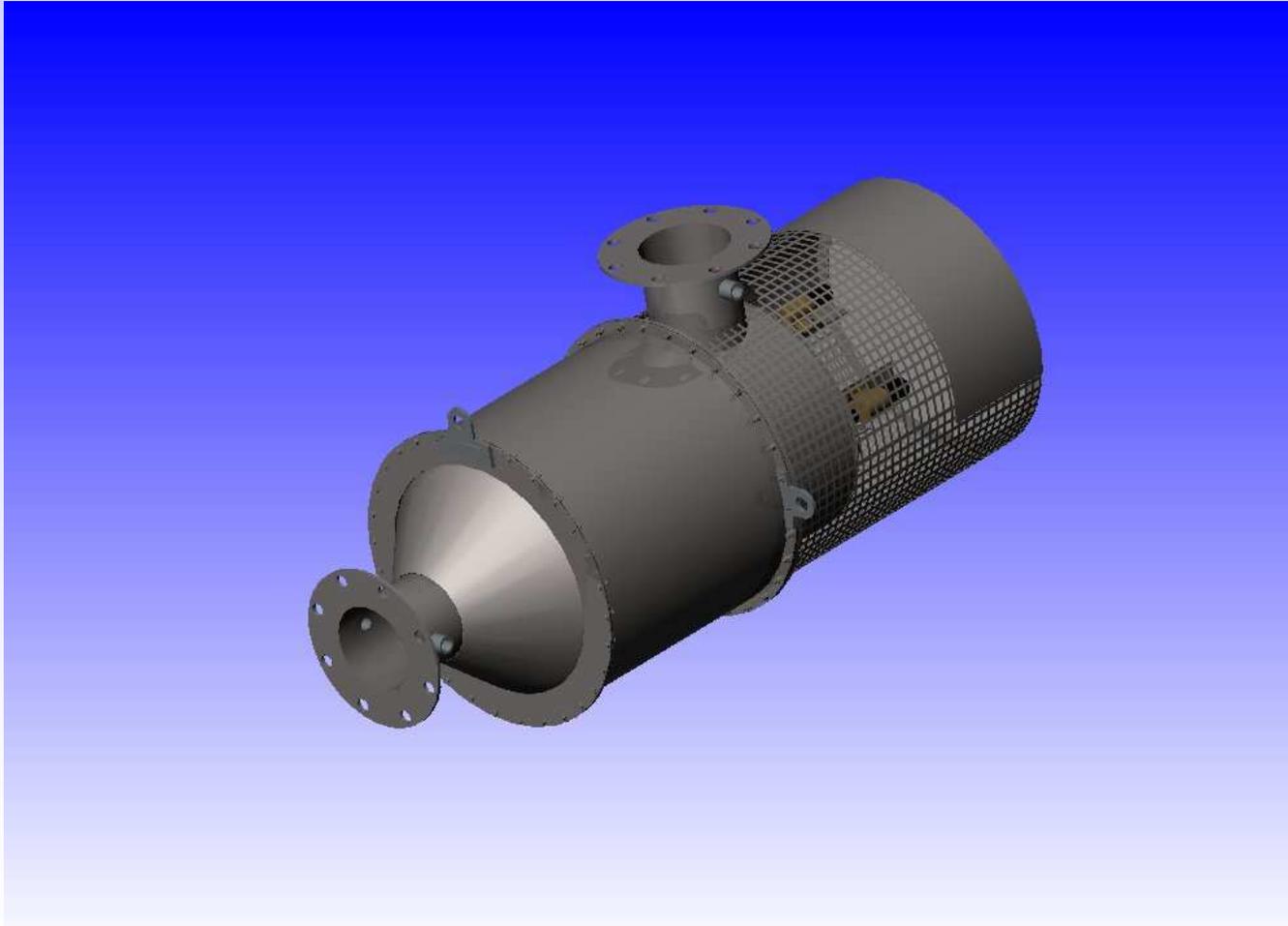


RYPOS

Active Diesel Emission Control Systems



RYPOS

Active Diesel Emission Control Systems

- 1. The Company**
- 2. The Product**
- 3. Field Testing**
- 4. RYPOS in House Testing**
- 5. RYPOS Product Specifications**
- 6. Conclusions**

RYPOS

Active Diesel Emission Control Systems

The Company

RYPOS is a privately owned company that engaged in research and development to design and manufacture an active Diesel particulate filter for the reduction of harmful emissions from Diesel engines.

