

# Defender™

## Fluid Catalytic Cracking (FCC) Catalyst for heavy resid feeds

**Defender is a premium FCC catalyst engineered for heavy resid feeds that require outstanding vanadium tolerance and best-in-class coke selectivity.**

### Technology

Based on our award-winning and commercially proven Distributed Matrix Structures (DMS) technology, Defender is engineered to provide enhanced diffusion of heavy feed molecules to pre-cracking sites that are located on the external surface of highly dispersed zeolite crystals. The feed pre-cracks on the zeolite itself, rather than on an active amorphous matrix material. This provides improved reaction selectivities and minimizes the secondary diffusion reactions to less valuable products.

The optimized porosity of the DMS technology platform allows high bottoms conversion with low coke, and higher yields of valued gasoline and light olefin products. This is achieved by reducing mass transfer limitations that are present in all FCC operations.

Defender utilizes a separate sulfur tolerant Vanadium trap, enabling outstanding vanadium tolerance even at high S loadings. Through an integrated specialty alumina-based nickel trap, Defender traps nickel and forms nickel aluminate, which is less deleterious for dehydrogenation reactions in the FCC riser.

### Applications

Defender is engineered for maximum conversion of the heaviest, most contaminated feedstocks.

- Total equilibrium catalyst metals (Ni+V) >5000 ppm
- Maximum conversion from heavy, aromatic feeds
- Best-in-class coke selectivity

### Typical Properties\*

#### Chemical Composition

Al <sub>2</sub> O <sub>3</sub> , wt%	37-45
Na <sub>2</sub> O, wt%	0.25-0.40
Surface Area, m <sup>2</sup> /g	225-330

#### Density

ABD, g.cm <sup>-3</sup>	0.71-0.86
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#### Particle Size

APS, μm	75
0-40, %	12

\* Properties can be customized to individual refiners' needs. These are the typical ranges that can be achieved.

## 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.

**BASF - We create chemistry**

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