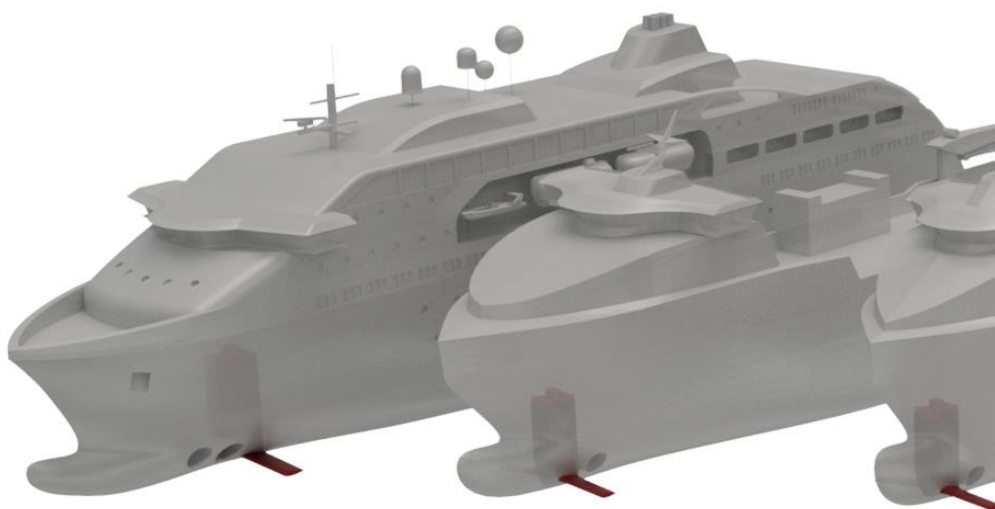




WAVEFOIL

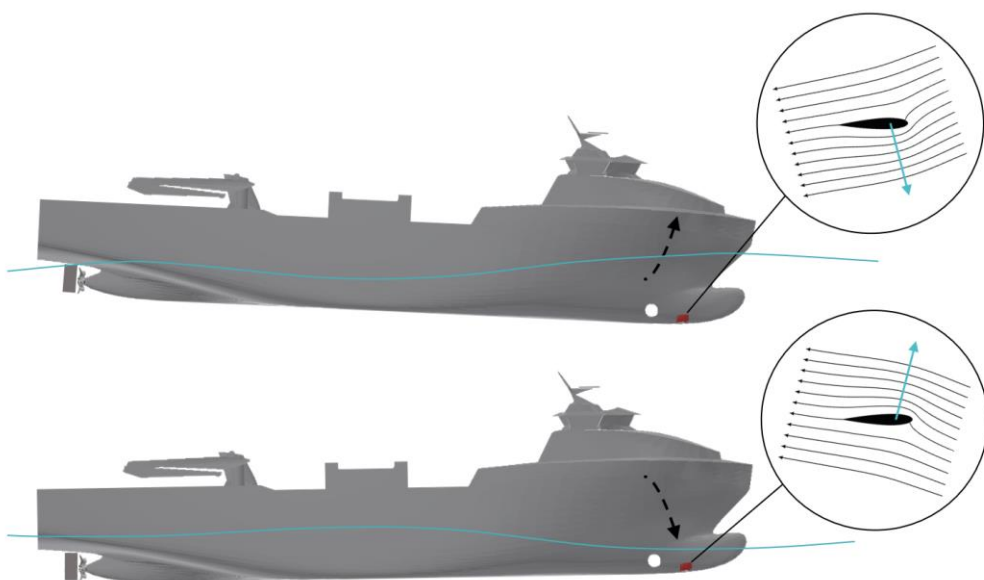
POWERED BY THE SEA



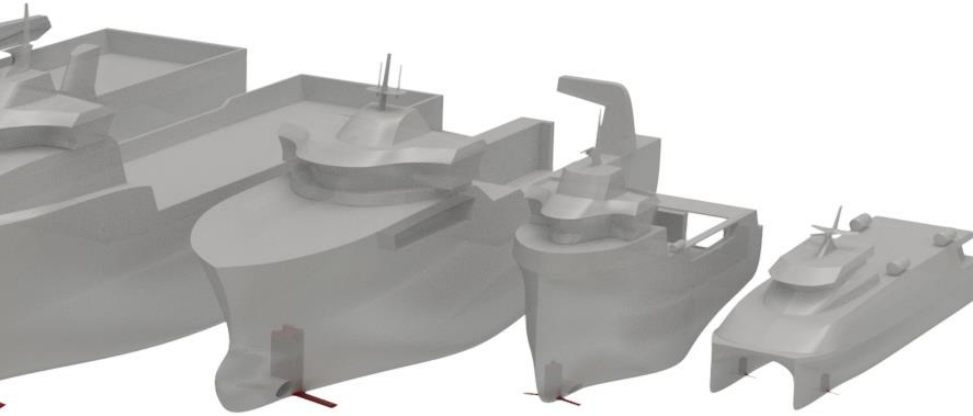
# RETRACTABLE BOW FOILS

Wavefoil provides retractable bow foils that reduce fuel consumption and ship motions in waves. Fuel saving for suitable ships is typically in the range of 5-15%, while ship motions typically are reduced by 10-25%.

A vessel operating in waves experiences increased resistance and decreased propulsion efficiency. This is effectively counteracted by the foils. In addition, the foils generate a thrust force due to the nature of an oscillating foil at forward speed – exploiting the same hydrodynamic principles as a swimming whale.



