Ketjen

Unleash the Potential

AMBER™

Gas oil catalyst benchmark for maximizing transportation fuels

AMBER™ catalysts are frequently used, high-quality catalysts from the Ketjen portfolio and are manufactured using ADM-20 matrix technology, which is common to its high-accessibility catalysts. AMBER™ is the benchmark for maximum transportation fuels against which all other gas oil catalysts are measured.

In addition, AMBER™ catalysts are solutions for non-residue processing refiners that require both excellent bottoms conversion and the gasoline and olefin selectivity that these catalysts offer.

AMBER™ catalysts possess high-accessibility (high mass transfer, as measured by the Ketjen Accessibility Index, KAI). Ketjen FCC catalysts feature the highest KAI in the industry. The high-accessibility structure offers large heavy-feed molecules quick access to the active sites and facilitates rapid egress of the products without secondary reactions (Figure 1).

AMBER™ catalysts contain specialty ADZ zeolites with high activity and exceptional hydrothermal stability. The advanced matrix technology (ADM-20) in AMBER™ catalysts protects the zeolite, thereby enhancing its activity and enabling selective cracking of bottoms to the lowest possible levels.

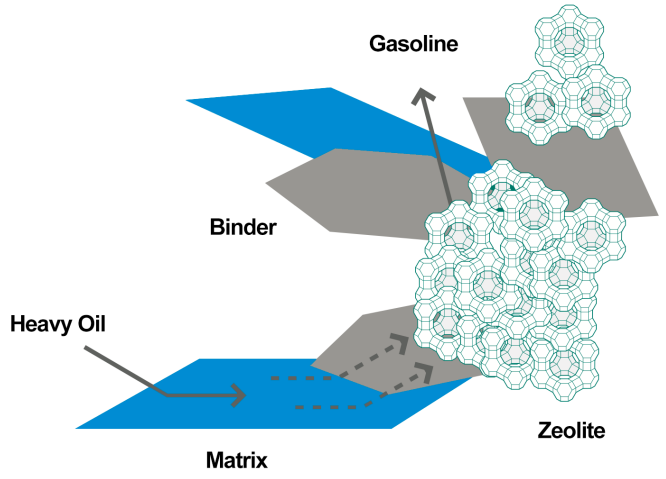

Figure 1: AMBER's high-accessibility structure offers large heavy feed molecules quick access to the active sites

The advantages of AMBER™

- Maximized gasoline and distillates production
- Improved bottoms conversion and higher intrinsic activity
- Controlled hydrogen transfer and overcracking, which results in higher LPG olefinicities
- Improved resistance to poisons

Yield	Competitor	AMBER™
Fuel gas, barrels of fuel oil equivalent	4.6	4.2
LPG, vol%	27.5	28.1
Gasoline, vol%	58.4	60.8
LCO/Slurry	2.2	2.8
C3=/TC3	0.76	0.76
C4=/TC4	0.58	0.58

Table 1: AMBER gives higher LPG and gasoline yield compared with a competitor's catalyst

The AMBER™ family was designed to equal or exceed the yield selectivity obtained with the previous generation of high-accessibility, gas oil catalysts and to provide improved physical properties. AMBER™ catalysts have higher average bulk densities and lower attrition indices.

AMBER™ is a proven gas oil FCC catalyst and has been applied in numerous applications. Thanks to its robust design, it provides the user with the additional advantage of being able to process opportunity feedstocks and thereby enhance refinery profitability.

A North American refiner was processing a moderately heavy feed but had an iron on equilibrium catalyst of up to 1.1 wt%. The high iron content, in combination with the larger feed molecules, made catalyst accessibility and bottoms-cracking ability of paramount importance. Using a competitor's catalyst, the slurry yield was too high and the gasoline yield was unacceptably low, as shown in Table 1.

Changing to AMBER™, with its high KAI and excellent bottomscracking ability, significantly improved the yield structure and profitability of the FCC unit: the slurry yield decreased by nearly 1.5 vol% and the gasoline yield increased by more than 2 vol%.

The benefits of the higher KAI and bottoms cracking potential of the ADM-20, as used in AMBER™, are highlighted by another application: a low-severity operation processing a low-sulfur gas oil feedstock (Table 2). In this case, AMBER™ replaces a traditional Ketjen catalyst. The typical feed has a low sulfur content of 0.5 wt% and a specific gravity of 0.8905.

In summary, AMBER™ is the FCC catalyst of choice for gas oil feed applications requiring:

- Maximum transportation fuels
- Highest bottoms conversion
- Higher catalyst activity
- Maximum accessibility and resistance to poisons
- Increased LPG olefinicities

Yield, wt%	Competitor	AMBER™
Dry gas	Base	Base - 0.2
LPG	Base	Base + 0.4
Gasoline	Base	Base + 1.6
LCO	Base	Base + 0.1
Slurry	Base	Base - 1.9
Coke	Base	Base

Table 2: AMBER gave higher LPG and gasoline yields compared with the base catalyst in a low-severity operation with a gas oil feed

Amber catalysts are a solution for non-residue processing refiners that require excellent bottoms conversion and target maximum transportation fuels.

FOR MORE INFORMATION ON THIS OR OTHER KETJEN PRODUCTS AND TECHNOLOGIES, PLEASE CONTACT YOUR KETJEN REPRESENTATIVE.

AMERICAS: 13100 Space Center Blvd • Houston, TX 77059 • USA • Tel: +1 281 480 4747 • Email: catmaster@ketjen.com
EUROPE AND AFRICA: Nieuwendammerkade 1–3 • 1030 BE Amsterdam • The Netherlands • Tel: +31 20 634 7300 • Email: catmaster@ketjen.com
MIDDLE EAST AND INDIA: PO Box 293774 • 6W Block A, Office 201, 2nd Floor • Dubai Airport Free Zone • Dubai • Tel: +971 4 701 7770 • Email: catmaster@ketjen.com
ASIA PACIFIC: 30 Cecil Street, Gopher Center, #28-05, • 08 Prudential Tower • Singapore 049712 • Tel: +65.6424.8400 • Email: catmaster@ketjen.com

www.ketjen.com