THE WÄRTSILÄ LNGPAC™ ISO

The Wärtsilä LNGPac™ ISO is a fuel gas handling system utilising removable LNG fuel tank containers that can be easily transported by road for refilling when LNG bunkering facilities are not available at the port. By adding flexibility to the bunkering process, the LNGPac™ ISO further enables the use of LNG as a viable marine fuel. The system can also be used as a cost effective solution for stationary applications, since the standard dimensions of the frame and the modularised skid-based fuel gas handling system make installation simple and fast.

TYPICAL APPLICATION AREAS

The Wärtsilä LNGPac™ ISO featuring LNG fuel tank containers that can be easily removed and transported for refilling at remote locations is an option with applications in many different areas. In particular, for small and medium sized vessels not requiring large LNG storage capacity, such a solution offers a realistic alternative to conventional stationary LNG tanks.

OPERATIONAL FEATURES

In addition to the LNG fuel tank container, the system consists of a docking station and an evaporator skid installed permanently on the ship. The Wärtsilä LNGPac™ ISO is intended for installation on an open and naturally ventilated deck.

The removable container is designed to fulfil all marine LNG tank requirements. It is of standard ISO frame dimensions (20 ft, 40 ft and 45 ft) and can be transported by road, rail and sea, although the maximum gross weight may vary in different countries for land transportation.

The LNG fuel tank container is fitted with a pressure build-up evaporator (PBE) for maintaining an operational pressure of approximately 5 bar in the tank. The pressurised tank is used instead of rotating equipment, such as pumps and/or compressors, to feed the gas to the engines. Having a PBE on the container enables complete redundancy, since should a container be out of service for any reason, another container can be easily taken into operation.

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ENVIRONMENTAL COMPLIANCE

LNG is a clean burning fuel that enables ship owners and operators to comply with the most stringent environmental legislation. When operating on LNG instead of conventional marine fuels, sulphur oxide emissions are reduced to almost zero, particulate emissions are more than 90 percent lower, and CO_2 levels are reduced by 20 to 30 percent as well, while nitrogen oxide emissions are at least 80 percent below the IMO's current stipulated level.

The LNGPac™ ISO expands the possibilities for ships to utilise LNG as fuel. Where no permanent bunkering infrastructure exists at the port, the fuel tank containers can be transported for filling elsewhere.

TOTAL COST OF OWNERSHIP

By facilitating the use of LNG as fuel by using Wärtsilä dual-fuel engines and the LNGPac™ ISO, operational costs can be sharply reduced. Fuel costs represent the lion share of total operating expenditures, and the comparatively low current price of LNG is likely to be even more cost competitive in the future. The already extensive availability of natural gas is being enhanced through the increasing mining of shale gas.

Because of its clean burning characteristics, the use of LNG fuel eliminates the need to employ exhaust emissions cleaning equipment. It also means that the burning of expensive low-sulphur fuel can be avoided. By significantly reducing operating costs, the revenue earning capability of the vessel is obviously increased accordingly.

Wärtsilä is today recognised as a pioneer and leader in propulsion systems for gas fuelled vessels. The company's strong and early commitment to this goal has created in-depth, in-house knowledge of the use of natural gas and LNG. The Wärtsilä LNGPac™ ISO is an important addition to Wärtslä's portfolio of solutions for the LNG fuelled ship market.

The key benefits of the LNGPac™ ISO include:

- Enables the use of LNG fuel where a stationary tank is not possible or best suited
- Eliminates the need to rely on permanent portside LNG bunkering facilities
- Expands the range of vessels able to utilise LNG as fuel through greater bunkering flexibility
- Removable fuel tank containers can be transported for filling at nearest available supply point
- All modules, including the LNG fuel tank containers, are monitored and controlled by a single dedicated PLC-based automation system
- Pressure build-up evaporator ensures complete redundancy, since should a container be out of service, another can easily be taken into operation
- Equipped with all necessary valves and instruments to fulfil safety and operational requirements

LNG fuel tank container	20 ft	40 ft	45 ft
Frame dimensions (external)			
Length m	6.058	12.192	13.716
Width m	2.438	2.438	2.438
Height m	2.591	2.591	2.896
Tank			
Geometrical volume (approx, room temp.) m3	17 TBD	40 TBD	45 TBD
LNG volume (80 % effective volume) m3	13.5 TBD	32 TBD	36 TBD
Max weight (approx.) kg	15,000 TBD	34,000 TBD	36,000 TBD

Tank container comparison	Wärtsilä LNG fuel tank container	Standard ISO tank container
Standard ISO frame	✓	✓
Compliance with transportation regulations (IMDG, TPED, ADR, RID, CSC among others)	✓	✓
Compliance with rules for use as LNG fuel tank on board ships:	✓	✗
IMO Type-C tank	✓	✗
Water spraying system	✓	✗
Tank safety relief valves designed for fire case	✓	✗
Connection to external vent mast	✓	✗
LNG leakage detection and protection	✓	✗
Class approved equipment & design	✓	✗
Stainless steel outer shell	✓	✗
Dry disconnect quick couplings	✓	✗
Connections at end for connecting to ship	✓	✗
Connection to automation system on the ship	✓	✗
Connection to safety systems on the ship	✓	✗

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