

Per-Tec Ltd



Power Trap™.

Ultrafine PM Control without Performance Penalties

Presented By:

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Presented August 25th , DEER 2003, Rhode Island, USA

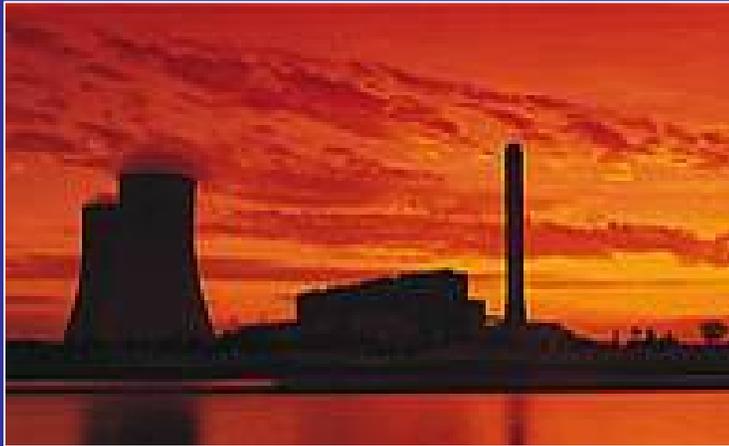
Today's Presentation

- Company Introduction
- The Product
- How It Works
- Applications
- Features
- Test Results
- System Maturity
- Case Studies

Per-Tec Ltd

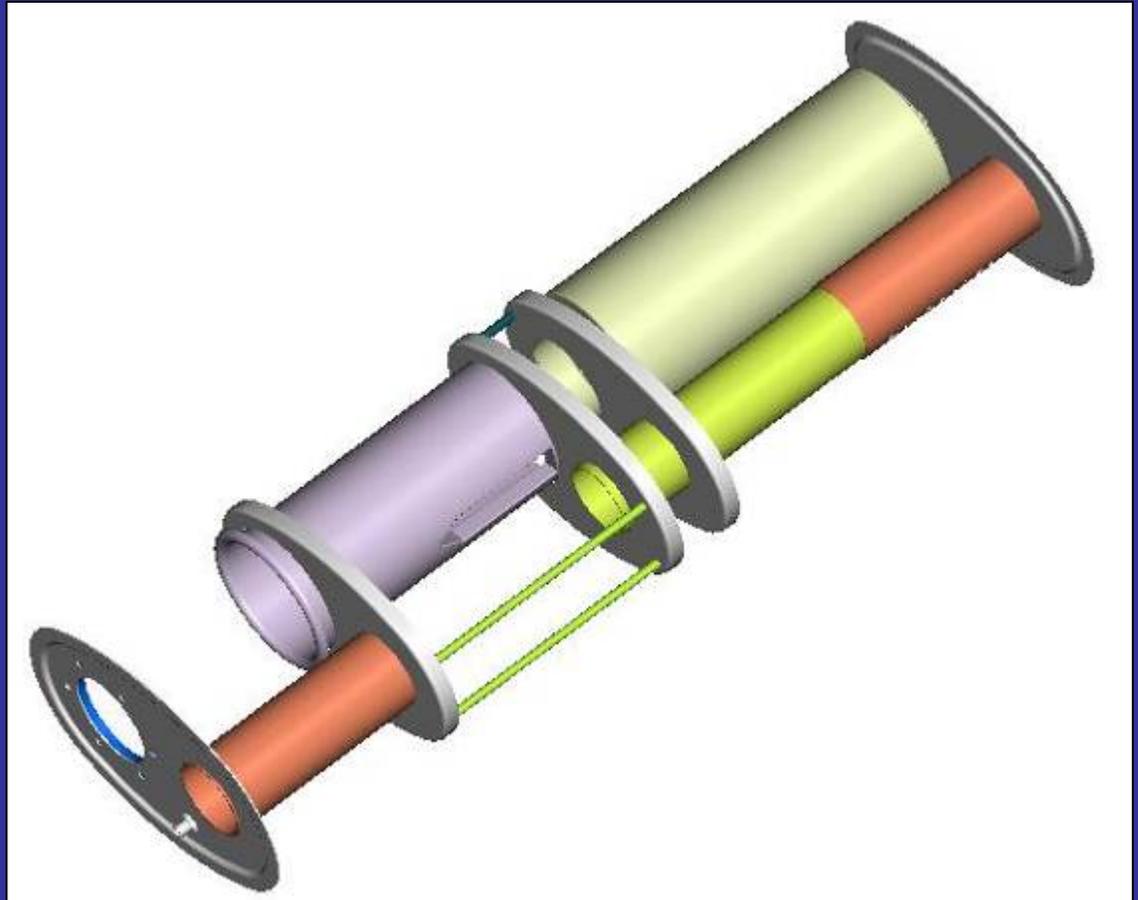
- 15 Years of Research
- Awards
 - DTI SMART Innovation Award
 - Mersey Basin Environmental Innovation Award
 - Green Fleet Diesel Innovation Award

