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# SMOOTHFLOW

## The solution to FCC catalyst fluidization problems

### Catalyst circulation

Albemarle has specially designed SMOOTHFLOW as a solution to FCC catalyst fluidization problems.

FCC catalyst circulation rate is a variable that is directly related to unit performance. As catalyst circulation rate increases, so does the ratio of catalytic cracking reactions to thermal cracking reactions. Catalytic cracking is much more selective, and results in improved bottoms conversion, gasoline yield and LPG selectivity. The ratio of iso-C<sub>4</sub>S (isobutane plus isobutylene) to dry gas gives an indication of the ratio of catalytic to thermal cracking. So, maintaining good catalyst circulation has a direct and positive impact on unit profitability.

In attempting to improve unit profitability, many refiners will experience catalyst circulation problems. These occur most frequently while pushing charge rate and occasionally while maximizing conversion. While there are several factors that can lead to circulation limitations, optimization of catalyst physical properties will result in improved fluidization characteristics and increased slide valve differential pressures in many cases.

One of the main observations in studies describing incipient fluidization and bubbling is that increasing the weight fraction of smaller particles in the circulating inventory increases the catalyst's ability to fluidize.

This is especially critical in units with unusual standpipe configurations (for example, slopes, bends or dog legs) and standpipes with large distances between the aeration taps.

By specifically targeting particles in the 20 to 60-micron range, Albemarle has developed SMOOTHFLOW to restore units to stable operation. Typical properties are shown below.

#### Typical properties for SMOOTHFLOW

PSD (0–19 μm), wt%	4
PSD (0–38 μm), wt%	28
Average PS, μm	46
ABD (g/cm <sub>3</sub> ) “as is”	0.77
Attrition index	3.5

SMOOTHFLOW is formulated with active FCC catalyst components that contribute to the primary catalytic cracking, thus avoiding any possible loss of activity because of dilution effects.

If you believe that your unit is experiencing fluidization problems, Albemarle will be pleased to provide technical assistance in order to determine whether SMOOTHFLOW is the appropriate solution.

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

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