

Ethylene Furnace Antifoulant

PPA-321 Extends Run Lengths & Reduces Costs



The chemistry of results™

Key Benefits

This technology allows ethylene producers to extend campaigns (i.e., days of run between decokings), resulting in:

- Increased throughput (less days down)
- Reduced maintenance cost (extending tube lifecycle and less decokings per year)
- Reduced fuel consumption (improved heat transfer)

Challenge

Athlon Solutions was contacted by a large, Gulf Coast ethylene facility to supply a furnace antifoulant. This site has several gas crackers with a 100% ethane feed and needed to extend runs in several of its furnaces, which had an average, baseline performance of 15 to 20 days without treatment. After consulting with the customer, Athlon Solutions customized an alternative product, which after several lab tests was approved for trial.

Solution

PPA-321 creates a film over the tube walls, providing a surface bond of P-S moiety that limits coke formation on tubes.

1. Dosage/Treatment: Initial treatment consisted of a high-dosage, feed rate during the first 24 to 48 hours at 100 ppm in order to create a protective film on the furnace tubes. For a maintenance level, dosage was reduced to 5 ppm.
2. Monitoring: During the trials, Athlon Solutions closely tracked TMTs, pressure drops, and other key operating variables.
3. Showing Value: Multiple Regression Analysis (MRA) is a statistical tool that has demonstrated to be the optimum way to demonstrate the value PPA-321 delivers to customers.

Results and Benefits

The application of PPA-321 was able to extend the furnace runs to more than 50 days from an average, baseline performance (without treatment) of 15-20 days. This means an extension in the decoking cycle of at least three times.

PPA-321 works particularly well in furnaces that have short decoking cycles determined by pressure drops. The furnaces where the greatest performance was achieved, are ones characterized by fouling in the frontend. In this situation, furnaces quickly build up considerable pressure drop, resulting in limited flow to the remaining tubes, a decrease in cooling, and making the furnaces tubes work hotter and coke faster.

The PPA-321 product prevents quick, frontend fouling and results in easier and cost-efficient management of coking build-up.

