

Retrofit Emission Controls for On-Road Diesel Engines

Manufacturers of Emission Controls Association [MECA]

Pacific Oil Conference

Reno, NV

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www.meca.org



Session Outline

- Diesel Retrofit Overview
- Application engineering
- Installation
- On-vehicle monitors
- Maintenance
- Q & A

MECA Background

- Founded in 1976 to be The Technical Spokesperson for Our Industry
- Currently, 46 Members
- Member companies have over 35 years of experience and a proven track record of success in developing and manufacturing emission control technology
- Members cover diverse range of emission control technologies for both new and existing engines/vehicles:
 - Catalytic converters (all fuels)
 - Diesel particulate filters
 - Exhaust components/exhaust system integration
 - Sensors

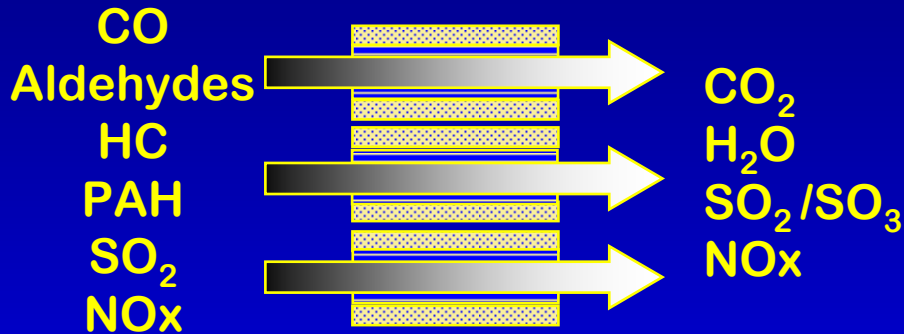


Experience with Diesel Retrofits Spans a Variety of On-Road Vehicle Applications



Retrofit Emission Control Technologies: DOCs Have Largest Experience Base

Diesel Oxidation Catalysts



Flow through monolith
with catalytic coating

- Level 1 PM Reduction (25%)
- Large Reduction in Toxics
 - Carbon monoxide and HC (90%)
 - Moderate PM reduction (25-50%)
- Nearly Universal Application with > Millions of Retrofits Worldwide
- Tens of Millions of OE Applications