*The lift from the foils works against the vessel motion and pulls the vessel forward*



**5-15%**

FUEL CONSUMPTION AND EMISSION REDUCTION

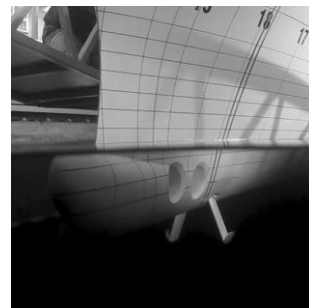
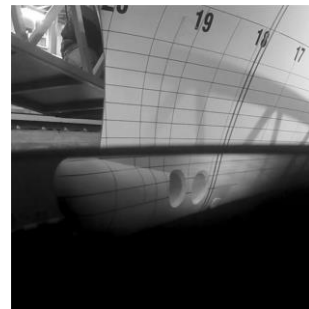
**10-25%**

MOTION DAMPING

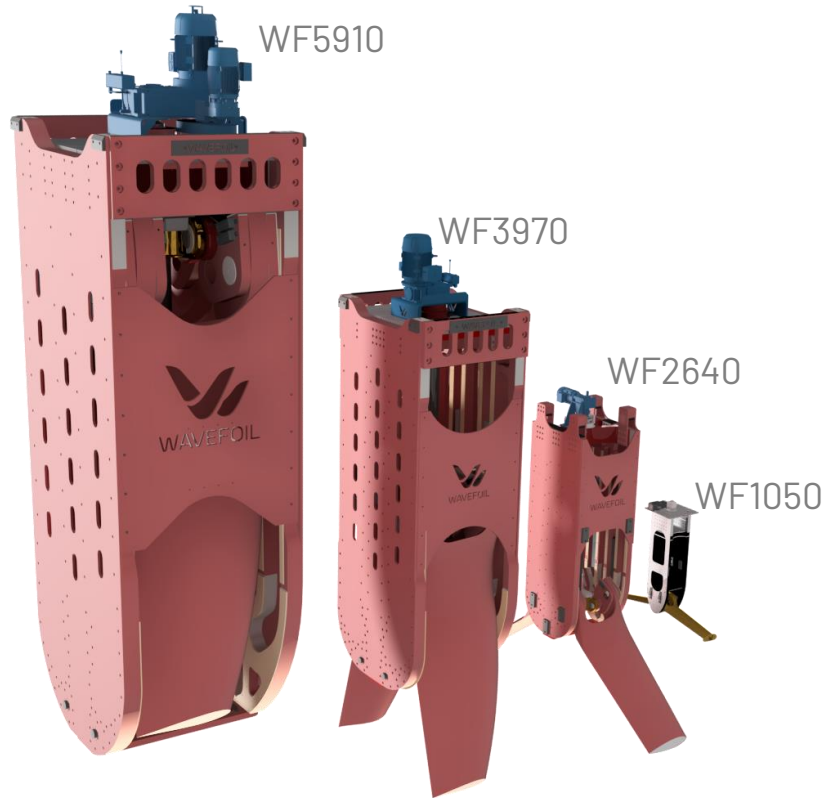
Wavefoil's unique retraction mechanism allows the crew to optimize the vessel performance based on the weather conditions. A decision support system (to be launched) will assist the crew to optimize fuel savings and to avoid extreme loads.



