



Ferox Effects On SOx

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The treatment of carbon-based fuels with Ferox has a significant effect on trace sulfur combustion chemistry. Numerous field tests run in diesel engines, gasoline engines and open flame applications (boilers) have consistently demonstrated a reduction of sulfur oxide (SOx) emissions. Sulfur related acid corrosion problems are also significantly reduced.

Ferox does not react with sulfur in the fuel nor does Ferox have any effect on the sulfur content of the fuel. Commonly accepted fuel specifications are not effected by Ferox treatment at recommended treatment levels. A fuel containing one percent sulfur prior to Ferox treatment will still contain one percent sulfur after Ferox treatment. However, Ferox will affect where the sulfur ends up and its chemical state after combustion.

Ferox promotes the formation of CO² during the combustion phase thus limiting the amount of CO² produced during the exhaust phase. The increased production of CO² reduces the amount of excess O² available for other reactions. The difference in the amount of CO² produced during the two phases correlates to a temperature difference. This temperature difference results in cooler exhaust temperatures and quicker heat transfer times.

Minerals contained in fuel are generally oxidized to metal oxides during the combustion process. When vanadium is oxidized to V⁵⁺, the production of sulfur trioxide increases due to the reversible dissociation of V⁵⁺, and sulfuric acid is ultimately formed (eq 3 and eq 5). The use of Ferox inhibits the formation and reversible dissociation of V⁵⁺, which occurs during the exhaust phase of the combustion process, by limiting the available O₂, high temperatures, and time periods needed for the reactions to occur. This greatly reduces the catalytic effect that V⁵⁺ has on the formation of Sulfur trioxide and thus the formation of sulfuric acid. By reducing the catalytic effect of V⁵⁺, Ferox promotes the combination of SOx compounds with other minerals in the fuel. In this manner, Ferox reduces the gaseous sulfur emissions.