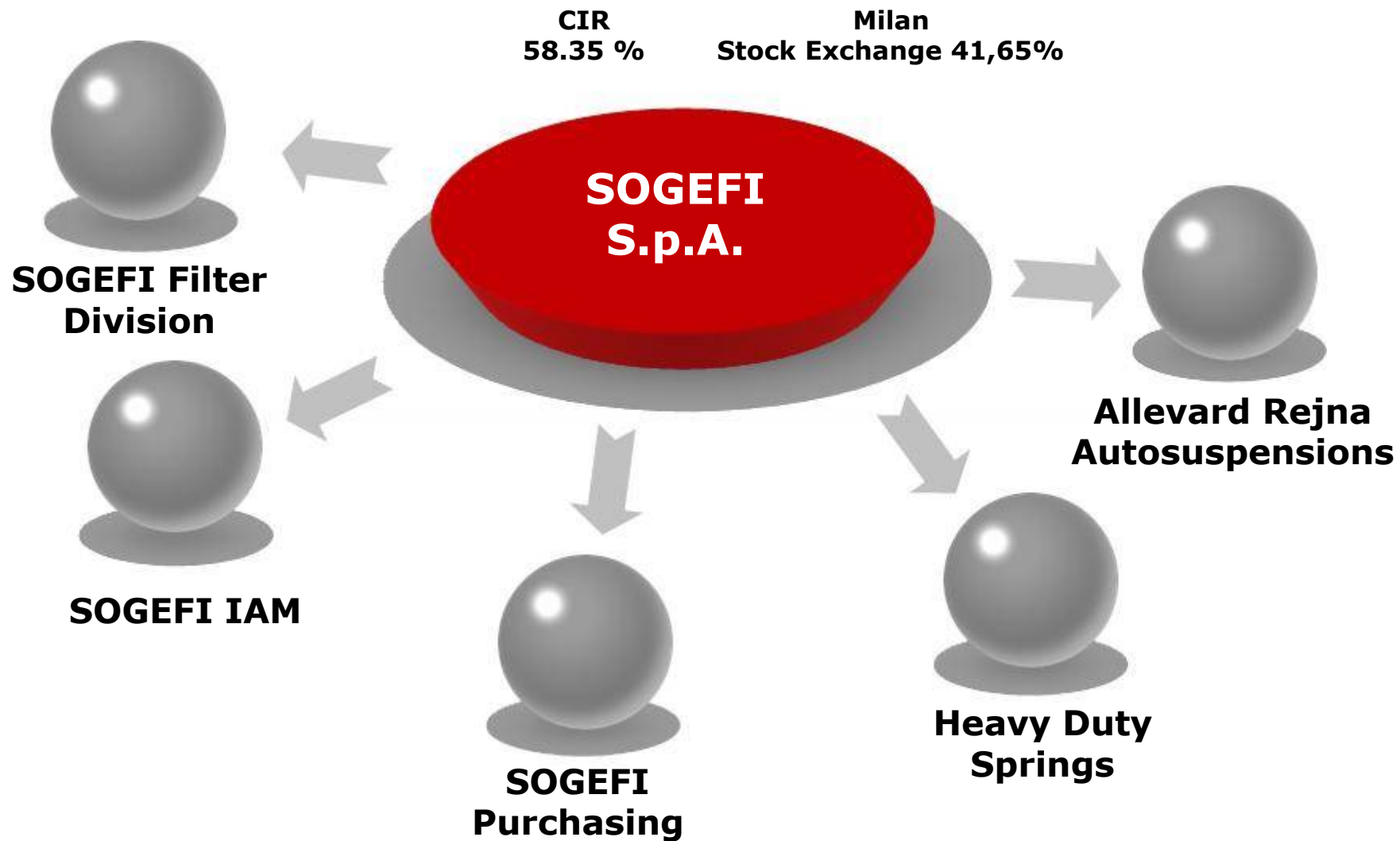


Filters Contribute to CO₂ Emission Reduction Challenge

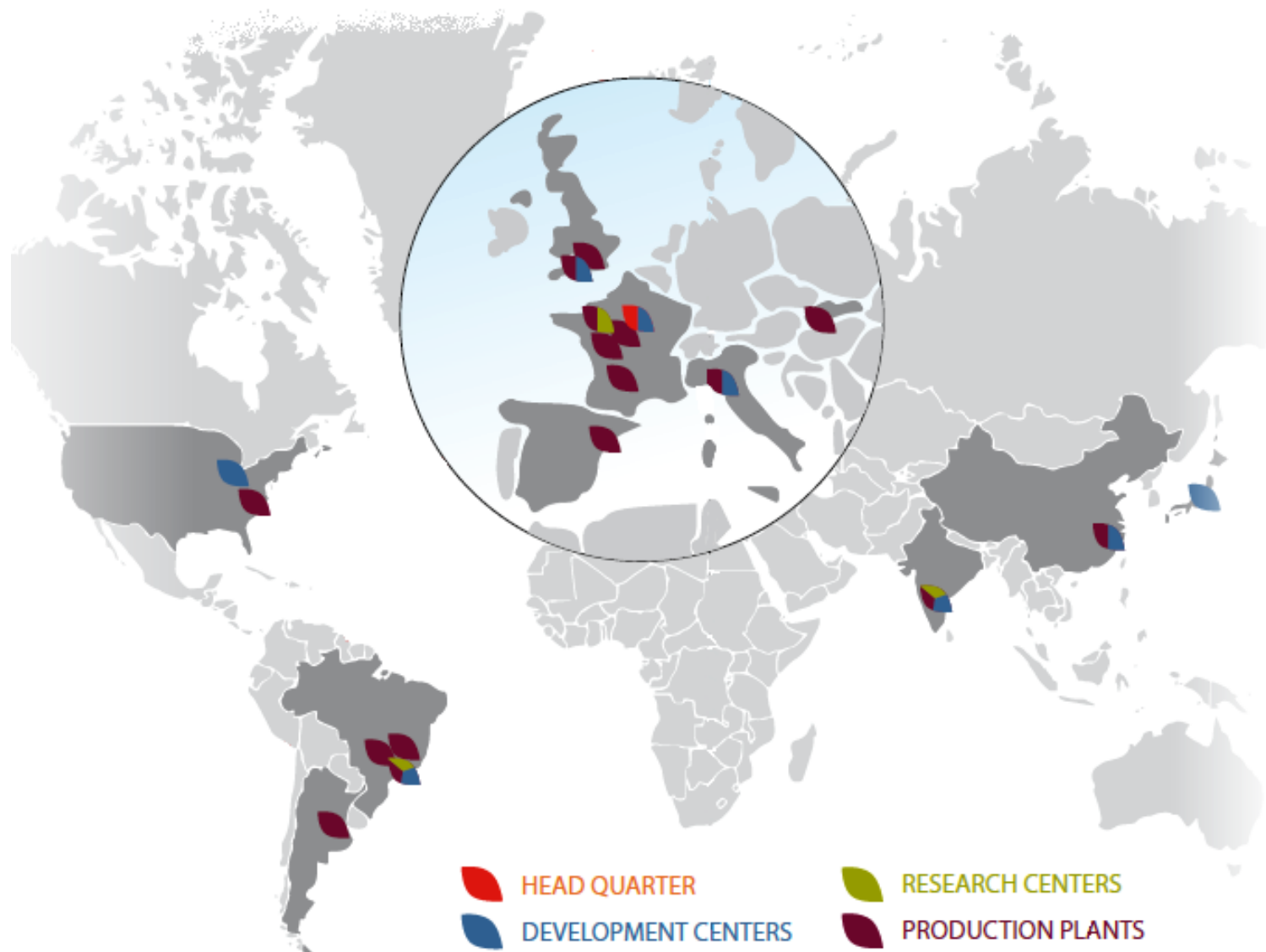
Ph. DUBIN – R&D Director

***Engine Expo 2010 Open Technology Forum
Powertrain – Engine and Transmission Developments
