

FACTS- Approved Emissions Reduction Measures (ERM)

The [*Non-Road Diesel Engine Emission Regulation Bylaw No. 1161, 2012*](#) (the Bylaw) provides fee refunds and reductions when an engine is upgraded or retrofitted with an approved Emission Reduction Measure. Currently, ERMs verified by the US Environmental Protection Agency (EPA) and California Air Resource Board (CARB) qualify for fee reductions and refunds under the Bylaw. Verified technology lists are maintained by each non-road diesel program and can be accessed at the web pages listed below.

Emission reduction measures include re-power, remanufacture, retrofit or a similar device, alteration or technological change that reduces the Particulate Matter (PM) emissions from a non-road diesel engine.

- To **repower** means to replace an older Tier 0 or Tier 1 engine with a less polluting higher Tier engine.
- To **remanufacture** means rebuilding an engine using new parts. To reduce the particulate matter (PM) in the exhaust, some Tier 0 and Tier 1 engines cores can be remanufactured using upgraded parts. Consult your dealer and the lists of verified technologies maintained by the US EPA and CARB.
- To **retrofit** means to install new devices developed to reduce PM emissions from diesel engines. Most are installed in the exhaust stream of the engine, in place of a muffler. The engine condition and maintenance practices need to be considered before installing a retrofit device. Installing an exhaust retrofit on worn engines or engines not maintained in good working condition can cause power loss, excessive fuel consumption, overheating and the retrofit device generally will not perform as designed. Engine manufacturers and equipment suppliers can assist in selecting an appropriate retrofit device for your equipment and the engine duty cycle.



Exhaust stream retrofits fall into 3 broad categories:

- **Diesel Oxidation Catalysts (DOCs)** can be used on most diesel engines and can reduce PM emissions by 25% or more. A DOC contains a flow-through metal or ceramic core coated with a precious metal catalyst. The catalyst promotes the oxidation of unburned PM, volatile organic compounds (VOC) and carbon monoxide (CO).
- **Flow-Through Filters (FTFs)** can be used on a wide variety of engines and can reduce PM emissions by approximately 50%. An FTF is similar to a DOC, but it uses a different type of core material to hold the catalyst. The core configuration results in greater contact with the catalyst.
- **Diesel Particulate Filters (DPF)** can be either “passive” or “active” devices and can reduce PM emissions by 85% or more. A passive DPF uses the heat from the engine exhaust to oxidize the PM collected in the filter. Active DPFs raise the temperature inside the filter using electricity or by injecting additional diesel fuel into the exhaust stream. Active DPF systems can be used on a much wider range of engines and duty cycles.

Biodiesel is produced primarily by refining vegetable oils and/or animal fats. Biodiesel is an approved ERM, as the PM emission rate for biodiesel is lower than petroleum based diesel fuel. PM reductions associated with biodiesel are proportional to the amount blended with petroleum based diesel fuel. Fee reductions will be applied for biodiesel blends greater than 5%, which is the legislated average amount blended diesel fuel sold in BC.

For information on how to apply for refunds or fee reductions, please refer to the [refund/fee reduction guidance document](#).

Please contact us if you have any questions at nonroaddiesel@metrovancover.org or 604-451-6655.

Web Resources:

1. [EPA National Clean Diesel Campaign \(NCDC\), Verified Technologies List](#)
2. [CARB Verification Procedure - Currently Verified](#)

