

**State of California
AIR RESOURCES BOARD**

EXECUTIVE ORDER DE-04-002-04

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Div. 26, Part 5, Chap. 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516, and Executive Order G-02-003;

Relating to Exemptions under Section 27156 of the Vehicle Code, and Verification under Sections 2700 through 2711 of Title 13 of the California Code of Regulations (CCR)

Engine Control Systems (ECS) Limited
Purifilter™ with High Load of Platinum (Purifilter™ H)

ARB has reviewed ECS Limited's request for verification of the Purifilter™ H. Based on an evaluation of the data provided and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that Purifilter™ H reduces emissions of diesel particulate matter (PM) consistent with a Level 3 Plus device (greater than or equal to 85 percent reductions and meets the 2009 nitrogen dioxide emissions limit) (Title 13 CCR, Sections 2702 (f) and Section 2708) and is compliant with the 2009 nitrogen dioxide emissions limit. Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the Purifilter™ H as a Level 3 Plus system for heavy-duty on-road vehicles using engines from the engine families listed in Attachment 1.

The aforementioned verification is subject to the following terms and conditions:

- The engine is originally manufactured from model year 1993 through 2006 having an engine family name listed in Attachment 1.
- The engine must be used by an on-road motor vehicle with a manufacturer's Gross Vehicle Weight Rating of over 14,000 pounds.
- The engine must not be certified by ARB as having exhaust gas recirculation.
- The application must have a duty cycle with an exhaust temperature profile greater than 280 degrees Celsius for at least 25 percent of the time.
- Only one filter can be installed per engine. For engines that are original engine manufacturer dual exhaust systems, including two exhaust manifolds, two mufflers, et cetera, only one filter can be installed per exhaust manifold.
- Each Purifilter™ H can only be used to treat the exhaust from one engine.

- The engine may or may not have a pre-existing oxidation catalyst from the original equipment manufacturer (OEM).
- The engine must not have a pre-existing diesel particulate filter (DPF) from the OEM.
- The engine must be certified for on-road applications.
- The engine must be certified at a PM emission level of at most 0.1 grams per brake horsepower-hour (g/bhp-hr), and greater than 0.01 g/bhp-hr.
- The engine must be four-stroke.
- The engine must be in its original certified configuration, except that if an OEM oxidation catalyst is present, it may be removed if Purifilter™ H is installed. Should Purifilter™ H be removed, the OEM oxidation catalyst must be re-installed, returning the engine to its original certified configuration.
- The engine can be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected.
- The engine must be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, must not be mixed with the fuel.
- The engine must be operated on fuel that has a sulfur content of no more than 15 parts per million by weight.
- The product must not be operated with fuel additives, as defined in Section 2701 of Title 13, of the CCR, unless explicitly verified for use with fuel additive(s).
- The product must not be used with any other systems or engine modifications without ARB and manufacturer approval.
- The system must be installed with a backpressure monitor to notify the operator when the backpressure limit is reached. The notification must occur and be clearly visible to the operator while the vehicle or equipment is in use.
- Swapping of the filter or any other system components among vehicles is not permitted for systems under manufacturer warranty. Spare filters may be used during cleaning of primary filters, but upon completion of cleaning the primary filter must be promptly re-installed on the vehicle. Primary filters can only be installed on the original installation vehicle. Spare filters will be labeled as seen in Attachment 3.

Swapping of spare filters must comply with Section 2706, Title 13, CCR, and the policy document found here: <http://www.arb.ca.gov/diesel/verdev/swap/swap.htm>. Engines fitted with Purifilter™ H must not be operated without all properly working components.

- Purifilter™ H in its entirety can be re-designated to other vehicles or equipment within a common ownership fleet only if authorized by ECS. Re-designations must be performed in accordance with Section 2706, Title 13, CCR, and the policy document found here: <http://www.arb.ca.gov/diesel/verdev/swap/swap.htm>.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the Purifilter™ H system, manufactured by ECS Limited of 83 Commerce Valley Drive East, Thornhill, Ontario, Canada L3T 7T3, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, Purifilter™ H is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles using engines listed in Attachment 1. This exemption is only valid provided the engines meet the aforementioned conditions.

