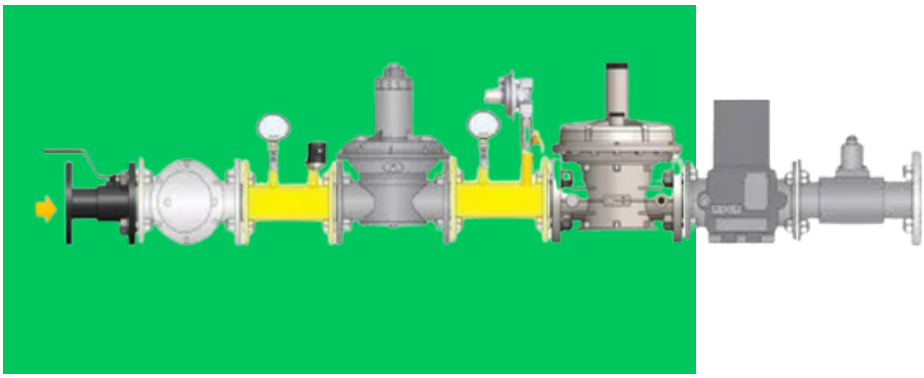
aceget®

InnoVoTek
Bsmart

RECD & DFK BROCHURE

Aceget offers certified emission control solutions for diesel generators, including CPCB-approved RECDs (up to 98% particulate reduction) and
Dual Fuel Kits for cost-efficient, cleaner operation.







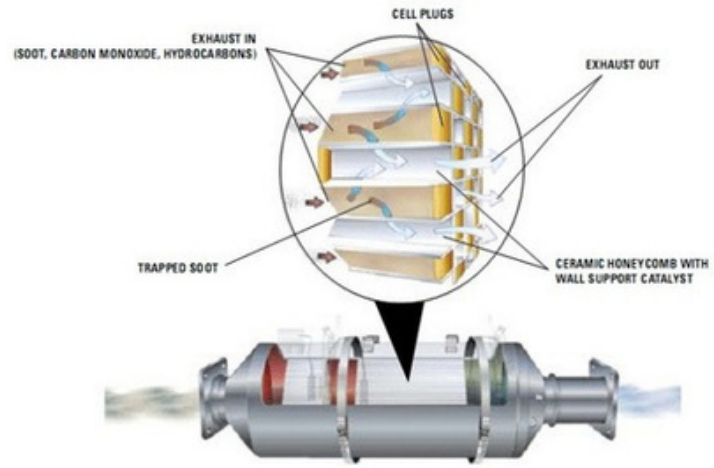
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RECD

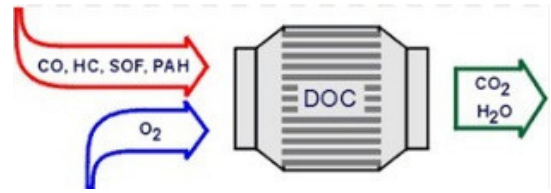
RetrofitEmission Control Device (RECD) is an advanced exhaust system installed on old diesel engines to reduce pollution. It combines a Diesel Oxidation Catalyst (DOC), which converts harmful gases like CO and HC into CO_2 and water, and a Diesel Particulate Filter (DPF), which traps and burns soot (PM) through regeneration. Together, they help meet emission norms like Bharat Stage IV and make diesel engines cleaner and safer for the environment.



DOC - Diesel Oxidation Catalyst

ADieselOxidation Catalyst (DOC)is a crucialcomponentin emission control systems, especially for retrofitting diesel generator (DG) sets. It functions by oxidizing toxic gases present in the exhaust into less harmful substances before they are released into the atmosphere. The DOC primarily targets Carbon Monoxide (CO), Unburned Hydrocarbons (HC), and the organic fraction of diesel particulate matter (SOF - soluble organic fraction).

Inside the DOC, the exhaust gases pass through a high-surface-area structure, typically made of ceramic or metal, and coated with noble metal catalysts like Platinum (Pt) and Palladium (Pd). These metals facilitate catalytic oxidation reactions in the presence of oxygen from the exhaust stream.



The key chemical reactions taking place inside a DOC:

CarbonMonoxide Oxidation

Reaction:

$2CO + O_2 \rightarrow 2CO_2$

Toxic carbon monoxide is oxidized into carbon dioxide, which is far less harmful.

Unburned Hydrocarbon Oxidation

Reaction:

$C_xH_y + O_2 \rightarrow CO_2 + H_2O$

Unburned fuel molecules (HC) are converted into carbon dioxide and water vapor.

Soluble Organic Fraction (SOF) Oxidation

Reaction:

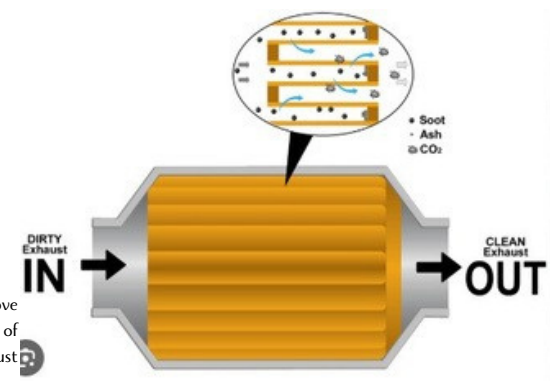
$SOF + O_2 \rightarrow CO_2 + H_2O$

The SOF of diesel soot (e.g., oil vapors, unburned fuel) is also oxidized.

