

RPA CD-16A Delayed Coker Defoamer

Reduced Chemical Cost and Longer HDS
Unit Run Time Saves Refinery \$600,000



The chemistry of results™

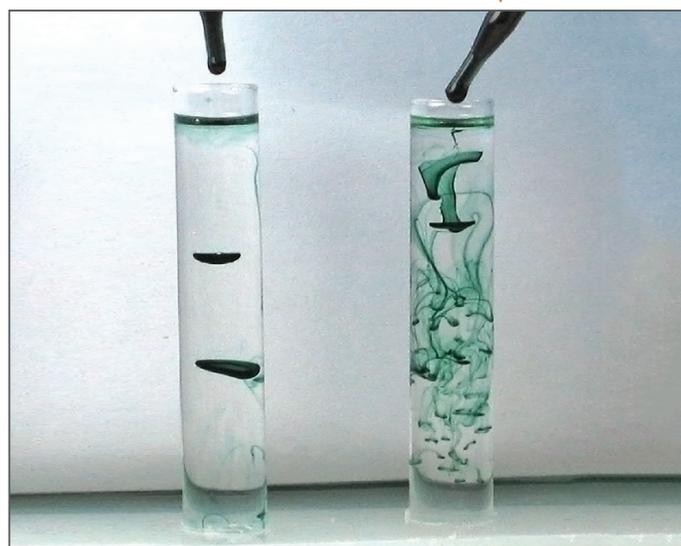
Background and Challenges

A large United States refinery was experiencing high silicone defoamer usages at their delayed coking unit. Average usage of the 600,000 cSt material was 50 gallons per day with spikes as high as 250 gallons per day. Not only did high feed rates significantly increase chemical treatment cost, but the subsequent silicone carryover was creating downstream catalyst poisoning at the hydrodesulfurization units. Catalyst deactivation limited on-stream run time to less than 6 months.

Athlon Solutions' Recommendation

A complete unit audit was conducted to determine the reason for high chemical usage. Feedstock analysis, downstream flows, and material balances suggested an overfeed of the current 600,000 cSt material. Higher than normal feed rates were required to achieve performance objectives and eliminate potential foam-overs. Athlon Solutions started an evaluation using unique chemistry that combines a 600,000 cSt silicone defoamer with a dispersant that helps distribute the chemistry across the entire foam front in a more efficient manner than traditional chemistries. The photo to the right shows the impact the dispersant has on the defoamer in a hydrocarbon fluid. This unique property allows for a significant reduction in silicon addition with no loss of performance.

Defoamer with and without dispersant



25% 600K cSt

RPA CD-16A

Performance Results

Sixty days of performance and chemical usage data was collected to establish a baseline. This graph shows the average usage of silicone at the delayed coker. The usage rate was normalized for chemical concentration by converting both chemistries to pounds per day as Silicon (Si). The average usage prior to the chemical change was 58 pounds per day. The average usage after the chemical change was 20 pounds per day as Silicon (Si). Chemical treatment costs were reduced by almost 60 percent with a reduction in downstream silicon poisoning on hydrotreater catalyst of over 50 percent.

