

Cat[®] Selective Catalytic Reduction



Reduced Emissions. Better For You; Better For Performance

Caterpillar developed the selective catalytic reduction system for stationary applications—the most durable, reliable and versatile process for reducing NO_x from combustion sources. The selective catalytic reduction system is proven technology that uses urea (a non-hazardous compound) injected into the exhaust of diesel and lean-burn natural gas engines to convert nitrogen oxide emissions into harmless nitrogen and water.

Reduces:

- Nitrogen Oxides (NO_x)
- Carbon Monoxide (CO) with oxidation catalyst
- Non-Methane Hydrocarbons (NMNEHC) with oxidation catalyst

Caterpillar. The difference counts.™

Cat[®] dealers define world-class product support. We offer you the right parts and service solutions, when and where you need them.

The Cat dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investment.

CATERPILLAR[®]

Cat Selective Catalytic Reduction

Open and Closed Loop Control Systems Available Worldwide

(For Stationary Systems via custom quotes)

Integrated System Solution for Emissions Control

Increasing emission regulations are driving the need for reduced emissions. With this system, Caterpillar can now provide an integrated power solution, meeting nearly all emission regulations. This proven technology offers the highest emission reduction available, reliable serviceability, rapid installation and optimized design for emission reduction.

Proven Technology

Caterpillar designed the Selective Catalytic Reduction system using a proven and durable catalyst. Similar systems have been in operation thousands of hours.

Highest Emission Reduction Available

Nitrogen Oxides (NO_x)

- Up to 90% reduction in Open Loop System (Diesel and Gas)
- Up to 95% reduction in Closed Loop System (Diesel and Gas)

Carbon Monoxide (CO) with oxidation catalyst

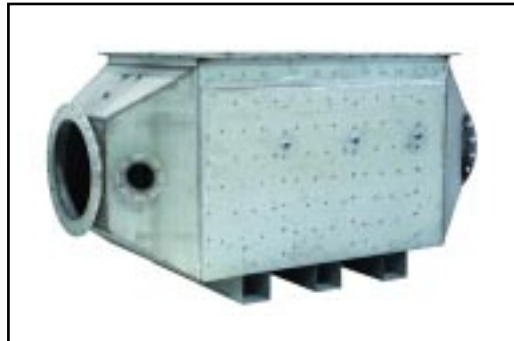
- 93% reduction with oxidation catalyst, meeting HPA regulations (Gas Only)
- 70% reduction with oxidation catalyst, meeting HPA regulations (Diesel Only)

Ammonia Slip

- 10 ppm Slip

Non-Methane Hydrocarbons (NMNEHC) with oxidation catalyst

- 40% reduction in NMNEHC with oxidation catalyst (above 350°C)



Module houses aftertreatment system—for use with Caterpillar® Power Modules



Reactor Module houses SCR catalyst and optional Oxidation catalyst

SCR System shown mounted on Cat® G3516 Power Module

Reliable Serviceability

- Relies on simple chemical reactions
- Commissioning and service support available
- Low maintenance costs
- Caterpillar standard warranty

Rapid Installation

- Requires less than 24 hours to install an open loop control and injection system
- Requires less than 32 hours to install a closed loop control system
- Site requirements necessary to install a system correctly the first time

Optimized design

- The chemical and physical features of Selective Catalytic Reduction are designed to match a diesel or lean-burn gas engine as well as site-specific conditions to maximize efficiency and reliability
- Lower operating costs with the combination of control unit and proportioning system that minimizes consumption of reducing agent
- Urea injection system is designed for efficient mixing of ammonia and exhaust gas to achieve maximum NO_x reduction
- Urea is safe to store with minimal maintenance required

Cat Selective Catalytic Reduction

Major components



Reactor

The selective catalytic reduction system offers superior emission reduction benefits with no impact on generator set performance. It's proven technology. It's safe and it's available for retrofit on new or existing 3400, 3500 and 3600 series diesel or lean-burn natural gas engines.



Catalyst

The major components of the selective catalytic reduction system include the following:

Reactor/Catalyst—Promotes the chemical reactions converting NOx into harmless nitrogen and water.

Mixer—Produces high conversion efficiency by thoroughly mixing the exhaust and urea before entering the selective catalytic reduction system.



Mixer

Compressor—Provides air for the system. Air assists in atomization that occurs when urea is injected into the exhaust system. The air also purges urea from the system when it is shut down.

Multiport Nozzle—Compressed air and liquid urea are forced through this nozzle into the exhaust stream.

Injector—Delivers the atomized urea directly into the exhaust flow.

Control system—Responsible for monitoring the parameters of the catalyst temperature, engine load, exhaust backpressure, urea flow and air pressure to ensure they are within specification. Additional features include:

- Advanced Diesel Engine Management
- Electronic Technician service tool software
- Shut down

Warning alarms—Indicate the level of urea in the tank needs to be adjusted. The control system's warning alarms will sound and activate a yellow light, but these alarms will not initiate shut down.

Dosing system—Removes urea from the urea tank and delivers it to the air-assisted multiport injector. This system also includes:

- Pressure relief valve
- Pulsation dampener
- Backpressure valve
- Three-way valve



Dosing System

Open and Closed Loop Control System Equipment

Major Components

- Standard main duct and reactor
- 1 control cabinet (open loop control system only)
- 2 control cabinets (closed loop control system only)
- Additional (site specific) exhaust monitoring system (closed loop control system only)

Urea Injection/Dosing System

- Single point air-assisted urea injection system
- Compressed air system
- Direct communication with Cat Engine Control Module

Catalyst System

- SCR catalyst
- Optional oxidation catalyst

Open and Closed Loop Control System Optional Equipment

- Urea tank
- Urea tank heater
- Urea tank low level alarm
- Remote monitoring
- Insulation
- Particulate trap
- Oxidation catalyst

Warranty

Caterpillar warrants the selective catalytic reduction system for one year or 8,000 hours of operation from time of sale, whichever comes first. All existing warranties in place for the engine would not be affected by installation of the selective catalytic reduction system provided the installation guidelines are followed.

Installation

Refer to the installation guide to install the components of the selective catalytic reduction system. The urea tank is not included.

For more information, see us today or visit our Web site at:
www.cat.com/EmissionsSolutions

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