22th of June 2010***

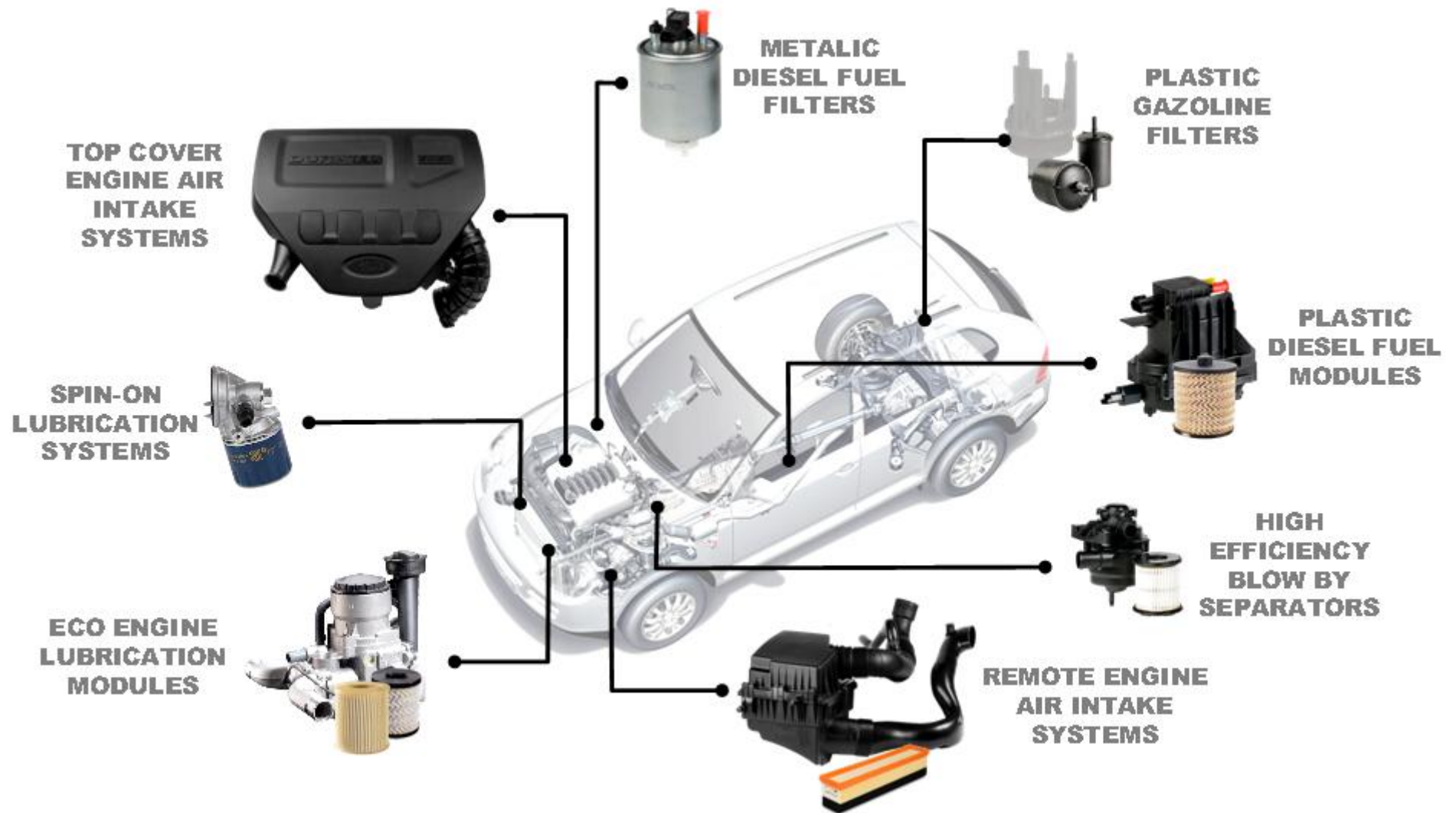
SOGEFI Group



SOGEFI Filter Division



SOGEFI Filter Division



SOGEFI Filter Division



SOGEFI Technical Roadmap for Automotive Emissions Reduction Participation



Weight & Frictions Reduction



Engine Ageing Reduction



Bio Fuels Compatibility



Weight & Frictions Reduction

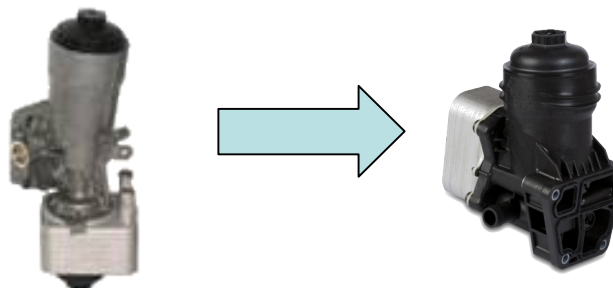


Weight Reduction

Average Weight Reduction of SOGEFI Liquid Filtration Systems of 25% during last 5 years