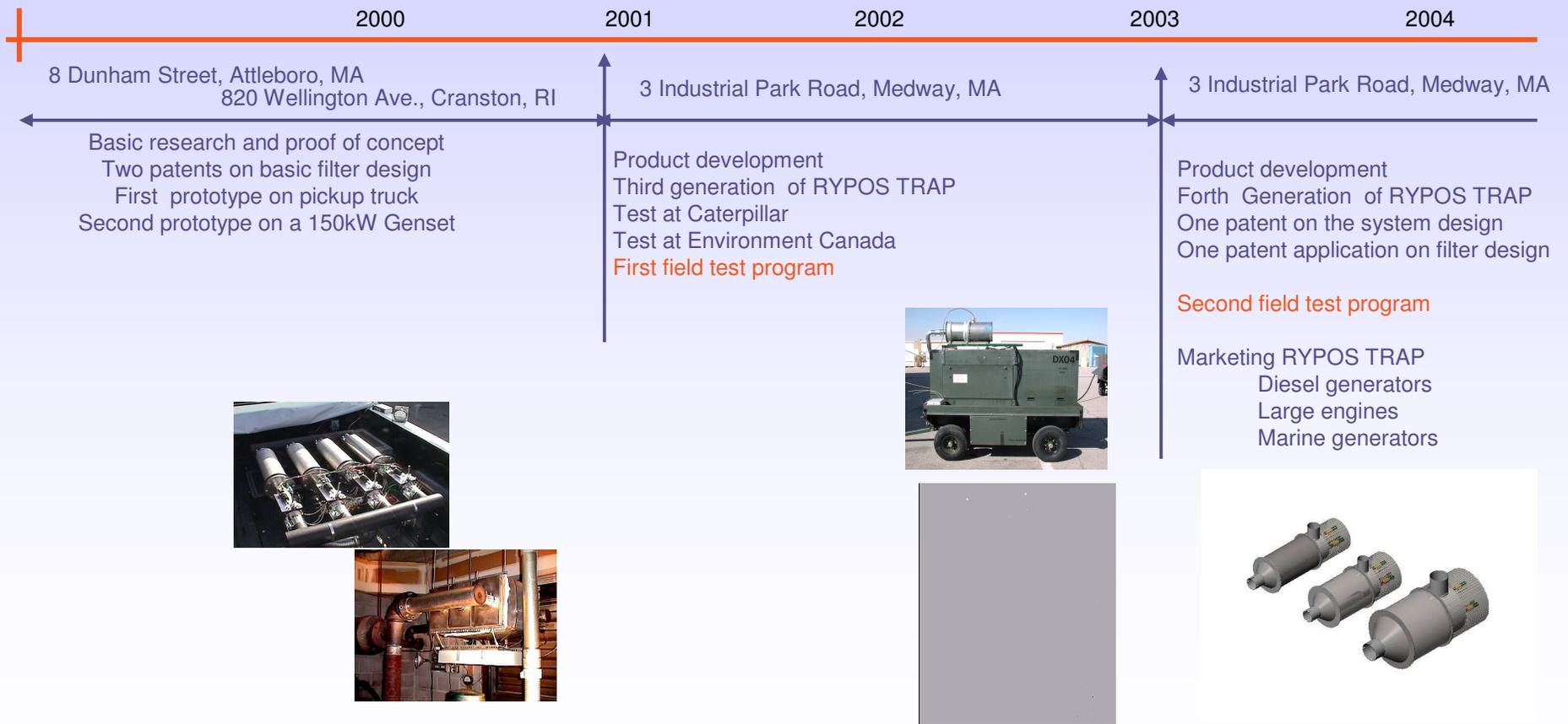
RYPOS' effort has led to:

- **proprietary control circuitry,**
- **4 U.S. Patents protecting the system design and filter cartridge design.**

