CleanAIR ENDURE™ SCR Catalyst

NOx Reduction for Lean Burn Engines and Gas Turbines

The ENDURE™ Advantage:

- Reduces NOx Up to 95%
- Works with Diesel Engines, Natural Gas Engines, and Gas Turbines
- State-of-the-Art NOx Monitoring and Reductant Injection System
- Does Not Contain Toxic Vanadium
- Catalyst Formulation Tailored to Application
- No Clean-Up Slip Catalyst Required
- Customized Replacement Catalyst Panels Available

Applications:

- Electric Power
- Industrial
- Petroleum

The CleanAIR™ Difference:

- In-House Development and Testing of Technology
- Custom Engineering, Flow Modeling and Design
- Integrated Manufacturing
- Product Optimization for Space Availability
- 304 Stainless Steel Construction
- Durable Product Manufacturing for Operations Under Extreme Conditions

For a price quote call

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EMPIRE CAT
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The CleanAIR ENDURE™ SCR Catalyst – Selective Catalytic Reduction of NOx for Lean Burn Engines and Gas Turbines

The CleanAIR ENDURE™ SCR (selective catalytic reduction) Catalyst for lean burn engines is designed to reduce NOx (nitrogen oxides) at all temperatures. The flow-through SCR catalyst is coated with a non-vanadium, zeolite-enhanced base that performs with a wide exhaust temperature window of 250° C 480° F) to 540° C (1004° F), reducing NOx by up to 95%.

ENDURE™ SCR in combination with PERMIT™ DPF OR ASSURE™ DOC

Applications for the ENDURE™ SCR Catalyst

Applications for the ENDURE™ SCR include stationary diesel and natural gas engines, pipeline compressors, on-road and off-road equipment, as well as gas turbines.

For diesel engines, the CleanAIR ENDURE™ SCR can be combined with the CleanAIR PERMIT™ Filter, PERMIT™ Filter/Silencer package or the CleanAIR ASSURE™ DOC for further reduction of PM, HC and CO.

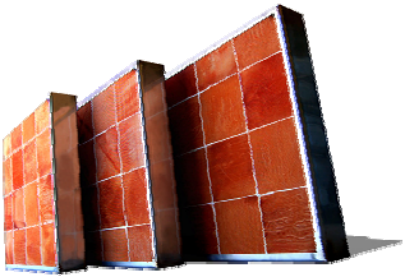
The ENDURE™ SCR Catalyst is also available as replacement catalyst panels for existing installations.

Selective Catalytic Reduction with a CleanAIR ENDURE™ Silencer

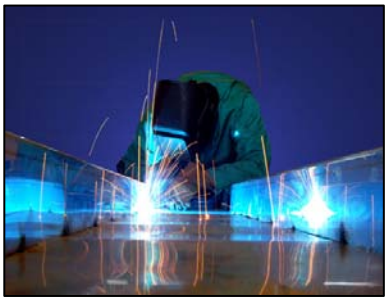
About the CleanAIR ENDURE™ SCR Catalyst

During selective catalytic reduction, NOx mixes with a reductant (ammonia or urea), then passes through a catalyst, where the ammonia-NOx mixture is converted into nitrogen and water. The CleanAIR ENDURE™ SCR introduces an important development in selective catalytic reduction: a zeolite-based catalyst containing no toxic vanadium that reduces NOx over a wide range of temperatures.

Because variables are different for each application, the ENDURE™ SCR Catalyst is tailored to on-site factors using custom formulation for optimal emissions performance. Another important aspect of the ENDURE™ SCR is product optimization to fit space availability. Utilizing custom engineering, design and flow modeling, CleanAIR engineers work one-on-one with application personnel to produce a fully integrated system, specific to each site's specifications.



Custom Replacement Panels



Available with the CleanAIR ENDURE™ Reductant Injection System

A CleanAIR innovation, the state-of-the-art ENDURE™ Reductant Injection System for NOx monitoring and reductant injection.

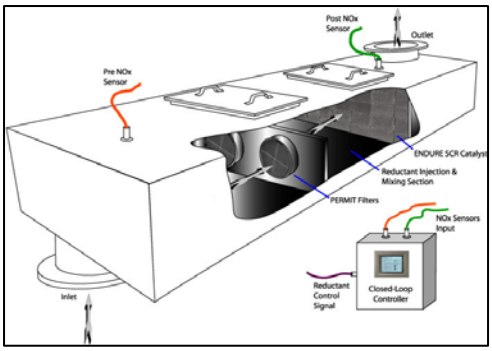
Features:

- Closed-loop, real-time NOx control and monitoring
- Works with anhydrous ammonia, aqueous ammonia, or urea reductant
- Touch screen controlled – available as 6" or 12" monitor size
- Downloadable data
- Ammonia slip controlled to less than 10 ppm
- No clean-up slip catalyst required

Touch screen control monitor

ENDURE™ SCR for Lean Burn Engines and Gas Turbines:

- Reduces NOx by up to 95%.
- Active over wide range of exhaust temperatures.
- Catalyst formulation is tailored to each application for optimal results.
- Can be installed in conjunction with a CleanAIR PERMIT™ diesel particulate filter or a CleanAIR ASSURE™ diesel oxidation converter. Placement after a filter or converter lessens the opportunity for plugging and catalyst degradation, therefore extending the life of the catalyst.
- Does not contain toxic vanadium, a volatile pollutant that can decompose into air borne particulate at high temperatures, eventually being emitted through exhaust.
- Tolerant of sulfur and steam which contribute to catalyst degradation. This, in turn, extends the life of the catalyst.
- No need for downstream slip catalyst to control ammonia emissions which could increase levels of NOx.
- Available with the ENDURE™ Reductant Injection System offering innovative touch-screen control. Developed specifically for use with the ENDURE™ SCR Catalyst, the system allows for closed-loop, real-time monitoring and control of NOx emissions.
- Custom designed 304L stainless steel replacement catalyst panels available for existing SCR systems.



Three solutions in one product: SCR combined with DPF or DOC within a stainless steel silencer packaging

ENDURE™ SCR system for 13 megawatt application

Nitrogen Oxides (NOx)

Nitrogen oxides (NOx) are formed when nitrogen (N_2) and oxygen (O_2) are combined at high temperatures and pressure during the combustion of fuel. All fuels emit NOx when burned, such as gasoline, diesel, biodiesel, propane, coal, and ethanol.

The EPA estimates that 49% of NOx emissions come from on-road and off-road vehicles, 27% from power generation (electric utilities) and the remaining 24% from industrial, commercial and residential sources.

Due to the many compounds that are a part of NOx (nitrogen dioxide, nitrous oxide, and nitric oxide), the pollutant contributes to a wide variety of health and environmental problems. NOx is considered an ozone precursor, a primary source of ground-level smog and a contributor to global warming.