Electrostatic Precipitation is Well Understood

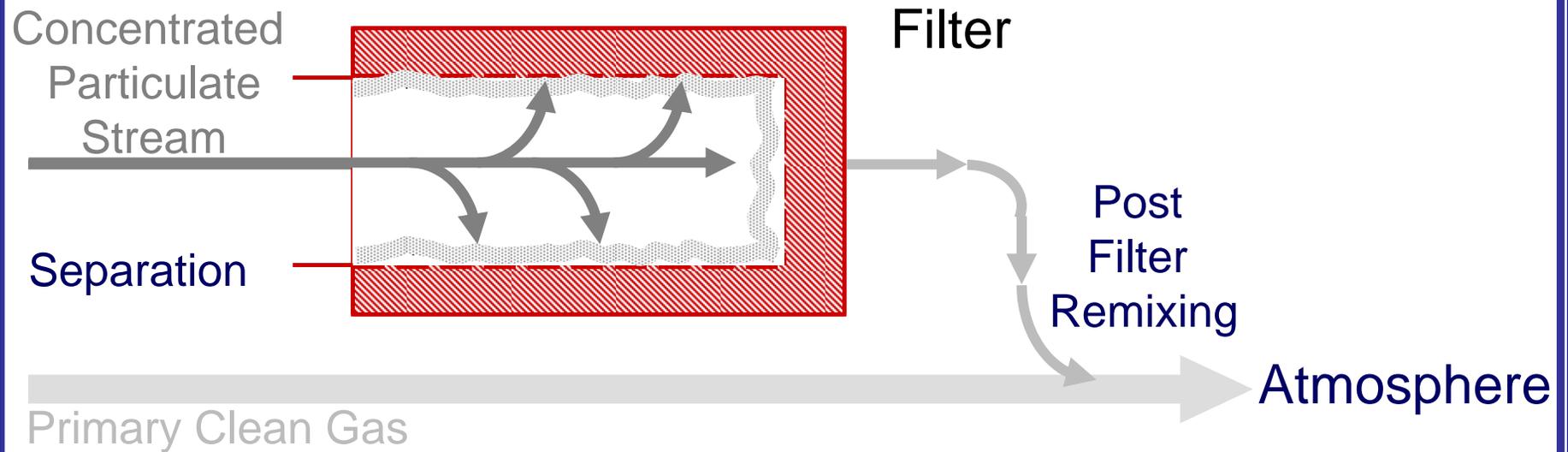
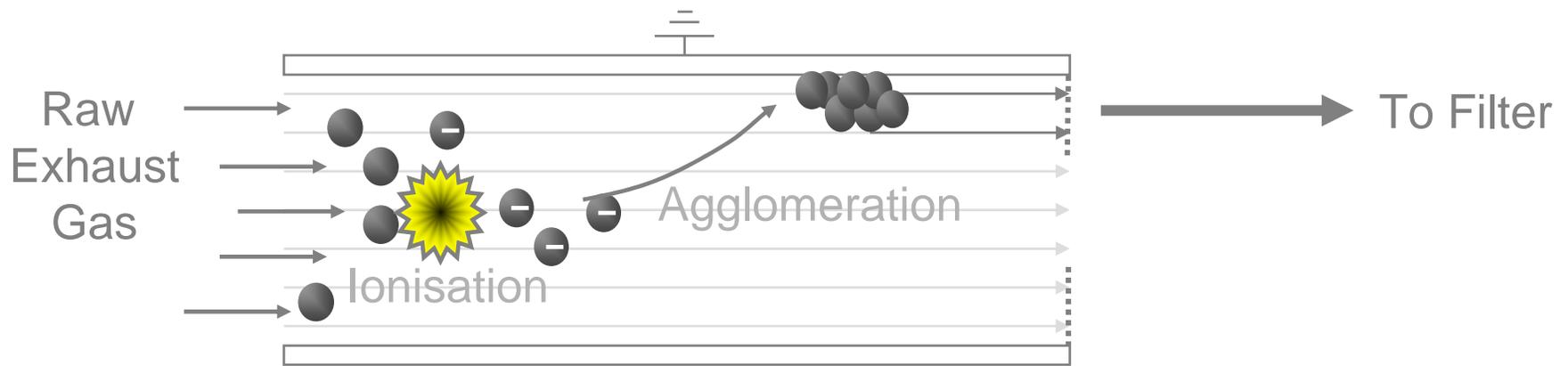


