

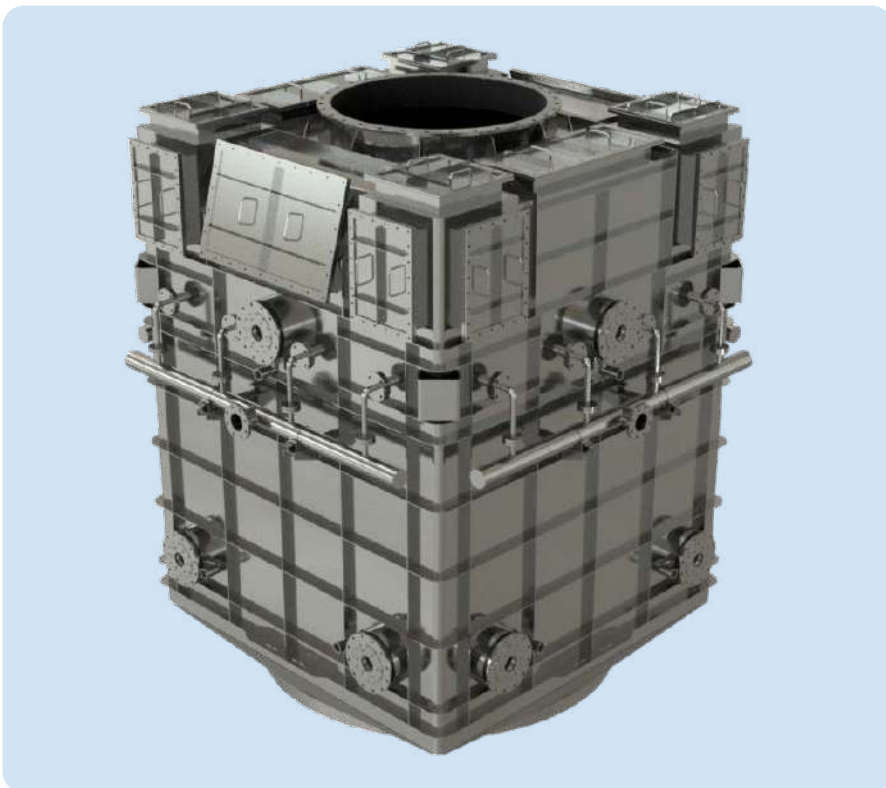


Wet Electrostatic Precipitator

☺ Exhaust Gas Cleaning

Wet Electrostatic Precipitator (WESP)

The solution for particulate matter removal



Exhaust Gas Cleaning

WESP is a well-known technology used in industrial contexts to **remove particulate matter and condensable species** from an engine's exhaust gases. **Ecospray marinized the solution** to make it suitable within marine contexts.

Black-blue plumes, visible at the stack, are an issue that affect most ships during engine start-up and maneuvering.

These plumes are mainly composed from harmful particles, which are by-products of the engine's combustion (such as PM10, 5 and 2.5) and part of the condensable species (SO_3), therefore **removing them will solve**, or at the very least mitigate, the issue.

Benefits



Works with both open loop and hybrid EGCSs.

Very high particulate matter removal efficiency: up to 95% even for very fine particles (<PM2.5 and PM1).



No backpressure issues: additional backpressure is very limited (up to 4 mbar), thanks to the specific design and the possibility for tailor made solutions.