DPF - Diesel Oxidation Catalyst

Working of Diesel Particulate Filter (DPF) - With Reactions

A Diesel Particulate Filter (DPF) is a highly efficient after-treatment device designed to physically trap and remove particulate matter (PM) or soot from diesel exhaust gases. It is a honeycomb-structured ceramic filter made of materials like cordierite or silicon carbide, with alternating channels blocked at opposite ends, forcing the exhaust gases to pass through porous walls. As a result, solid particles get trapped, while the cleaned exhaust exits the filter.



The DPF captures over 85-95% of soot, including both solid carbon particles and the soluble organic fraction (SOF). Over time, this trapped soot builds up, and unless it is removed, it can increase backpressure on the engine. To resolve this, DPFs undergo a process called regeneration, where the collected soot is oxidized into CO_2, either passively (through normal exhaust heat) or actively (by injecting fuel or using a heater to raise the temperature).

NO_2 in passive regeneration

Reaction:

$C\ (soot) + NO_2 \rightarrow CO_2 + NO$

In passive regeneration, nitrogen dioxide (NO_2) reacts with soot to produce carbon dioxide and nitrogen monoxide (NO), enabling regeneration at lower temperatures.

In active regeneration, extra fuel is injected into the exhaust stream or a burner/heater is used to raise the temperature above 550°C, allowing soot to burn off and convert into carbon dioxide. This restores the filter's capacity and maintains system efficiency.

DPFs are extremely effective but require proper engine calibration and temperature management to avoid ash clogging or filter failure. Modern systems often include temperature sensors, pressure sensors, and ECU-controlled regeneration logic to ensure safe operation.

DUAL Fuel Kit

A Dual Fuel System is an advanced retrofit or OEM-integrated solution that enables a conventional diesel engine to run on a combination of diesel and Piped Natural Gas (PNG). The engine retains its original diesel injection system but is modified to allow controlled induction of PNG into the intake air stream. This hybrid combustion model significantly reduces operational cost and emissions, making it an eco-friendly and economically viable solution for industrial, commercial, and power generation applications.

How It Works

Air and PNG Mixing

PNGis introduced intothe engine's intake manifold via a gas-air mixer or port injection system. The gas pressure is regulated through a PNG reduction and metering unit, ensuring safety and precision.

Dual Combustion Process

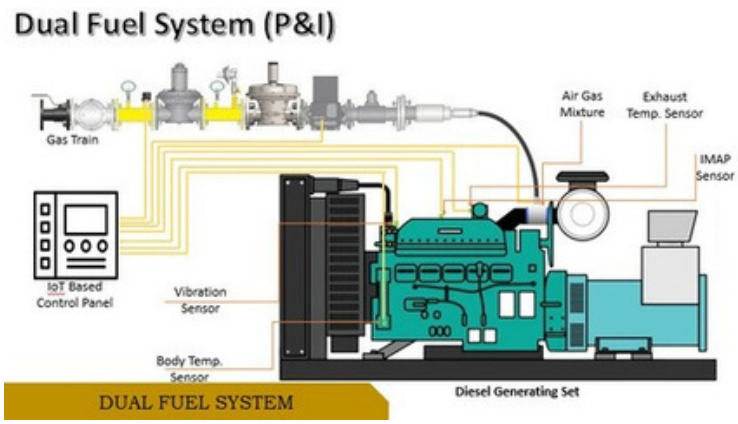
Theignitionofdiesel triggers thecombustion of the PNG-air mixture, creating a complete, clean, and efficient burn. The energy produced is similar to that of 100% diesel, but with lower cost and cleaner exhaust gases.

Compression & Ignition

As thepistoncompresses thePNG-air mixture inside the cylinder, a small quantity of diesel (typically 10% to 30% of the total energy input) is directly injected by the diesel injector at the end of the compression stroke. Diesel acts as a pilot fuel, auto-igniting due to high temperature and pressure.

Smart ECU Monitoring

Adedicated ElectronicControl Unit (ECU) constantly monitors engine parameters like RPM, load, exhaust temperature, knock, and oxygen levels to adjust gas injection levels and maintain the right diesel-gas ratio. In case of unsafe conditions or PNG supply failure, the system automatically reverts to 100% diesel mode, ensuring uninterrupted operation



Key Technical Components

Component	Description
PNG Pressure Regulator	Reduces PNG pressure from pipeline (typically 4
Gas Solenoid Valve	Automatically controls gas flow based on ECU
Mixer or Injector	Blends PNG into the intake air or injects it port-
Diesel Injector	Injects small quantity of diesel for ignition.
Electronic Control Unit	Brain of the system; balances fuel ratio, safety
Sensors	Include knock, temperature, MAP

Benefits of PNG-Based Dual Fuel System

Fuel Cost Reduction: Operational cost may reduce up to 50-70%, depending on PNG and diesel prices.