- Light Materials (Glass Reinforced Plastic)

VW 1.6 & 2.0 Diesel
Engines Oil Filtration
Modules



40% Saving

- Compact Designs (Real Life Dimensioning & Chevron Pleating)

Renault-Nissan 2.0
Diesel Fuel Filter



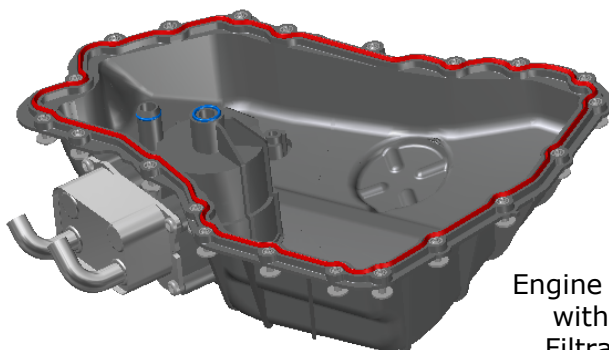
25% Saving

**Corresponding to an Average of
1.2kg for a Diesel Vehicle**

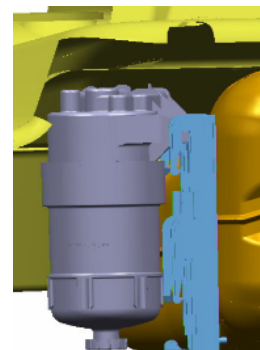


Weight Reduction

1.5kg More Weight Saving are Possible with New Products Positions and Combinations



Engine Plastic Oil Pan
with Integrated
Filtration Module



Plastic Lateral Tank
Mounted Diesel fuel
Filter

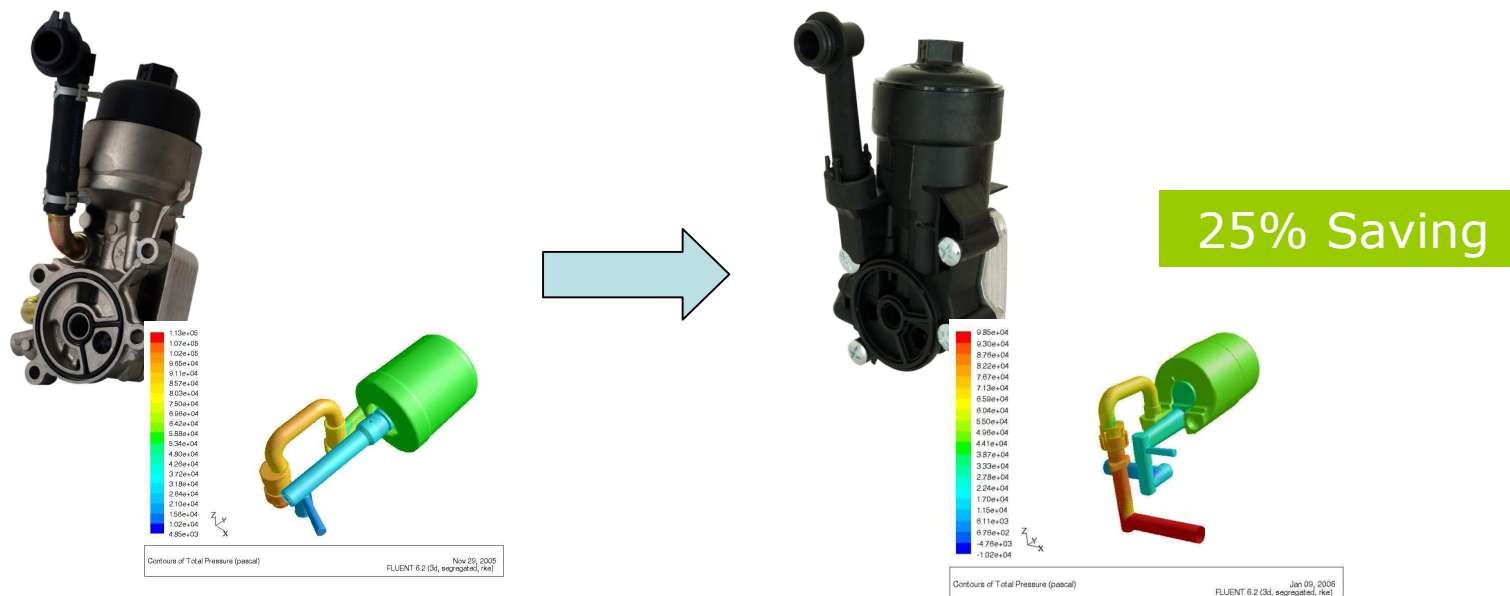
**Total Weight Saving Up to 3.0kg compare to
Euro 4 Diesel Vehicles**

