NETT® Diesel Exhaust Gas Purifiers

... the emission control authority.

NETT® TECHNOLOGIES INC.

FEATURES OF NETT DIESEL EXHAUST PURIFIERS

UNDERGROUND MINING

CONSTRUCTION & TUNNELING

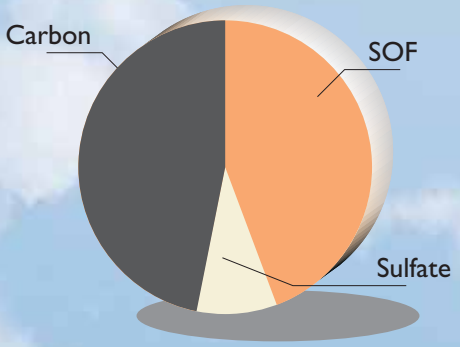
MATERIAL HANDLING

URBAN BUSES AND TRUCKS

Improve air quality and working conditions ...

satisfy **MSHA** *standards ...*

comply with **OSHA** *requirements ...*



Diesel Particulate Matter

The NETT catalytic purifiers offer:

- Effective conversion of hydrocarbons and aldehydes. This translates to less eye irritation. The diesel odor is virtually eliminated.
- Reduction in particulate emissions due to the elimination of the SOF fraction.
- High reduction of carbon monoxide to reduce problems with dizziness and headaches.
- The lowest light-off temperature due to zeolite hydrocarbon traps (D-Series catalyst).
- New advanced catalyst formulation with practically no sulfate formation.
- Low pressure drop due to very thin walls and large frontal open area of the catalyst substrates.
- Easy maintenance or, in most cases, maintenance-free operation. The thin walls of the substrate provide very little risk of clogging by diesel particulate.
- Compact design for easy installation on the equipment.

About Diesel Emissions

Diesel exhaust gases contain several components which are harmful to humans and to the environment. Diesel emissions can be divided into gaseous compounds and particulate matter. The gaseous compounds include carbon monoxide (CO), hydrocarbons (HC), and aldehydes. All of these are generated in the exhaust as a result of incomplete combustion of fuel. A significant portion of the exhaust hydrocarbons is also derived from the engine lube oil. When engines operate in enclosed spaces, such as in underground mines, tunnels, or warehouses, carbon monoxide can accumulate in the ambient atmosphere and cause headaches, dizziness, and lethargy. Under the same conditions, hydrocarbons and aldehydes cause eye irritation and choking sensations. Hydrocarbons and aldehydes are major contributors to the characteristic diesel odor.

Other harmful gas compounds in diesel exhaust are nitrogen oxides, generated from combustion air in the engine cylinder under high pressure and temperature conditions, and sulfur dioxide derived from the sulfur contained in diesel fuel.

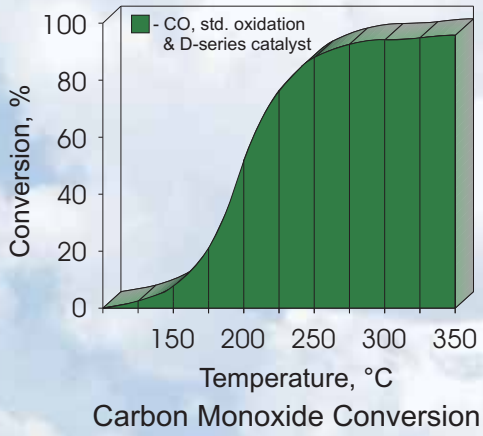
Diesel particulate matter (DPM) is the most apparent and troublesome of all diesel emissions. DPM, as defined by most regulations and sampling procedures worldwide, is a complex aggregate of solid and liquid material. Its origin is carbonaceous particles generated in the engine cylinder during combustion which subsequently combine with several other exhaust components. DPM is divided into three fractions:

- Carbon - dry carbon particles, commonly known as soot.
- Soluble Organic Fraction (SOF) - heavy hydrocarbons adsorbed and condensed on the carbon particles.
- Sulfate - hydrated sulfuric acid.