PowerTrap™

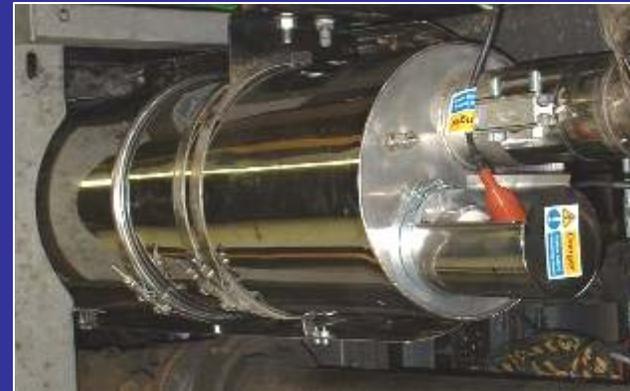
- **Electrostatic Precipitation Process**
- **Non-Temperature Dependent System.**
- **Cannot Physically Block.**
- **Controlled Regeneration**
- **Low Power Source**



The PowerTrap™ Process



Existing Trials



PowerTrap™ Features Page 1

- Controlled Regeneration Process from Vehicle's Own Power
- Controller Monitors % Time vs. % Load to Determine Regeneration Point
- CPU is Fully Programmable

PowerTrap™ Features Page 2

- Back Pressure is Pre-Determined
- Fuel Sulphur Tolerant
 - System Tested with both on and off- road diesel to 2000 ppm.

