The Wärtsilä 31 is the first in a new generation of medium speed engines, designed to set a benchmark in efficiency and overall emissions performance.

The Wärtsilä 31 is available in 8 to 16 cylinder configurations and has a power output ranging from 4.2 to 9.8 MW, at 720 and 750 rpm. The launch of the Wärtsilä 31 introduces a 4-stroke engine having the best fuel economy of any engine in its class. At the same time, it maintains outstanding performance across the complete operating range. Its modular design enables significant reductions in maintenance time and costs, thereby improving power availability and reducing the need for spare parts.

The Wärtsilä 31 retains its high efficiency and environmental values throughout the entire lifecycle of the vessel.
- Lowest fuel consumption over a wide operating range.
- Highest cylinder power in its segment, 610 kW/cylinder.
- Available in Diesel, Dual Fuel (DF) and Pure Gas (SG) versions.
- Meets the coming IMO Tier 3 regulations when operating on gas, and with an SCR when using diesel fuel.
- Reliability guaranteed through extensive validation and Wärtsilä’s vast manufacturing experience.
- Supported by Wärtsilä’s extensive global service network.

Typical applications
The Wärtsilä 31 is designed to be suitable for a broad range of ship types and applications, such as a main propulsion engine, in diesel-electric configurations, in hybrid installations or as an auxiliary engine. It can be optimised for running either at constant speed or along a propeller curve. In the Offshore sector, the Wärtsilä 31 is a perfect solution for OSV’s and drilling or semi-submersible vessels, where operational flexibility, high power density, long intervals between overhauls, and high levels of safety are of paramount importance.
In the cruise and ferry sector, the Wärtsilä 31 represents a particularly good investment for ferry and Ro-Pax fleet operators focusing on trimming their fuel expenses while maintaining high standards in environmental performance. Within the merchant fleet, the Wärtsilä 31 is designed for application as a main engine for small to medium sized tankers, bulk carriers, and container vessels.

**Operational features**

The modular structure of the Wärtsilä 31 brings unprecedented multi-fuel flexibility to the market. Not only is the diesel version separately optimised for heavy or light distillate fuels, but the engine is available also as a Dual-Fuel version (burning alternatively gas or diesel) and as a pure gas engine (running uniquely on gas). This represents the ultimate in engine fuel flexibility.

The introduction of an advanced fuel injection system, combined with state-of-the-art air injection technology, enables the most efficient and economical use of low sulphur fuel oils (<0.1%S), making the Wärtsilä 31 especially suited for operating in emission controlled areas. The advanced UNIC engine control system, the advanced injection system, and the variable valve timing make optimal running performance achievable at any engine load. Low and part load running, as well as transient performance, are assured. The overall operational benefits also include smokeless operation and superior load acceptance.

**Smart maintenance – more uptime**

The engine is designed for long periods of maintenance-free operation. While most engines with a similar output require maintenance at intervals of approximately 2,000 hours, the Wärtsilä 31’s maintenance schedule intervals are four times longer, i.e. after 8,000 hours. This, and the maintenance-friendly design, increases uptime, promotes scheduling, and cuts operating costs.

**Modular design**

The modular design of the Wärtsilä 31 reduces the time spent on maintenance. The shift from single parts to exchange units, such as for example the power units, injectors and HP fuel pumps, enables easier and more efficient maintenance work and, therefore, maximized uptime.

The modular design also enables fast and efficient engine conversions. Thanks to the standardized component interfaces, engines can be converted to use different fuels, for example from diesel to gas, without any machining. Utilizing exchange units for the conversion will reduce the time needed.

The modern Wärtsilä 31 engine documentation increases the efficiency of both the planning and the actual maintenance work. The Operation and Maintenance Manual contains work cards explaining the work steps as well as the needed spare parts and tools. In addition to a large amount of spare part kits and spare part sets, the Wärtsilä 31 spare parts catalogue also includes exchange units.

