

DIESELYTIC SXC DIESEL OXIDATION CATALYSTS

TURNKEY SOLUTIONS FOR RICE NESHAP

DESIGNED FOR STATIONARY ENGINES USED IN POWER GENERATION

RICE NESHAP regulations for diesel/compression ignition engines are effective as of May 3, 2013
RICE NESHAP regulations for methane, propane, natural gas, gasoline/spark ignition engines are effective as of October 19, 2013



Contact Information

Local Telephone Number: 905-799-9770
Fax Number: 905-799-9771

E-mail Addresses: sales@catalyticexhaust.ca
cep89@aol.com

www.catalyticexhaust.com

Toll Free: 1-800-551-5525

WHAT IS RICE NESHAP

RICE - defined as "Reciprocating Internal Combustion Engine"

NESHAP - defined as "National Emission Standards for Hazardous Air Pollutants"

The US Environmental Protection Agency signed final revisions for **RICE NESHAP** on February 2010. The goal of **RICE NESHAP** is to reduce harmful exhaust emissions from reciprocating internal combustion engines. Power generation engines now have exhaust emission regulations due to the hazardous air pollutants released from the exhaust and crankcase during normal operation.

THE HAZARDS OF DIESEL EXHAUST

During normal operation in the engine combustion chamber diesel engines produce a number of harmful pollutants such as Carbon Monoxide, Total Hydrocarbons and Diesel Particulate Matter. **RICE NESHAP** regulations aim to lower the 30 deadliest Hazardous Air Pollutants (HAP) released from the engine exhaust and crankcase. **Catalytic Exhaust Products Limited** can offer you the **direct fit, affordable solution**.

THE AFFORDABLE SOLUTION

The **DIESELYTIC SXC™** Diesel Oxidation Catalytic (DOC) focuses on reducing the 30 Hazardous Air Pollutants (HAP) by reducing dangerous concentrations of harmful pollutants such as Carbon Monoxide (CO), Total Hydrocarbons (THC) and Diesel Particulate Matter (DPM). The harmful pollutants are catalytically burned (oxidized) to form harmless Carbon Dioxide (CO₂) and water (H₂O). The end result is a **safe and healthy environment** that meets **RICE NESHAP** regulation.

Three of the primary catalytic oxidation reactions which occur include:

Carbon Monoxide: $2\text{CO} + \text{O}_2 = 2\text{CO}_2$

Hydrocarbons: $4\text{HC} + 5\text{O}_2 = 4\text{CO}_2 + \text{H}_2\text{O}$

Formaldehyde $\text{HCHO} + \text{O}_2 = \text{CO}_2 + \text{H}_2\text{O}$

DIESEL COMPRESSION IGNITION ENGINE REQUIREMENTS FOR RICE NESHAP

A) DIESEL ENGINES AT AREA EMISSION SOURCES

(defined as a facility that produces less than 10 tons per year of any single hazardous air pollutant and less than 25 tons per year of any combined hazardous air pollutants)

Engine Category	Emission Standard	Alternative CO Reduction	Components Required*
Non-Emergency 300 < hp ≤ 500	49 ppmvd CO	70%	DOC, CCV/OCV, Ultra-low Sulfur Fuel
Non-Emergency > 500 hp	23 ppmvd CO	70%	DOC, CCV/OCV, Ultra-low Sulfur Fuel, CPMS

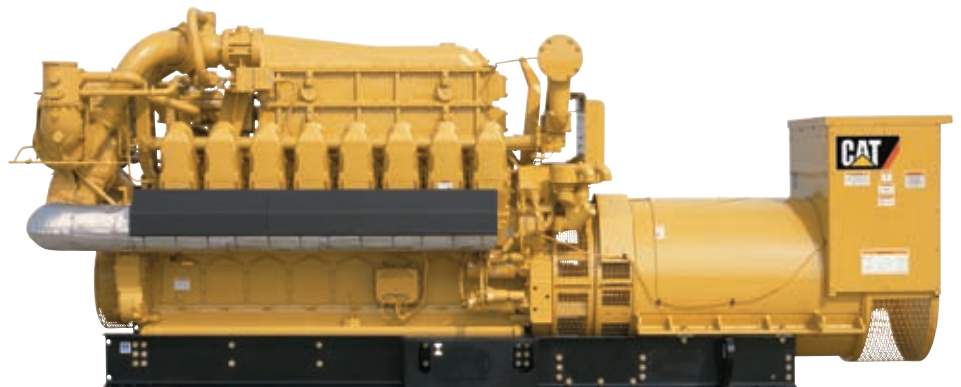
B) DIESEL ENGINES AT MAJOR EMISSION SOURCES

(defined as a facility that produces or has the potential to produce more than 10 tons per year of any single hazardous air pollutant or more than 25 tons per year of any combined hazardous air pollutants)

Engine Category	Emission Standard	Alternative CO Reduction	Components Required*
Non-Emergency 100 < hp ≤ 300	230 ppmvd CO	N/A	DOC
Non-Emergency > 300 hp ≤ 500	49 ppmvd CO	70%	DOC, CCV/OCV, Ultra-low Sulfur Fuel
Non-Emergency > 500 hp	23 ppmvd CO	70%	DOC, CCV/OCV, Ultra-low Sulfur Fuel, CPMS

* Component Definitions:

DOC = Diesel Oxidation Catalyst
 CCV / OCV = Closed Crankcase Ventilation /
 Open Crankcase Ventilation
 CPMS = Continuous Parameter
 Monitoring System



TECHNICAL FEATURES OF THE DIESELYTIC SXC™ DIESEL OXIDATION CATALYST (DOC)

1) HIGH EFFICIENCY "TORTUOUS" FLOWPATH CATALYTIC CORE

The **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) features a unique "tortuous" flowpath catalytic core. The tortuous flowpath catalytic core incorporates a curved, mixed flow cell design which takes advantage of the physical properties of harmful pollutants. **The collision of harmful pollutants with the catalytic core is dramatically increased and concentrated to provide maximum reduction of harmful pollutants.** In comparison, straight flowpath purifier design allows a percentage of harmful pollutants to flow through the catalytic core without contacting the catalytic surface. By promoting catalytic core contact, the tortuous flowpath core design is superior in reducing harmful pollutants.