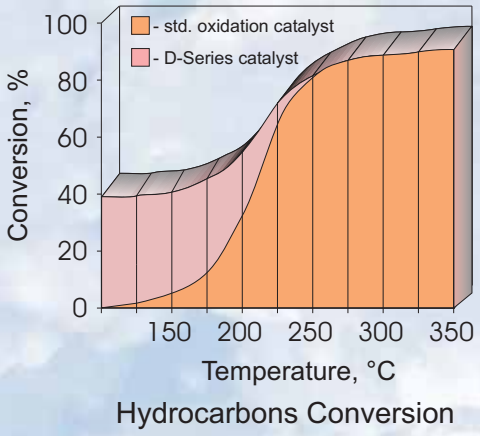
DPM, because of its sub-micron particle size, is almost totally respirable. It is known to increase the risk of heart and respiratory diseases and has been classified by several government agencies as "human carcinogen" or "probable human carcinogen". DPM has been identified as a Toxic Air Contaminant (TAC) by the California Environmental Protection Agency.

PERFORMANCE OF NETT PURIFIERS

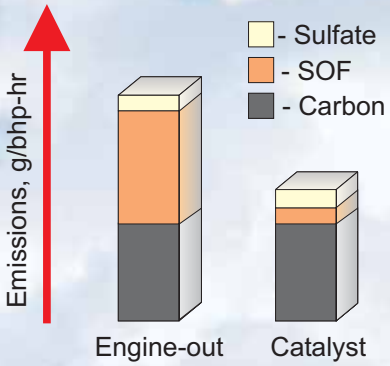
advanced catalyst technology for high emissions reduction and durability ...



Carbon Monoxide Conversion



Hydrocarbons Conversion



DPM Conversion

Graphs are only illustrative. Catalyst performance varies with engine, its duty cycle, and fuel.

NETT catalytic purifiers utilize a precious metal diesel oxidation catalyst (Pt, Pd, other metals and/or their blends) bonded to monolithic, "flow-through" catalyst supports. The supports are made either of corrugated, high temperature resistant stainless steel foil or thin-wall cellular ceramics. In either case, the supports are packaged into rugged stainless steel containers.

The precious metal catalyst is deposited onto an intermediate layer called the "washcoat". The washcoat is made of high surface area activated aluminum oxide. It also includes proprietary catalytic stabilizers and promoters that dramatically increase the catalyst durability and enhance its performance.

M-Series diesel oxidation catalysts oxidize carbon monoxide, hydrocarbons, and aldehydes contained in diesel exhaust to nontoxic compounds: carbon dioxide and water vapor. The catalyst activity increases with temperature. A minimum exhaust temperature of about 200°C is necessary for "light-off" of the standard diesel catalysts.

This generic catalyst formulation provides good control of CO & HC in all applications of medium to high exhaust temperatures, as well as DPM at medium temperatures.

D-Series catalysts with hydrocarbon traps are designed to extend the use of diesel purifiers into the low temperature region. The D-Series catalysts include zeolites, also known as molecular sieves, in their washcoat. These zeolites trap and store diesel exhaust hydrocarbons during periods of low exhaust temperature, such as during engine idling. Then, when the exhaust temperature increases, the hydrocarbons are released from the washcoat and oxidized on the catalyst. Due to this hydrocarbon trapping mechanism, the D-Series catalysts exhibit low HC light-off temperatures as shown on the graph to the left.

D-Series catalysts are recommended for the control of HC, DPM & CO at all temperature ranges, as well as for low temperature diesel odor control.

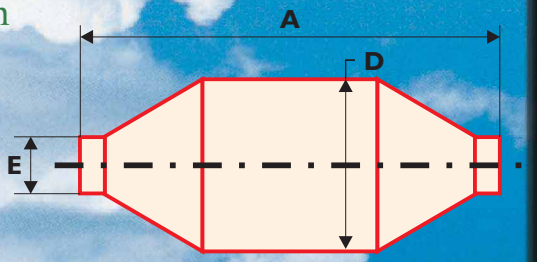
At higher exhaust temperatures both types of catalyst can provide HC conversions of above 80% and CO conversions of more than 90%.