RYPOS

Active Diesel Emission Control Systems

Company History



RYPOS

Active Diesel Emission Control Systems

The Product

RYPOS Trap is an active Diesel particulate filter system

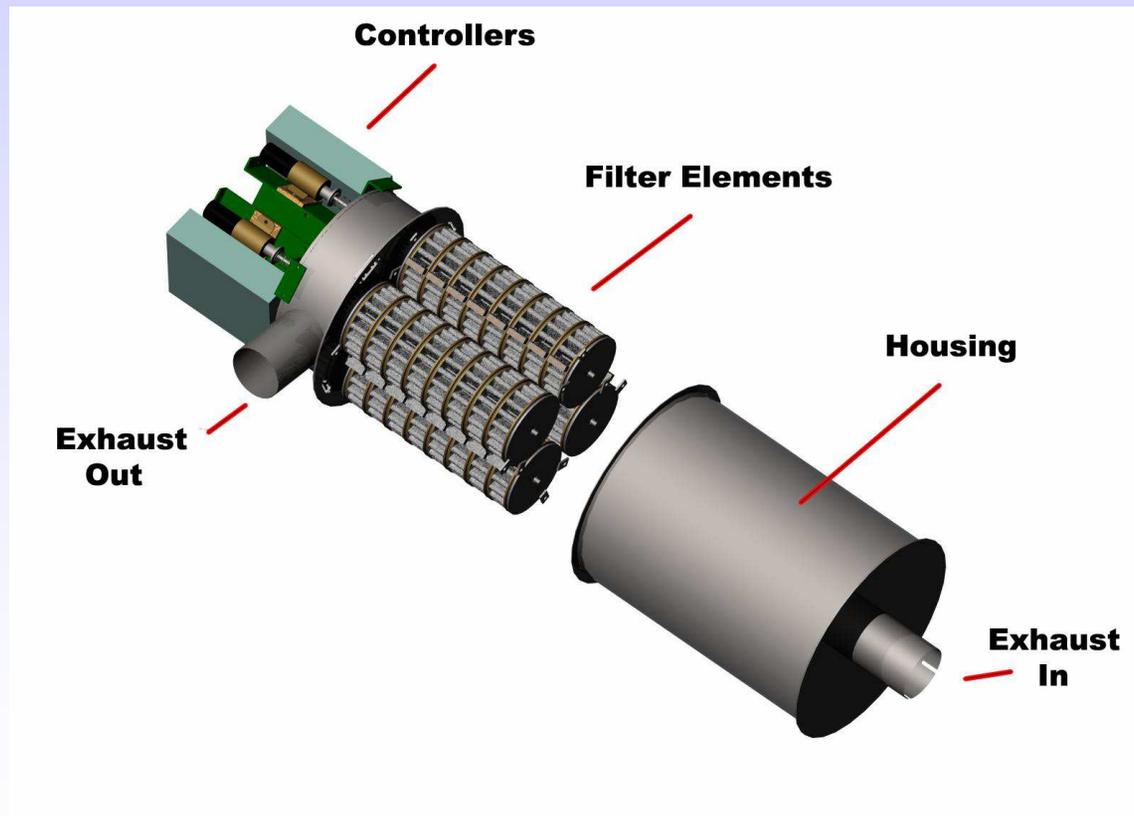
RYPOS Trap has very low electric power consumption for regeneration.

The regeneration is independent of engine exhaust temperature or fuel sulfur content.

RYPOS

Active Diesel Emission Control Systems

The Product



RYPOS

Active Diesel Emission Control Systems

Electrical Control System

The operation of the RYPOS Trap is controlled by a microprocessor.

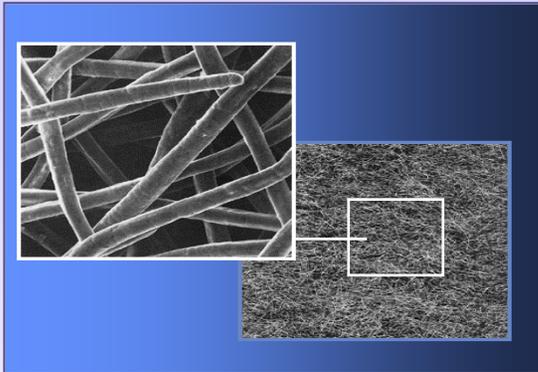
The controller monitors the trap and periodically, as required, an electric current is passed through a filter element, which then acts as a heating element.