*The WF3970, on a pelagic trawler designed by Salt Ship Design for Liegruppen.  
To be delivered by Cemre Shipyard in 2023.*



# PRODUCT RANGE



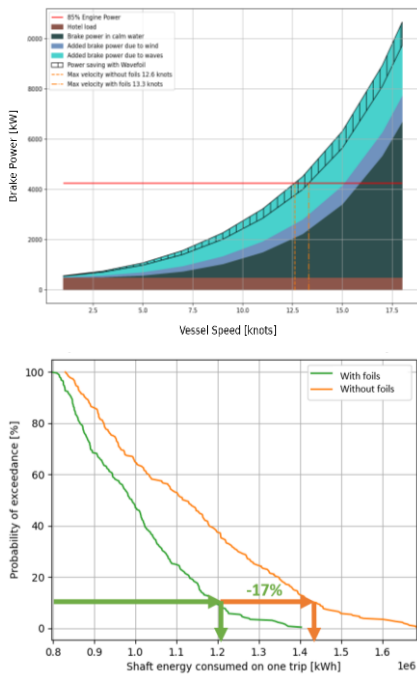
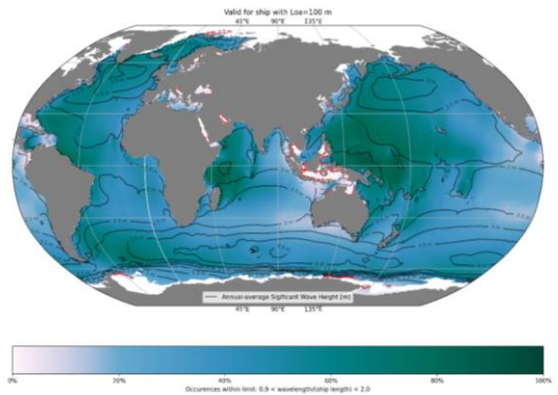
	WF5910	WF3970	WF2640	WF1050
Typical vessel types	<ul style="list-style-type: none"> <li>Expedition cruise vessels</li> <li>Chemical tankers</li> <li>Cargo vessels</li> <li>Coast Guard vessels</li> </ul>	<ul style="list-style-type: none"> <li>Fishing vessels</li> <li>Live fish carriers</li> <li>Ocean-going ferries</li> <li>Small cargo</li> <li>Yachts</li> </ul>	<ul style="list-style-type: none"> <li>Fishing vessels</li> <li>Research vessels</li> <li>Small car/passenger ferries</li> <li>Yachts</li> </ul>	<ul style="list-style-type: none"> <li>High-speed passenger ferries</li> <li>Ambulance vessels</li> <li>Offshore wind crew transfer vessels</li> </ul>
Typical hull type	Conventional vessels	Conventional vessels	Conventional vessels	High-speed catamarans
Typical vessel length	90-200 meters	50 - 100 meters	35 - 60 meters	20 – 40 meters
Typical vessel speed	12 - 18 knots	10 - 18 knots	8 - 13 knots	20 - 35 knots
References	<ul style="list-style-type: none"> <li>Prototype under production, supported by EU's EIC Accelerator program.</li> </ul>	<ul style="list-style-type: none"> <li>MS Liafjord, Pelagic trawler (Q1 2023)</li> <li>TBD (2023)</li> </ul>	<ul style="list-style-type: none"> <li>MF Teistin, car ferry</li> </ul>	<ul style="list-style-type: none"> <li>MS Bard, sightseeing</li> <li>MS Thea Jensen, ambulance vessel</li> <li>2 x TBN, ambulance vessel(Q2 2022)</li> </ul>
Dimensions: Foil length (CL to foil tip) Longitudinal Transverse Height Weight	5910 mm 2392 mm 2940 mm 8890 mm 80 tons	4200 mm 1770 mm 2160 mm 6475 mm 24 tons	2640 mm 1200 mm 1270 mm 3795 mm 7.2 tons	1050 mm 475 mm 460 mm 1685 mm 0.42 tons



# SIMULATIONS

Wavefoil has developed a simulation program that can predict energy consumption statistics for any route world-wide. The program includes a world-leading software package to predict the savings from retractable bow foils.

