

# Propulsion Solutions for Fishing Vessels







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Wärtsilä propulsion systems have been developed to provide outstanding reliability, low operating costs, environmental friendliness, easy installation/integration, and intuitive operating control. Wärtsilä designs and produces controllable pitch and fixed pitch propellers for the commercial, navy and superyacht markets. Wärtsilä's unique hydrodynamic expertise dates back to 1903. With this wealth of experience and more than 20,000 installations throughout our history, we present in this brochure our latest innovative solutions for fishing vessels.

## Controllable pitch propeller systems

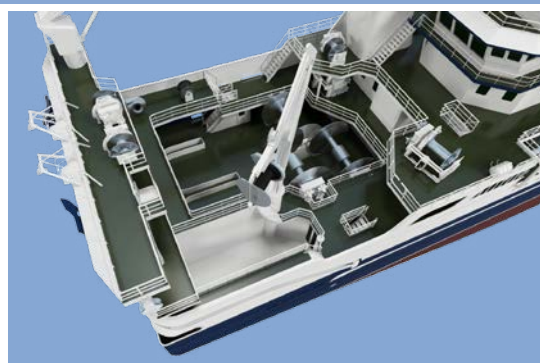
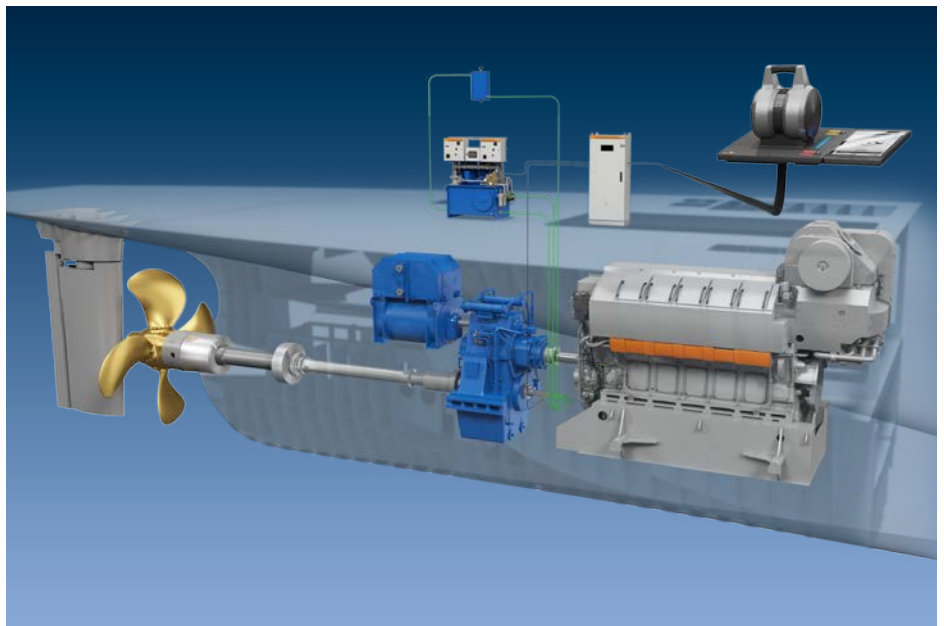
A Wärtsilä Controllable Pitch (WCP) propeller system consists of a hub, the propeller blades, shafting, hydraulics and a remote control system, as well as any further accessories needed to meet the customer's requirements. For every vessel, the most appropriate solution is available from our 4 bladed

propellers formed perfectly from Cunial bronze or stainless steel, with or without a nozzle. The range of WCP propeller systems starts at a power of approximately 1000 kW and a propeller diameter of 1200mm, and in principle has no upper limit. As your single point of contact, Wärtsilä will take care of the correct

interfaces and performance of the total installation.

### **Why a Wärtsilä controllable pitch propeller system?**

WCP propeller systems are particularly beneficial when more than one operating condition is of importance, as is the case of fishing



vessels. WCP propeller systems allow operating at optimum pitch settings for various operating conditions, for example when both trawling and free-sailing performance are important. Similarly, these vessels benefit greatly with such systems, since they are also sailing in summer and winter/day and night conditions, and are sensitive to fouling or

varying weather conditions.

A CP propeller is often the choice for fishing vessels with a shaft generator (PTO) operating at constant rotational speed. The PTO is either installed at the reduction gear or directly at the shaft line through a tunnel gear. A shaft generator also allows the use of a redundant propulsion system or booster, in which case the PTO can operate as an electric motor (PTI).

For certain types of “double-duty” vessels, such as trawlers, WCP propeller systems give both increased pull and higher vessel speed, since adjusting the pitch makes it possible to utilize full power at both low and high vessel speeds.

Finally, CP propellers have higher manoeuvring capabilities. At low vessel speeds, the CP propeller generally makes more propulsive power available than a fixed pitch propeller, and astern thrust is easily achieved using the reverse pitch setting.