- Automatic regeneration cycles
- Timing sequence, duty cycle, flow control and filter unit selection
- Pressure sensing is used to initiate regeneration cycles
- Electronic switching of high current to filter elements (automatic)
- Monitoring and remote display

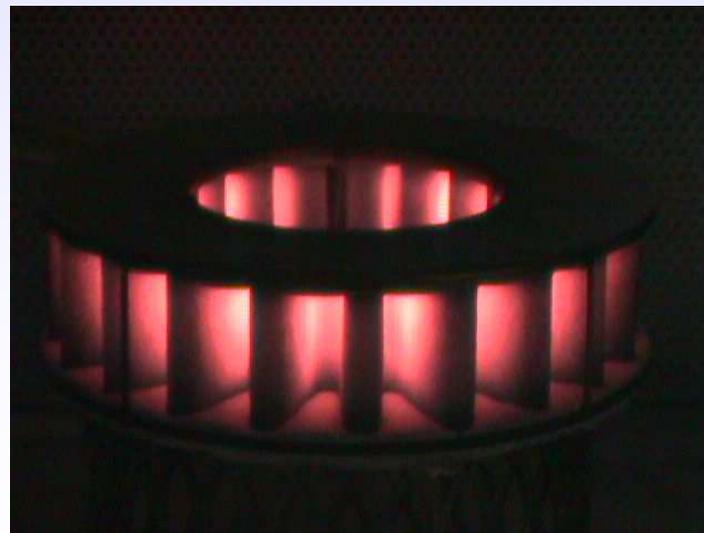
RYPOS

Active Diesel Emission Control Systems

Patented Active Filter Design



- o Electro conductive
- o High porosity
- o Low back pressure
- o Withstands high temperatures
- o Heats up fast (low thermal mass)
- o High filter efficiency



RYPOS

Active Diesel Emission Control Systems

RYPOS Active vs. Passive Traps

RYPOS ACTIVE TRAP	PASSIVE TRAPS
Sintered Metal Fibers	Ceramic Cell Cordierite Silicon Carbide
Active Regeneration Using Electric Heating	Passive Regeneration Using Oxidation Catalyst (precious metal) Or Fuel Additives (heavy metal)
Controlled Regeneration Not Sensitive to Exhaust Temperature	Uncontrolled Regeneration Sensitive to Exhaust Temperature
Not Sensitive to Sulfur	Sensitive to Sulfur
Low Back Pressure (< 40 inches of water)	High Back Pressure(> 80 inches of water)

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Active Diesel Emission Control Systems

Field Testing

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Active Diesel Emission Control Systems

100kW Diesel Generator, Riverside, California March – September, 2002



RYPOS

Active Diesel Emission Control Systems

200kW Diesel Generator, Riverside, California March – September, 2002



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75kW Diesel Generator, Edwards AFB, California March – September, 2002



RYPOS

Active Diesel Emission Control Systems

75kW Diesel Generator, Edwards AFB, California March – September, 2002



RYPOS

Active Diesel Emission Control Systems

7WTC Demonstration Project January, 2004



RYPOS

Active Diesel Emission Control Systems

7WTC Demonstration Project January 2004



RYPOS

Active Diesel Emission Control Systems

7WTC Demonstration Project

Engine: Cummins VTA28-G1
Power: 567kW (760 hp)

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Active Diesel Emission Control Systems

