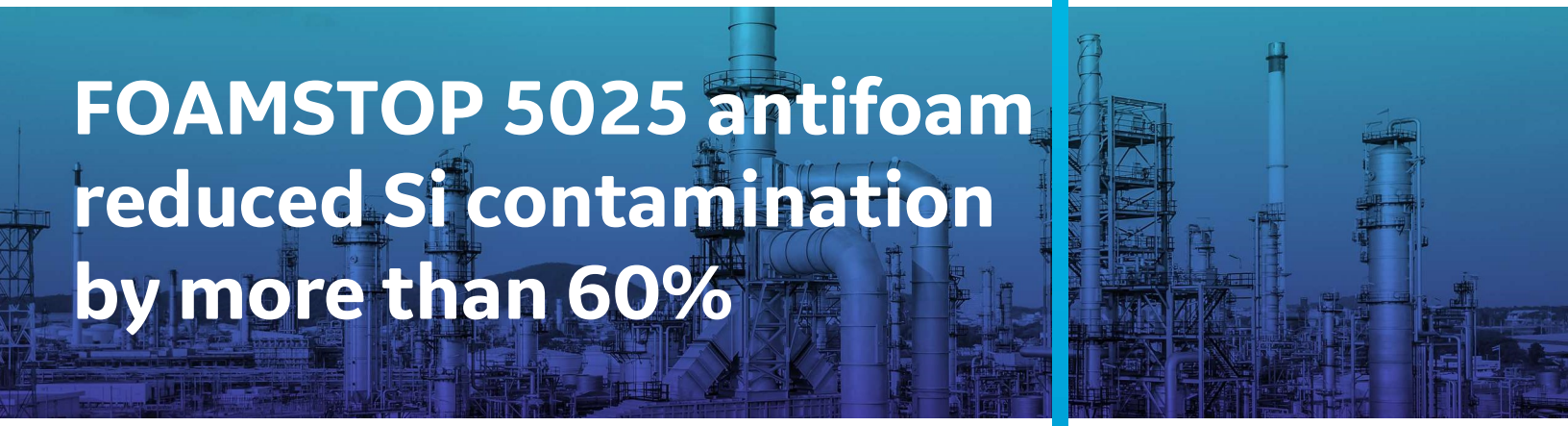
BAKER HUGHES
a GE company

FOAMSTOP 5025 antifoam reduced Si contamination by more than 60%



To resolve the persistent problem of foaming in their processing units, refiners commonly implement one or more antifoam chemistries. In delayed coker processes, traditional silicone-based antifoams have been used for many years due to their relative thermal stability. However, the fractions of these products that do thermally decompose contribute silicon (Si) to the coker product streams. When these streams reach the hydrotreater, the silicon shortens the operating life of the catalyst, resulting in increased operating costs and more frequent catalyst replacements.

The search for an alternative solution

A North American refinery was using a standard 600,000 cSt polydimethyl-siloxane to control the foam in their delayed coker. The cracked naphtha product from the coker was sent to a hydrotreater, carrying along with it silicon that was slowly poisoning the hydrotreater catalyst. The refinery was spending millions of dollars each time they had to change the catalyst early due to silicon poisoning. Looking for an alternative antifoam solution to reduce the silicon concentrations entering the naphtha hydrotreater, the refiner reached out to Baker Hughes, a GE company (BHGE).

After further analysis of the problem and processing conditions, BHGE recommended implementing its new **FOAMSTOP™ 5025 low catalyst impact (LCI) antifoam** to control the delayed coker foaming. Because the FOAMSTOP LCI antifoam is more thermally stable than traditional silicone chemistries, it is more persistent in the coke drum, resulting in lower silicone concentrations in the coke drum and cracked products.

Since implementation of the FOAMSTOP 5025 antifoam, the silicon carryover to cracked products has significantly decreased, reducing downstream reactor catalyst silicon poisoning. Figure 1 shows a comparison between the two treatments, confirming the silicon content decreased by 64% in the coker naphtha and by 73% in the NHT naphtha when using FOAMSTOP 5025 antifoam. This allowed the refiner to double the reactor bed catalyst life, delivering annual savings of $400,000 USD.

Challenge

Incumbent antifoam product was causing silicon poisoning, forcing the refiner to spend millions of dollars to change out the catalyst in the naphtha hydrotreater

Results

- Reduced silicon content in coker naphtha by 64% and NHT naphtha by 73%
- Doubled the reactor bed catalyst life, delivering annual savings of $400,000 USD
- Controlled foaming while reducing antifoam usage rate over incumbent product

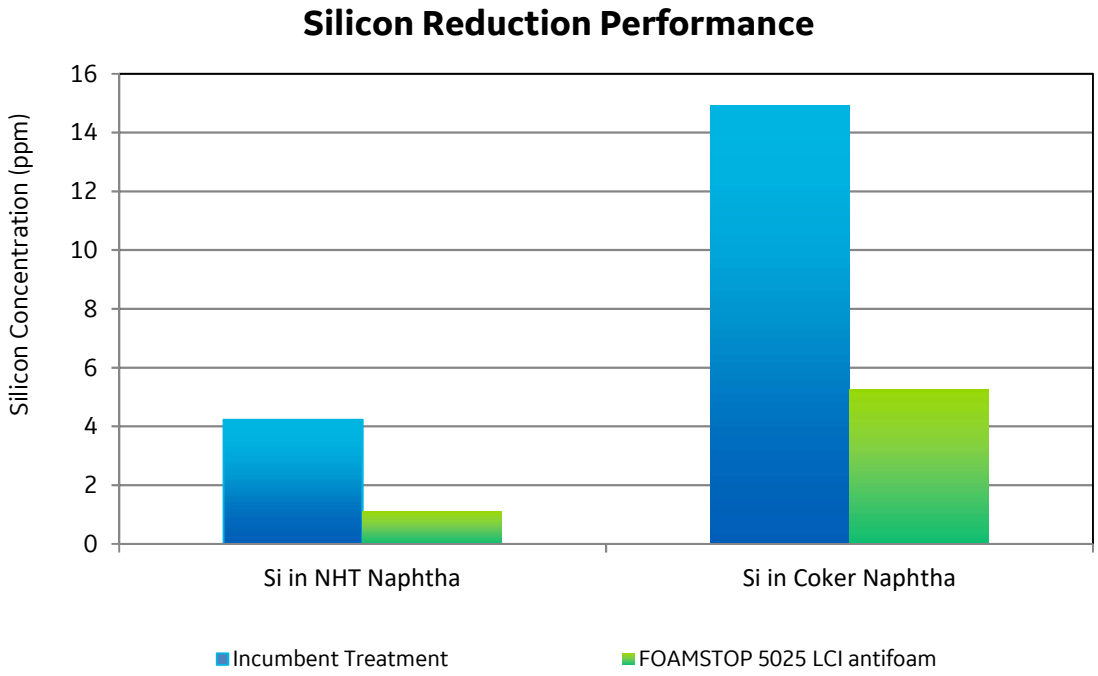


Figure 1. Silicon (Si) concentrations in both the NHT naphtha and coker naphtha were significantly reduced when using FOAMSTOP 5025 LCI antifoam compared to the incumbent product.

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