PowerTrap™ Features Page 3

Euro 4 Requirement

**Dashboard
Operational
Indicator**



- Dashboard Indicator to Confirm System is Operational

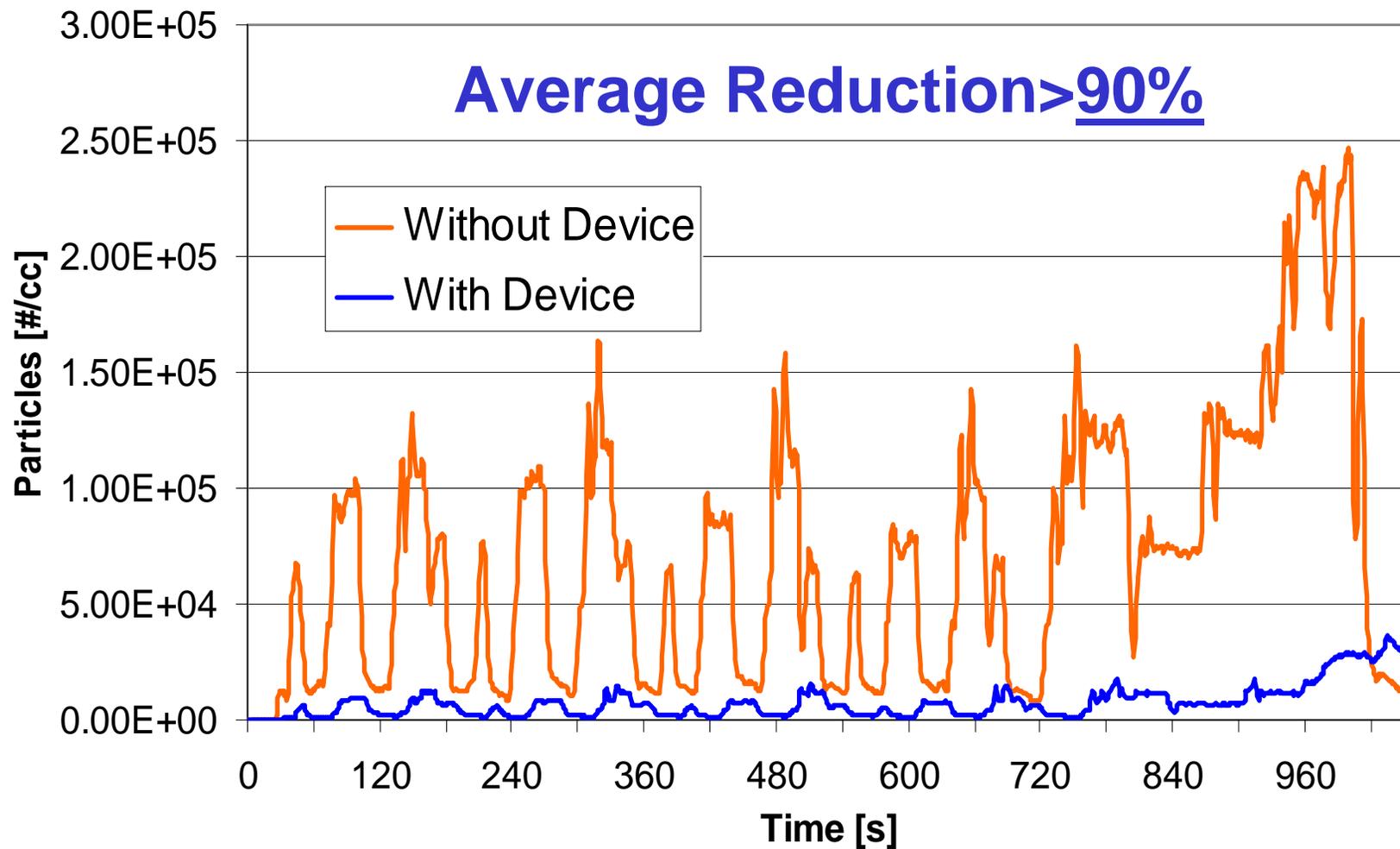
PowerTrap™ Features Page 4

- Power Consumption
 - 12 V System
 - Electrostatic Process (Continuous DC)
Average 15 Watts
 - Periodic Regeneration (once every 12-15 hrs)
 - Average 40 Amps for a 60-80 second period
 - 24 V System
 - Electrostatic Process (Continuous DC)
Average 15 Watts
 - Periodic Regeneration (once every 4-7 hrs)
 - Average 35 Amps for a 50-60 second period

PowerTrap™ Features Page 4

- Potential to Replace Original Silencer
 - Excellent Noise Reduction Performance
- Platform Flexibility
 - The Power Trap System has been Designed to Accommodate Available Filtration Technology and Coatings

EU Light Duty Transient Drive Cycle Cold Start 60nm CPC (2.5ltr Euro 1)