Southworth-Milton, NH
October, 2003



RYPOS

Active Diesel Emission Control Systems

Southworth-Milton, NH

Engine: CAT 3406

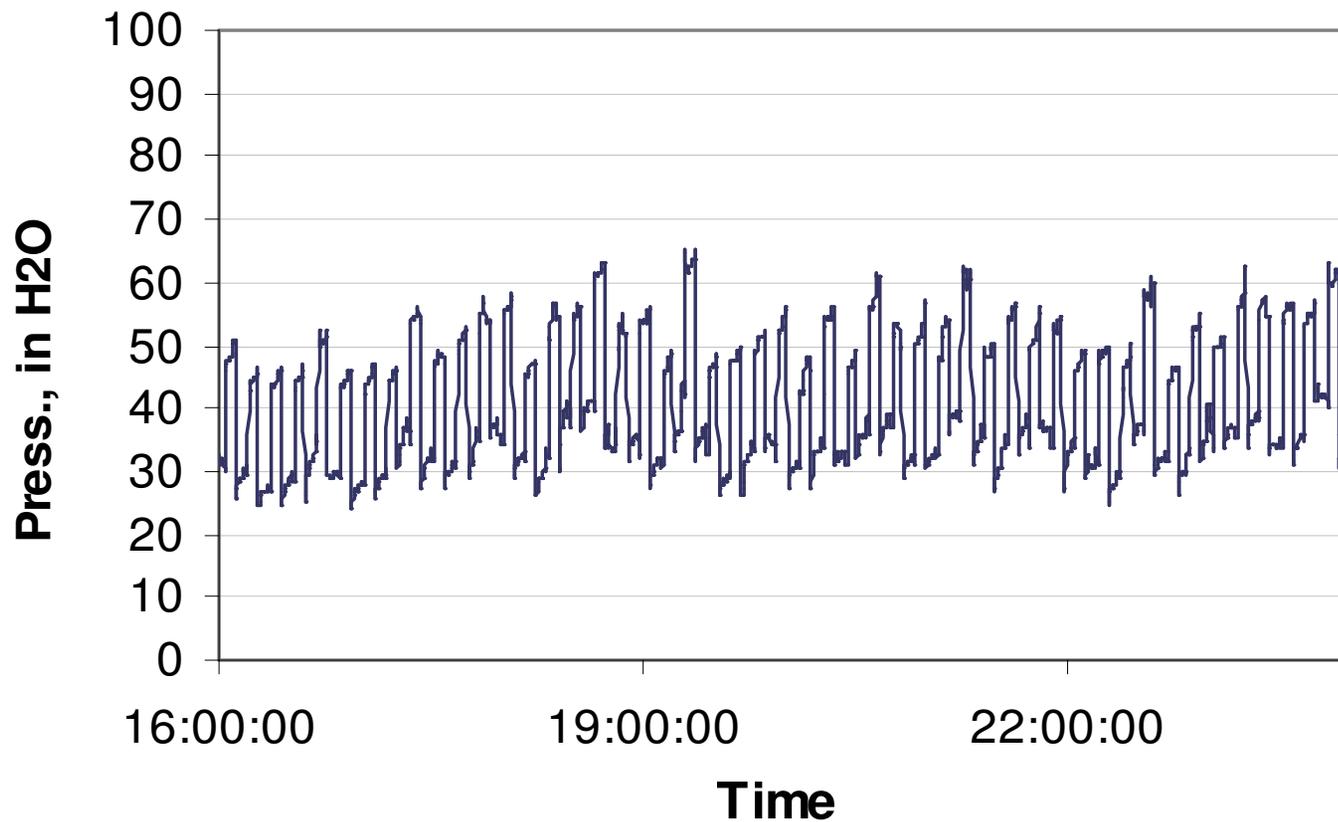
Power: 350kW (490 hp)

RT16

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Active Diesel Emission Control Systems

Pressure Profile on November 22, 2003, 3 pm- 12 am



RYPOS

Active Diesel Emission Control Systems

UNC Health Science Library, NC
June, 2003



RYPOS

Active Diesel Emission Control Systems

UNC Health Science Library, NC

Engine: Perkins D150P4

Power: 150kW (191 hp)

RT8

RYPOS

Active Diesel Emission Control Systems

Future Projects

- 2/21/2004 Locomotive Test, SwRI
(428 hp, 2600 cfm) RT24 with DOC**
- 3/15/2004 Navy Test, Philadelphia: RT24**
- 6/01/2004 Navy Funding, California:2 RT12 with DOC
6 RT32 with DOC**