0.2% NEDC Vehicle Fuel Consumption Saving



Frictions Reduction

DW10B Oil Filtration Module Investigation



1 bar reduction in NEDC* cycle conditions
19% Oil Pump Energy Saving
0.8% NEDC Vehicle Fuel Consumption Saving

*70°C average oil temperature, 1350l/h average oil flow



Engine Ageing Reduction



Engine Ageing Reduction

Closed Crankcase Ventilation

Blow-By

- **Origin:**

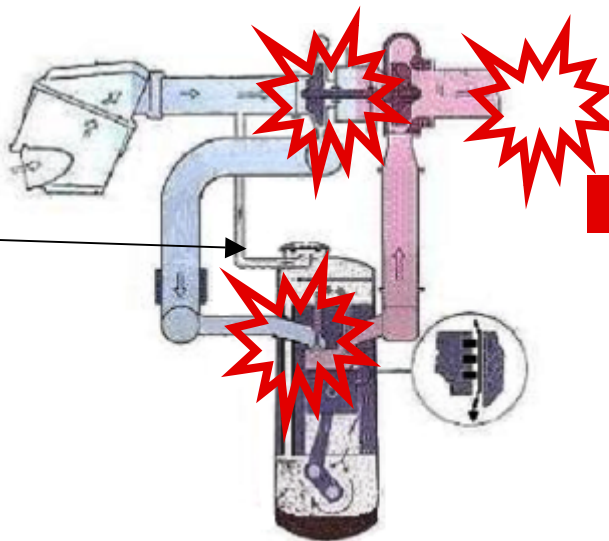
- ⇒ Piston rings leak
- ⇒ Valve leak

- **Nature:**

- ⇒ Burned and unburned gases
- ⇒ Vapor and Soots
- ⇒ Oil droplets

- **Gas evacuation:**

- ⇒ Avoid pressure in the crankcase
- ⇒ Forbidden to release in atmosphere



Sooty Oil Droplets Impacts

- Inlet Valve Fouling
- Compressor Fouling
- Catalytic Converter Poisoning
- Diesel Particulate Filter Clogging

⇒ **Vehicle Emissions Performances Decrease**

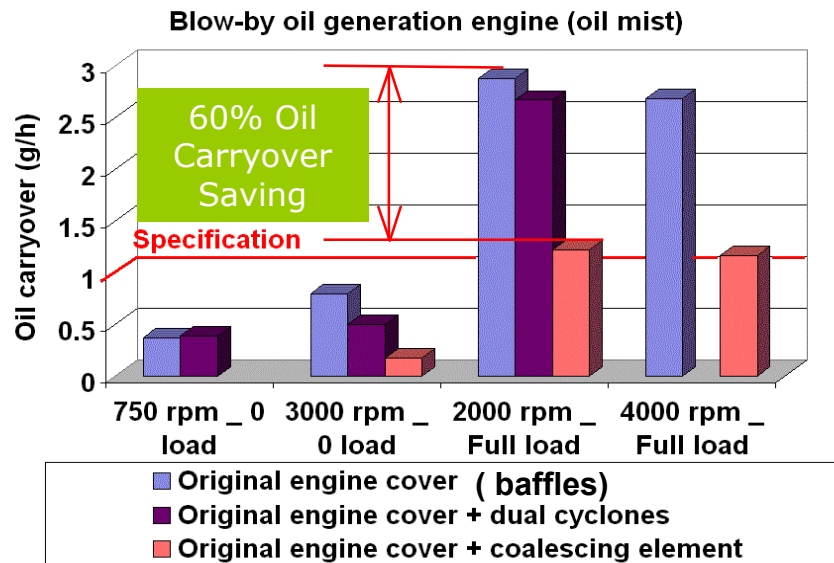
Exhaust Regulations	China Euro 4	Taiwan	Japan 2010	Euro 5 & Korea	USA Tier II
Durability requirements	100 000km	80 000km or 5 years	80 000km (<1.7t) 250 000km (>1.7t)	100 000km or 5 years	120 000miles