🌱 Eco-Friendly: PNG burns cleaner than diesel, significantly reducing CO_2, NOx, and PM emissions.

🔄 Flexibility: Automatically switches to 100% diesel in case of gas failure—no shutdown risk.

🔧 No Engine Modification: Most systems require minimal changes, retaining diesel mode and warranty.

🔌 Ideal for DG Sets: Commonly used in 500 kVA to 2000 kVA gensets in urban areas with PNG access.

🛠️ Low Maintenance: Cleaner combustion leads to less carbon deposits, extending engine life and oil change intervals.

Why Choose Us

At Aceget Private Limited, we bring over 18 years of technical excellence in diesel generator systems, Retrofit Emission Control Devices (RECD), solar EPC projects, and industrial utility engineering. Our solutions are fully compliant with global and Indian emission standards such as Tier-2 and CPCB-IV+, ensuring you meet regulatory demands without compromising performance. With a customer base of over 1200 clients across NCR and beyond, we're known for our transparent dealings, quick project execution, and strong after-sales support. We specialize in offering customized, IoT-enabled systems designed for efficiency, reliability, and long-term cost savings. Whether it's installation, AMC, or emergency technical support, Aceget ensures fast response and dependable service across India. With us, you don't just get a product — you get a dedicated partner in clean, future-ready power solutions.



INDUSTRY EXPERTISE

Over 18 years of experience in DG Sets, RECD, Solar EPC, and utility engineering.



TAILOR-MADE SOLUTIONS

Customized designs suited for your specific technical and operational needs.



COMPLIANCE READY

All products comply with Tier- 2, CPCB-IV+, and international emission norms.



PAN-INDIA REACH

Seamless delivery, installation, and service across India.



STRONG AFTER-SALES SUPPORT

Prompt AMC, spares availability, and on-site technical assistance.



TRANSPARENT DEALINGS

No hidden charges; everything clearly documented and pre-approved.



FAST TURNAROUND

Quick response from quotation to commissioning.



TRUSTED BY INDUSTRY LEADERS

1200+ satisfied industrial clients across NCR and other regions.

Your Strategic Partner in Innovation and Reliability

At Aceget, we pride ourselves on being more than just a service provider we are your strategic partner in power and emission solutions. Our commitment to innovation drives us to continuously adopt the latest technologies, ensuring your systems are not only compliant but also future-ready. We invest in rigorous staff training, continuous R&D, and customer feedback to improve our offerings. Our proactive communication and dedication to minimizing downtime allow your operations to run smoothly without disruption. Choosing Aceget means choosing a team that anticipates your needs, adapts quickly, and delivers results that align with your business goals.

About Us

Aceget Private Limited is a forward-thinking clean-tech engineering company focused on delivering sustainable energy solutions for industrial and commercial applications across India. With deep expertise in emission control technologies and power engineering systems, Aceget is committed to transforming the diesel generator landscape through certified, low-emission retrofit solutions.

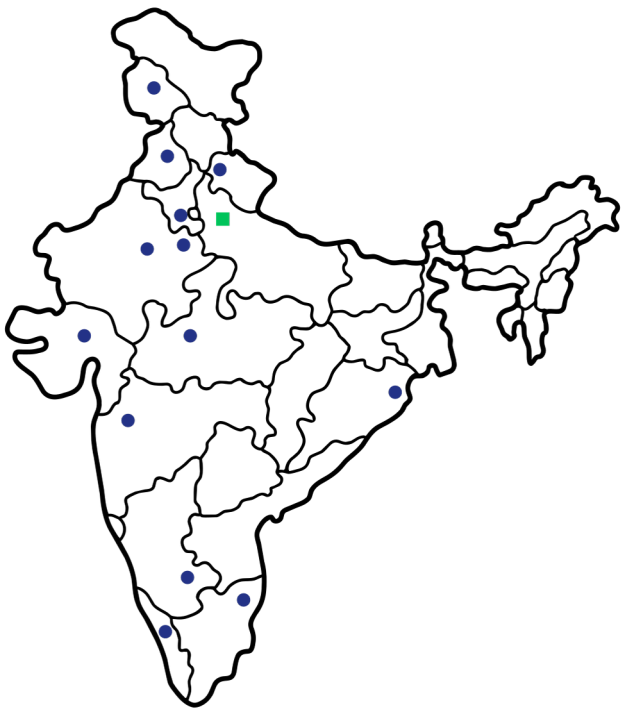
From Chairman's Desk

At Aceget, we don't just supply emission solutions — we deliver regulatory confidence. In a time when compliance is non-negotiable, our RECD and Dual Fuel systems empower industries to stay operational, sustainable, and future-ready. With engineering precision and nationwide execution, we stand committed to clean power, delivered responsibly.

Our Network

- Head Office
- Branch Office
- 100+ Business Development Partner in Pan India

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