

# RETROFIT EMISSION CONTROL DEVICE (RECD) FOR **CAT® DIESEL GENERATORS**



PROGRESSIVE TECHNOLOGY FOR ENVIRONMENTAL FRIENDLY SPACES

Images shown may not reflect actual configuration

# A SOLUTION THAT SUPPORTS THE ENVIRONMENT

## ENABLING PARTICULATE MATTER (PM) REDUCTION ON DIESEL POWERED GENERATORS

Caterpillar, in agreement with Pi-Green, introduces a pioneering filterless technology for PM reduction for Diesel Genset(s). The Pi-Green Retrofit Emission Control Device (RECD) is based on filter-less technology and is highly efficient in improving air quality. These RECDs are compliant with the NGT order dated 6th August 2019 in O.A 681/2018 as declared by the manufacturer\*. It uses Electrostatic Precipitation (ESP) to enable sub-micron particulates to get collected at opposite- charged surfaces and form into larger clusters through the process of agglomeration. The collected soot is removed at optimal intervals using a patented scraping mechanism.

### Captures PM with more than 70% efficiency



No Manual Cleaning



No Water



No Choking



No Chemicals



No Replacement



No Solvent



Low Maintenance



No Filter

### FEATURES AND ADVANTAGES

- ▶ Operates as soon as the Genset is started
- ▶ Optimized Electro Static Precipitation (ESP) with flow conditioning and current discharge management
- ▶ High efficiency - Consistent PM separation
- ▶ Low back pressure with almost zero adverse impact on engine operation
- ▶ Minimal (electrical) energy requirement having the least impact on operational parameters, lower periodic maintenance and minimal thermal insulation



- ▶ No thermal management required unless surface temperature limitation is imposed
- ▶ Diagnostics capable and ready, transmits data and fault codes with cloud based push notifications for users
- ▶ Soot collected or trapped can be used in paint and other industries as raw material
- ▶ Durable standardized aesthetic enclosure, modular design that does not need periodic maintenance, minimal thermal insulation
- ▶ Robustness to wide operating conditions of in-use DG sets



#### Durability and Performance:

- ▶ Long-term performance durability with no wear-out components
- ▶ No chemicals therefore minimal ageing, carefully designed routings, forced cooling wherever required, redundancy in cooling the arrangement, adequate service protocols to maintain efficiency
- ▶ Optional installation of sacrificial electrodes for very corrosive environmental applications (Coastal applications)



#### Structural and environmental durability:

- ▶ Robust component build with stringent quality requirements
- ▶ Genset-like bedframe-based installation, protection from environmental factors such as heat-resistant paint on internal units, galvanized and powder-coated sheets and structural members for enclosure, thermal management for power and control unit, well-designed seals and interfaces



#### Installation Aspects:

- ▶ Installation checklist as well as pre-order site survey for feasibility (for larger independent installations)

**\*Note:** The RECDs for gensets rated higher than 800 kW are not mandated to be certified by any CPCB approved labs. For gensets rated lesser than 800 kW, Type approval certification pending with ARAI.



