

Parratech Emission Control

Proven Emission Reduction Technology

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Parratech Selective Catalytic Reduction (SCR) System

Suited to Stationary Diesel & Gas Engines

Proven Emission Reduction Technology

Reducing up to 98% nitrogen oxide (NOx), 90% carbon monoxide (CO) & 70% non-methane hydrocarbons (NMHC)

With stringent air quality regulations for power generation and industrial applications, there is an increasing need for reducing emissions in today's world. Selective Catalytic Reduction is a post-combustion nitrogen oxides (NOx) control technology capable of achieving NOx reductions of up to 98 percent.

The Parratech Selective Catalytic Reduction System achieves high NOx reductions by optimally distributing an ammonia (NH₃)

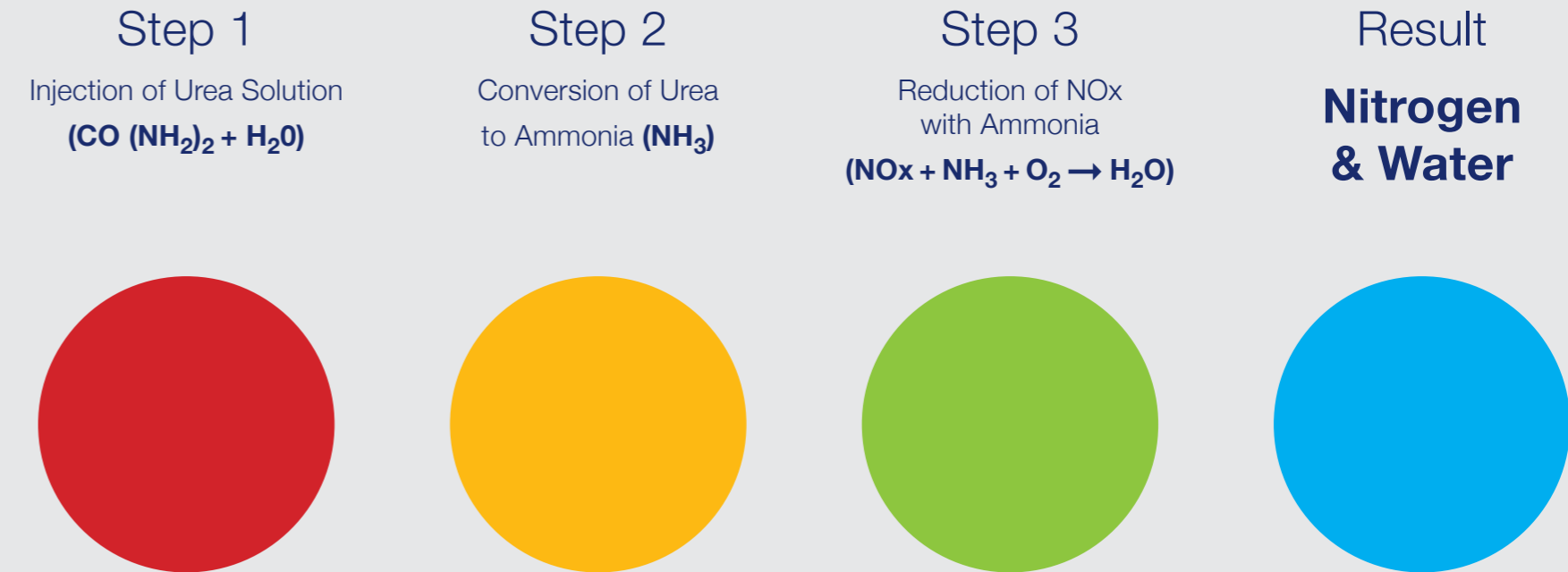
based reagent into the flue gas, which then passes through layers of catalyst. The NH₃ and NOx react on the surface of the catalyst, forming harmless nitrogen (N₂) and water (H₂O).

Parratech's Selective Catalytic Reduction Systems are used for the control of NOx on diesel and gas fired engines, gas fired turbines along with various industrial applications including process & glass furnaces, waste incineration plants & boilers.



SCR Principle

Selective Catalytic Reduction with Aqueous Urea as Reducing Agent



Main Components

Design, Construction,
Performance & Operation

- Oxidation Catalyst
- SCR Reactor
- SCR Catalysts
- NOx Analyser Cabinet
- Urea Dosing Unit
- Control Panel - PLC
- Modbus Interface System
- Urea Mixing Pipe with Injection Nozzle
- Urea Pump Station
- Urea Tank
- Compressor



SCR Reactor

Design, Construction,
Performance & Operation

The SCR Reactor is constructed from heavy duty heat resistant carbon steel and also consists of heavy bracing to ensure it is Explosion Resistant to AS 3814-2009.

The SCR Reactor is designed for ease of thermal lagging & also considers maintenance access and catalyst loading and unloading.

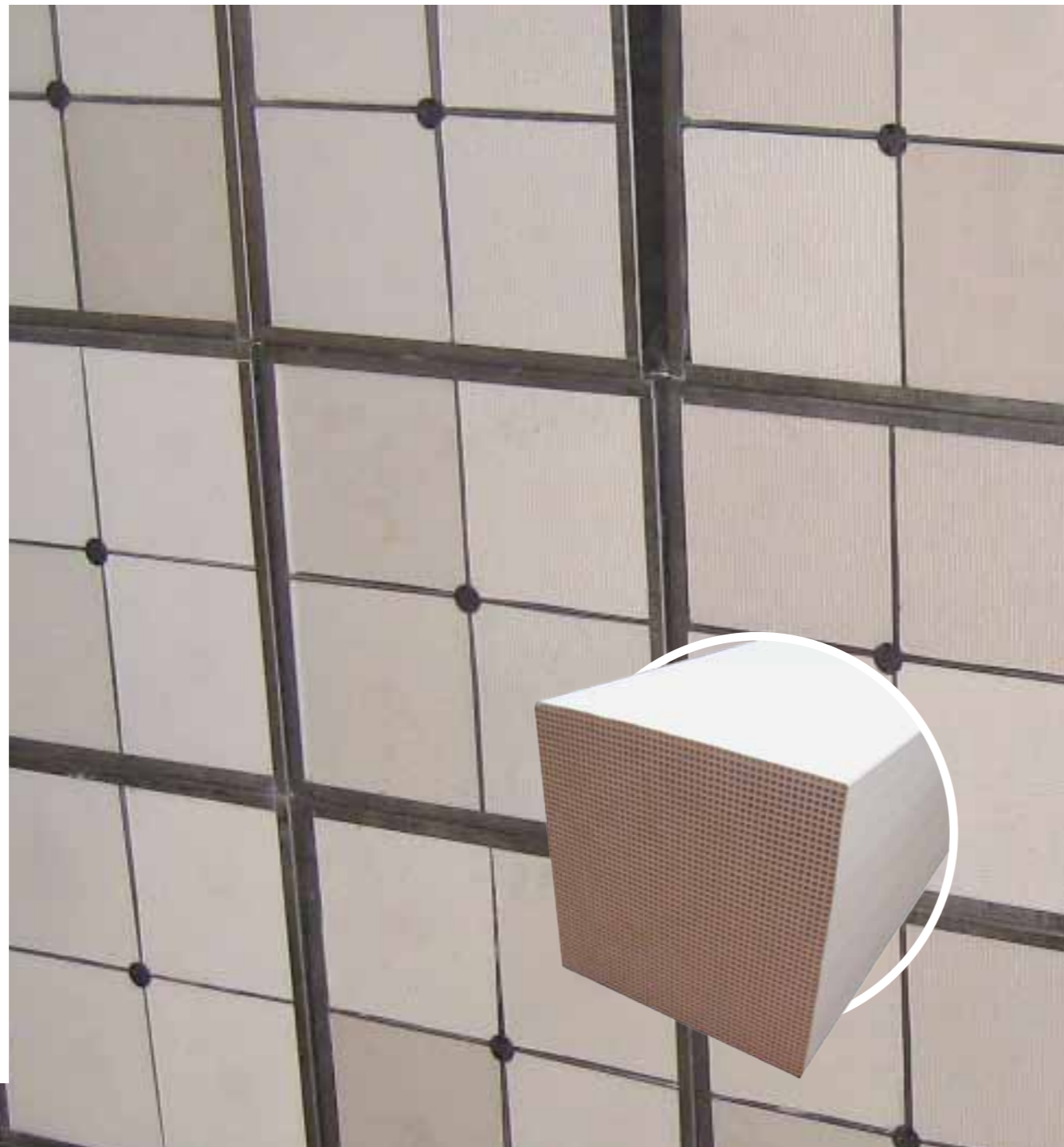
Flanges are also welded to the inlet & outlet of the SCR Reactor.