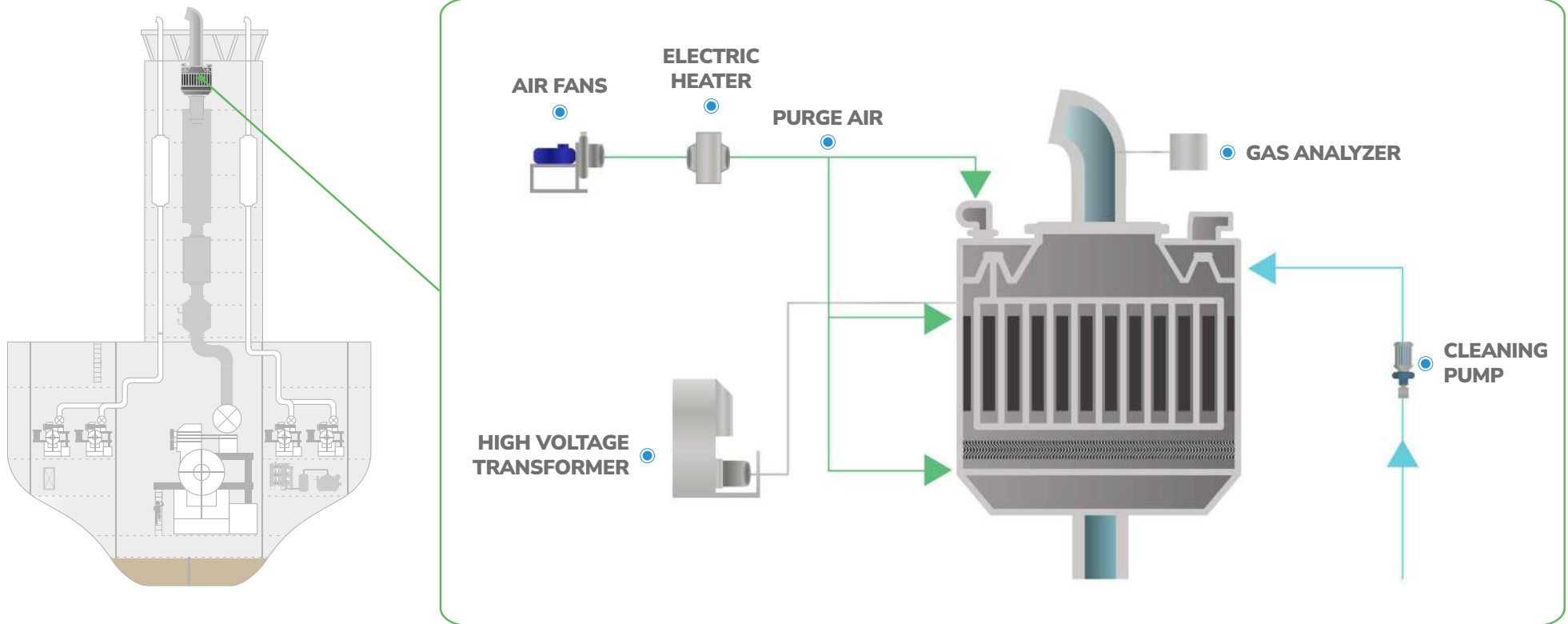


Low OPEX: the power consumption is low, about 0.5% of the engine's rated power or 15-20% of the existing EGCS. Maintenance and consumables are negligible.

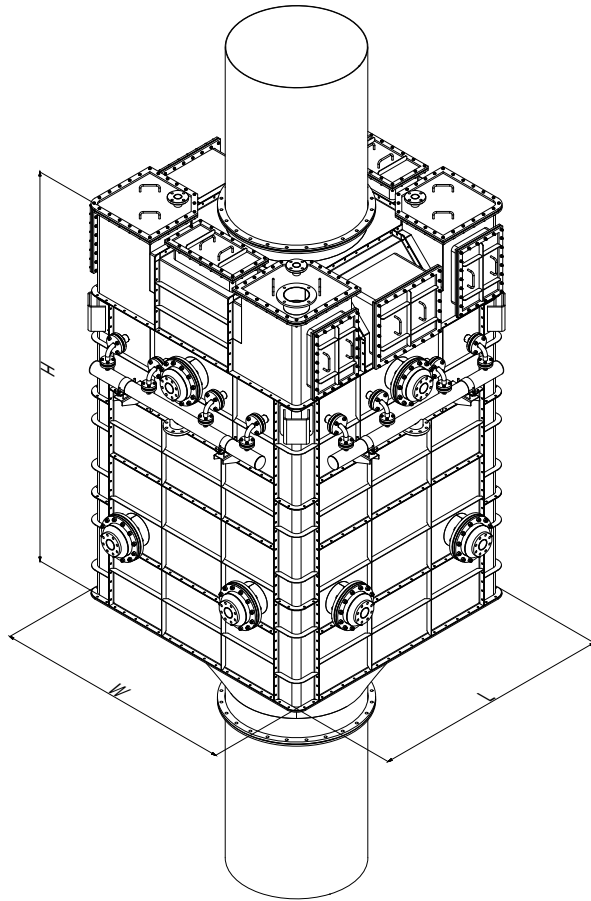


How it works

The system consists of a **reactor installed in the exhaust gas stream** either as a stand-alone unit or **integrated in the DeSOx tower**. In this reactor, high voltage electrodes are installed inside collecting tubes. A strong electric field is generated because of the **potential difference** (up to 60kV), **producing a flux of ions pushing the particles** (including PM2.5 and lower) **to the tube walls** (collecting plates). A proprietary purging system removes soot and particles deposits from the collecting plates.



Technical information



Maximum nominal power*	WESP dimensions**			Particular Matter removal efficiency
	mm (L)	mm (W)	mm (H)	
MW				%
Up to 8 MW	2.200	2.200	3.600	PM2.5 and PM10: up to 90% at design conditions.
Up to 12 MW	2.600	2.600	3.800	
Up to 16 MW	2.700	2.700	3.800	
Up to 18 MW	3.000	3.000	4.000	
Up to 20 MW	3.300	3.300	4.000	
Up to 24 MW	3.500	3.500	4.000	
Above 24 MW	Custom design TBD***			

*WESP is designed for 55-65% engine load

**WESP design dimensions are based on estimated exhaust gas flow rate

***Multiple WESP units concept

Technology Map



Exhaust Gas Cleaning

Advanced DeSox

Exhaust Gas Cleaning Systems

Catalytic Abatement

DeNO_x SCR
Diesel Oxidation Catalyst
Methane Slip Reduction

Filtration

Wet Electrostatic Precipitator
Diesel Particle Filtration
Filter Cassettes



Carbon Capture

Carbon Capture and Sequestration

Scrubbing with Ammine
Scrubbing with Calcium Hydroxide
Molten Carbonate Fuel Cells

Liquefaction

CO₂ Liquefaction



Clean Fuel

Pre-Treatment and Upgrading

Smart Blending
Pre-Treatment
Biogas Upgrading

Liquefaction

Biomethane Liquefaction
Natural Gas Liquefaction
Nitrogen Rejection Unit



Green Power Generation

Lean Gas To Power

Lean Gas To Power

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