

FUEL CONDITIONING SYSTEM ENERMULSION

REDUCE COSTS AND MAKE YOUR VESSELS OPERATION GREENER

Fuel savings up to 7%

NOx & PM Reduction

Better Combustion Performance + Cleaner Engine

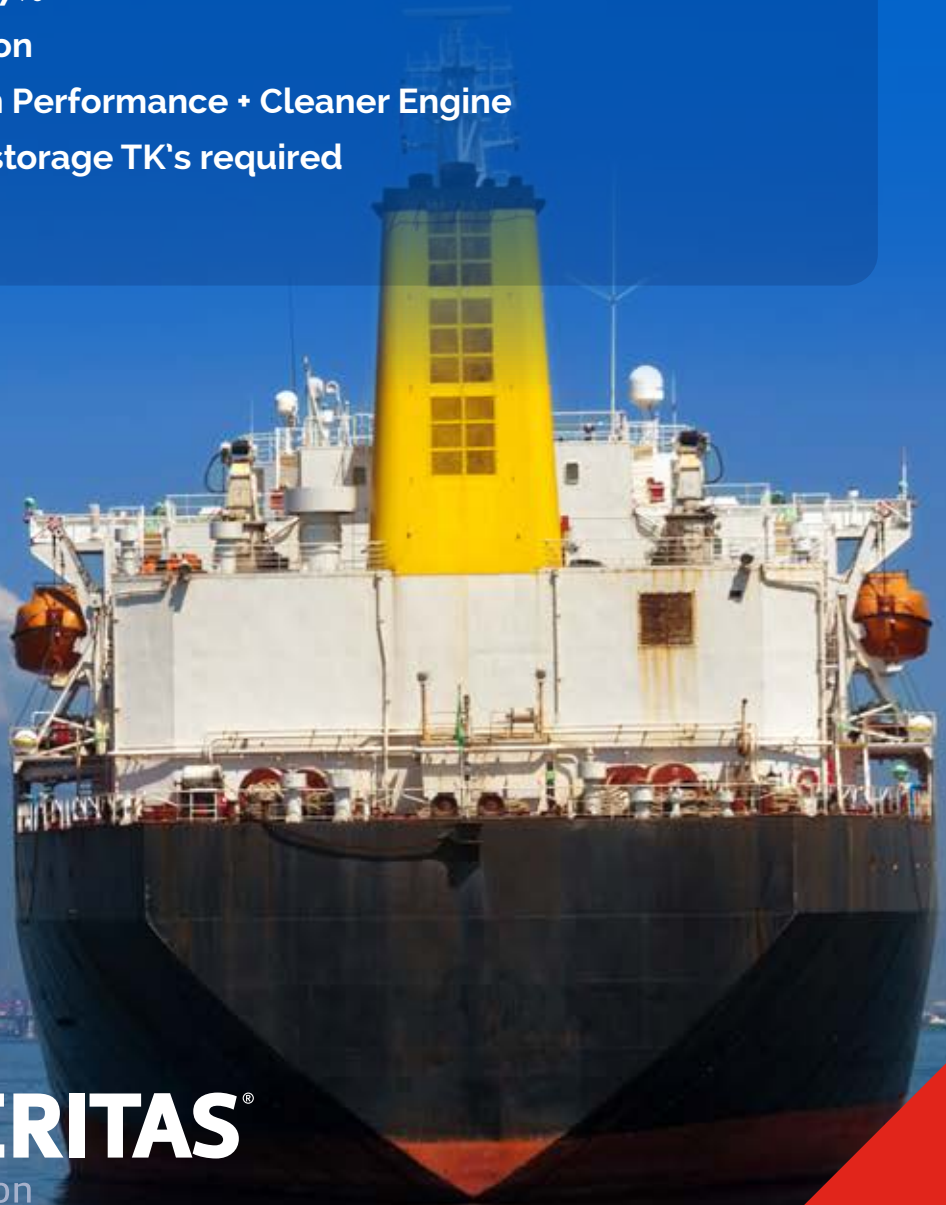
In-line System no storage TK's required

Easy operation



TECNOVERITAS[®]

Dedicated to innovation



ENERMULSION

Developed especially to control exhaust emissions and fuel savings.