SCR Catalysts

Design, Construction,
Performance & Operation

The SCR Catalyst is specifically designed to reduce NOx emissions. Each layer of honeycomb catalyst is fully extruded to TiO_2 WO_3 - V_2O_5 .

The SCR Catalyst is designed and constructed to withstand high activity and long operating times



Oxidation Catalyst

Design, Construction,
Performance & Operation

The SCR Oxidation Catalyst is specially designed for the reduction of Carbon Monoxide (CO) and Non-Methane Hydrocarbons (NMHC).

Due the metallic Catalyst special substrate coating the Carbon Monoxide and Non-Methane Hydrocarbons (NMHC) reduction rate will not be affected by the slipped ammonia/urea. The Oxidation Catalyst is fully housed in a high grade T304 Stainless Steel construction casing with a cover plate allowing easy access for inspection or replacement of the catalyst element.



Control System

Design, Construction,
Performance & Operation

- NOx Analyser Cabinet
- Urea Dosing Unit
- Control Panel - PLC
- Modbus Interface System

The heart of the SCR System is the control system. Our PLC Control system contains the most efficient self-diagnostic software available. It continuously monitors process parameters such as urea flow, pressure, temperature and emission performance.

The high quality, compact cabinet incorporates a LED touch screen operator interface panel which is user friendly and utilized for programming and monitoring along with in instant reporting.

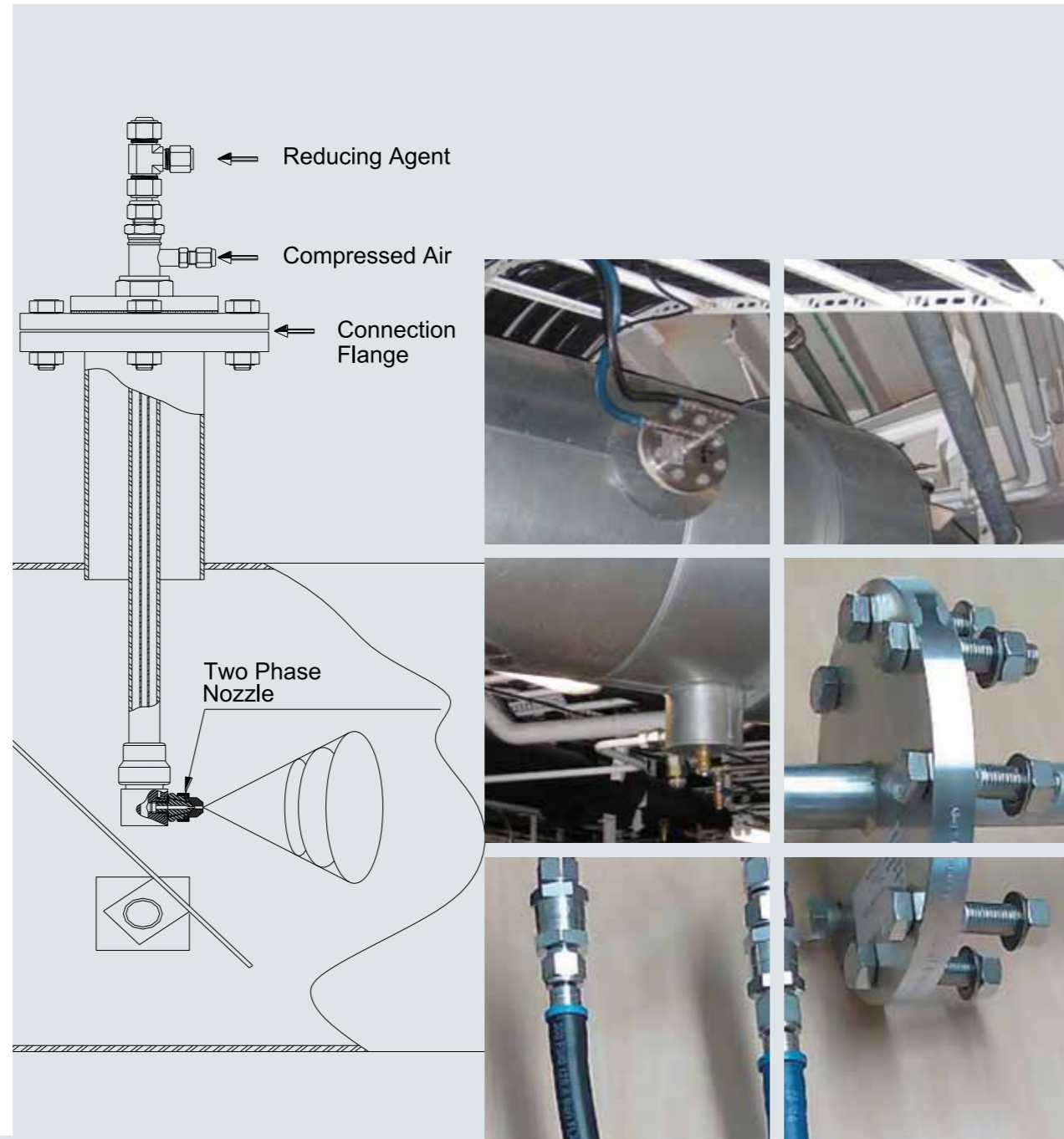


Urea Mixing Pipe with Injection Nozzle

Design, Construction, Performance & Operation

The Urea Mixing Pipe with Injection Nozzle is designed and manufactured for accurate, plug-free performance and reliability. The nozzle delivers injection control of urea into the exhaust stream.