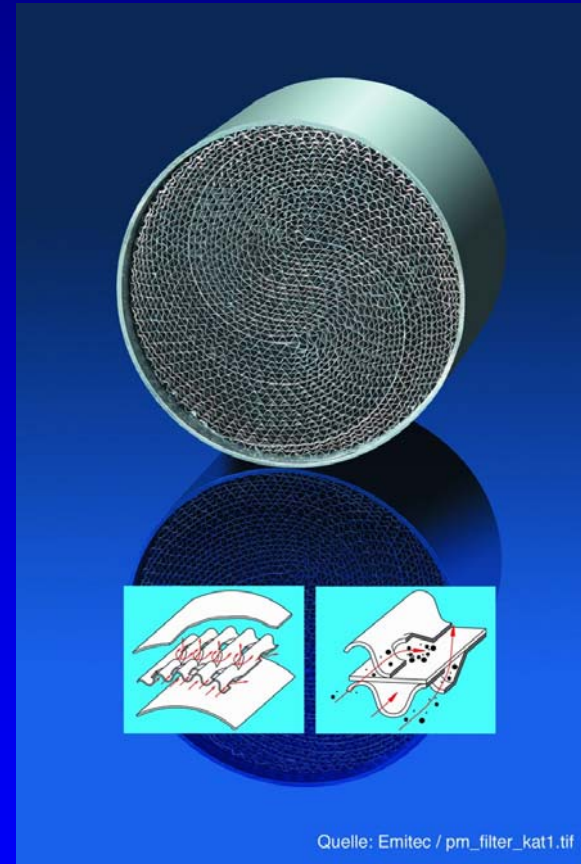


Different Types of Particulate Filters are Available

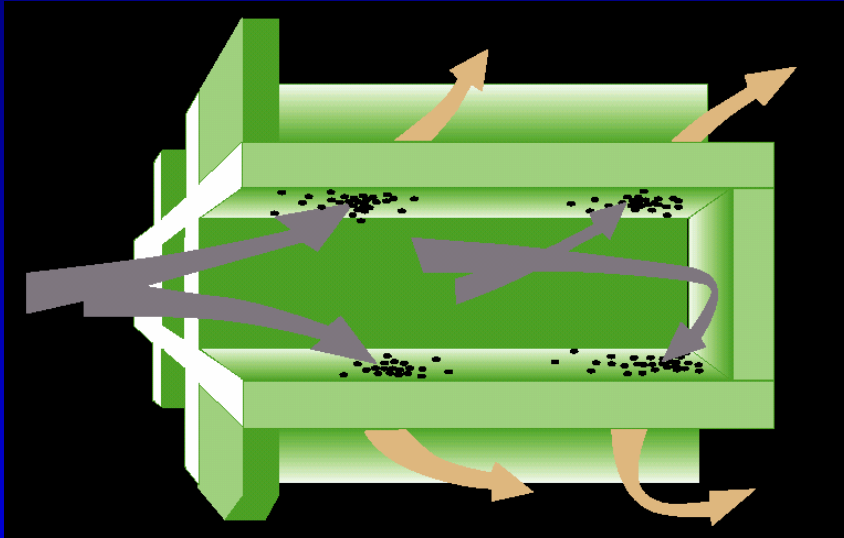
Partial or Flow Through Filters



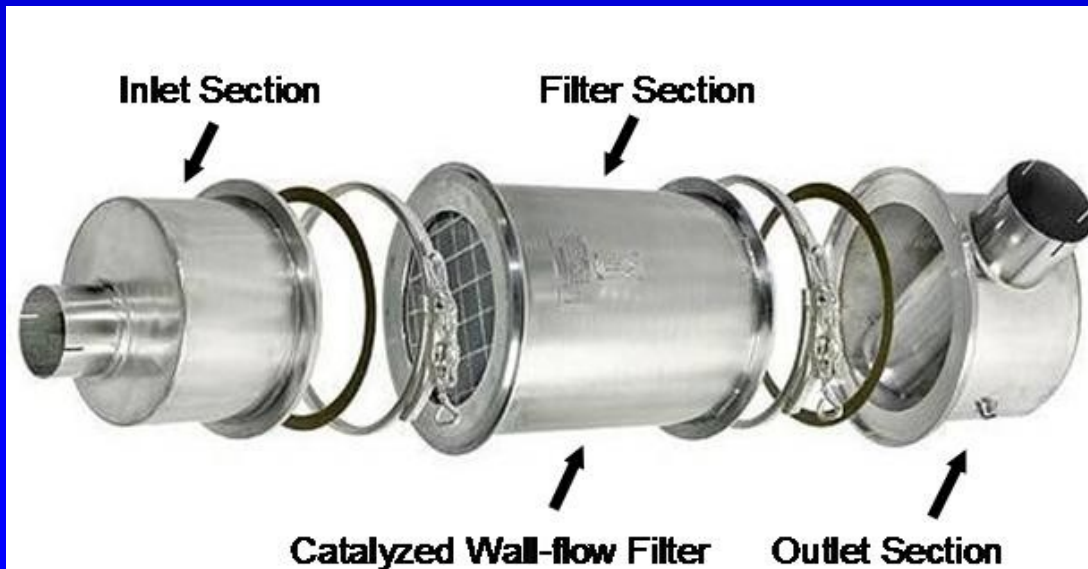
- Level 2 PM Reduction (50-75%)
- Has applicability on older engines, light-duty vehicles
- Filtering achieved with sintered metal sheets or wire meshes
- Resistant to plugging



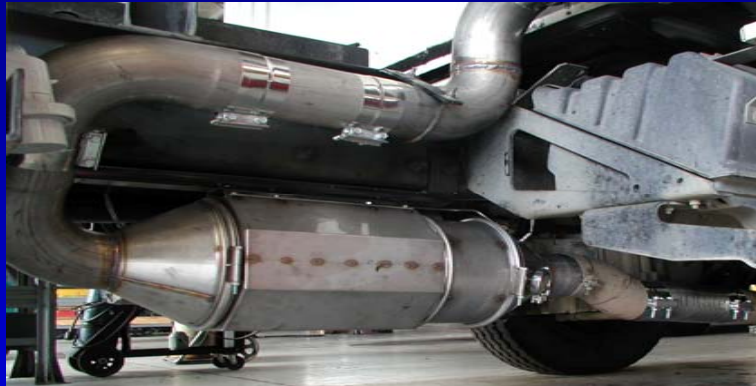
Wall Flow Filters offer the highest filtration efficiency



- Level 3 PM reduction (>85%)
- Large reduction in toxics from catalyzed filters
- Most ARB verified level 3 filters are passive
- > 200,000 Retrofits worldwide
- > 2 Million OE Applications
- Same technology as on 2007 OE trucks.



