Albemarle understands that refiners today are faced with an array of challenges to profitable operation in the form of difficult feeds, frequently changing market conditions, and increasingly stringent environmental regulations, all of which exert downward pressure on refining margins. Into this highly competitive environment, Albemarle introduces GRANITE™ technology, providing the most flexible, effective portfolio of tunable catalyst and additive products available.

GRANITE technology features several new catalyst lines, including EVEREST™ and EVEREST ACTION™, employing the recently unveiled ADM-85 matrix/binder technology, expanding the formulation window to allow higher concentrations of premium active components and providing improvements in zeolite stability and coke selectivity.

**EVEREST: Building on the superior bottoms upgrading, metals resistance, and gasoline quality of UPGRADER**

Building upon Albemarle’s long established and highly successful UPGRADER catalyst line, with its superior bottoms upgrading, metals resistance, and gasoline quality, EVEREST offers improvements in each of these areas using the improved binding provided by ADM-85 to pack the catalyst with even more of the quality, active components that drive yields and profits, while maintaining or improving catalyst physical properties and attrition resistance. Additionally, catalysts formulated with ADM-85 feature improved coke selectivity and enhanced zeolite stability.

Table 1 compares the yield results between a conventional UPGRADER catalyst with the analogous EVEREST formulation (featuring a more aggressive formulation made possible by the improved binding of ADM-85) in a commercial resid unit processing a feed exhibiting a CCR concentration of 2.5%, with a combined Ni + V concentration on e-cat of > 12000 ppm.

Significant improvements in gasoline and LCO yield are apparent, as well as dry gas and bottoms upgrading. The improvement in coke selectivity is reflected in the reduced regenerator dense phase temperature.

**EVEREST ACTION: Enhanced butylene and gasoline octane in a highly coke selective catalyst with improved zeolite stability**

As in the case of EVEREST, EVEREST ACTION also exhibits improved physical properties that open a wider catalyst formulation window, allowing for the inclusion of higher levels of premium active components. EVEREST ACTION utilizes ADZT-100, the shape selective zeolite technology system associated with Albemarle’s commercially proven and highly successful ACTION product line. Furthermore, due to the benefits of ADM-85, with the associated higher maximum zeolite levels and greater zeolite stability, these components are incorporated into a high activity catalyst with only a modest amount of RE, with the additional butylene and octane bonuses that entails.
Results from ACE testing for **EVEREST ACTION**, referenced against a conventional **UPGRADER™** catalyst, and compared to **UPGRADER** with ZSM-5 additive and a conventional ACTION formulation, demonstrate a remarkable increase in butylene yield (Figure 1).

**EVEREST ACTION** also represents step-out improvement in gasoline octane barrels. Figure 2 compares the octane gain per unit of gasoline lost for each catalyst relative to the **UPGRADER** reference. Both ACTION catalysts show a distinct benefit relative to **UPGRADER** benchmark, both with and without ZSM-5 additive, but the **EVEREST ACTION** shows a marked improvement even relative to the conventional ACTION, itself widely recognized and employed as the premium gasoline octane catalyst.

Additionally, the **EVEREST ACTION** catalyst yields 15% less coke relative to both the **UPGRADER** and conventional ACTION against which it is compared, along with a 30% higher zeolite retention in lab-scale steaming. Both of these results are typical of catalysts bound with ADM-85, which consistently yield marked improvements in coke selectivity and zeolite stability compared to analogous catalysts using more conventional binders.

**EVEREST ACTION** is the catalyst of choice for targeting high butylene yields and octane barrels, while providing superior bottoms upgrade with excellent coke selectivity.

**EVEREST and EVEREST ACTION: Powerful new additions to the Albemarle catalyst portfolio**

**EVEREST** and **EVEREST ACTION** represent two new premium, step-out FCC catalyst lines from the innovative industry leader to optimize yield slates and maximize profits across a wide variety of feed types, operational constraints, and yield objectives.

For more information on these or other Albemarle products, contact your Albemarle representative.