The injection technology is based on a two phase nozzle which is automatically self cleans (water purge) at the start up/shut down of the system. This technology avoids deposit build up and clogging and ultimately ensures reliable operation.



Urea Pump Station

Design, Construction, Performance & Operation

The Urea Pump Station is specially designed to ensure streamline operation.

Unlike other SCR Systems which utilize a variable speed pump, our Urea Pump has constant speed enabling consistent and reliable urea deliver and avoiding intermittent injection levels.



Urea Day Tank

Design, Construction,
Performance & Operation

The Urea Day Tank provides storage of Aqueous Liquid Urea.

Designed and constructed complete with all fittings, valves, drains and alarms the Day Tank is constructed from high grade T304 Stainless Steel and is specially sized to accommodate the engine's capacity.



Air Compressor

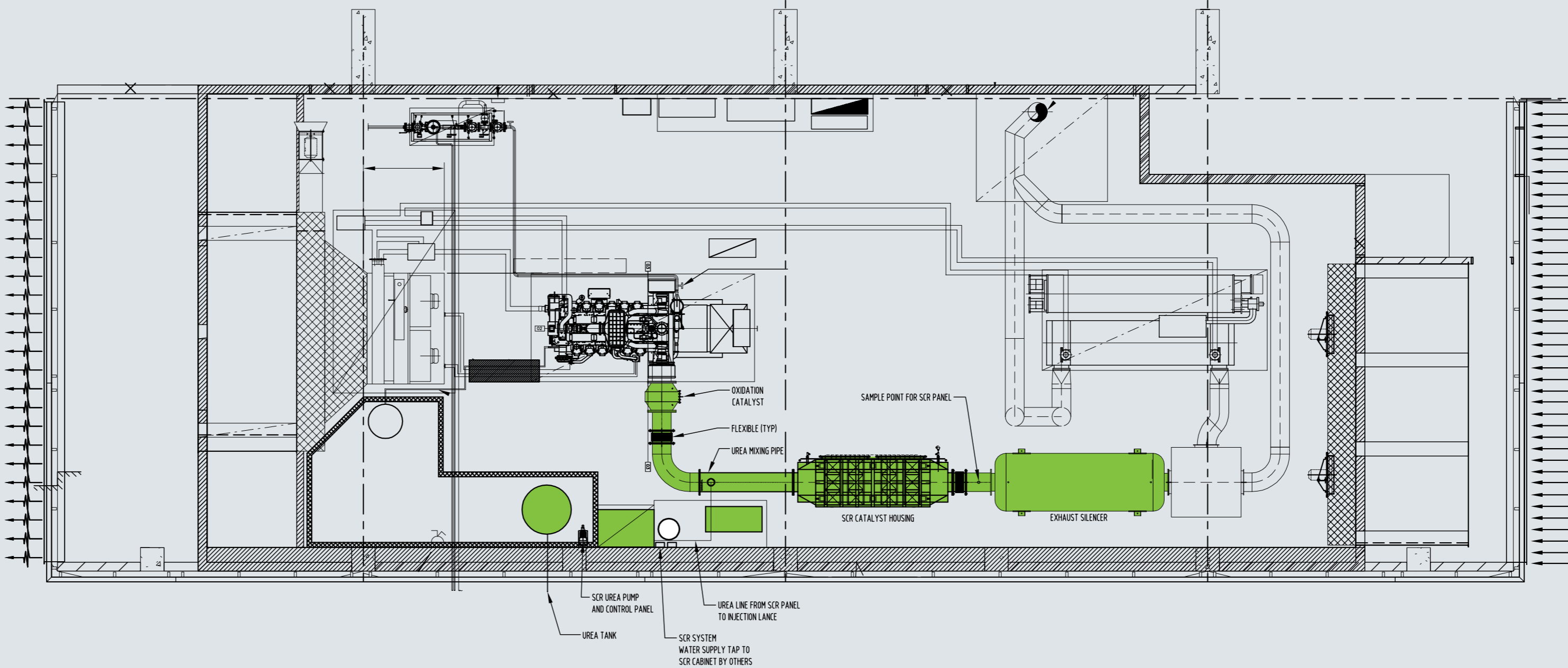
Design, Construction,
Performance & Operation

The air compressor provides a reliable source of air to control the injection of urea. Programmed and operated through the PLC Control System, the Air Compressor is sized and selected in accordance with specific project requirements.