New Filtration Need for New Regulations Compliance

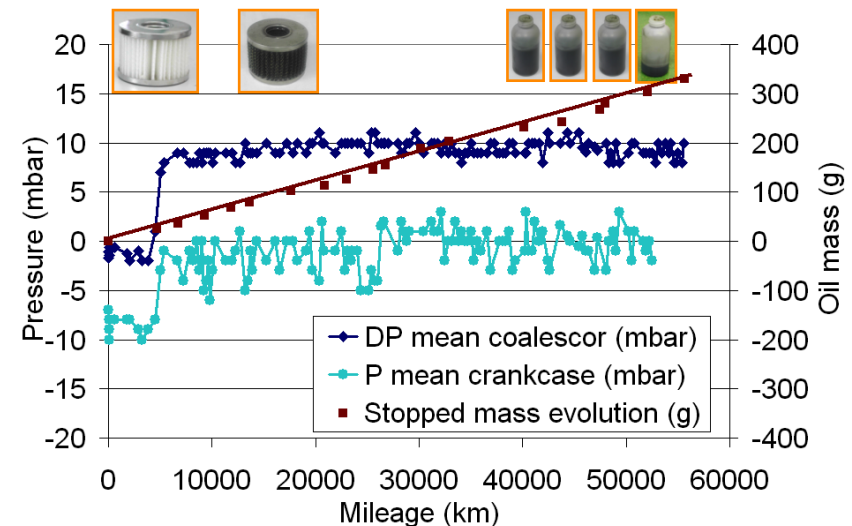


Engine Ageing Reduction

Engine Dyno Tests (1.6 l Diesel)



60 000km Driving Test (2.0l diesel)



60 gr/10,000km Oil Carryover Saving

Up to 25%* Ash Deposit Saving into DPF
0.2% Fuel Consumption Increase Limitation
at 100 000km