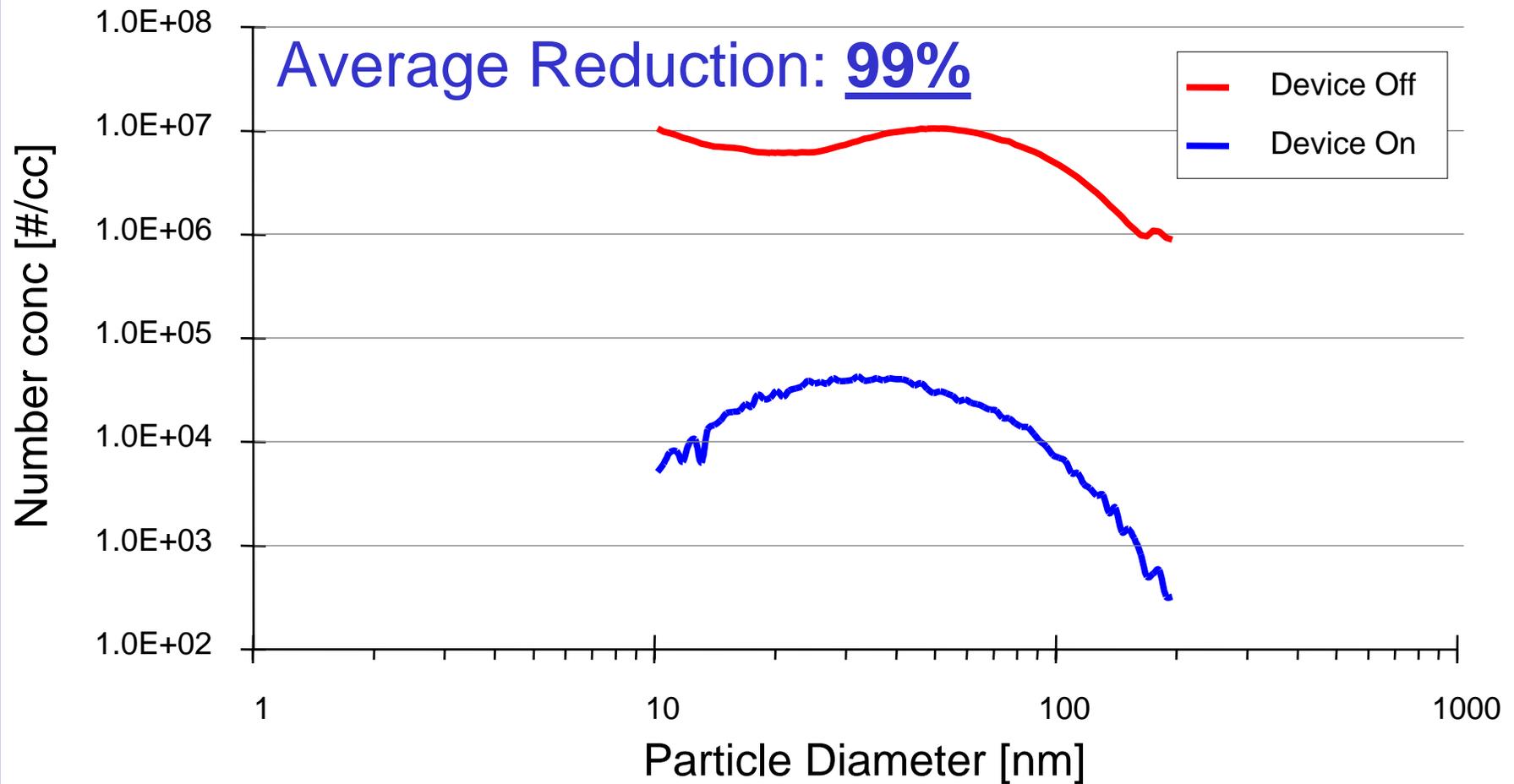


Independently Tested by:



Shell Global Solutions

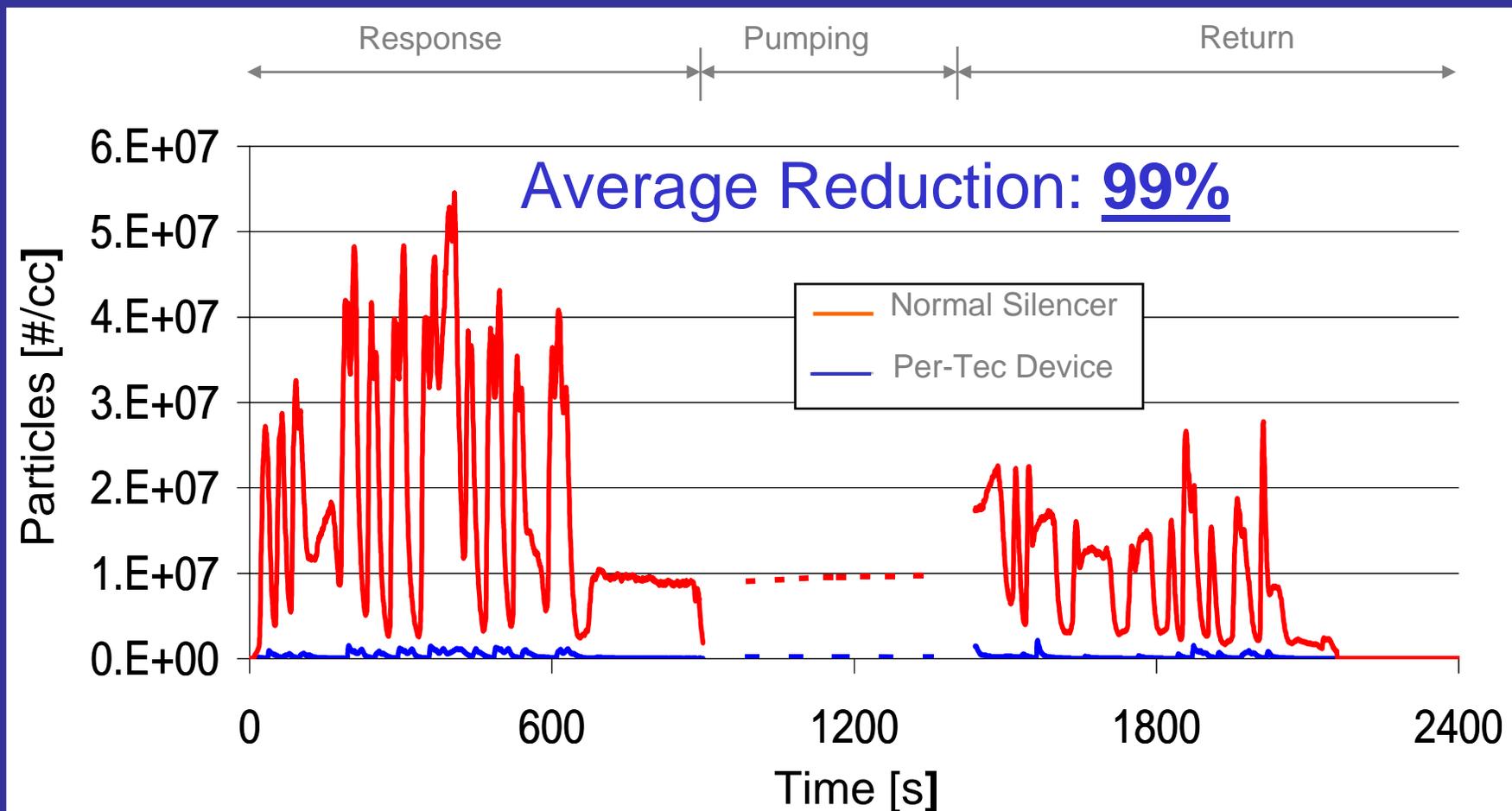
8.2I Dennis Sabre Fire Appliance Steady State SMPS Scan (10-200nm)



Independently Tested by:



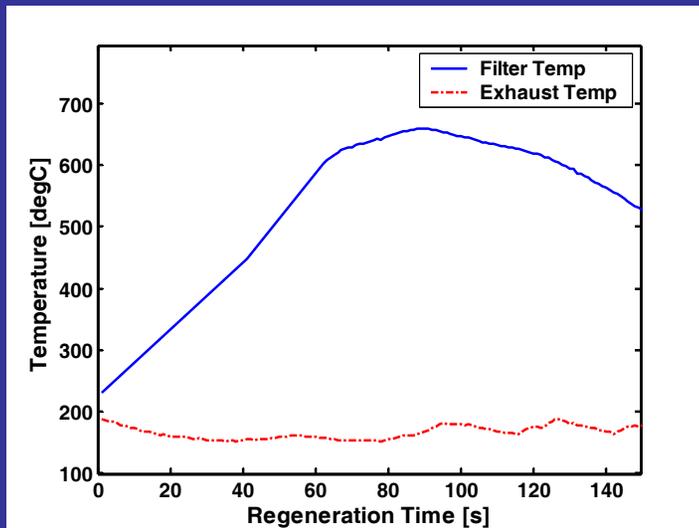
Emergency Fire Appliance Drive Cycle 60nm Particle Reductions