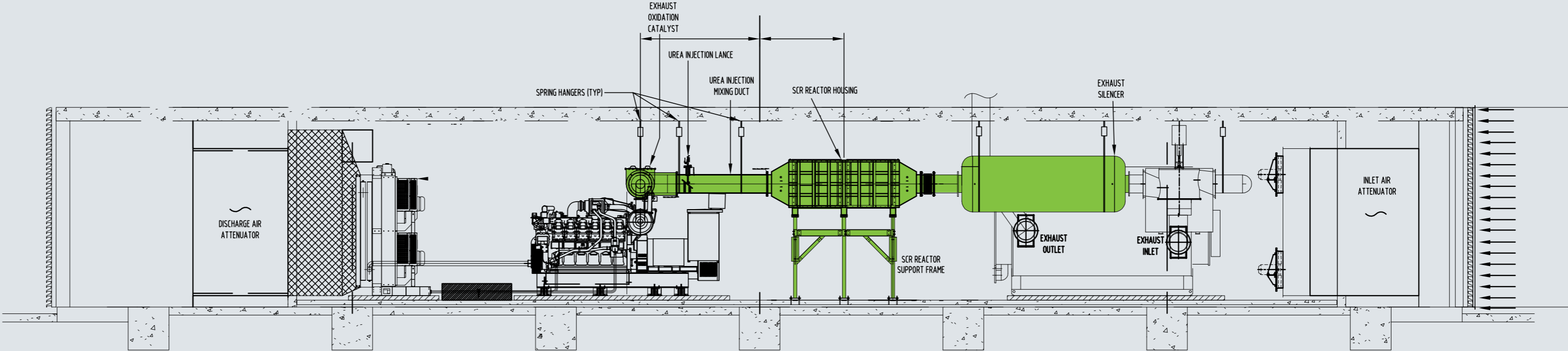
Sample Layout

Typical Parratech SCR



Sample Layout

Typical Parratech SCR



Parratech Oxidation Catalyst

Suited to Gas Engines

Proven Emission Reduction Technology

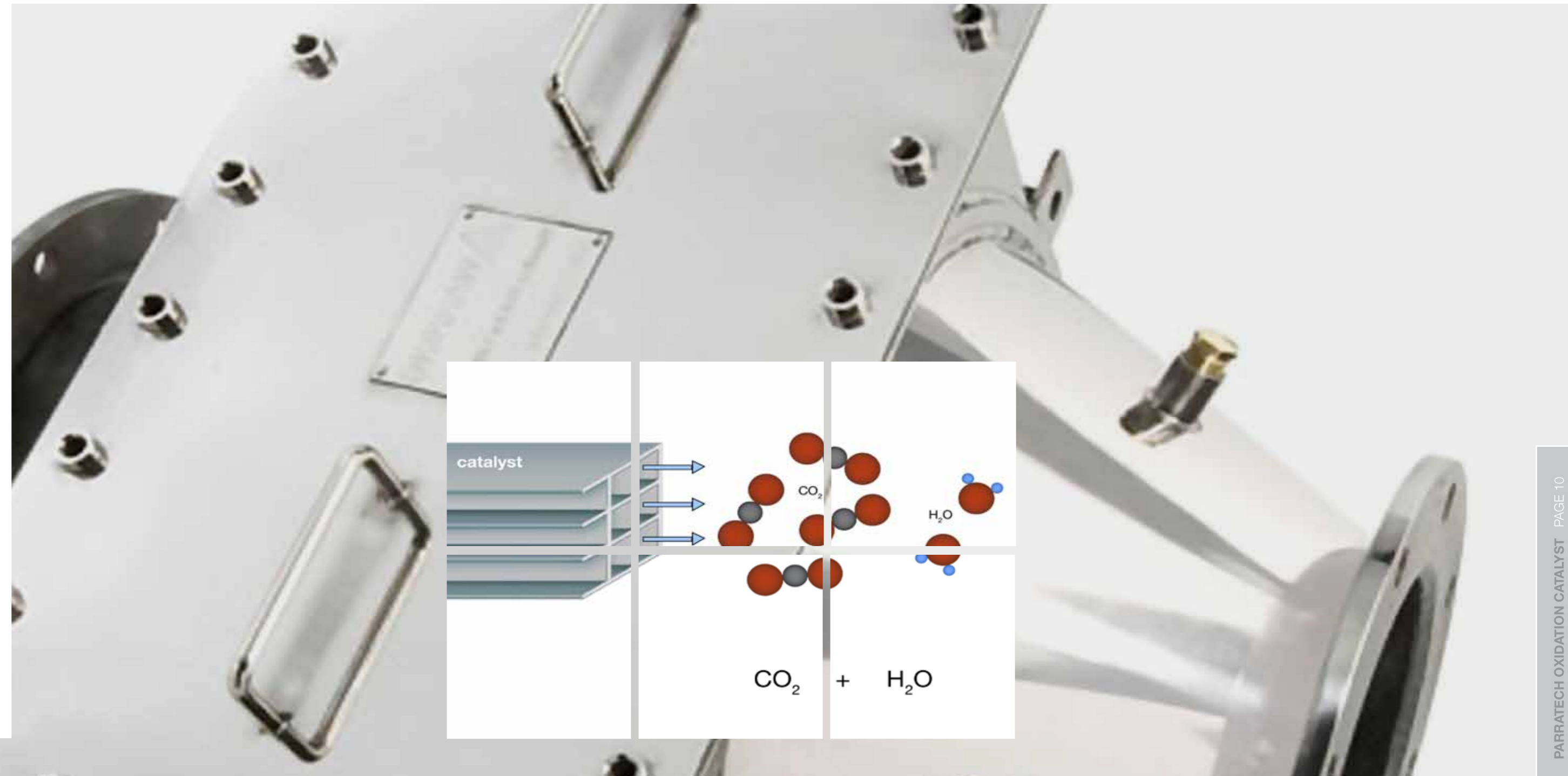
Reducing up to 90% carbon monoxide (CO), 90% voluble organic compounds (VOC) & 50% non-methane hydrocarbons (NMHC)

Parratech Oxidation Catalysts effectively oxidize carbon monoxide (CO), non methane hydrocarbons (NMHC) & Voluble Organic Compounds (VOC's) into harmless carbon dioxide (CO₂) and water vapour (H₂O).

The Parratech Oxidation Catalyst consists of a precious metal coated, metallic substrate

which reduces harmful components found in exhaust gas.

This Catalyst has a unique washcoat containing zeolite that allows the absorption of the particulate matter at lower exhaust temperatures until sufficient temperature for oxidation is achieved.



Oxidation Catalyst

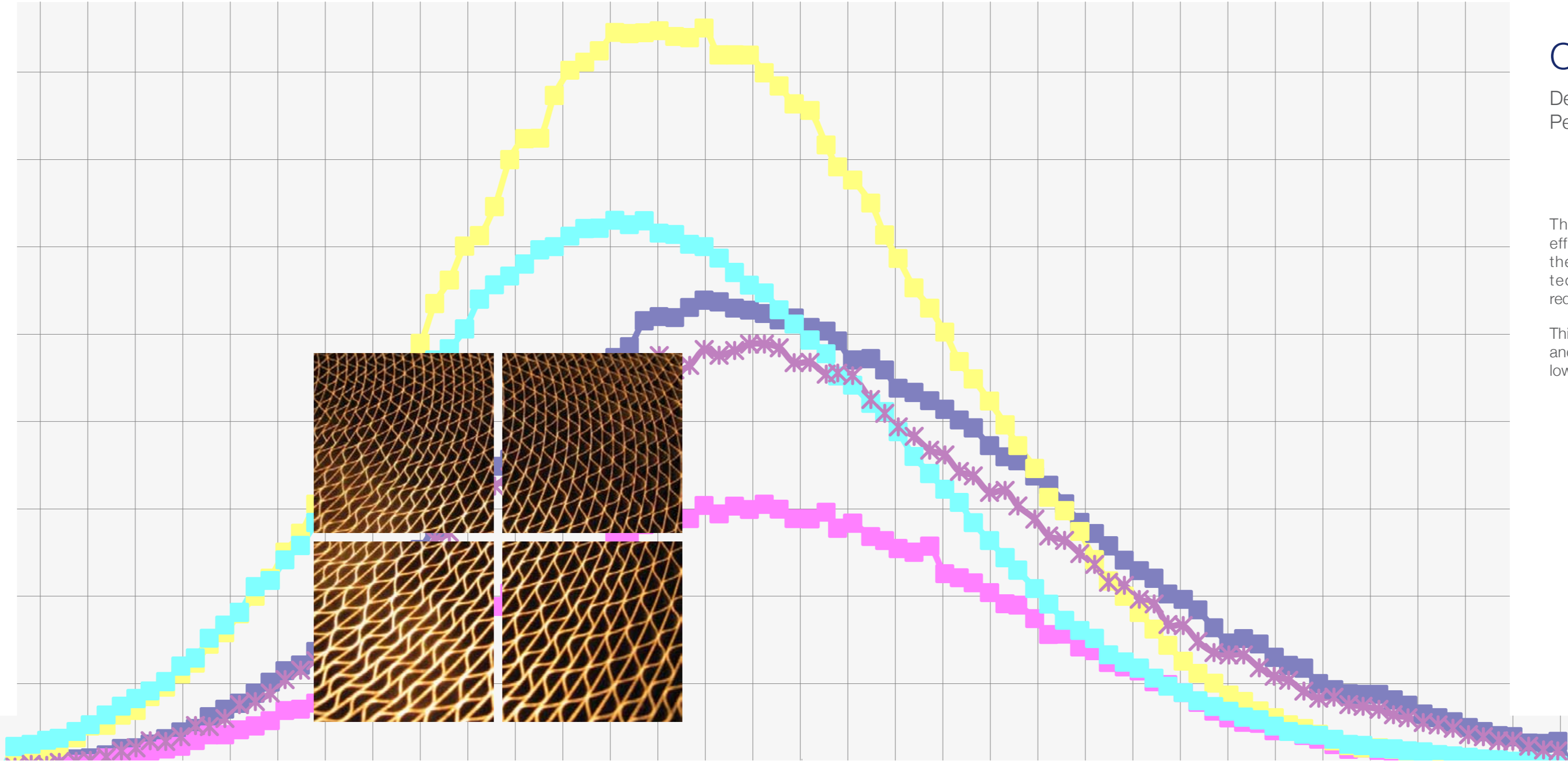
Design, Construction,
Performance & Operation