## Wärtsilä propeller systems

### Key benefits

#### High propeller efficiency:

Wärtsilä propulsion systems are custom designed for each vessel. All Wärtsilä propellers are wake-adapted and, in co-operation with the customer, the propeller is designed for optimal performance in all relevant operating conditions. Targeting the highest possible propeller efficiency is a standard, while at the same time ensuring minimal noise and vibration levels on board and maintaining excellent behaviour regarding cavitation. Advanced high lift blade profile sections and optimised propeller tip loadings are natural for us.

#### Reduced fuel consumption:

The Wärtsilä OPTI-Design is the result of highly experienced design engineers in our European R&D headquarters having access to the very latest and most sophisticated software and analysis tools.

Computational Fluid Dynamic (CFD) analyses of 3D geometries, analyse not only the propeller performance but most importantly also, the interaction between the propeller and hull. This provides extremely accurate information for achieving design and parametric optimisation. This state-of-the-art design protocol optimises the vessel's overall propulsive efficiency. OPTI Design can provide fuel savings of up to 4 percent. With each propeller being individually customised to meet specific application requirements, the vessel's fuel consumption and emissions are reduced.

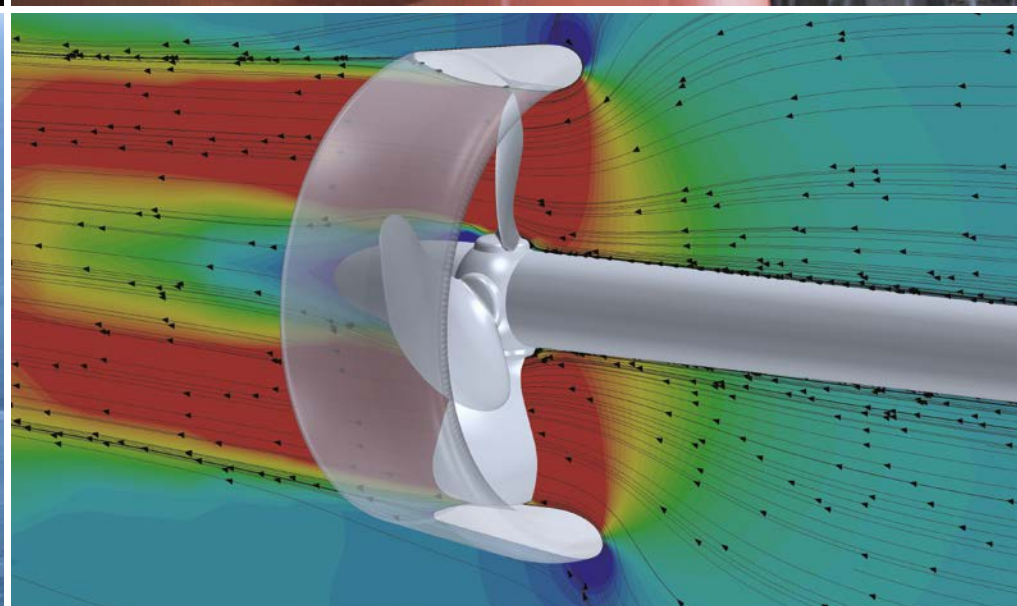
#### Minimum noise and vibration

**levels:** Thanks to the use of the state-of-the-art technology, it has become possible to accurately predict propeller induced forces acting on the hull. This valuable propeller design software asset is utilised to find the optimal balance between propeller induced

vibrations and propeller efficiency for applications where comfort is of importance. In addition, high end cavitation models and modern CFD codes ensure well predicted noise levels for research and naval applications.

**Reliable:** Since operational reliability is important, Wärtsilä places high priority on the robustness of all components used in its products and solutions. The reliability of the Wärtsilä propeller system is the result of robust drive line components, such as seals, bearings and the pitch actuating system. The latest WCP hub design features improved blade bearing loading, making the hub specifically suitable for demanding ICE class applications. The extensive product portfolio, including seals and bearing systems, and Wärtsilä's wide experience with applications in all marine segments, ensure lifelong and trouble-free operation of the shaft line and sterntube.





### **Wärtsilä's hydrodynamic design experience**

The hydrodynamic design covers propellers for many types of vessels, from smaller fishing boats with an open WFP, to large trawlers with nozzled WCP systems.

Our long history and experience in designing propellers gives us extensive hydrodynamic knowledge,

and we have developed design tools validated by a large number of model test results, full-scale measurements, and research and development efforts. Co-operation with well-known research institutes and universities worldwide ensures our prime position when it comes to propulsor hydrodynamics.





## High Performance nozzles

The Wärtsilä High Performance nozzle is yet another development based upon the company's strong in-house propeller design know-how. It is specifically designed to increase the thrust of marine propellers, and performs significantly better than the industry standard nozzle types.