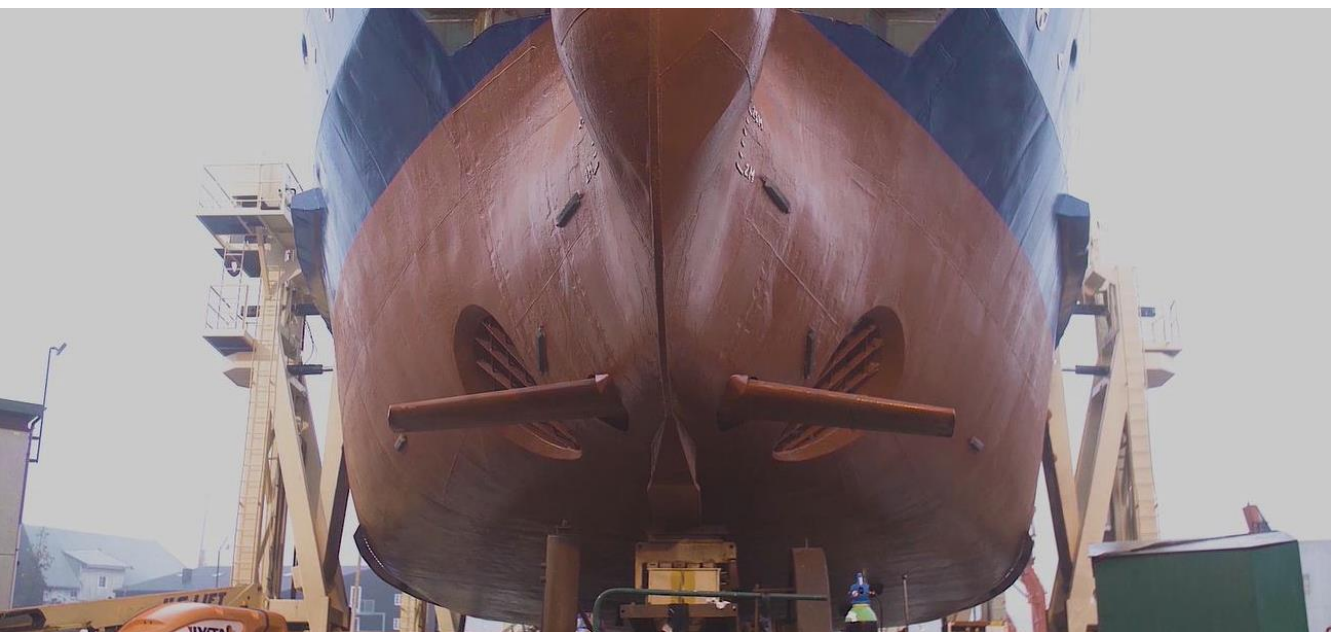
However, the program is not limited to bow foil simulations. Wavefoil may assist decision makers in any phase of the design process – from early-stage predictions to third-party evaluations of the final design.



## Insight and decision support through:

- Prediction of fuel consumption and motions with and without retractable bow foils
- Early-stage prediction of critical parameters like installed power and energy storage capacity based on the vessels' main dimensions.
- Continuous dialog though the design process to evaluate current design.
- Third-party evaluation of the final design parameters based on the customer's hull geometry.
- Fuel saving potential for wind-assisted propulsion (a generic model)
- Animation of the vessels' motion in waves.





*M/F Teistin with WF2640 retracted and deployed at MEST Shipyard, Tórshavn*

**8%**

FUEL SAVING IN TOTAL

**11%**

FUEL SAVING IN TRANSIT

The 45-meter RoPax vessel M/F Teistin was retrofitted with a WF2640 in 2019. The long-term fuel consumption has been monitored after the installation and compared to the average consumption for the last four years before the installation. The total fuel consumption has been reduced by 8%. Excluding the constant power need to accommodation etc., the fuel-saving in transit is measured to 11%.





*M/S Thea Jensen with WF1050 interacting with Norwegian rescue services*

## HIGH-SPEED VESSELS

High-speed catamarans achieve significant motion damping by installing our WF1050 foil module in each hull. Full-scale measurements on board M/S Thea Jensen have shown 25% motion damping with the foils deployed. Simulations have shown up to 30% motion damping in other sea states.

M/S Thea Jensen operates in up to 10 knots higher speed with the foils deployed for a given comfort criteria. Similarly, the vessel can handle up to 50% higher waves before wet deck slamming occurs.



*Wavefoil bridge panel on board M/S Thea Jensen*

**30%**  
REDUCTION IN  
VERTICAL MOTION

**50%**  
HIGHER WAVES AT A GIVEN  
COMFORT CRITERIA



*M/S Berg with WF1050 in Svolvær, Norway*



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