Conversion of diesel particulate matter is an important function of the modern diesel oxidation catalyst. The conversion of SOF may reach and exceed 80%. Catalysts for heavy-duty applications incorporate sulfate suppressants to maximize their particulate matter performance. The resulting total conversion of DPM depends on the engine, exhaust gas temperature, fuel, and duty cycle. Conversions between 20 and 50% are typically observed. Low sulfur fuel is recommended for use with catalytic converters. It will minimize the irritating sulfur dioxide emissions and enhance the catalyst DPM performance.

Nett D-Series catalysts have won the OEMmie Award for Modern Innovative Engineering

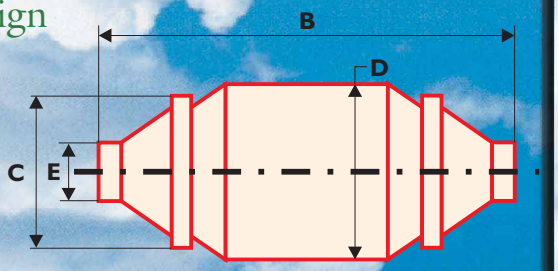
Universal-Fit - Welded Design

In the welded design the inlet and outlet cones are welded directly to the catalyst body. It is the simplest and most sturdy design. It is also the most compact and will fit where others will not.



Universal-Fit - Clamped Design

The inlet and outlet cones are attached to the catalyst body using quick release clamps. This design allows for easy removal of the center body. Recommended for older, dirty engines, where periodic catalyst cleaning may be necessary.



NETT PURIFIER MODELS AND DIMENSIONS

Direct-Fit Designs

Direct-fit purifiers are available for most popular equipment makes and models. Custom models can be designed for any exhaust system configuration.

Purifier sizing will vary depending on the engine size, the raw emissions, and the targeted emission reductions. Please contact your distributor or our office for assistance. We need to know either the exhaust flow rate of your engine or its make, model, displacement, type of aspiration, rated speed and power.

M-Series DOC (diesel oxidation catalyst) Models

Model	MD15	MD25	MD35	MD55	MD65	MD85	MD125	MD155	MD215	MD295	MD385	MD665
A, mm	175	198	213	236	250	260	274	312	447	447	495	635
inches	*6.90*	*7.80*	*8.40*	*9.30*	*9.80*	*10.25*	*10.80*	*12.30*	*17.60*	*17.60*	*19.50*	*25.00*
B, mm			221	244		267	282	320	457	457	508	642
inches			*8.70*	*9.60*		*10.50*	*11.10*	*12.60*	*18.00*	*18.00*	*20.00*	*25.30*
C, mm			119	142		168	196	218	218	218	218	218
inches			*4.70*	*5.60*		*6.60*	*7.70*	*8.60*	*8.60*	*8.60*	*8.60*	*8.60*
D, mm	66	79	91	112	130	142	168	193	226	264	302	398
inches	*2.60*	*3.10*	*3.60*	*4.40*	*5.10*	*5.60*	*6.60*	*7.60*	*8.90*	*10.40*	*11.90*	*15.70*
E (ID)												
Weight, Welded Models												
kg	0.4	0.6	0.8	1.1	1.5	1.8	2.7	3.3	5.0	6.8	8.5	12.5
lb	*0.9*	*1.3*	*1.8*	*2.4*	*3.3*	*4.0*	*6.0*	*7.3*	*11.0*	*15.0*	*18.7*	*27.6*
Weight, Clamped Models												
kg			1.8	2.2		3.6	4.5	5.4	6.7	7.6	9.2	13.7
lb			*4.0*	*4.9*		*7.9*	*9.9*	*11.9*	*14.8*	*16.8*	*20.3*	*30.2*

D-Series DOC Models - please contact your authorized NETT® distributor for the dimensions of available purifier models

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