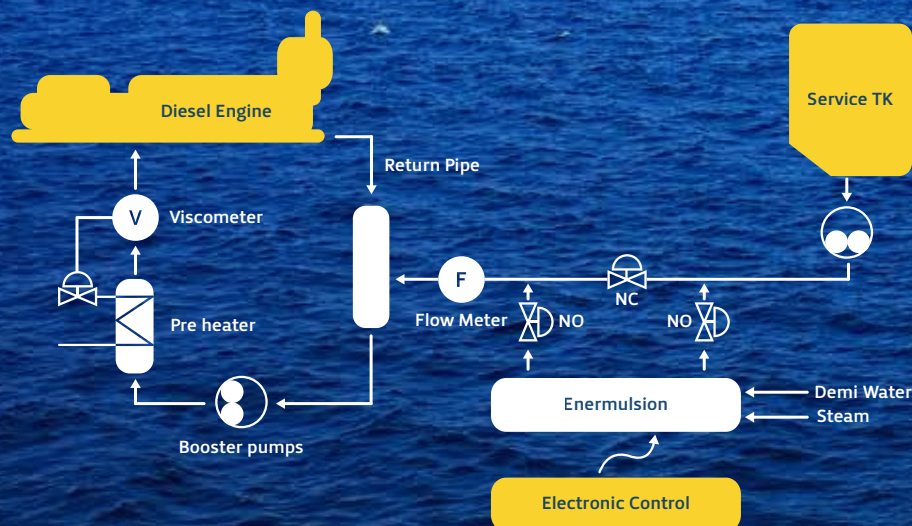
Enermulsion is a solution to reduce exhaust emissions (NO_x , SO_x , CO_2 , VOCs, PM) while being able to decrease fuel consumption, to address the urgent issues of escalating fuel prices and stricter emission restrictions.

This fuel conditioning system may be applied with success to fuels with high levels of asphaltenes. It can also be used with the same advantages with lighter fuels such as LFO, IFO and MDO.



HOW DOES IT WORK?

The installation of Enermulsion is easy, requiring minor intervention on the existing fuel system, and its operation is fully controlled by the Electronic Control Unit.



MAIN FEATURES



Easy and Fast
Installation



In-line
Operation



Fully
Automated



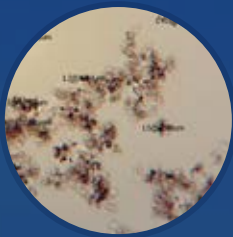
No Storage
Required



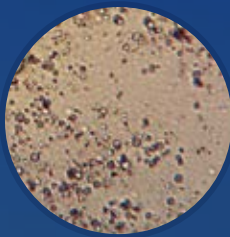
NO_x Tier II
Compliant

THE MECHANISM

The Emulsification of HFO comprehends a mixture of water in fuel oil in a way that small particles (6 µm) of water are formed in the fuel oil to produce a very **stable water-in-fuel emulsion**. The main purpose of doping fuel oil with small quantities of water (up to 30%) aims at **improving combustion efficiency and thus thermal efficiency**. The reduction of the fuel consumption is attributed to the following effects:



BEFORE
HOMOGENISATION



AFTER
HOMOGENISATION

- 1 Formation of a finer spray due to rapid evaporation of water (micro-explosion - Chaderton Mechanism);
- 2 Shorter hydrocarbon molecules with (OH) radicals, therefore improved combustion;
- 3 More air entrained in the spray due to increased momentum and penetrating force;
- 4 More fuel burning in premixed combustion stage due to a longer ignition delay;
- 5 Decrease in cooling loss due to a lower flame temperature;
- 6 Suppression of thermal oxidation of nitrogen - Zeldovich Mechanism; and
- 7 Higher exhausted mass flow rate, bigger turbocharger efficiency, more combustion air.

THE BENEFITS

FUEL SAVINGS

By using a fuel emulsification system, fuel consumption can be **reduced up to 7%**.

INLINE SYSTEM, NO STORAGE TK'S REQUIRED

The installation of Enermulsion requires **no modifications** to the engines and **no interruptions** to the engine operation, as it is an **automated in-line system**, also no additional tanks are required.



NO_x & PM REDUCTION

It is known that NO_x and Particulate Matter has a tremendous impact on the environment and on human health, especially Particulate Matter that causes lung cancer. With Enermulsion **NO_x reduction can be achieved up to 30% and PM up to 80%**.



CLEANER ENGINE

With a stable rate of fuel cracking and water molecule thermionic decomposition, resulting in a molecular rearrangement, the result is an **improved fuel combustion**. The water decomposition rate is continuously optimised to the engine load by Enermulsion's control system.



ABOUT TECNOVERITAS

TecnoVeritas is a specialist provider of engineering services and solutions to the shore and marine industries, with more than 20 years of experience.

Head quartered in Portugal with a global reach, TecnoVeritas is focussed on emissions and energy management, and has a strong track record of delivering high quality solutions combining innovation with world leading technical expertise.

Dedicated to innovation

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WINNER
Clean Shipping



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