



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 WASHINGTON, D.C. 20460

August 14, 2003

OFFICE OF  
 AIR AND RADIATION

Mr. Julian Imes  
 Donaldson Company, Inc.  
 1400 West 94<sup>th</sup> Street  
 Minneapolis, MN 55431-2370

Dear Mr. Imes:

The U.S. Environmental Protection Agency (EPA) has reviewed your request for verification of the Donaldson Company, Inc. Series 6100 Diesel Oxidation Catalyst Muffler (DOC) in combination with the Donaldson Spiracle™ Closed Crankcase Filtration System (Spiracle). Based on our evaluation of the verification application and test data, EPA hereby verifies that this technology reduces emissions of certain criteria pollutants by the percentages described in the table below.

This technology combination is approved for use on the following engines and/or vehicles provided all of the required operating criteria are met as described below:

All 4-stroke highway heavy and medium heavy-duty diesel engines including, turbo-charged or naturally aspirated, non-EGR, mechanically or electronically injected and originally manufactured from 1991 through 2003 model years.

Technology	Baseline Fuel (sulfur content)	Fuel with Technology (sulfur content)	Particulate Matter <sup>a</sup> (PM) %	Carbon Monoxide (CO) %	Hydrocarbons (HC) %	Oxide of Nitrogen (NOx) %
Series 6100 DOC + Spiracle (1)	≤ 500 ppm	≤ 15 ppm	32	31	14 <sup>b</sup>	N/A
Series 6100 DOC + Spiracle (2)	≤ 15 ppm	≤ 15 ppm	28	34	42	N/A

<sup>a</sup> Total PM reduction figures reflect reductions from both tailpipe and crankcase emissions.

<sup>b</sup> Verification test results produced an average HC percentage reduction of 14%. However, the 95% confidence interval included zero so no reduction is assigned.

The following operating criteria must be met in order for appropriately retrofitted engines to achieve the aforementioned emissions reductions:

1. The engine must be operated with a fuel that contains a sulfur content of no more than 15 ppm for use with the Series 6100 DOC & Spiracle system.


2. The engine exhaust temperature must be at least 150 degrees C during the duty cycle.
3. The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
4. To meet the conditions of this verification, the Spiracle Closed Crankcase Filtration System requires that the filter cartridge must be changed at every lube oil change recommended by the engine manufacturer or every 500 hours, whichever comes first.

EPA estimates that these systems will incur no discernable fuel economy penalty when used in a compatible application.

Information on the Series 6100 Diesel Oxidation Catalyst Muffler in combination with the Donaldson Spiracle™ Closed Crankcase Filtration System, percent reduction, applicable engines, and in-use testing program will be posted on the EPA Voluntary Diesel Retrofit Program website ([www.epa.gov/otaq/retrofit](http://www.epa.gov/otaq/retrofit)). As you know, Donaldson will be responsible for completing the required in-use testing program and for submitting all in-use testing data to EPA.

Thank you for participating in EPA's Voluntary Diesel Retrofit Program. If you have any questions or comments, please contact Anthony Erb, of my staff, at (202) 564-9259.

Sincerely,



Merrylin Zaw-Mon, Director  
Certification & Compliance Division  
Office of Transportation and Air Quality