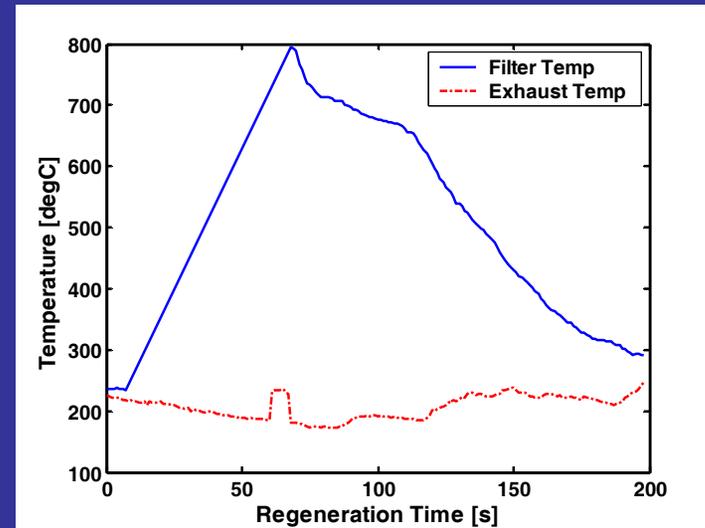
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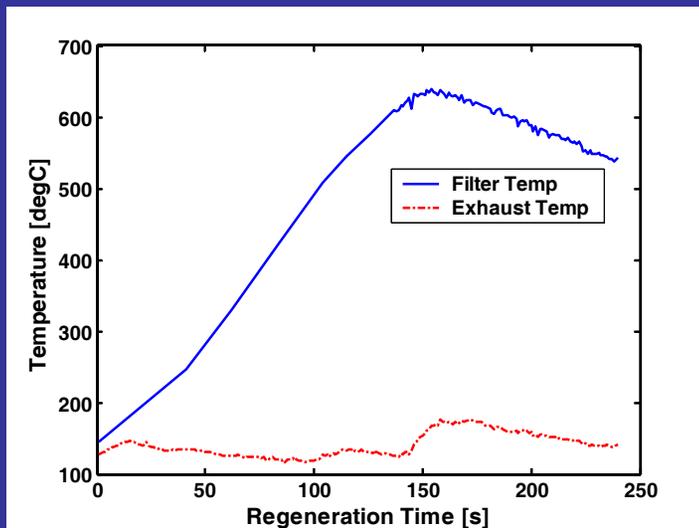
Controlled Regeneration Curves



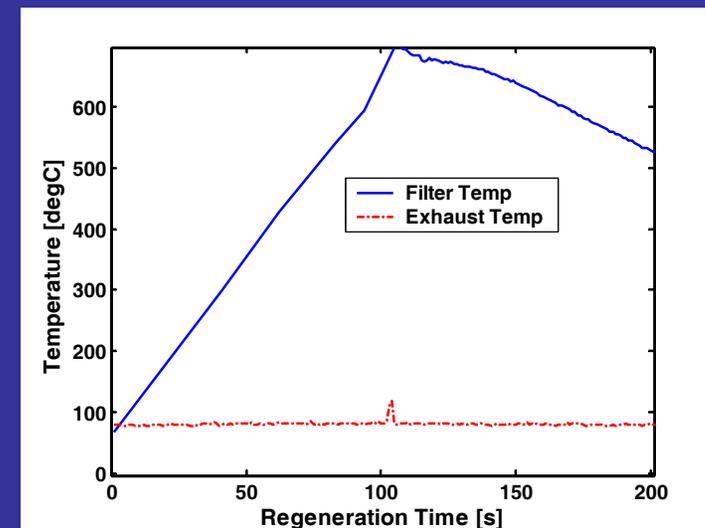
Dennis 8.5l Fire Appliance



Dennis Dart Passenger Bus (Cummins 6BT Engine)



Metrocab 2.5l Taxi



Dennis Dart Passenger Bus (Cummins 6BT Engine)