The Parratech Oxidation Catalyst housing is constructed from T304 stainless steel for corrosion resistance and long life operation, even in the most extreme duty cycle applications.

The substrate is retained in the housing via a stainless steel mesh, firmly fitted to prevent vibration movements caused from a difference in the thermal expansion of the substrate under normal operating conditions.

The ultra effective brazed metallic substrate eliminates potential honeycomb cracking or telescoping inside Silencer. This substrate is impregnated with precious metals to enable the chemical reactions.

The Parratech Oxidation Catalyst can be manufactured to specific design requirements where space & design criteria are essential.



Oxidation Catalyst

Design, Construction,
Performance & Operation

The Parratech Oxidation Catalyst is efficient & maintenance free. Despite the hours of operation the Catalyst technology will function whenever required.

This technology ensures that power loss and engine stress are minimized due to low back pressure design.

Parratech Diesel Oxidation Catalyst

Suited to Diesel Engines

Proven Emission Reduction Technology

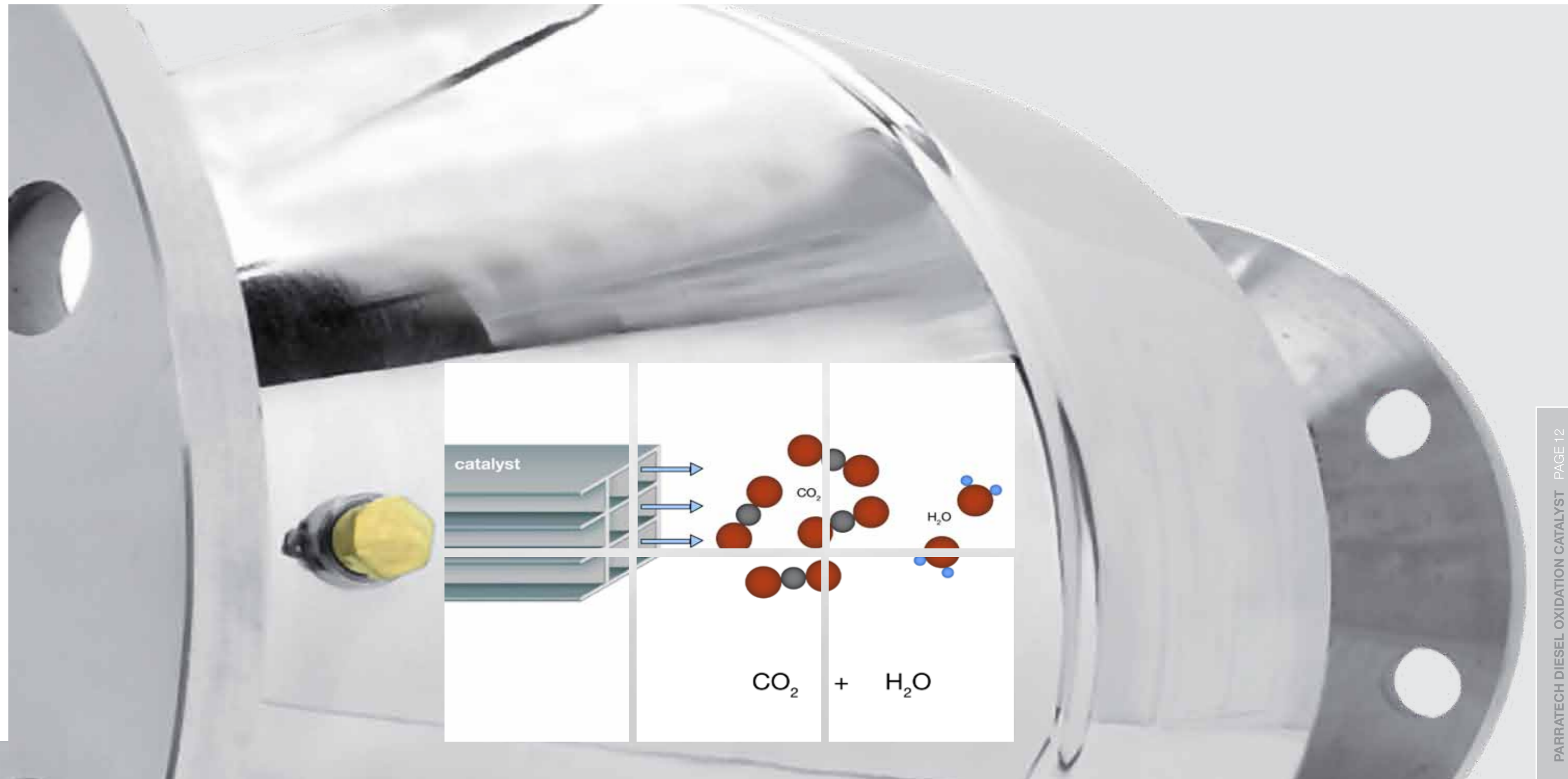
Reducing up to 30% particulate matter (PM), 90% carbon monoxide (CO), 85% hydrocarbons (HC) & 85% aldehydes (R-CHO)

Parratech Diesel Oxidation Catalysts are effective for the control of carbon monoxide (CO), hydrocarbons (HC), aldehydes (R-CHO) and the soluble organic fractions (SOF) of the particulate matter (PM).

The Parratech Diesel Oxidation Catalyst consists of a precious metal coated, metallic substrate which reduces harmful

components found in exhaust gas and removes unpleasant diesel odour.

This Catalyst has a unique washcoat containing zeolite that allows the absorption of the particulate matter at lower exhaust temperatures until sufficient temperature for oxidation is achieved.



