NaphthaMax III catalyst provides the refiner with increased surface area retention as well as improved zeolite stability. After successful pilot plant testing in the refiner's circulating riser, NaphthaMax III replaced the unit's base catalyst.

Results

The improved coke selectivity also led to an impressive 20ºF drop in regenerator temperature allowing the cat/oil ratio to increase from <5.3 to 5.6. This increase, along with the high severity operation led to a significant boost in conversion, accompanied by a gasoline yield increase of over 1 vol %. The improved coke selectivity also translated to lower dry gas make. NaphthaMax III delivered increased gasoline yield with a high degree of coke selectivity, showing extremely high hydrothermal stability even at high severity operations.

The refinery reported an increase in profitability of $0.71/bbl and continued to use NaphthaMax III after the trial.

Positive Yield Shifts with NaphthaMax III		
	Before	**After**
Feed rate, bpd	Base	+600
Feed API	Base	-0.3
Feed Concarbon, wt %	Base	-0.01
Feed UOP K	Base	-0.1
Reactor Outlet Temp, ºF	Base	+4
Regenerator Bed Temp, ºF	Base	-19
Delta Coke, wt %	Base	+0.05
Catalyst Addition Rate, tpd	Base	-0.4
Ecat Activity, wt %	Base	Base
Normalized Yields (Feed & Severity)		
Conversion, vol %	Base	+0.4
Gasoline, vol %	Base	+1.3
Dry Gas, wt %	Base	-0.6
Slurry, vol %	Base	-0.6
Total Liquid, vol %	Base	+0.4

About Us

BASF's Catalysts division is the world's leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF's Catalysts division develops unique, proprietary solutions that drive customer success.

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