

Boroflex™

Fluid Catalytic Cracking Catalyst for bottoms upgrading of highly contaminated residue feeds

Based on BASF's novel Boron Based Technology (BBT), Boroflex delivers 30% higher bottoms conversion for a 1.30 \$/bbl profitability improvement.

Goal

A residue FCC unit wanted improved bottoms upgrading, lower dry gas, improved olefinicity and higher gasoline yield. Refinery feed: CCR 2-3 wt%, Ecat Nickel 2,500-3,000 ppm, Ecat Vanadium 1,000-1,500 ppm, and no olefins additives.

Results

Boroflex outperformed another catalyst supplier's premium bottoms upgrading technology. In the commercial trial,

Boroflex bottoms upgrading and yield selectivity combined with high metals tolerance gave clear superior performance:

- Decreased bottoms by 30%
- Lowered dry gas by 0.3 wt%
- Increased light olefins (propylene + butylenes increased by 1.8 wt% or 15%) within their wet gas compressor limit
- Increased gasoline by 0.6 wt%

Total unit profitability improvement of **0.97-1.30\$/bbl** (seasonal) was observed.

Boroflex vs. Supplier A			
Operating Yield (wt%)	Supplier A	Boroflex	Delta
Dry Gas	2.8	2.5	-0.3
Propane	2.1	1.6	-0.5
Propylene	7.7	8.2	0.5
n-Butane	1.2	1.3	0.1
Iso-Butane	4.4	4.2	-0.2
Total Butylenes	4.2	5.5	1.3
LPG	19.6	20.8	1.2
Gasoline	39.3	39.9	0.6
LCO	19	21.2	2.2
Bottoms	13.6	9.5	-4.1
LCO/BOT	1.4	2.2	0.8
Coke	5.8	6	0.2

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

Americas

BASF Corporation
25 Middlesex/Essex Turnpike
Iselin, New Jersey, 08830, USA

Asia Pacific

BASF South East Asia Pte Ltd
7 Temasek Boulevard
#35-01 Suntec Tower One
Singapore 038987

Europe, Middle East, Africa

BASF SE
67056 Ludwigshafen, Germany

Global Email

refining-catalysts@basf.com

Boroflex is a trademark of BASF.

Although all statements and information in this publication are believed to be accurate and reliable, they are presented gratis and for guidance only, and risks and liability for results obtained by use of the products or application of the suggestions described are assumed by the user. NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH.

Statements or suggestions concerning possible use of the products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that toxicity data and safety measures are indicated or that other measures may not be required. © 2018 BASF

BF-10599