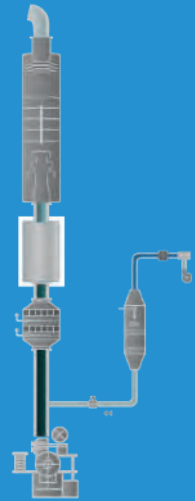


**ECOSPRAY**  
TECHNOLOGIES

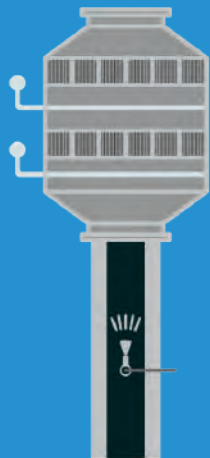
M A R I N E

# MARINE SOLUTIONS



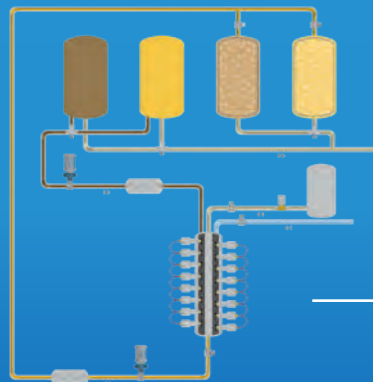
## SCR DeNOx SYSTEM

Main engine HFO/MGO fueled NOx abatement



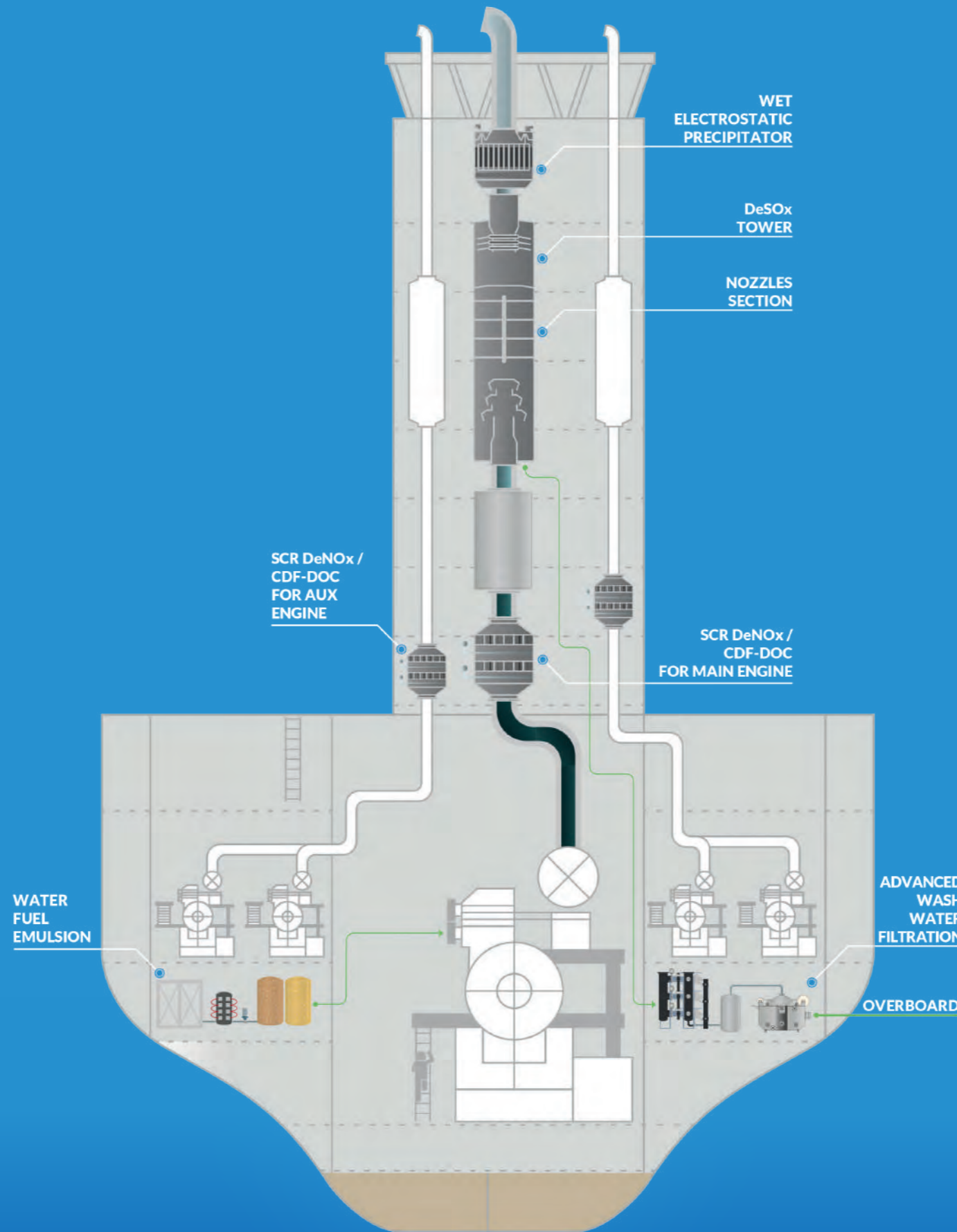
## SCR DeNOx SYSTEM

Auxiliary engine NOx abatement



## WATER FUEL EMULSION

NOx, PM and fuel consumption reduction



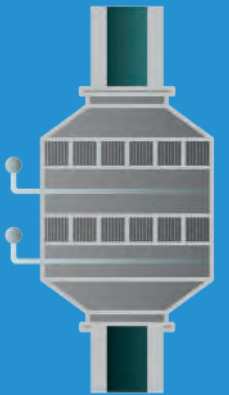
## WET ELECTROSTATIC PRECIPITATOR

Black smoke, plume and PM abatement



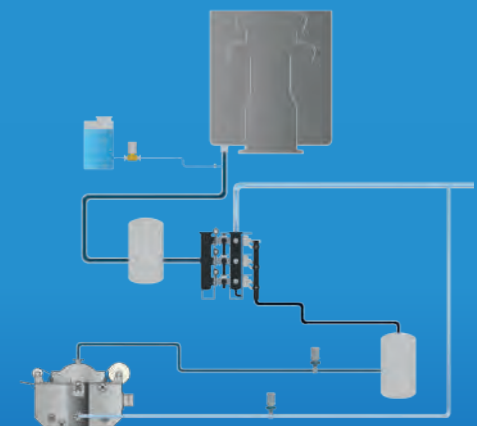
## CATALYTIC DRY FILTER / DIESEL OXIDATIVE CATALYST

Soot, ash and particulate matter, heavy metals, aromatic hydrocarbons (HC, CH<sub>2</sub>O, VOC) including PAH, and carbon monoxide (CO) removal



## ADVANCED WASH WATER FILTRATION

Soot and pollutants abatement in Open Loop design EGCS



# CLEAN AIR CLEAN WATER

We provide integrated solutions for sustainable ships, removing SOx, NOx, and PM beyond the global requirements – for both **air emission and wash water**. **Just focus on your business**, and we'll take care of your fleet and make your operations greener – from emissions to energy and fuel saving.

Pairing out relentless and significant investments in research and development with the experience we have gathered from **more than 700 system** installations worldwide (both on commercial and passenger vessels), we provide a wide range of products and services.

We not only deliver the best technology available but provide all the services our customers need. We follow our clients through the **entire value chain**: from design to financing, we provide everything from real-time assistance and training, to systems fine tuning and data analysis.