Diesel Oxidation Catalyst

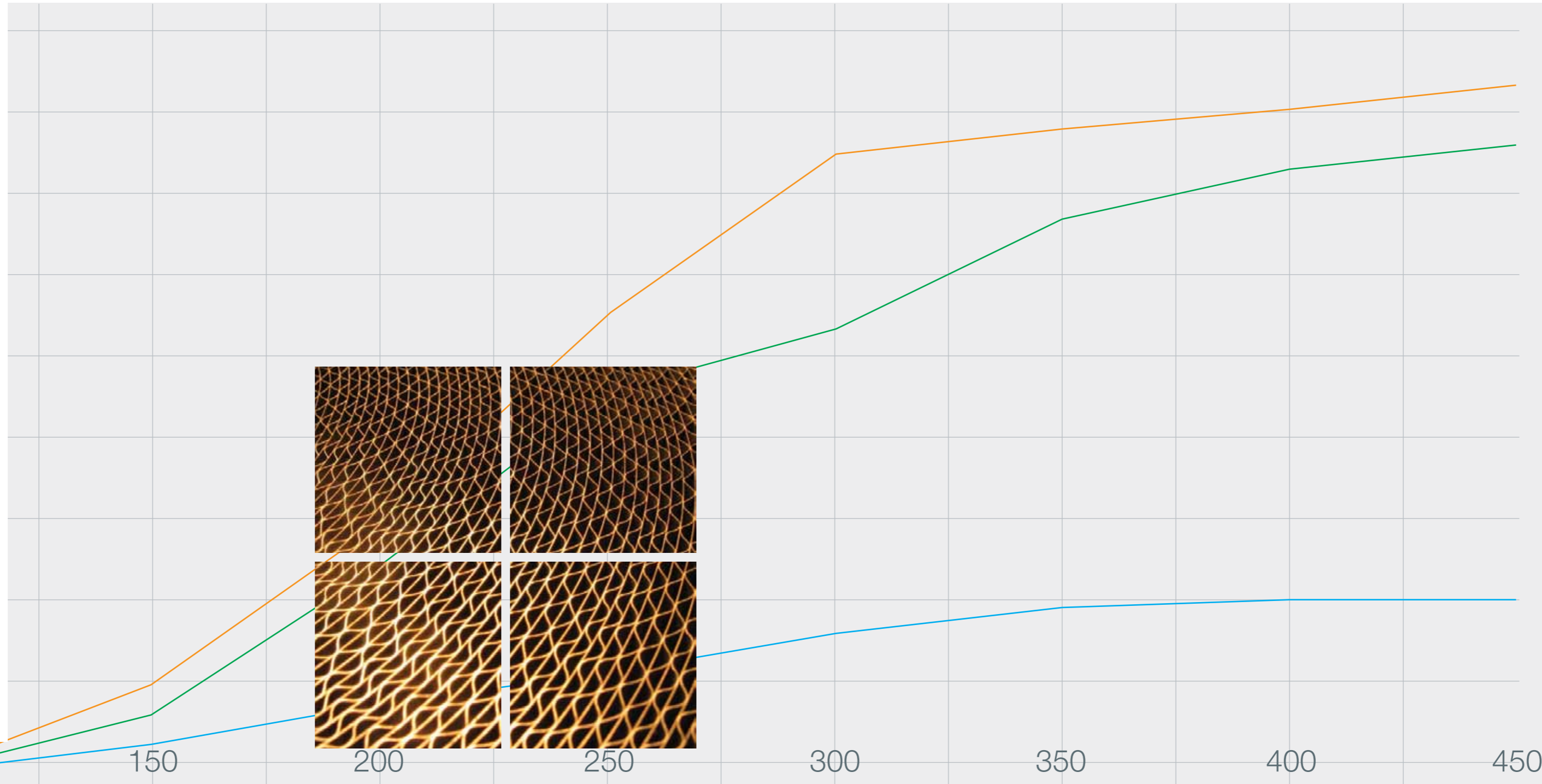
Design, Construction, Performance & Operation

The Parratech Diesel Oxidation Catalyst housing is constructed from T304 stainless steel for corrosion resistance and long life operation, even in the most extreme duty cycle applications.

The substrate is retained in the housing via a stainless steel mesh, firmly fitted to prevent vibration movements caused from a difference in the thermal expansion of the substrate under normal operating conditions.

The ultra effective brazed metallic substrate eliminates potential honeycomb cracking or telescoping inside Silencer. This substrate is impregnated with precious metals to enable the chemical reactions.

The Parratech Diesel Oxidation Catalyst can be manufactured to specific design requirements where space & design criteria are essential.



Diesel Oxidation Catalyst

Design, Construction, Performance & Operation

The Parratech Diesel Oxidation Catalyst is efficient & maintenance free. Despite the hours of operation the Catalyst technology will function whenever required.

This technology ensures that power loss and engine stress are minimized due to low back pressure design.

