



Linda S. Adams,  
Secretary

# Air Resources Board

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**Robert F. Sawyer, Ph.D., Chair**

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**Arnold Schwarzenegger**  
Governor

June 15, 2006

Mr. Don Newburry  
Research & Development Manager  
MIRATECH Corporation  
4224 South 76<sup>th</sup> East Avenue  
Tulsa, Oklahoma 74145

Dear Mr. Newburry:

The Air Resources Board (ARB) has reviewed the MIRATECH Corporation application for the verification of the CombiKat<sup>®</sup> CBS Particulate Trap. Based on the evaluation of the data provided, ARB hereby verifies that the CombiKat<sup>®</sup> CBS Particulate Trap reduces emissions of diesel particulate matter (PM) by 85 percent or greater (Level 3) for use in stationary emergency standby and prime generators certified at a PM emission level equal or less than 0.2 grams per brake horsepower hour (g/bhp-hr) (as tested on an appropriate steady-state certification cycle outlined in the ARB off-road regulations – similar to ISO 8178 D2). The applicable engine families are listed in the enclosure labeled 'Attachment 1'.

Also, ARB hereby conditionally verifies emergency and prime pumps with engines certified to meet Tier 1, Tier 2, or Tier 3 off-road engine standards and certified at a PM emission level equal or less than 0.2 g/bhp-hr. The applicable engine families for the conditionally verified emergency standby and prime pumps are the same as those listed in the enclosure labeled, 'Attachment 1'. The CombiKat<sup>®</sup> CBS Particulate Trap is therefore verified as a Level 3 diesel emission control device for stationary diesel engine generators with a PM emission level equal or less than 0.2 g/bhp-hr and conditionally verified for stationary diesel engine pumps with a PM emission level equal or less than 0.2 g/bhp-hr, subject to the terms and conditions specified below.

The required emissions and durability testing of the CombiKat<sup>®</sup> CBS Particulate Trap were performed per the testing protocol "Proposed Verification Testing Protocol for the CBS Soot Trap" submitted to ARB and approved in February, 2005. Currently, the system has completed 1000 hours of durability testing, including 144 cold starts, with positive results, making the system eligible for verification. The full approval process required several sets of emissions tests and 1000 hours of durability testing for prime engines, designed to cover both generators and pumps simultaneously.

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.  
For a list of simple ways you can reduce demand and cut your energy costs, see our Website: <http://www.arb.ca.gov>.*

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California Environmental Protection Agency

ARB stationary emergency and prime generators and pumps verification approval test program for the CombiKat® CBS Particulate Trap consists of nine phases:

- 1) Baseline Emissions Testing
- 2) Zero-hour Control Device Emissions Testing
- 3) Durability Testing (0 - 168 hr)
- 4) Post 168 hr Conditional Verification Emission Test
- 5) Durability Testing (168 - 500 hr)
- 6) Post 500 hr Control Device Emissions Testing
- 7) Durability Testing (500 - 1000 hr)
- 8) Post 1000 hr Control Device Emissions Testing
- 9) Field Test on a Diesel Powered Pump

The first eight phases (1 through 8) have been completed for the generator verification and pump conditional verification. Phase 9 is required to complete the verification for diesel powered pumps. Since all durability and testing were conducted on a diesel powered generator, an additional 200 hours of field operation is required for the diesel powered pumps. The additional 200 hours of field operation must be completed within three years after receiving conditional verification (Section 2705: Field Demonstration Requirements (b)(1)). When the additional 200 hours of field operation is successfully completed, an extension to the Executive Order for the full verification on pumps can be provided. If these conditions of verification are not satisfied by the specified time period, the verification for pumps is automatically terminated. For three years from the date of this letter, conditional verification on pumps is equivalent to verification for the purpose of satisfying the requirements of in-use emission control regulations.

The durability and testing were conducted on a diesel powered generator that emits PM emissions at a rate of 0.16 g/bhp-hr as tested on the ISO 8178 D2 cycle. Based on this PM emission rate, a full verification is given for stationary diesel powered generators, and conditional verification for stationary diesel powered pumps, that emit PM at a rate equal to or less than 0.2 g/bhp-hr.