*50% of DPF Ashes linked to Blow-By Oil Carryover



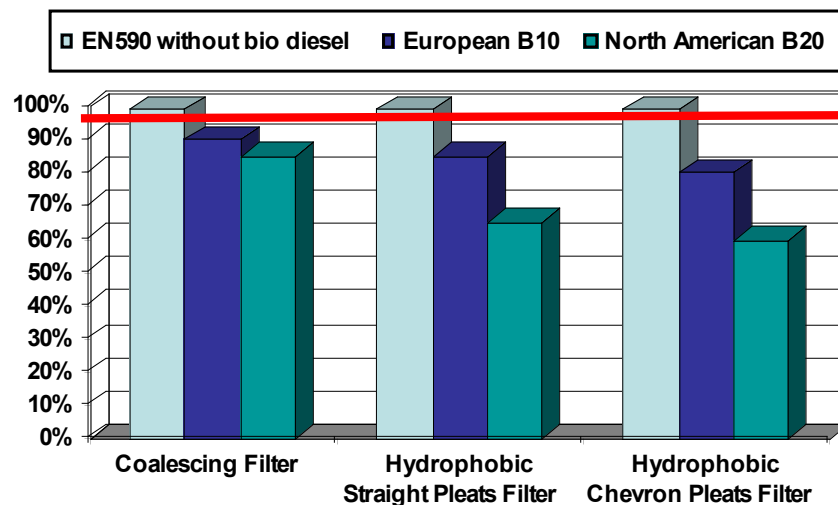
Bio Fuels Compatibility



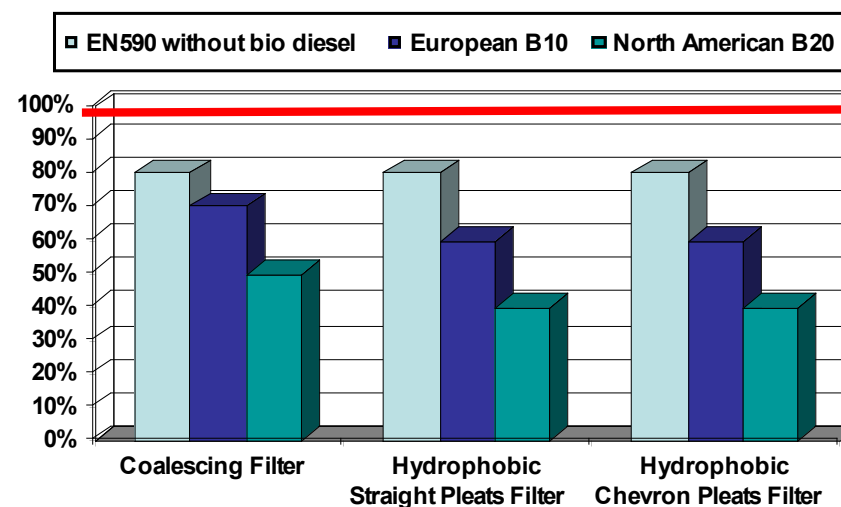
Bio Diesel Compatibility

Laboratory Tests Investigations

ISO 4020, 150l/h, 2% water
(Filter in Suction)



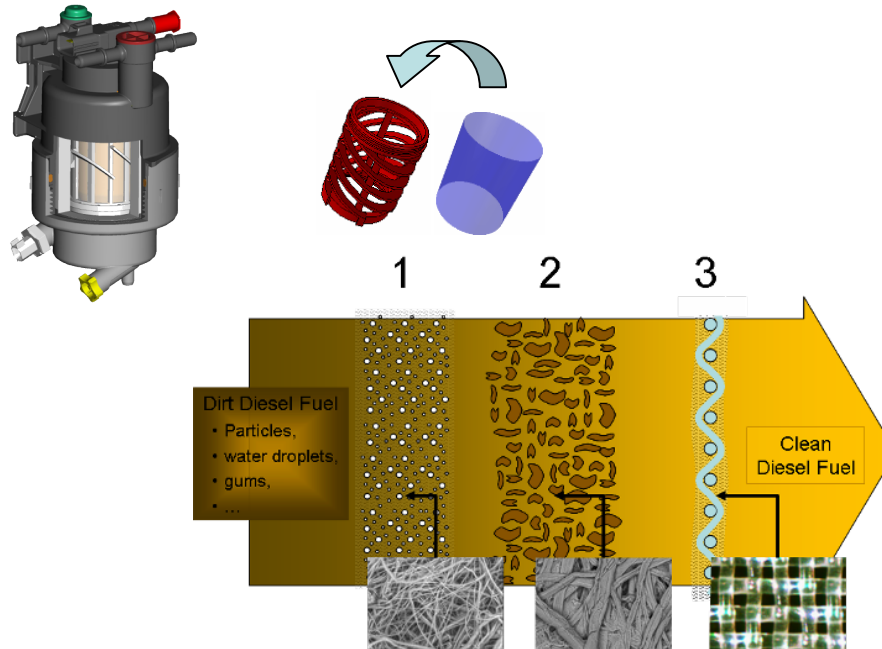
ISO/TS 16332, droplets 60µm, 180l/h, 2% water
(Filter in Suction)



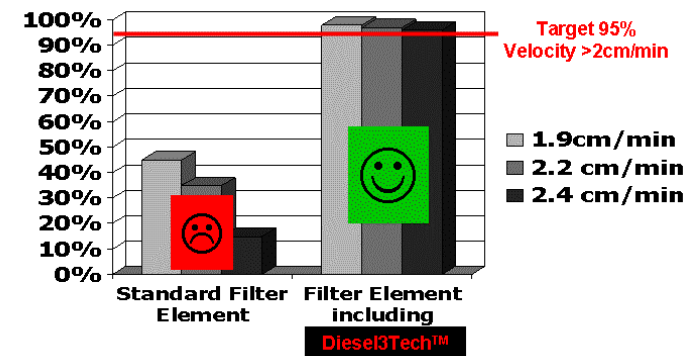
New Filtration Technology Need for 95% Separation OEMs Requirement



Bio Diesel Compatibility



Emulsified Water ISO/TS 16332:09/2006 Validation B20
(60µm, Fuel TIF 12mN/m)



Guaranty Optimum Injection System Protection in US ULSD-B20



Automotive passion

Conclusion



Plastic, Compact and Integrated Liquid Filtration Solutions Permit up to 1% Fuel Consumption Saving on NEDC



High Efficiency Coalescing Blow-By Oil Mist Separators Permits up to 0.2% Vehicle Fuel Consumption Increase at 100,000km



Multi Layers Diesel3Tech™ Technology Permits Optimum Injection Systems Protection in Bio Diesel Fuels

More information, visit us at Booth 3150