Parratech Particulate Oxidation Catalyst

Suited to Diesel Engines

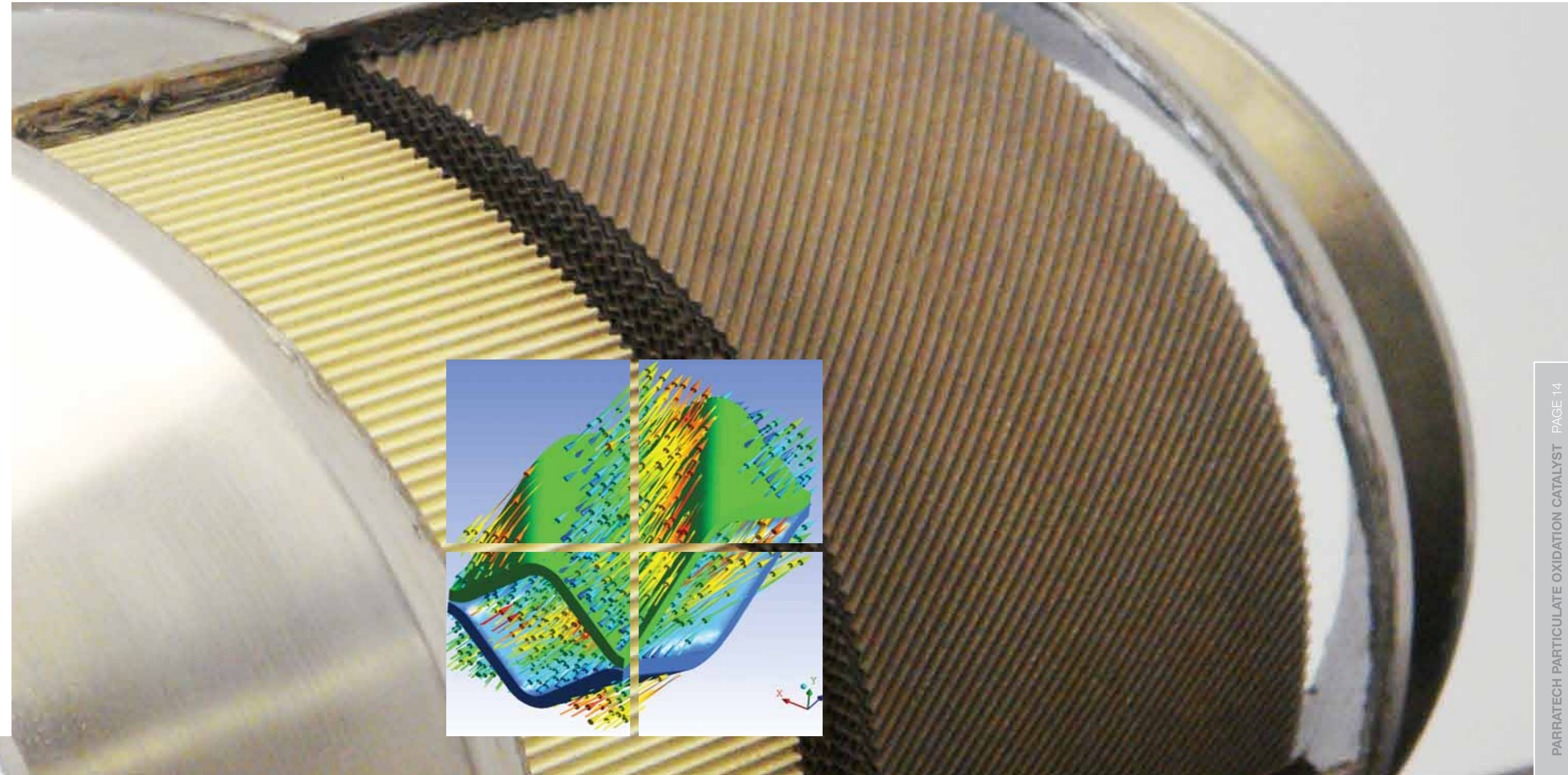
Proven Emission Reduction Technology

Reducing up to 70% particulate matter (PM), 90% carbon monoxide (CO), 85% hydrocarbons (HC) & aldehydes (R-CHO)

Parratech's Particulate Oxidation Catalysts reduces particulate matter (PM), carbon monoxide (CO), hydrocarbons (HC) & aldehydes (R-CHO) into harmless carbon dioxide (CO₂) and water vapour (H₂O). In addition the Parratech POC also reduces the otherwise normally obnoxious diesel smell.

Designed, developed & proven to efficiently trap particulate matter in LDD & HDD applications, the Parratech POC technology eliminates the risk of soot loading/blocking therefore making it fail safe for applications with varying exhaust gas temperatures and varying engine operating loads.

The Parratech POC is becoming increasingly popular due to its versatility and proven efficiency on Diesel Engines.



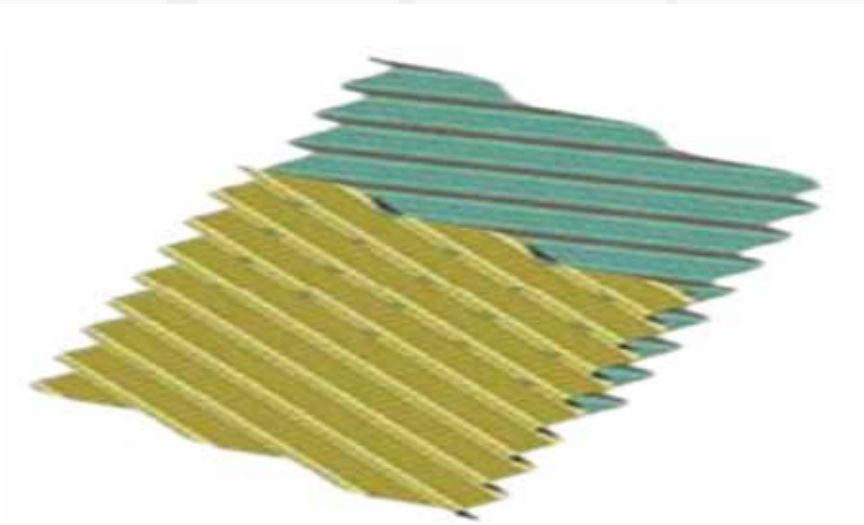
Particulate Oxidation Catalyst

Design, Construction, Performance & Operation

The Parratech Particulate Oxidation Catalyst is an open filter design construction, which consists of corrugated stainless steel fine screens that form a cylindrical substrate.

These screens are criss-cross in structure causing the gas to deflect through the channels in its course of flow, the particulates are therefore trapped and oxidized in the sidewalls of the substrate. Due to the swirling motion of the gas, enhanced heat and mass transfer the chemical reaction takes place inside the catalyst resulting in a dramatic increase in efficiency.

The catalyst has a unique thin washcoat layer including impregnated Platinum (Pt). This coating improves particulate trapping and oxidisation; it also enables optimum self cleaning operation.



Substrate channels are designed with several corrugated screen layers, forming a non blocking element.



Particulate Oxidation Catalyst

Design, Construction, Performance & Operation

Parratech's Particulate Oxidation Catalyst housing is manufactured from Stainless Steel ensuring superior mechanical strength, durability and corrosion resistance. The housing is also designed & constructed to withstand thermal expansions of the substrate when under operating conditions.

The particulate matter (PM) reduction efficiency of Parratech's POC significantly exceeds its volatile organic content, with conversions of up to 70% efficiency being achieved. It is wholly self-cleaning, subsequently eliminating the troublesome weight of regular maintenance.

Utilizing the latest technology the Parratech POC is designed, engineered & constructed to withstand the harshest of environments, ensuring long life functionality & operation.

