

Fuel Conversion from MDO /LFO to HFO operation



HFO sample

Most Wärtsilä marine and power plant installations can be converted from MDO to HFO operation without major modifications to the engine. Some additional auxiliary equipment is required for fuel oil treatment.

Many installations, both marine and power plant, have been originally designed and delivered for operation on MDO (Marine Diesel Oil) or LFO (Light Fuel Oil). All the medium speed engines in the Wärtsilä portfolio are also designed for HFO (Heavy Diesel Oil) and conversion from

MDO operation to HFO operation is possible without major alterations to the engine specification.

Generally an engine won't require many changes if it has already been updated with the latest technology, particularly with antipolishing rings in the cylinders. However, a plant will require new auxiliary equipment for handling heavy fuel oil, particularly for heating the fuel oil to a correct viscosity before the engine injection system.

Required auxiliary equipment:

- Unloading / storage and transfer system
- Unloading system consists of unloading pumps
- Storage tank is for the storage of the fuel oil at a suitable temperature to ensure that the fuel oil can be pumped. The storage tank also requires heating in order to control and maintain correct viscosity of the fuel oil in the tank.
- Transfer system is designed to pump fuel oil from storage tank to fuel oil treatment system (to buffer tank).

Treatment system

Treatment system consists of buffer tank, separator units and day tank.

The treatment system ensures that a sufficient amount of clean HFO is available for engine operation.

The HFO is transferred from the storage tank to the buffer tank. The buffer tank is also called the settling tank.

HFO separation takes place before the fuel oil is passed to the day tank.

The day tank should ensure fuel supply for 8-12 operating hours (maximum filling).

Fuel feeding and return fuel system

The fuel feed system supplies clean HFO from the day tank to the engine injection pumps. The feed system also consists of heating elements and a viscometer so that the viscosity of the fuel oil is correct before entering the engine.

The fuel feed system the contains following main equipment / components:

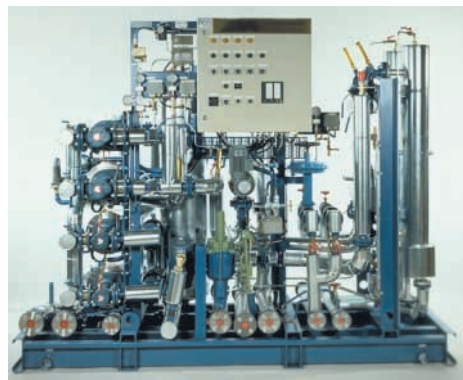
- Booster unit with heaters (steam or electric), viscometer to control the viscosity (with temperature adjustment), feeder pumps and booster pumps that provide correct pressure and flow for fuel oil before supply to the circulation system. The booster unit can also supply fuel oil to more than one engine.
- Pump and filter unit with fuel oil filters and fuel feed pump. Pump and filter unit is required when there is more than one engine connected to the same fuel oil system (same booster unit). Sufficient flow of fuel oil for the engines is ensured when each engine has a pump and filter unit.

List of possible engine modifications:

- Injection pump elements
- Anti-polishing ring modification on liners and pistons
- Suitability of fuel oil filter for HFO (if built-on)
- Exhaust valves (recommended Nimonic type)
- Rotocaps or Rotomats for exhaust and inlet valves

Required auxiliary equipment for HFO operation.				
Description	1 engine	2 engines	3 engines	4 engines
HFO unloading unit	1	1	1	1
HFO storage tank	1 (2)	1 (2)	1 (2)	1 (2)
HFO transfer pump unit	1	1	1	1
HFO buffer tank	1	1	1	1
HFO separators	2	2	2	2
HFO day tank	1	1	1	1
HFO booster unit	1	1	1	2 *)
Pump & filter unit	1	2	3	4
Return fuel unit	1	2	3	4
Lubricating oil separators	1	2	3	4
Sludge collecting tank	1	1	1	1
Heaters (tank, separators, pipe trace, booster unit)	set	set	set	set

*) Booster units generally designed for a maximum of three engines.



HFO booster unit



HFO separators

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Wärtsilä Corporation

Kauppaustikko 15
FIN-65100 Vaasa
Finland

Tel. +358 (0)10 709 0000
Fax +358 (0)10 709 2422

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