Eltron Research & Development

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Tech Brief

New Catalyst Shows Superior Performance, Sulfur Tolerance to Diesel Exhaust

Pollution control technology for use with off-road diesel sources

Eltron's catalyst:

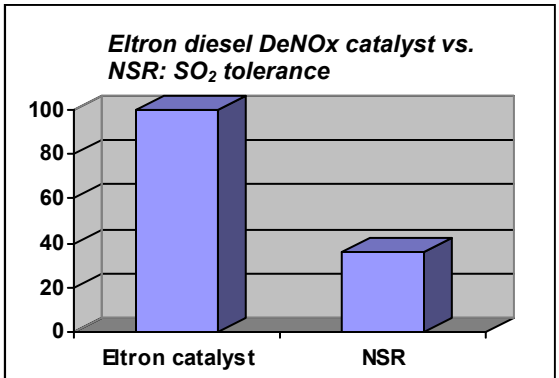
- Reagentless: does not require supplementation of exhaust-borne oxidizable species with fuel or urea
- Inexpensive: converter for a heavy off-road engine can be made cost-effectively
- Simple: needs only a converter canister downstream of engine.
- Highly competitive with all other NOx technologies
- Sulfur tolerant: tolerates up to 1,000 ppm SO_2 under simulated conditions
- Destroys other pollutants, including unburned hydrocarbons and CO
- Effective: addresses Tier 3 and Tier 4 standards for off-road engine exhaust
- Operates under moderate conditions: 150-250°C (as well as higher temperatures)

The Problem

The United States Army and the Environmental Protection Agency (EPA) are seeking an improved solution for removing NO_x from the exhaust of diesel engines, with minimal waste. Existing catalysts do not tolerate exhausts produced by fuels containing sulfur.

The Solution

Eltron has developed a catalyst for exhaust aftertreatment that does not use ammonia and is not sulfur oxide sensitive. The catalyst is a passive, lean NO_x catalyst that functions by using exhaust-borne, unburned hydrocarbons to reduce NO_x.



Comparison of the SO_2 tolerance of Eltron's catalyst to the NSR trap. The x-axis shows % of activity retained.

Performance demonstrated shows that it is superior to that of competing passive, lean NO_x catalysts and that its sulfur tolerance is markedly superior to that of NSR (NOx storage–release) traps. At only 25 ppm, the NSR loses approximately 60 percent of its activity, becoming significantly less active than the Eltron material. At a much higher SO_2 concentration (1,000 ppm), the Eltron catalyst demonstrates no loss of activity.

The novel catalyst is incorporated in a converter or canister, and does not require supplementation of exhaust-borne oxidizable species with fuel or urea.

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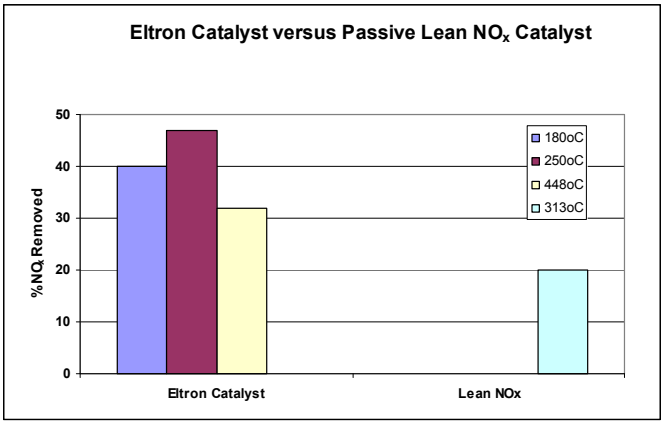
Features and Benefits

The catalyst has been tested under both laboratory and real-world, diesel exhaust conditions. In the lab tests, performance exceeded that of competing strategies under similar conditions. In other testing, up to 50 percent removal was observed. Furthermore, Eltron's catalyst destroys other pollutants including unburned hydrocarbons and CO.

Eltron's cost-effective methodology includes incorporating the catalyst onto a ceramic or metal monolithic support, which is encased in a converter canister that is integrated into the exhaust system.

The catalyst works under moderate conditions of 150°C-250°C. Performance data shows that it is capable of addressing Tier 3 and Tier 4 standards for off-road diesel exhaust sources.

Eltron's catalysts enable the military to use the fuel that is preferred. In commercial applications – including construction machinery, generators, marine, incinerators and in semis – Eltron's catalyst protects the environment by reducing harmful emissions and they help ease the burden of meeting increasingly more stringent exhaust standards.



Activity of Eltron catalyst supported on fecralloy monolith in diesel engine exhaust (at GHSV = 150,000h-1) versus the overall performance of lean NO_x catalyst. GHSV = 150,000h-1.

Contact Us

To discuss the possibility of entering into a business relationship with Eltron, contact the Business Development Group at business@eltronresearch.com.

To learn more about Eltron Research & Development's catalysts and the many other technologies that the company is researching and commercializing, visit www.eltronresearch.com.

Eltron Research & Development Inc.

Eltron Research & Development Inc. invents and commercializes novel technologies involving advanced materials, energy, water and environmental systems.

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