

Application

Marine: HFO and Marine Diesel Oil (MDO / MGO / DO)

Targets: Marine engine manufacturers, booster module producers, maintenance companies, ship builders

Application

Due to seaport legislation and maritime regulations, marine engines – both diesel and heavy fuel oil burners - are required to operate at lesser polluting levels when approaching coast lines. Within a specified boundary, ships switch from HFO to light fuel oil or marine distillate. Shippers face additional challenges such as deep water navigation and sea port landing; optimized engine performance is crucial in all situations.

Crudes' origins, refining methods, and additives contribute to differences in quality. Atomized oil burns at a high volume flow rate; proper fuel spraying at a specific viscosity allows burners to operate efficiently, yielding optimum engine performance. Precise regulation of fuel oil spray in wide viscosity and temperature ranges **requires continuous and accurate viscosity measurement and control** without manual intervention.

Challenges

HFO burning presents problems such as:

- Extreme smoke temperatures
- Unburned fuel in the smoke
- Carbon and soot build-up in the combustion chamber
- Clogging
- Dirty fuel burning

Causing:

- Unburned fuel oil waste
- Fuel over-consumption
- Increased stack emissions
- Frequent maintenance operations in harsh conditions
- Increased shipping time

Switching from HFO to marine distillate initiates issues such as:

- High viscosity difference between HFO and marine distillate
- High working temperature for HFO burning
- Low working temperature for gasoil burning

Resulting in:

- Uncertain transition time from HFO to gasoil
- Ambiguity regarding temperature and viscosity stabilization
- Unclear working conditions of HFO / gasoil
- HFO and MDO waste
- Weakened motors

Solution

The installation of a vibrating inline process viscometer – **Sofraser OEM viscosity sensor** – and associated electronic controller in a fuel conditioning module allows MDO to HFO changeover from viscosity to temperature control (and vice versa).

How it works

The sensor measures viscosity which is then compared against a value set by the engine manufacturer. The controller adjusts the electrical valve actuator on the heater's supply. Correct viscosity is maintained.

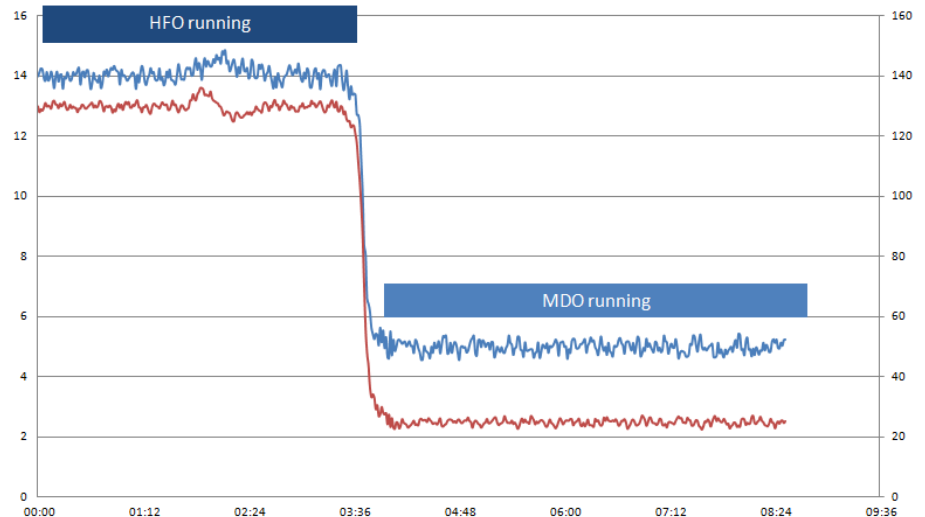
Installation

The Sofraser OEM inline process viscometer:

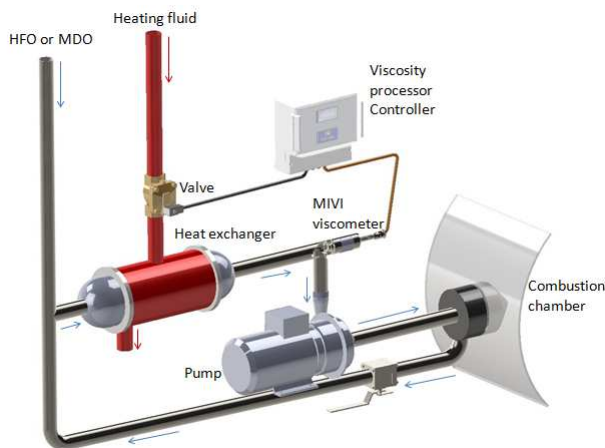
- is easily fitted at the heater outlet
- continuously delivers viscosity and temperature information to the electronic controller
- instantly assures correct in-line viscosity at the outlet by activating the component that monitors the heater

Viscosity records obtained on merchant marine vessel on Mediterranean sea.

HFO to MDO switch on marine vessel



Operation diagram



Shipyards installation



Key product characteristics

- Standard dual fuel operation
- Robust over time, no moving parts, no maintenance
- No drift in time
- Easy to clean and uncomplicated access to wetted part
- Large working temperature range
- Not affected by pressure and flow fluctuations
- Marine compliant