The Purifilter™ H system must be installed as designed and the following major components must be installed in the following order in the exhaust tailpipe from upstream to downstream: one backpressure sampling probe and one thermocouple (these can be in reverse order or in the same cross-sectional area before the inlet section), and one catalyzed DPF. The system must also be equipped with a backpressure monitor and data logger that notifies the operator in a clearly visible manner when the backpressure limits have been reached while the vehicle or equipment is in use. The major components of the Purifilter™ H system are identified in Attachment 2. Schematics of the approved product and engine labels are shown in Attachment 3.

This Executive Order is valid provided that installation instructions for the Purifilter™ H system do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the Purifilter™ H, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the device. ARB must be notified in writing of any changes to any part of the Purifilter™ H system. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

ECS must ensure that the installation of Purifilter™ H conforms to all applicable industrial safety requirements.

Marketing of Purifilter™ H using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior approval is obtained from ARB.

Identification must include both device and engine labels consistent with the requirements of Title 13, CCR, Section 2706 and Attachment 3 of this Executive Order. Changes or modifications to the label or label placement are prohibited without prior written approval from ARB.

This Executive Order does not apply to any Purifilter™ H advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

A copy of this Executive Order must be provided to the ultimate purchaser at the time of sale.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13, CCR, Section 2706 (j)), ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is:

CA/ECS/2003/PM3+/N00/ON/DPF02

The designated family name **CA/ECS/2003/PM3+/N00/ON/DPF02** replaces the previous name CA/LUB/2003/PM3/N00/ON/DPF02.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, ECS is responsible for record keeping requirements (Section 2702), honoring the warranty (Section 2707), and conducting in-use compliance testing (Section 2709).

This Executive Order is valid provided that the diesel fuel used in conjunction with the device complies with Title 13, CCR, Sections 2281 and 2282, and if biodiesel is used, the biodiesel blend shall be 20 percent or less subject to the following conditions:

- The biodiesel portion of the blend complies with the American Society for Testing and Materials Specification D6751 applicable for 15 parts per million sulfur content; and
- The diesel fuel portion of the blend complies with Title 13, CCR, Sections 2281 and 2282.

Other alternative diesel fuels such as, but not limited to, ethanol diesel blends and water emulsified diesel fuel are excluded from this Executive Order.

Proper engine maintenance is critical for the proper functioning of the diesel emission control strategy. The owner and/or operator of the vehicle on which the diesel emission control strategy is installed, is strongly advised to adhere to all good engine

maintenance practices. Failure to document proper engine maintenance, including keeping records of the engine's oil consumption, may be grounds for denial of a warranty claim.

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the exemption and verification provided herein to assure that the exempted and verified add-on or modified part continues to meet the standards and procedures of Title 13, CCR, Section 2222, et seq, and Title 13, CCR, Sections 2700 through 2711.

Systems verified under this Executive Order shall conform to all applicable California emissions regulations.

This Executive Order does not release ECS Limited from complying with all other applicable regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

This Executive Order DE-04-002-04 hereby supersedes Executive Order DE-04-002-03, dated March 1, 2010; Executive Order DE-04-002-02, dated September 25, 2008; Executive Order DE-04-002-01, dated January 9, 2008; and Executive Order DE-04-002.

Executed at El Monte, California, this 12th day of April 2011.



Robert H. Cross, Chief
Mobile Source Control Division

Attachment 1: Table 1: ARB-Approved California Engine Families for ECS Purifier H
Table 2: ARB-Approved Federal Engine Families for ECS Purifier H

Attachment 2: Part 1: Parts List for ECS Purifier H
Part 2: Purifier H Hwy Stamped Flange

Attachment 3: California Verification Labels for Purifier "H" On-Road