## PASSENGER VESSELS

Cruise, Ro-Ro and Ro-Pax



## COMMERCIAL VESSELS

Bulk carriers, Tankers, Containerships,  
Multi-purpose vessels, Heavy Lift



## ADVANCED DeSO<sub>x</sub> SOLUTIONS

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### Open Loop & Hybrid design EGCS for Sulfur abatement

Our portfolio comprehends a wide range of solutions to meet all your needs: Open Loop or Hybrid design, Inline or U-Type configuration. The Ecospray EGCSs are available in different sizes, from 1,800 to 5,000 mm in diameter, and a range of 5 to 80 MW rated engine power.

Time-tested and boasting exceptional proven performance, our advanced air quality systems are easy to install, both for retrofit and newbuilding on board of any vessel.

### Advanced Wash Water Filtration for soot and pollutants abatement in Open Loop design EGCS

Beyond the IMO compliance in terms of pH, PAH, and turbidity, Open Loop EGCSs can be equipped with advanced Wash Water Filtration (WWF) system in order to further mitigate visible effects.

This is an effective solution that includes a combination of a proprietary degassing system, a fine filter array, and a band filter, provided in different configurations depending on the available space.





## CATALYTIC SOLUTIONS

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Our catalytic solutions are designed to achieve abatement targets for NO<sub>x</sub>, Hydrocarbons (HC, CO, CH<sub>2</sub>O, VOC), Particle Matters (PM) and Methane slip (CH<sub>4</sub>), according to customers' needs. Powered by our technological partner, Catemission, these solutions can be applied to any type of vessel, with the possibility of full-service contracts that include systems financing.

### SCR systems for NO<sub>x</sub> abatement

A new generation of SCR systems with metallic catalysts have been developed to meet demanding IMO Tier III emission levels, and more – up to 95% NO<sub>x</sub> reduction. Those catalysts can be used with urea as a reagent, removing NO<sub>x</sub> at low exhaust gas temperature – typical conditions of 2-stroke diesel engines after the turbocharger.

The urea SCR can be combined with a Diesel Oxidation Catalyst (DOC) unit, which allows the reduction of carbon monoxide and hydrocarbons, including PAHs.

### Water Fuel Emulsion for NO<sub>x</sub>, PM and fuel consumption reduction (for HFO and MGO)

A new generation of the Water Fuel Emulsion system can be used in combination with SCR in order to further reduce NO<sub>x</sub>, PM, HC and fuel consumption. The technology is based on an innovative ultrasonic unit which allows a superior breakdown of water particles and better emulsion stability.





## ADVANCED FILTRATION SOLUTIONS

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### **Wet Electrostatic Precipitator for black smoke, plume and PM abatement**

The WESP system has been developed to eliminate plume visible at stack, especially during engines start-up and at low loads, capturing particle matter (PM<sub>2.5</sub> and lower) and part of the condensable species (SO<sub>3</sub>). It can be installed downstream the DeSOx tower and features low pressure drop and high removal efficiency. The WESP, as an option for both Open Loop and Hybrid EGCS, can be integrated into an existing DeSOx tower, or installed as a stand-alone unit.

### **Catalytic solutions for low sulfur fuels (0,5% and 0.1%)**

The Catalytic Dry Filter and/or Diesel Oxidative Catalyst reactor allows the removal of soot, ash and particulate matter, heavy metals, aromatic hydrocarbons (PAH) and

carbon monoxide (CO). This unique system can achieve a significant reduction of black smoke in the exhaust gas emission.

### **Black smoke removal for inland water navigation**

We provide advanced EGCS developed for ferry and cruise lines (river or lake navigation): this system removes the black smoke and particulate matters produced by diesel engines especially during maneuvering and port usage.

Our horizontal wet scrubbing technology aims to drastically reduce black smoke and particulate matter (PM and soot), as well as odor emissions using only fresh water, thanks to a proprietary two-stage solution (scrubbing + cooling).



# LET'S BUILD SUSTAINABLE FLEETS TOGETHER

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