You also requested conditional verification of the CombiKat® CBS Particulate Trap on a stationary diesel powered generators that emit PM in the 0.2 to 0.4 g/bhp-hr range. The ARB staff is still evaluating this proposal. We will contact you for additional data to support extending conditional or full verification of your system to stationary engines with emissions in the 0.2 to 0.4 g/bhp-hr range.

The verification and conditional verification is valid provided the following operating criteria are met:

<b>Parameter</b>	<b>Value</b>
Application	Stationary Emergency Standby and Prime Power Generation or Pumping
Engine Type	Diesel, with or without turbocharger, certified to 0.2 g/bhp-hr or less of PM.
Minimum Exhaust Temperature for Filter Regeneration	The engine must operate at the load level required to achieve sufficient exhaust temperature for regeneration at the rated PM level of the engine, per Figure 1. Operation at lower temperatures is allowed, but only for a limited duration. Per Figure 1, operate in the "Passive Regeneration Okay" side of the graph for at least 30 Minutes.
Maximum Consecutive Minutes Operating Below Passive Regeneration Temperature	720 Minutes
Number of Cold Start and 30 Minute Idle Sessions before Regeneration Required	24
Number of Hours of Operation Before Cleaning of Filter Required	Application Specific. Per calculations provided below under 'Filter Sizing'. 2000 Hours Typical.
Fuel	California on-road or off-road diesel fuel with less than or equal to 500 ppm sulfur. Biodiesel is not acceptable for this verification.
PM Verification Level	Level 3 Verification: At least 85% reduction of PM.

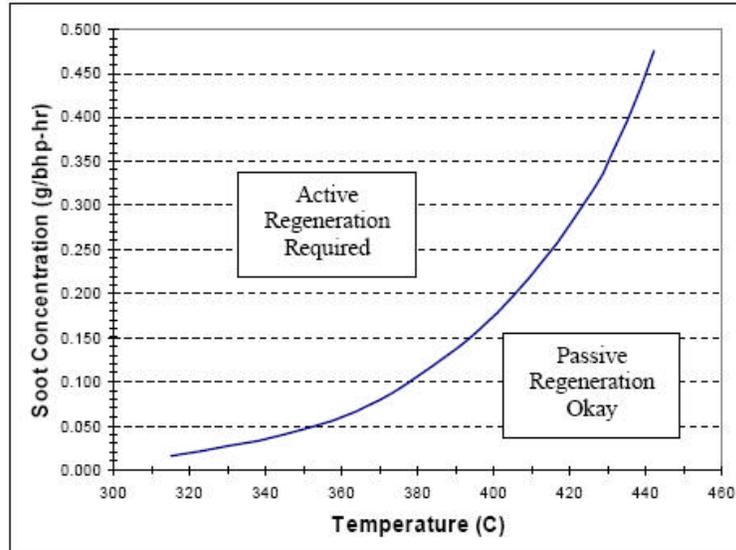


Figure 1: Passive Regeneration Temperature Requirements

Since there may be significant variations from application to application, MIRATECH Corporation will review actual operating conditions (duty cycle, baseline emissions, exhaust temperature profiles, and engine backpressure) prior to retrofitting an engine with a CombiKat<sup>®</sup> CBS Particulate Trap to ensure compatibility.

Furthermore, the engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer. MIRATECH Corporation must install the Dwyer, Series 300 SGT Photohelic Differential Pressure Switch/Gage Transmitter or equivalent (backpressure monitor) on all engines retrofitted with a CombiKat<sup>®</sup> CBS Particulate Trap.

ARB hereby assigns the CombiKat<sup>®</sup> CBS Particulate Trap the designated family name of:

**CA/MES/2005/PM3/N00/ST/DPF01**

This identification number should be used in reference to this conditional verification as part of the system labeling requirement.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, MIRATECH Corporation is responsible for honoring their warranty (Section 2707) and conducting in-use compliance testing (California Code of Regulations, Title 13, Section 2709).

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Should you have any questions or comments, please contact Mr. John Lee,  
Air Resources Engineer, at (916) 327-5975.

Sincerely,

/s/

Daniel E. Donohue, Chief  
Emission Assessment Branch, SSD

Attachments

cc: John Lee, Air Resources Engineer  
Technical Analysis Section, SSD