RYPOS

Active Diesel Emission Control Systems

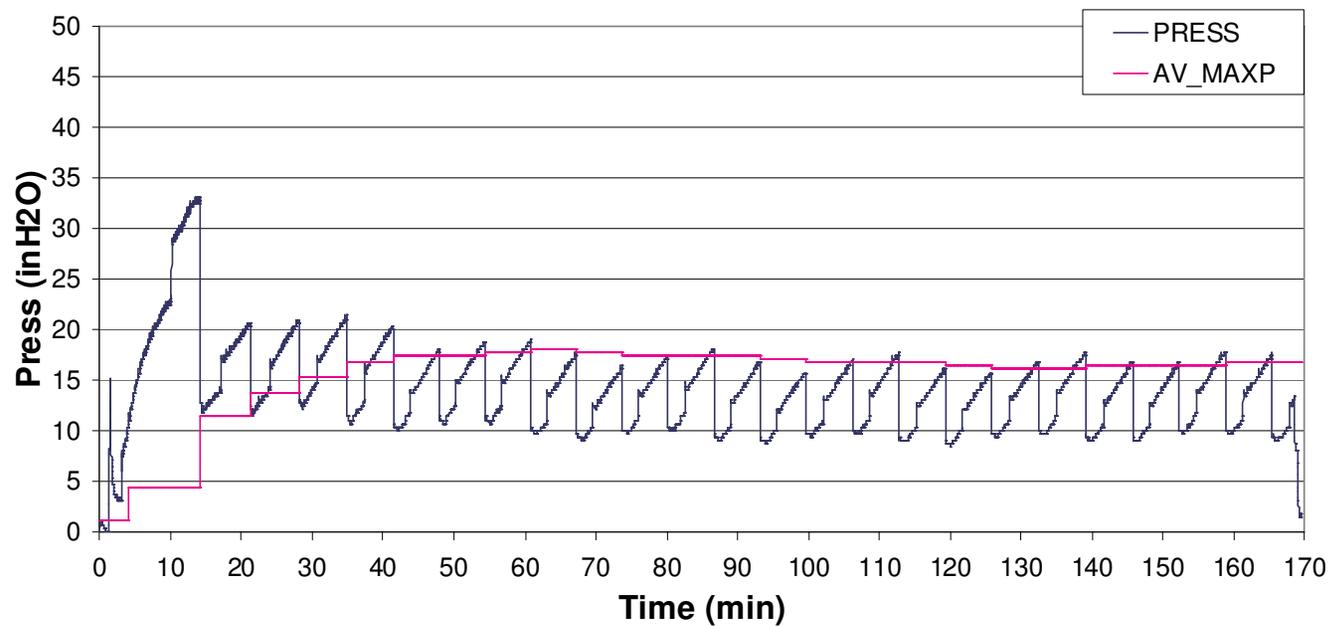
In House Testing: 180kW Genset



RYPOS

Active Diesel Emission Control Systems

3 Layer Filter Media Sequential Filter Regen

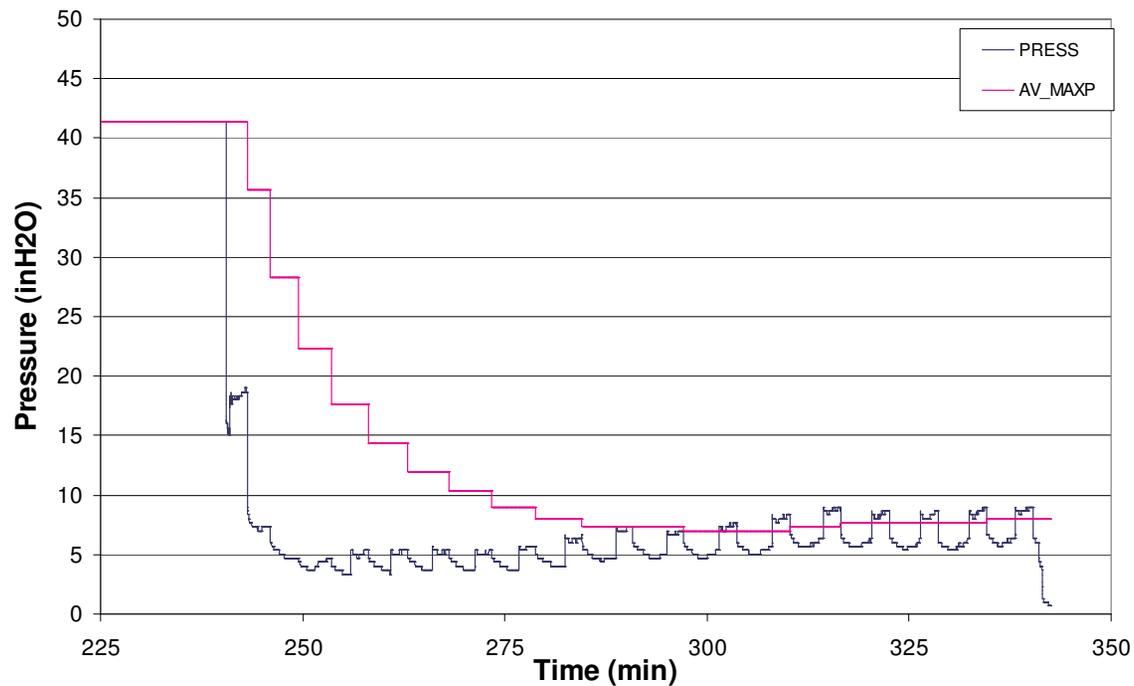


Load: 75kW, Exhaust Flow: 850cfm

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3 Layer Filter Media Two Filter Regen



Load: 75kW, Exhaust Flow: 850cfm

RYPOS

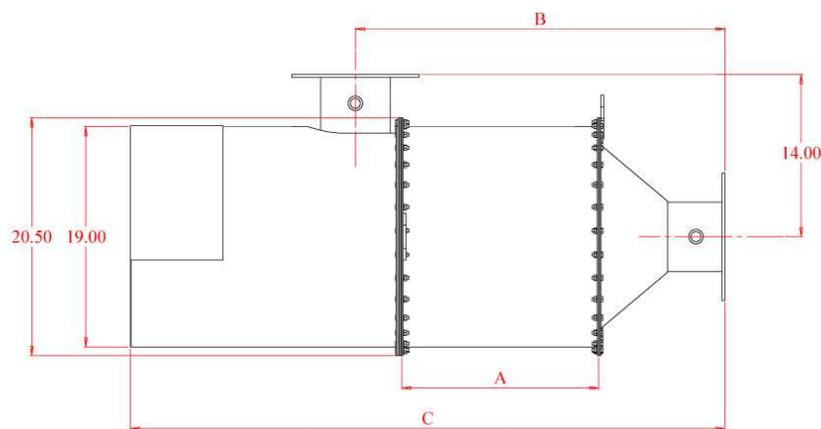
Active Diesel Emission Control Systems

RYPOS Product Specifications

