

RPS-853 Helps Refiner Treat Sour Naphtha to Protect Assets and Meet Sales Specifications

NON-NITROGEN SCAVENGER REDUCES H₂S CONTENT IN NAPHTHA TO LESS THAN 10 PPM FROM 5,000 PPM TO OUTPERFORM REFINERY'S HIGHLY CORROSIVE GLYOXAL SOLUTION WHICH CAUSED PIPELINE AND STORAGE CHALLENGES

GULF COAST

CHALLENGES

- » High levels of H₂S in straight-run sour naphtha
- » Large amounts of scavenger needed to meet naphtha sales specs
- » Current solution, glyoxal chemistry, leads to corrosion challenges with pipelines and storage units
- » Non-nitrogen and non-metal solution needed to mitigate corrosion risk

SOLUTIONS

- » RPS-853, a non-nitrogen, non-metal, non-glyoxal, and neutral pH H₂S scavenger
- » Water-soluble and a proprietary polyhydric ether
- » Injected into the sour naphtha rundown to storage
- » Circulating naphtha in storage tank to increase scavenger contact and reaction speed

RESULTS

- » 1,500 ppm optimal treat rate to ensure the naphtha meets sales specifications
- » Average dosage ratio of 1.0 ppm RPS-853 : 3.0ppm H₂S in the vapor
- » Less than 10 ppm of H₂S in vapor phase

CHALLENGE

A Gulf Coast refiner's naphtha hydrotreater (NHT) unit processes straight-run sour naphtha for feed into a catalytic reformer unit, where H₂S levels are traditionally measured at 3,000 ppm in the vapor phase. Annually, the refinery shuts down the reformer unit, which produces reformate for blending into the gasoline pool for catalyst regeneration or replacement.

During a recent shutdown, the H₂S level raised to 4,000 – 5,000 ppm in the vapor, concerning operators who determined there is a need for more H₂S scavenger and inventory space to treat this significant increase.

Due to the high concentrations of H₂S, the sour naphtha must be treated with a non-nitrogen H₂S scavenger to meet sales specifications of 10 ppm H₂S in the vapor phase and <1 ppm H₂S in the liquid phase. Non-nitrogen instead of a traditional nitrogen-based triazine chemistry is needed to mitigate the corrosion risk, as many refiners require nitrogen content to be less than 5 ppm.

The refiner's traditional solution, a glyoxal chemistry injected into the sour naphtha rundown, has a very low pH and is highly corrosive, resulting in several failures on the rundown pipeline and a capital investment to upgrade the bottoms of the storage tanks.

To protect assets, manage costs and meet specifications, the refiner needed a better treatment solution.

HALLIBURTON'S SPECIALLY CHEMICALS SOLUTION

Athlon, a Halliburton Service, proposed the use of **RPS-853**, a non-nitrogen, non-metal, non-glyoxal, and neutral pH H₂S scavenger with extensive success in treating sour crude oil to mitigate the corrosion risk to assets, reduce safety hazards, and improve hydrocarbon quality.

With RPS-853, Athlon possesses a superior, non-nitrogen scavenger, which is also water-soluble. The proprietary polyhydric ether not only has excellent scavenging performance, it also has a neutral pH mitigating the corrosion risks associated with aldehyde-based technologies.

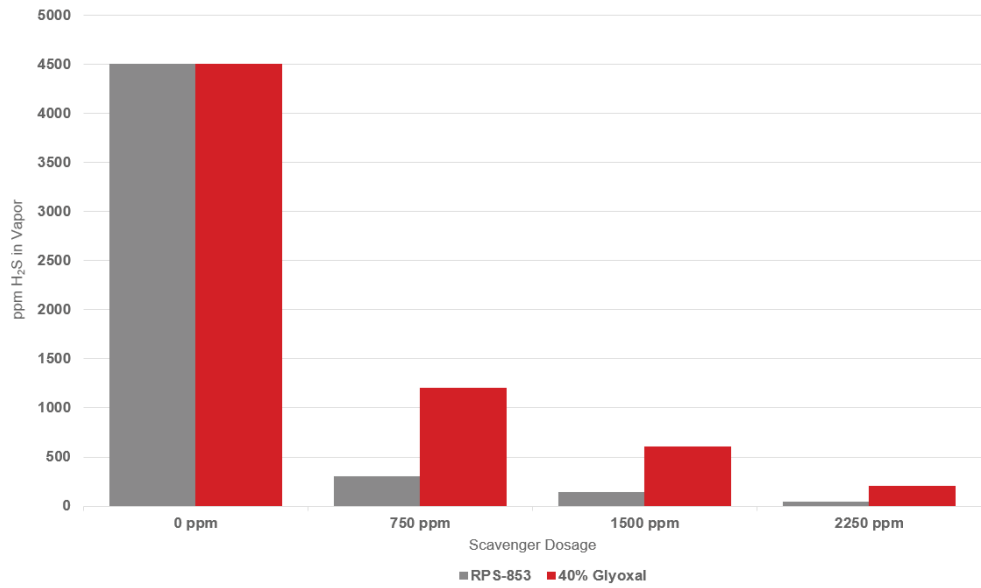
Athlon worked with refinery operations to inject RPS-853 into the sour naphtha rundown to

reduce to reduce H₂S in the vapor and liquid over a two-week period. To increase scavenger contact and reaction speed to rapidly reduce the high H₂S rates, Athlon and refinery operations decided to keep the naphtha circulating in the storage tank prior to loading barges.

RESULTS

The dosage typically ranged from 1,200 ppm – 1,700 ppm with 1,500 ppm found to be optimal to ensure the naphtha meets sales specifications without overtreating. Based on the rundown rates and untreated sour naphtha’s H₂S content, the team averaged a dosage ratio of 1.0 ppm RPS-853 : 3.0 ppm H₂S in the vapor, which was much lower than the previous product.

The success is additional proof that RPS-853 is a best-in-class, amine-free H₂S scavenger for treating sour naphtha.



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