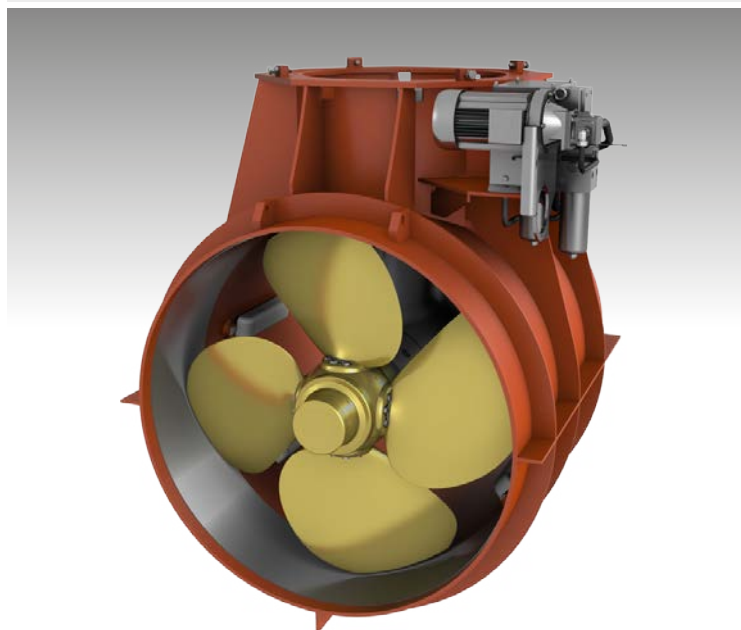
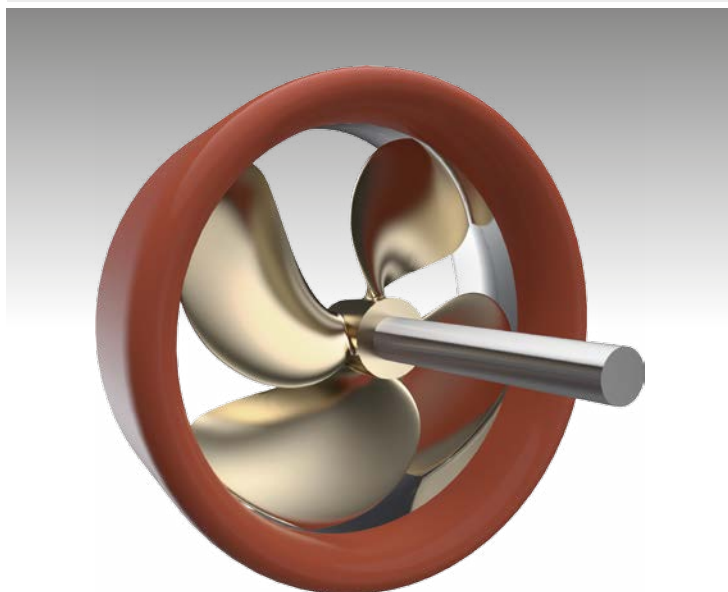
The HP Nozzle can accommodate to your operational requirements, combining seamlessly with FP and CP propellers. By working together with our experts, we can maximize your vessel's performance based on the full operational profile, and not just on a single design point. It also protects the propellers from the nets when manoeuvring while fishing.

## Transverse thrusters

The Wärtsilä Transverse Thruster (WTT) has been developed in response to market requirements for efficient and reliable hydrodynamic performance with less maintenance. The WTT comes in a wide range of sizes, matching the needs of your fleet.

Wärtsilä transverse thrusters provide high thrust levels in an overall compact package. The propeller design and hydrodynamic design of the thruster gearbox and its supports are optimized by means of Computational Fluid Dynamics (CFD) analysis.

For applications where low noise and vibration are required, such as for research vessels, Wärtsilä can also optimize the tunnel locations, entrance shape and design.





## 2-speed gears

The Wärtsilä 2-speed gear is designed to serve vessels having multiple operational modes or reduced transit speeds. This selectivity brings notable economic and environmental benefits, especially for fishing vessels. The Wärtsilä 2-speed gear is available with a high degree of modularization in the 2 MW to 12 MW power range.

As with all Wärtsilä gears, the modular design of the 2-speed gear is simple, reliable, yet compact in size for easy installation and maintenance. It is suitable for diesel mechanic propulsion and for a hybrid format combining diesel mechanic and diesel electric propulsion. The hybrid option enables a booster mode as well as slow steaming.

## Propulsion control systems

Wärtsilä's wide range of propulsion products would be incomplete without the ability to control them. The Protouch panel design is space saving and conceived to allow easier and more intuitive operation of the propulsor functions. Its modularity allows for a wide range of propulsion and thruster configurations, from single FPPs, going to twin CPPs with WTTs, to more complex offshore configurations. Installation of all the components is straightforward thanks to CAN OPEN field buses interconnectivity. Furthermore, pitch control for constant and variable RPM operations with one lever is available, as well as other specific functions.







Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. By emphasising technological innovation and total efficiency, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers.

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