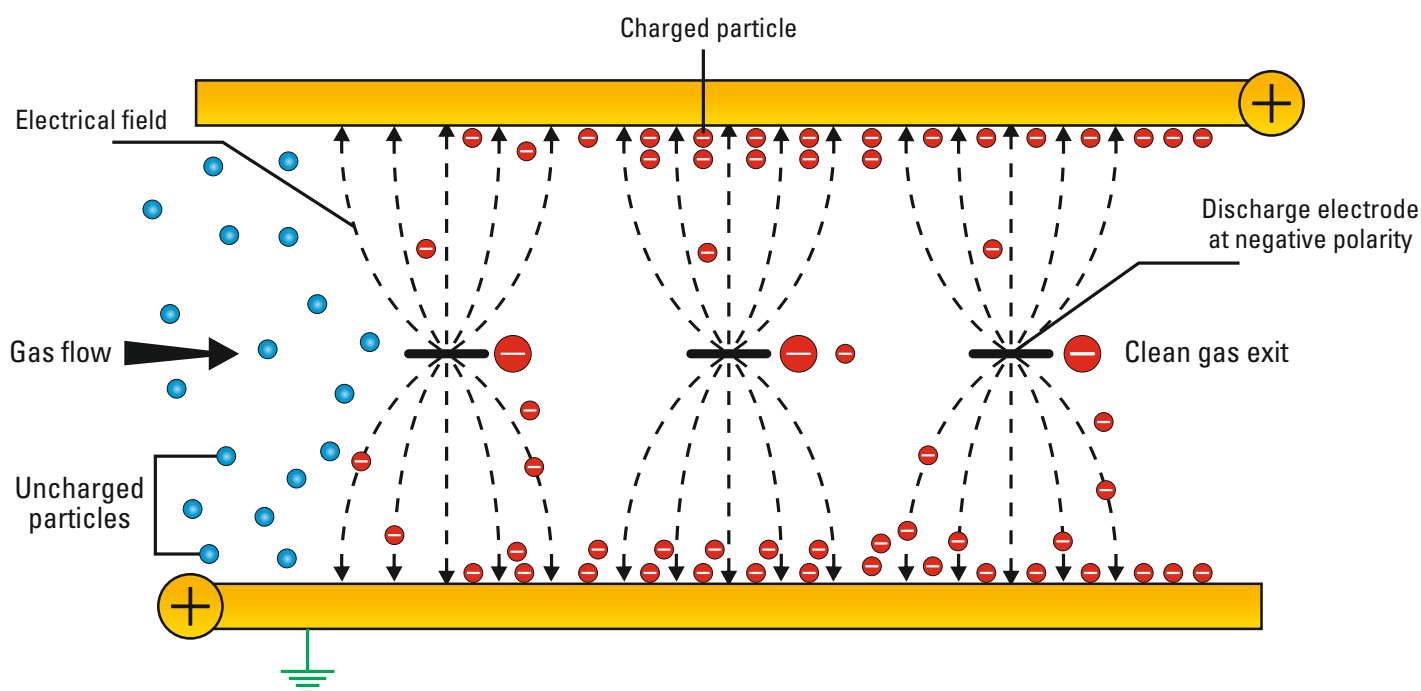
## Durability and Performance:

| Technology   | PM Capture Efficiency | Initial Cost     | Operational Cost  | Prominent Failure Mode        | Impact on Engine                          | Ease of maintenance          | Robustness to exhaust challenges |
|--|-----------------------|------------------|---|-------------------------------|---|------------------------------|----------------------------------|
| Diesel Oxidation Catalyst (DOC)                                  | 20-45%                | Low              | Negligible  | Face Plugging                 | Negligible                                | Not serviceable              | No                               |
| DOC+Partial flow Filters or Partial Oxidation Catalyst (PFF/POC) | 40-75%                | Moderate to High | Moderate (fuel penalty due to back pressure)            | Crack, melting, thermal event | Variable back pressure (~30 kPa)          | Ash cleaning                 | No                               |
| DOC+Diesel Particulate Filter (DPF)                              | >90%                  | High             | High (fuel penalty due to back pressure & regeneration) | Crack, melting, thermal event | Variable back pressure (up to 40 kPa)     | Ash cleaning<br>Soot removal | No                               |
| Water/Solvent Based Exhaust scrubbers Solution                   | NA                    | High             | Moderate to High (wash fluid & chemical replenishment)  | Fouling and engine hydro-lock | Back pressure because of HE               | Frequent service             | Probably Yes                     |
| <b>Filterless Solution for RECD#</b>                             | <b>75-95%*</b>        | <b>Moderate</b>  | <b>Negligible (periodic soot collection)</b>            | <b>None</b>                   | <b>Low back pressure - design control</b> | <b>Easy service</b>          | <b>Yes</b>                       |



## Operating Principle:

- ▶ RECD is installed after the diesel genset muffler without disturbing the existing setup
- ▶ Exhaust gases enter RECD and are confronted with electrical discharge created through high voltage DC field
- ▶ Passing through the field, particulate matter acquires an electrical charge and is attracted to the oppositely charged electrode
- ▶ PM gets agglomerated on the collector electrode and forms substantially higher particle-size clusters
- ▶ Agglomerated PM is periodically scrapped and collected using a patented mechanism for environmentally safe disposal



**\*Note:** RECDs are available for Cat Diesel Gensets rated less than 800 kW and greater than 800 kW





Caterpillar authorised dealers:



Gainwell Commosales Private Limited (GCPL)  
in North India, North-Central India, Eastern India,  
Nepal and Bhutan.

**Toll-free # 1-800-419-3356**  
**[www.gainwellindia.com](http://www.gainwellindia.com)**



GMMCO Limited in South, West and  
Central India.

**Toll-free # 1-800-425-2546**  
**[www.gmmco.in](http://www.gmmco.in)**

Product manufactured by Pi-Green Innovations Pvt. Ltd. recommended for use on Cat diesel gensets, available only through Caterpillar authorized dealers.

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