**Asset performance management**

**Service Agreements**

Wärtsilä’s long-term Service Agreements provide customers with assured high availability of their equipment, and with operational flexibility. A long-term
The new car and passenger ferry being built for Danish operator Mols-Linien, will be powered by two 8-cylinder Wärtsilä 31 main engines. “The selection of this particular engine was based on the unique efficiency for the required output, and also the favourable maintenance intervals it allows,” says Flemming Kristensen, Technical Director, Mols-Linien A/S.

Wärtsilä’s propulsion solution provides the efficiency and environmental sustainability needed for the new purse seiner/trawler being built by Danish shipbuilder Karstensen Shipyard. Wärtsilä’s scope includes the Wärtsilä 31 engine which has established a new benchmark in terms of fuel efficiency, and the Wärtsilä 2-speed gearbox which provides additional fuel savings and lower noise levels.

Wärtsilä will supply the engines, the navigation system, and a broad scope of other products and systems for a new luxury and environmentally friendly ferry being built for Viking Line in Finland.

Six Wärtsilä 31DF dual-fuel engines running primarily on LNG will provide the propulsion and power for the vessel. The combination of high efficiency, low fuel consumption, and the reduced level of exhaust emissions from operating on clean burning LNG, is expected to create low operating costs and a minimal environmental footprint.

Service Agreement with fixed prices for everything from maintenance planning to availability of spare parts and manpower, and from technical support to training, enables excellent financial predictability. A Service Agreement with the emphasis on optimised maintenance is a proven way of preventing the unexpected, and of ensuring the highest levels of productivity and profitability from the installation throughout its entire lifecycle.

Asset Performance Services
Through intelligent data acquisition and advanced analytics, Wärtsilä is able to optimise and increase the availability of customer’s assets. Real-time remote access to operational data enables advanced support and immediate response to ensure the safe operation of the installation, regardless of its location. Experienced specialists are available to give prompt response and advice to the crew or operating team via phone and e-mail, reducing the need for unscheduled maintenance visits.

Online Services
Wärtsilä’s Online Services provide access to technical information regarding the installation and equipment, such as bulletins, interactive manuals and service history. Via Online Services you can also create and manage technical requests, check the availability and price of spare parts, create orders, track and trace deliveries, and much more.

Key business benefits:
- Improved operational availability
- Increased servicing efficiency
- Easy to convert
- Increased efficiency in planning and carrying out maintenance
- Increased speed and flexibility of operations via Asset Performance and Online Services
**Wärtsilä 31**

- **Cylinder bore**: 310 mm
- **Piston stroke**: 430 mm
- **Cylinder output**: 610 kW/cyl
- **Speed**: 750 rpm
- **Mean effective pressure**: 30.1 bar
- **Piston speed**: 10.75 m/s

**Fuel specification**: Fuel oil

**Rated power**

- **Engine type**: kW
- **8V31**: 4 880
- **10V31**: 6 100
- **12V31**: 7 320
- **14V31**: 8 540
- **16V31**: 9 760

**Rated power Wärtsilä 31 DF**

- **Engine type**: kW
- **8V31 DF**: 4 400
- **10V31 DF**: 5 500
- **12V31 DF**: 6 600
- **14V31 DF**: 7 700
- **16V31 DF**: 8 800

**Engine dimensions (mm) and weights (tonnes)**

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**Wärtsilä 31 DF**

- **Cylinder bore**: 310 mm
- **Piston stroke**: 430 mm
- **Cylinder output**: 550 kW/cyl
- **Speed**: 750 rpm
- **Mean effective pressure**: 27.2 bar
- **Piston speed**: 10.75 m/s

**Fuel specification**: Fuel oil

**Rated power**

- **Engine type**: kW
- **8V31 DF**: 4 400
- **10V31 DF**: 5 500
- **12V31 DF**: 6 600
- **14V31 DF**: 7 700
- **16V31 DF**: 8 800

**Engine dimensions (mm) and weights (tonnes)**

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