2) HIGH QUALITY CATALYTIC COATING

The **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) is coated with high quality precious metals and superior grade washcoats. The high quality, uniform core coating increases cold start performance **and provides high efficiency removal (oxidation) of harmful pollutants by up to 86%+.** The high quality coating ensures a long and reliable operating life in the most adverse conditions.

3) LOW EXHAUST GAS PRESSURE

The **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) is made up of high strength, ultra thin metallic alloy walls which reduce exhaust backpressure to a minimum. **Even under high load/speed engine operating conditions, the operating efficiency of the engine will not be affected.**

4) SUPERIOR PHYSICAL STRENGTH

The **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) incorporates several design features which result in excellent stability and reliability under extremely high operating temperatures and severe vibration. Thick foil retainer rings and folded catalytic edges improve overall structural rigidity.

5) LOW MAINTENANCE AND EASY INSTALLATION

The compact and efficient design of the **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) allows for easy installation and service with minimal equipment downtime.

CLOSED/OPEN CRANKCASE VENTILATION (CCV/OCV RESPECTIVELY)

- Eliminates crankcase blow-by emissions, which can contribute up to 25% of total emissions
- Increases oil operating efficiency and reduces wear on engine
- Improves reliability and maintainability of engines
- Minimal maintenance
- **Applicable to all non-emergency diesel engines that have 300 horsepower or greater**

CONTINUOUS PARAMETER MONITORING SYSTEM (CPMS) FEATURES

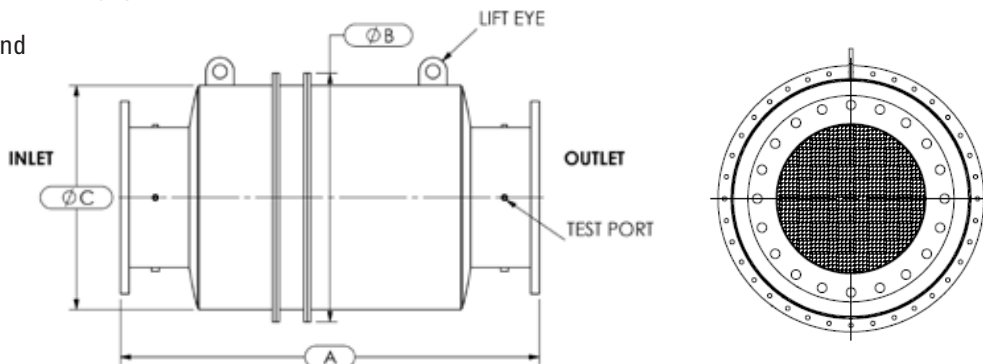
- Rugged design for heavy use or remote locations
- Fully programmable from front keyboard
- Programmable alarm when measurements are near or out of compliance range
- 3 ½ inch² with housing and mounting options
- Power loss will not erase memory
- **Applicable to all non-emergency diesel engines that have 500 horsepower or greater**



SELECTING THE CORRECT DIESEL OXIDATION CATALYST (DOC) MODEL

In order to correctly select the proper **DIESELYTIC SXC™** Diesel Oxidation Catalyst (DOC) the following information is usually required:

- A) The make and model of the diesel engine and equipment.
- B) The engine horsepower rating
- C) The engine's maximum gas flow rate and the engine's maximum temperature
- D) Outside diameter (O.D.) pipe size
- E) Termination flange details



Model	Maximum Horsepower (hp)	Kilowatts (kW)	DOC Dimension A	DOC Dimension B	DOC Dimension C
12SXC-F	335 hp	250 kW	18.0"	11.6"	N/A
14SXC-F	450 hp	360 kW	20.8"	13.0"	N/A
16SXC-F	600 hp	448 kW	20.8"	15.0"	N/A
18SXC-F	850 hp	634 kW	38.0"	21.0"	18.0"
20SXC-F	1000 hp	746 kW	42.0"	23.0"	20.0"
22SXC-F	1300 hp	970 kW	44.0"	25.0"	22.0"
24SXC-F	1500 hp	1119 kW	48.0"	28.0"	24.0"
26SXC-F	1800 hp	1343 kW	50.0"	30.0"	26.0"
28SXC-F	2100 hp	1567 kW	52.0"	32.0"	28.0"
30SXC-F	2400 hp	1791 kW	54.0"	34.0"	30.0"
32SXC-F	2700 hp	2015 kW	60.0"	35.5"	32.0"
34SXC-F	3000 hp	2239 kW	64.0"	37.5"	34.0"
36SXC-F	3500 hp	2612 kW	70.0"	39.0"	36.0"

SELECTING THE CORRECT CRANKCASE VENTILATION SYSTEM MODEL

To determine the correct closed crankcase ventilation system, confirm your crankcase vent cubic feet per minute (CFM) airflow with a mass airflow sensor. Horsepower can be used as a rough reference if an airflow sensor is not available.

CCV Model	Maximum Applicable Horsepower*	Crankcase Flow Rate (CFM)
CCV 4500	400	10
CCV 6000	800	20
CCV 8000	1600	40
CCV 12000	2000	50

* For engines with greater than 2000 horsepower please call sales at 1-800-551-5525

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