



The CleanAIR ASSURE™ DOC

Reduces HC, CO and PM

The ASSURE™ DOC (diesel oxidation converter) for diesel off-road engines is a flow-through catalyst designed to reduce carbon monoxide (CO), hydrocarbons (HC) and a small percentage of diesel particulate matter (PM). The high-performance, durable oxidation catalyst is housed within a 304L stainless steel, corrosion resistant package. This unique catalyst technology is available as a standard ASSURE™ add-on DOC unit or as a direct muffler replacement.

Each unit is individually sized to meet engine specifications. This is necessary to keep engine backpressure at a low level. Every effort is made to design the ASSURE™ DOC to fit in the smallest possible package while maintaining engine performance.

Applications for the ASSURE™ DOC for off-road include construction equipment, trucks, mining equipment, cranes and forklifts.

Reduces:

- HC up to 99%
- CO up to 99%
- PM by 20%

***Reduces Odor and Toxic Emissions
for Diesel Off-Road Engines***

Reduce Odors and Toxic Emissions

- Reduces Carbon Monoxide (CO) and Hydrocarbons (HC) by up to 99%
- Works with all diesel engines
- Reduces 20% to 30% of particulate matter (PM)

Customized to Client's Specifications

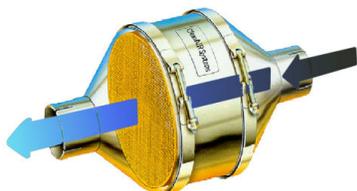
- Custom design and fabrication
- Product Optimization for Space Availability
- Does not require regeneration
- Available as a Muffler Replacement
- Available with V-Clamp or Welded Design
- Available with Custom Inlet and Outlet Configurations

Guaranteed Long-Life Construction

- 304L Stainless-Steel Housing, Corrosion-Resistant
- All Products Constructed to Operate Under Extreme Conditions

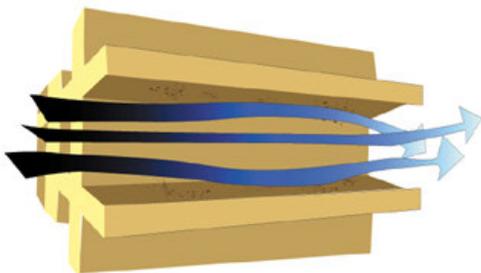
No Health Risk

- Uses non-toxic, non-vanadium catalyst



How the ASSURE™ DOC Works

Polluting emissions result from the incomplete combustion of fuel. Oxidation completes the combustion. The ASSURE™ DOC transforms pollutants into harmless gases through oxidation, by combining the pollutants with oxygen in the exhaust. In the case of diesel exhaust, CO, HC and PM, are oxidized into carbon dioxide and water vapor.



Flow-through substrate used for diesel oxidation catalysts.

Diesel particulate matter is the most complex and troublesome diesel emission. PM is made up of both solid and liquid material. Although the chemical and physical compositions of the various particles differ, the basic components of PM are elemental carbon and heavy hydrocarbons. The ASSURE™ DOC reduces the soluble organic fraction of PM, which is a liquid material consisting mostly of hydrocarbons, by oxidizing it into carbon dioxide and water.

Reduces Odor and Toxic Emissions

Reduces:

- HC up to 99%
- CO up to 99%
- PM by 20%



**CleanAIR
SYSTEMS**

ASSURE™ DOC Emissions Reduction Summary

Control Technology	Fuel	HC	CO	PM
ASSURE™ DOC for diesel engines	ULSD (<15 ppm S)	Up to 99%	Up to 99%	20% to 30%
	Biodiesel (<15 ppm S)	Up to 99%	Up to 99%	Up to 50%

Results are fuel dependent and may vary with application.

Exhaust Temperature Requirements

Temperature of the exhaust is one important factor in the design of the ASSURE™ DOC. Fuel sulfur content also play an important role. Depending upon these factors, the ASSURE™ DOC will reduce emissions at temperatures as low as 180°C (356°F), increasing rapidly as temperature increases. Consult your sales specialist for expected application activity and ideal operating conditions.

How Fuel Effects Performance

For the maximum performance in PM removal efficiency, it is recommended that the ASSURE™ DOC operates in conjunction with ultra low sulfur diesel fuel (ULSD), less than 15 ppm sulfur by weight. As the fuel sulfur content increases, the PM removal efficiency decreases. High sulfur fuel, greater than 500 ppm, will not damage the catalyst.



Muffler Replacement

The ASSURE™ DOC is packaged inside a 304L stainless steel housing and finished by bead blasting to give a highly corrosion-resistant product that will replace the existing muffler and last for years. The muffler can be clamped together to allow access to the DOC unit for inspection if desired. Slip-on, bolt flanges or other types of connectors can be designed on the unit. In general DOC muffler units are the same size or slightly larger than the original muffler. This is necessary to keep engine backpressure at a low level. Every effort is made to design the ASSURE™ DOC to fit in the smallest possible package while maintaining engine performance.



**CleanAIR
SYSTEMS**

To submit an online Request for Pricing, go to:
www.cleanairsys.com/rfp.asp

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