Parratech Diesel Soot Filter – DSF

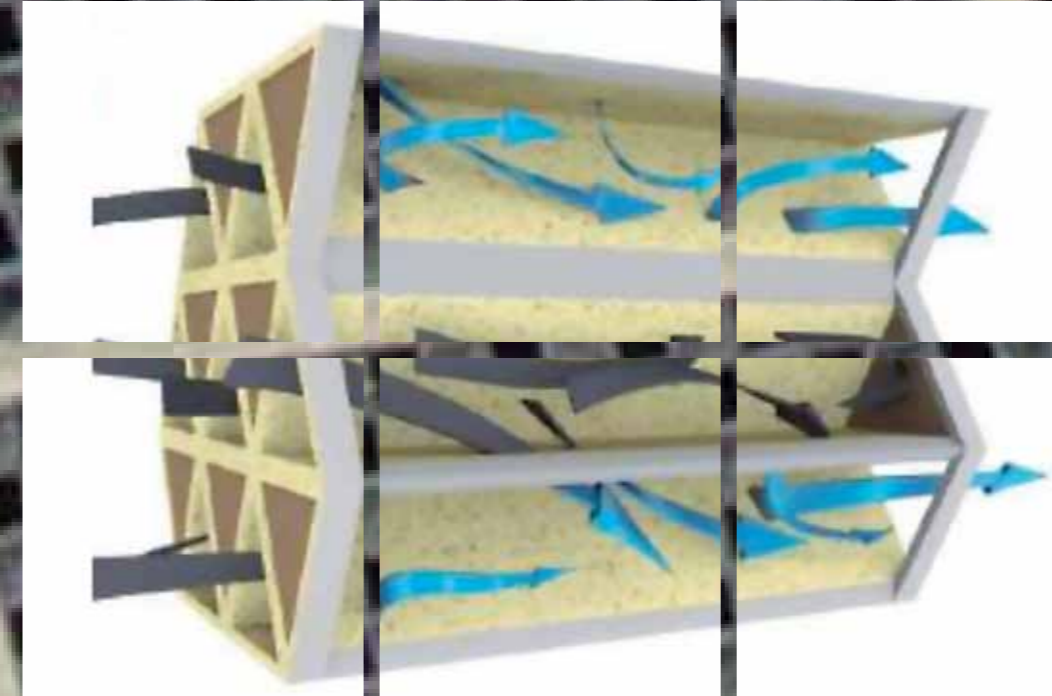
Suited to Diesel Engines

Proven Emission Reduction Technology

Reducing up to 98% particulate matter (PM), 90% carbon monoxide (CO), 85% hydrocarbons (HC) & 85% aldehydes (R-CHO)

Parratech Diesel Soot Filter (DSF) is designed to virtually eliminate particulate matter (PM), commonly known as 'soot' or 'smoke'. The Filter also substantially reduces other poisonous gases including carbon monoxide (CO), hydrocarbons (HC) & aldehydes (R-CHO). In addition Parratech Diesel Soot Filters also reduce the otherwise normally obnoxious diesel smell.

Reducing up to 98% particulate matter, the Parratech Diesel Soot Filter is becoming increasingly popular in applications where developers, builders & contractors must fulfil their 'duty of care' obligations by taking the necessary step of minimising air pollution – ultimately installing Parratech Diesel Soot Filters.



Diesel Soot Filter

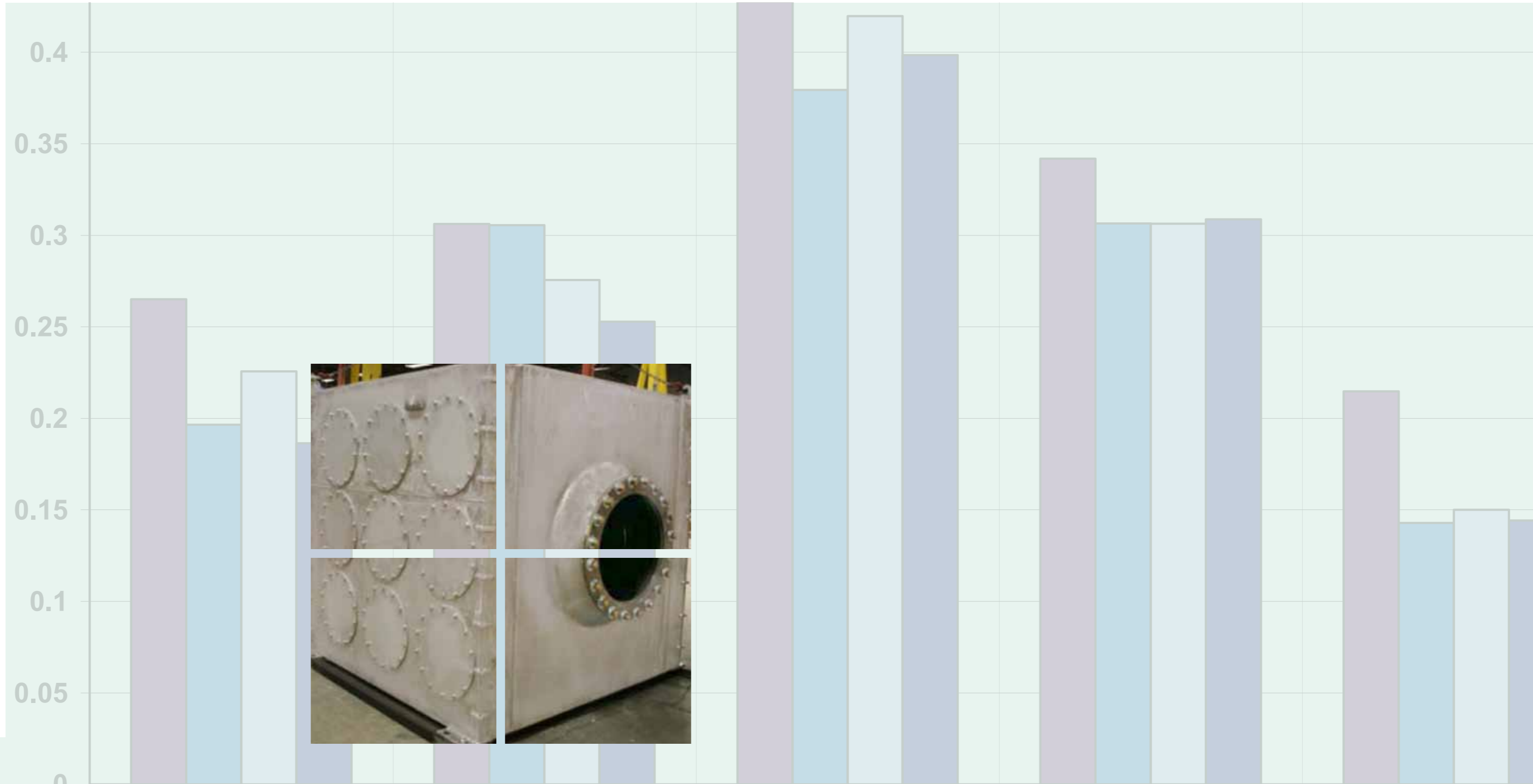
Design, Construction,
Performance & Operation

Parratech's honeycomb structured Diesel Soot Filters (DSF) is made of Silicon Carbide, specially used for soot filtration in diesel engine exhaust.

The exhaust gases are lead into the filter where the channels of its segments are alternately closed. The exhaust gases are forced to flow through the ceramic walls into the neighbour channel. The porosity of the walls is designed in a way that gases can pass and particles are held back, subsequently trapping the particles in the wall.

The rugged, compact Parratech Diesel Soot Filter has a stainless steel housing for superior mechanical strength, durability & corrosion resistance.

Optional features include; heating system, by-pass valve, inlet configuration and material construction options.



Diesel Soot Filter

Design, Construction,
Performance & Operation

The Parratech's Diesel Soot Filter is coated with a sulphur-resistant catalyst, the coating interacts with the collected soot to oxidise the soot into carbon dioxide, a gas and water vapour which passes through the filter. This process of passive regeneration or soot burn-off occurs in a drive cycle where the exhaust gas temperature is approximately 375°C.

The Soot Filter's efficient & maintenance free operation is consequent upon the function of the exhaust gas temperature and a minimal 20% duty cycle.

Should the exhaust gas temperature be below the recommended 375°C, a heating system is required to be installed to heat the exhaust gas in order to ensure maximum efficiency & functionality. This optional heating system also includes a temperature and back pressure control panel for ease of efficiency assessment.



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