RYPOS

Active Diesel Emission Control Systems

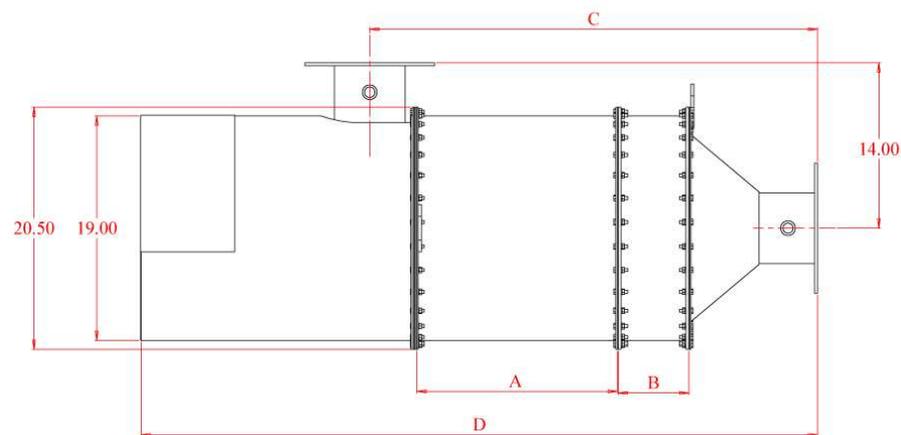
RYPOS TRAP Without DOC



RYPOS

Active Diesel Emission Control Systems

RYPOS TRAP With DOC



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Active Diesel Emission Control Systems

Conclusions

- **Reliable regeneration independent of exhaust temperature**
- **Consistency in maintaining low engine back pressure**
- **High Performance, up to 90% of soot.**
- **Low energy consumption, an average of 1.25kW for a 500kW Genset.**