



# TECNOVERITAS<sup>®</sup>

Dedicated to innovation

## BioHFO

FUEL DECARBONISATION SYSTEM

Minimising ETS CO<sub>2</sub> costs and improving CII



[www.tecnoveritas.net](http://www.tecnoveritas.net)

# FINALLY, THE SOLUTION TO DECARBONISE THE EXISTING FLEET UP TO 50%



Carbon Taxation (ETS) will hit hard most ship owners, starting in 2025! Most vessels may be scrapped or placed in secondary markets.

TecnoVeritas has been fully dedicated to ship performance for the last 30 years!

Responding to the challenge of the actual fleet decarbonization requirements, TecnoVeritas is capable of decarbonizing up to 50% any type of vessel, therefore making possible the impossible.

The patent pending solution from TecnoVeritas is based on the research carried by LabTecno (Accredited Fuel And Oil Lab) for the last two years.

The solution for decarbonization is based on the use of B100 (pure Biofuel) associated with HFO (any grade) and high-intensity ultrasound hardware.

Results have been processed both in lab and on board.

The project had a special authorization and support from the Portuguese Maritime Authority (DGRM).

In practice, a reduction of up to 50% of the CO<sub>2</sub> emissions can be achieved using BioHFO. Other advantages of BioHFO is the decrease in other emissions species like NOx, SOx, Particulate Matter, and improved SFOC of up to 2%.

The system is easily installed onboard, as a customised retrofit.

## BioHFO

### The Decarbonisation System

#### The solution for CII & ETS CO<sub>2</sub> costs control

BioHFO is:

- › A fully automated and type-approved fuel processing system installed onboard using HFO (or MDO) of any grade and B100
- › An environmentally friendly alternative to achieve the desired CII rating, and therefore, CO<sub>2</sub>, reducing the carbon ETS taxes
- › Can decrease CO<sub>2</sub> emissions up to 50%
- › Minimises the SFOC, SOx, NOx and PM emissions

## ETS TAXATION SAVINGS

As an example, a vessel consuming 20 t/day of HFO, sailing 250 days/year will face an additional operating cost (a carbon fee of 100€/t) of up to 632 000€ referred to 2024 CO<sub>2</sub> emissions, 1,106 M€ referred to 2025 CO<sub>2</sub> emissions and 1,580 M€ referred to 2026 CO<sub>2</sub> emissions.

The CO<sub>2</sub> ETS Tax penalties are too large to be ignored! BioHFO will cut CO<sub>2</sub> ETS taxes in up to 50%!

## SYSTEM OPERATION

BioHFO is fully automated processing B100 and HFO in line (no tanks required);  
Optimised percentages of fuel to achieve the desired CII rating and reduce ETS penalties;  
No time for waxes precipitation, or filters clogging;  
Type Approved.

The BioHFO operation, as required by MARPOL and other authorities is logged automatically with date, time and position stamp.



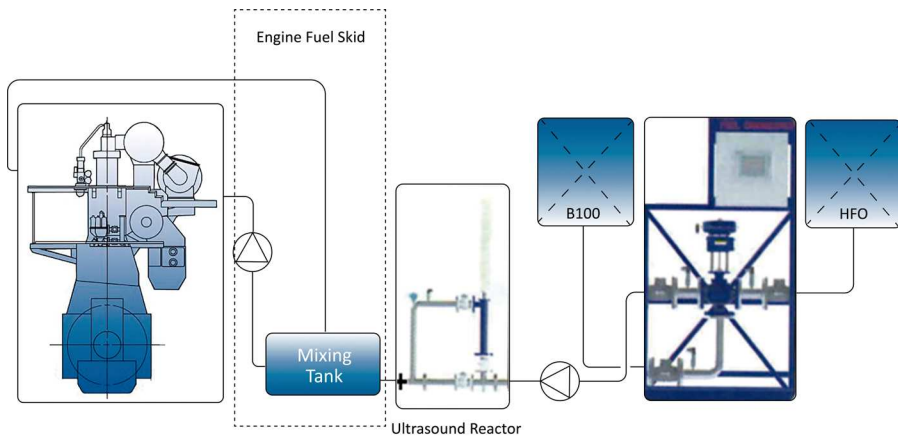


Figure 1

The BioHFO system includes an ultrasound reactor, whose purpose is to bind chemically HFO (or MDO) with B100 molecules. The ultrasound reactor simultaneously reduces larger HFO particles (such as asphaltenes) to a sub-micron size appropriate to prevent clogging of filters, improve Specific Fuel Oil Consumption, and reduce particulate matter.

## INSTALLATION

The BioHFO slim and compact design, makes its installation extremely simple and straightforward without extensive fuel system piping modifications, resulting in a modest installation cost. The installation can be easily performed as a retrofit or as a standard system in new vessels.

## ADVANTAGES AND FEATURES

- Improved CII rating
- Minimization of ETS Carbon costs
- Compliance with decarbonisation objectives
- Improved combustion SFOC and emissions
- Full processing and fuel management
- Fast and simple installation
- CII and CO<sub>2</sub> emissions monitoring and fuel consumption reporting

**Note: BioHFO is compliant with the MEPC80 and IMO Interim Guidance on the use of Biofuels under IMO-DCS and CII Regulations**

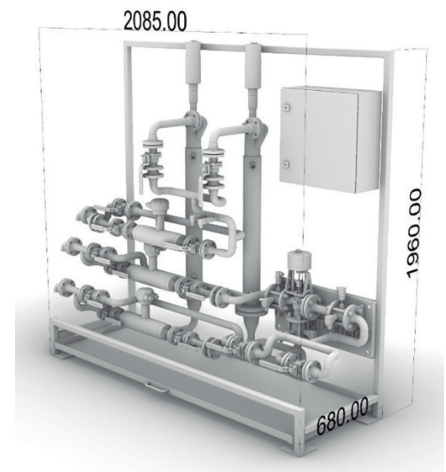


Figure 2

### High-intensity Sonication System

Fuels compatibility is ensured by the BioHFO density measurement in real time. HFO (or MGO) and B100 parameters are entered into the control system - that contains mathematical models developed by LabTecnico - which cover all possible processing possibilities to obtain the desired CII rating.

## BioHFO 3D Schematic

Note: Characteristics may change from project to project, and are merely indicative.

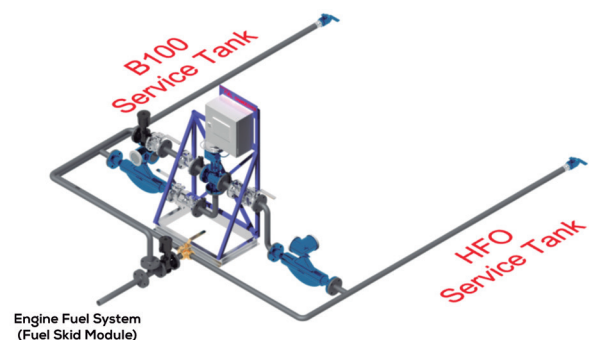


Figure 3

# ABOUT TECNOVERITAS

TecnoVeritas is a 30-year combination of expertise and experience dedicated to implementing technologies according to the market needs. From strong traditional roots in maritime services, TecnoVeritas has bloomed into areas such as ship design, industrial retrofitting, consulting, system production and R&D.



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