DPFs with Active Soot Regeneration Strategies Available for Retrofits

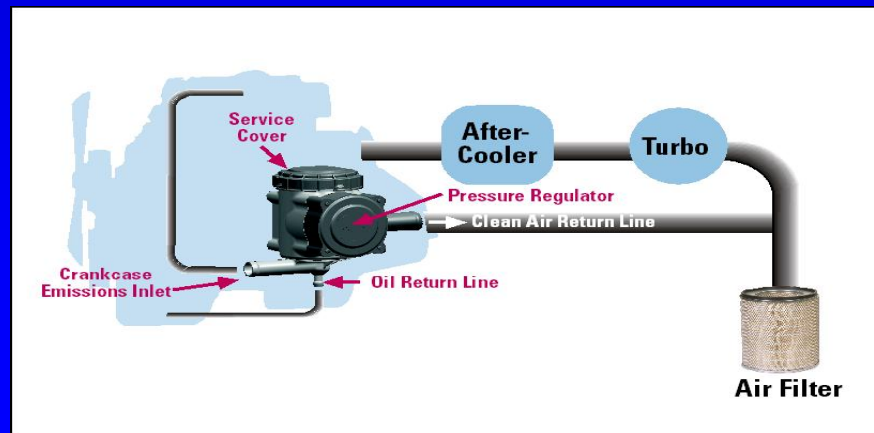


- Active regeneration is required for filter systems in cool exhaust applications
 - Un-catalyzed filters require external heat source for soot regeneration.
 - Electric heaters can be installed in front of DPF.
 - DPF can be regenerated externally.
 - 1-8 hour regeneration cycle



Closed Crankcase Filters can Provide Additional PM Control

- DOC provides Level 1 PM reduction (25%)
- Flow through or “partial” filters provide Level 2 PM reduction potential (50%)
- Wall flow filters provide (85%) or Level 3 reduction.
- Closed crankcase filters can be combined with any of the above for additional PM control.
- ARB and EPA verified system is DOC and CCF.

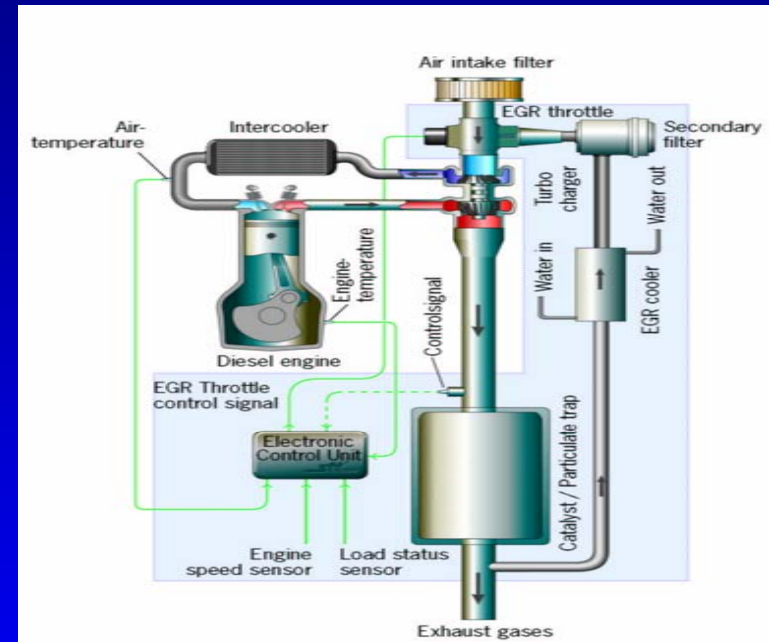


Integrated Solutions for Combined PM/NOx Reductions Available for Retrofit

Lean NOx Cat. + DPF
– 25% NOx reduction



Low Pressure EGR + DPF
– 40% NOx reduction



- Selective Catalytic Reduction (SCR) and DPF combination system will become available in the future.

Emission Control Industry's Perspective on Retrofits

- Proven Technology Available
- Technology Options Expanding
- Application Range Expanding
- Retrofit “Success” Builds on Experience
- Incentive Funds Needed to Make Large Impact on Air Quality

Key Considerations for Successful Retrofit Programs

➤ Successful Retrofits Require a Team Effort Between Fleet Owners, Operators, and Technology Providers

- Application engineering
- Installation
- On-vehicle monitors
- Maintenance

www.dieselfetrofit.org

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Diesel Retrofit Technology for *Clean Air*



The purpose of this web site is to provide useful information related to diesel retrofit emission control technology. By making this information available, MECA hopes to assist interested stakeholders in establishing and operating more effective diesel retrofit programs.

The **Manufacturers of Emission Controls Association (MECA)** is a non-profit association incorporated in Washington, DC. MECA's mission is to provide technical information on emission control technology, thereby facilitating the establishment of strong and effective state, federal, and international air quality programs that promote public health, environmental quality, and industrial progress.

For an overview of this website, please refer to our [Site map](#).

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