



KOC-15™ – The flexible and effective way to lower afterburn in your FCC unit

KOC-15 additive is Albemarle’s most widely used platinum-based combustion promoter, and is commercially proven to provide many refiners with a reliable, low-cost and flexible solution to afterburn and excess carbon monoxide (CO) emissions.

In the regenerator, the coke (carbon) on the spent catalyst is burned to form carbon dioxide (CO₂). During combustion of carbon to CO₂, CO forms as an intermediate. The conversion of carbon to CO in the presence of oxygen occurs rapidly; however, the conversion of the CO to CO₂ can be rate limiting.

Under ideal conditions, the conversion of carbon to CO₂ occurs entirely in the dense bed of the regenerator, where the heat liberated from this reaction is absorbed by the surrounding catalyst particles. If CO is allowed to escape the dense bed, it continues to react with the available oxygen. When this occurs in the dilute phase, the cyclones,

the plenum or even further downstream of the FCC regenerator, there is little or no catalyst present to absorb the heat generated. This leads to high temperatures in these areas, a phenomenon known as afterburn.

When unmitigated, the high temperatures associated with afterburn may cause serious metallurgical damage and lead to unexpected shutdowns and, consequently, significant losses. KOC-15 reduces this risk by increasing (promoting) the rate of conversion of CO to CO₂ in the dense bed.

Albemarle tested KOC-15 against five commercially available competitors’ combustion promoters. The results (Figure 1) showed that KOC-15 provided the highest conversion of CO to CO₂ per unit of platinum in the additive.

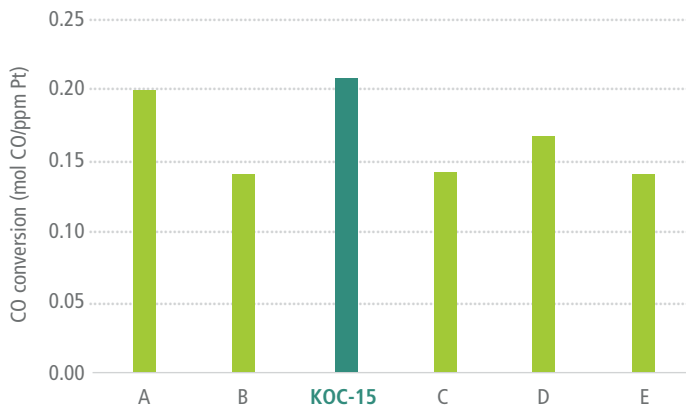


Figure 1: KOC-15 shows the highest conversion of CO to CO₂ per unit of platinum in a CO conversion laboratory test. Carbon on spent catalyst was oxidized in an atmosphere of 2% oxygen and 98% nitrogen at 700°C (1292°F).



“ KOC-15 IS COMMERCIALY PROVEN TO PROVIDE MANY REFINERS WITH A RELIABLE, LOW-COST AND FLEXIBLE SOLUTION TO AFTERBURN. ”

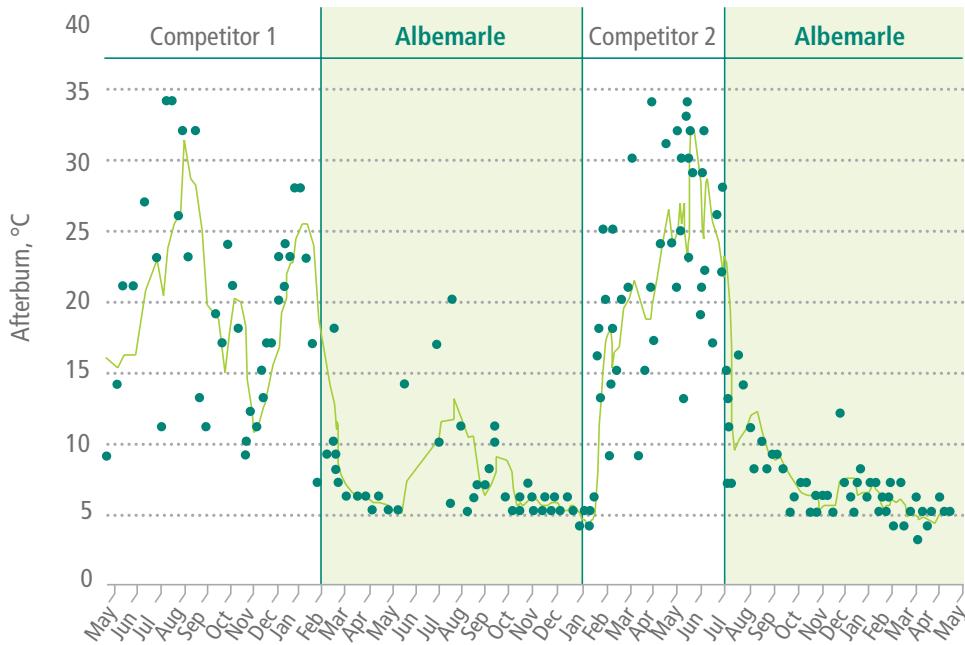


Figure 2: KOC-15 clearly outperforms two different competitors' platinum-based additives. All the promoters were added to achieve a constant platinum level of 3 ppm in the circulating inventory.

KOC-15 is produced by a proprietary method that uniformly distributes the platinum metal across the surface of a specially designed alumina support. The uniform distribution maximizes the activity by allowing each particle of platinum to be catalytically available for the combustion of CO to CO₂ and minimizes deactivation due to surface sintering, agglomeration and covering up of the platinum. The special alumina support provides a strong, accessible and robust framework that minimizes attrition of the entire particle and resists the loss of platinum from it.

Typical product properties	▼
Additive name	KOC-15
Application	Combustion promotion
Attrition index, wt%	1.5
Average bulk density, g/ml	0.85
Surface area, m ² /g	105
Particle size distribution (0–40), %	7
Particle size distribution (0–20), %	2

▼ For more information on this or other Albemarle products and technologies, please contact your Albemarle representative.

AMERICAS
2625 Bay Area Blvd
Suite 250
Houston, TX 77058
USA

**EUROPE, MIDDLE EAST,
INDIA AND AFRICA**
Nieuwendammerkade 1–3
1030 BE Amsterdam
The Netherlands

ASIA PACIFIC
Room 2208, Shui On Plaza
No. 333 Huai Hai Zhong Rd
Shanghai 200021
China

JAPAN
16F, Fukoku Seimei Building
Uchisaiwai-cho, 2-2-2
Chiyoda-ku
Tokyo 100-0011
Japan

Tel: +1 281 480 4747
Email: catmaster@albemarle.com

Tel: +31 20 634 7300
Email: catmaster@albemarle.com

Tel: +86 21 6103 8666
Email: catmaster@albemarle.com

Tel: +81 3 5251 0793
Email: catmaster@albemarle.com

www.albemarle.com

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