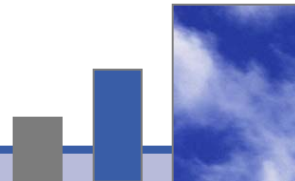




## **Cleaning up the Diesel Engine**

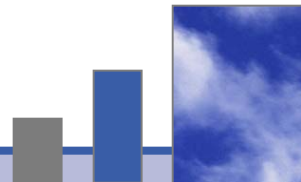
**Tom Swenson, P.E.  
Cleaire Advanced Emission Controls<sup>®</sup>, LLC**

**December 8, 2004**



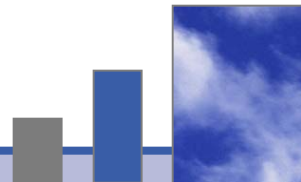
# Cleaire and Cummins West

- **Cummins West is the regional distributor of Cummins Engines, Onan Generators & Komatsu Heavy Equipment**
  - 350 employees
  - 8 locations
- **Cleaire is a division of Cummins West, Inc.**
  - Formed to address clean-up of in-use diesel engines
  - Headquartered in San Leandro
  - Manufacturing facility in San Diego
  - Product distribution through Cummins Distribution Network



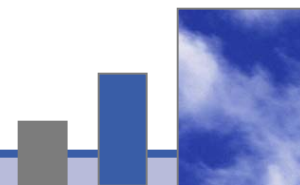
# Outside the Box thinking

- Diesel doesn't have to be a dirty word
- Retrofit existing engines to reduce fleet averaged emissions
- Delay purchase of new engines without delaying emission reduction
- Verified retrofit devices exist today to reduce both PM and NOx emissions
- Retrofits are part of an overall emission reduction program that also includes early vehicle replacement, new engine standards and alternative fuels



# CARB & EPA Verified Technologies

	PM Reduction	NOx Reduction
Diesel Oxidation Catalyst	25%	-
Aqueous Fuel	50%	15%
Diesel Particulate Filter (DPF)	85%	-
Combined NOx Catalyst and DPF	85%	25%



# Longview®

- Integrated NOx and PM control system
- Replaces Muffler
- Modular catalyst system for maintenance
- Program underway to retrofit >1300 transit buses in the bay area
- Applicable to a wide variety of engines and applications



The screenshot shows the top navigation bar of the Forbes.com website. It features the 'Forbes' logo in large white text on a blue background, with 'COM' in a smaller font to its right. Below the logo, it lists 'U.S. | EUROPE | ASIA'. To the right of the logo, there is a search bar with a magnifying glass icon and the text 'Jump | Free Trial Issue'. Below the search bar is a dropdown menu labeled 'Select Section'. Further right, it says 'HOME PAGE FOR THE WORLD'S BUSI'. At the bottom of this bar are several navigation links: 'HOME', 'BUSINESS', 'TECHNOLOGY', 'MARKETS', 'WORK', and 'LISTS'.

[Home](#) > [News & Analysis](#)

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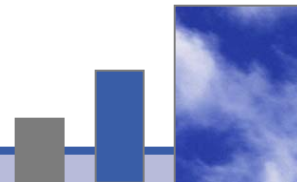
BusinessWire



## **Cleaire Receives California and EPA Approval of Diesel Emission Reduction Technology for Use on Wide Range of Heavy-Duty Engines**

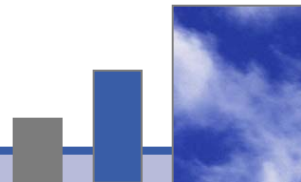
08.17.04, 12:17 PM ET

California and Federal officials have approved the Longview(R) diesel emission retrofit system for use in all 50 states on virtually all on-road heavy-duty diesel engines manufactured between 1994 and 2002, officials of Cleaire Advanced Emission Controls(R), LLC announced today.



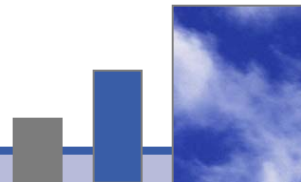
# Your Core Business

- A port's core business is not clean air
- However, to have healthy air where we live, work and play requires aggressive application of the highest applicable control strategies in every business sector
- Growth and development make it difficult to maintain, let alone make improvement
- Whatever the technology placed into service, a quality service and support provider is necessary to ensure the continued device performance



# DPF Cleaning System

- DPFs **combust** most captured particulate matter
- Inorganic ash collects in the DPF over time and requires removal
- Analysis of cleaner filtrate found . . .
  - Zinc concentrations from California Waste Extraction Test exceed total and soluble threshold concentrations
- Filtrate is a **California hazardous waste**

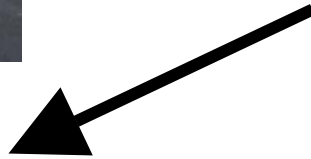


# Filter Maintenance: Out of the Air and Into a Hazardous Waste Facility

Captured in tail pipe . . .



Stored onsite . . .



and sent to hazardous waste facility.

# We'll Clean it up, so you can take it out!



For additional  
product/sales  
information  
contact:

Cummins West  
1-800-595-5050

[www.cleaire.com](http://www.cleaire.com)

## Thank You!