Regeneration Count 3598

PSU (kV) 29.8

Pre Temp (degC) 219

F1 Temp (degC) 240

F2 Temp (degC) 595

Total current (mA) 0.318

PSU1 current (mA) 0.306

PSU2 current (mA) 0.012

GPS Valid 

GPS Date 13/07/03

GPS Time 17:34:07

GPS Lat 5328.4761N

GPS Long 210.7408W

MPH 30.27



F1 last off temp 0 Regeneration Profile

F1 max off temp 0 F1 R Time 0

F2 last off temp 604 **Per-Tec RDA**
SIEMENS

F2 max off temp 804 F2 R Time 150

Data 
Recieved

Data 
Valid

flash errs
0

Wd errs
0

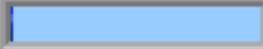
status
8508

port errs
0

QUIT

Filter 1 % 

h:m:s 2:26:42

Filter 2 % 

h:m:s 7:59:57

System Maturity

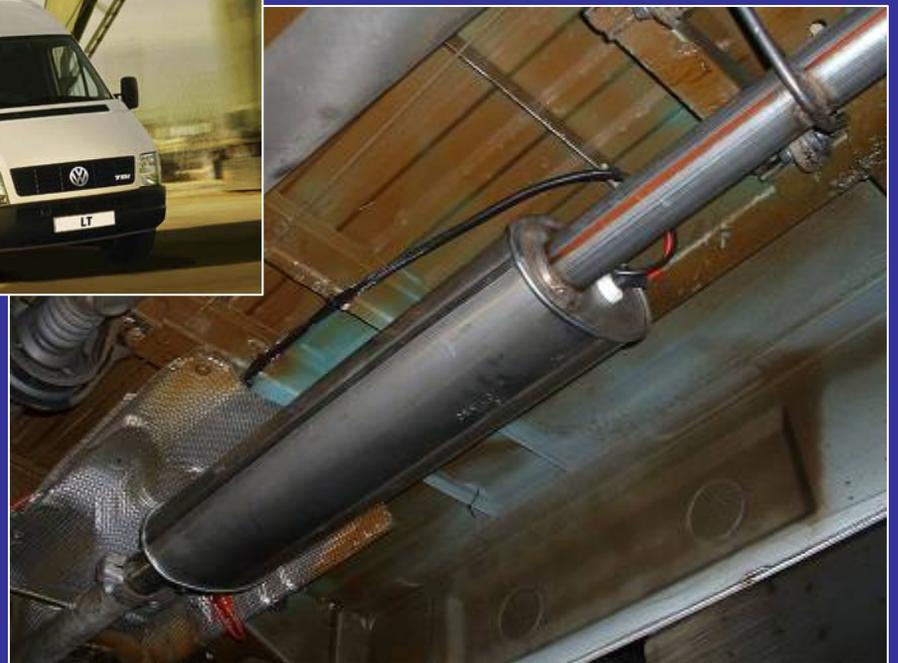
- European Type Approval Attained
- Now in production, being delivered to customers
- UK Government approval
- 75% subsidy; currently up to 3.5 tonne
- Heavy duty in final stage of approval
- 3 OEMs and 1 Global Engine Supplier are Currently Working with Per-Tec

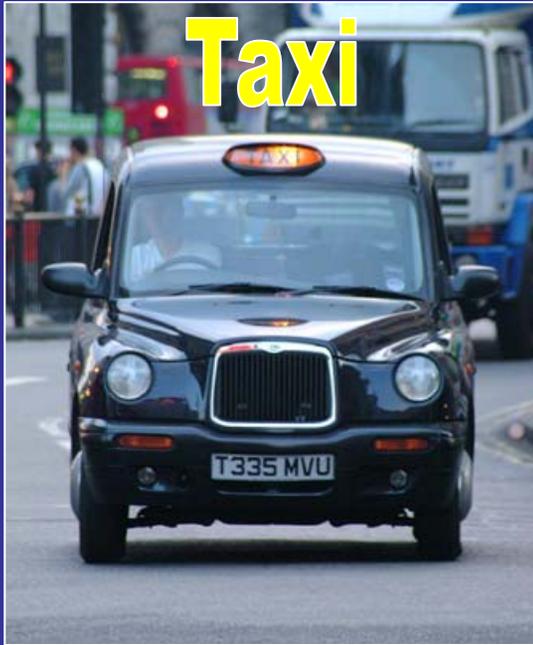
Cost

- Currently competitive with other existing systems offered for the UK retro-fit market
- OE Pricing is Achievable



VW LT35 Van





Fire Appliance



Per-Tec Ltd



THE UNIVERSITY
of MANCHESTER

**May We Thank John
Fairbanks and the
Department of Energy for
this Kind Invitation**

Any Questions?