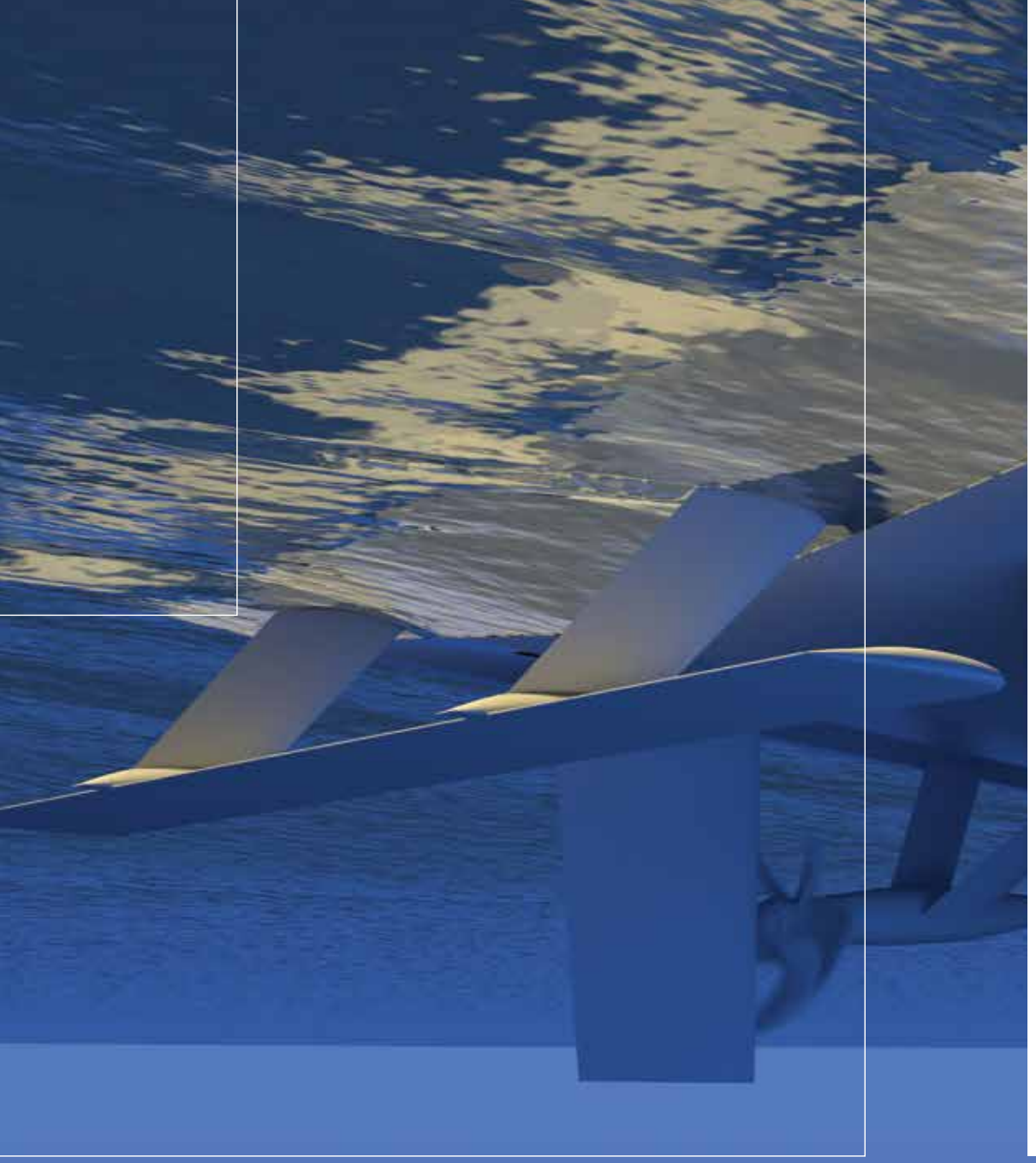

FUEL SAVING FOILS
hullvane®
LIFTING EFFICIENCY
WWW.HULLVANE.COM

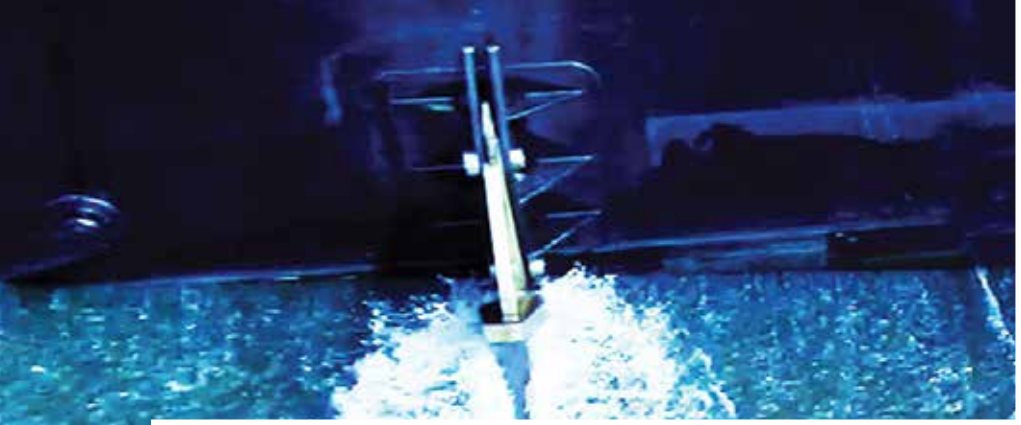


The Hull Vane® is a fuel saving device in the form of a fixed foil, located below the stern of a ship.



The Hull Vane® influences the stern wave pattern and creates hydrodynamic lift, which is partially oriented forward. This results in a reduction of the ship's total resistance. The performance of the Hull Vane® depends on the ship's length, speed and hull shape in the aft body sections, and ranges from 5 to 15% for suitable ships.

The Hull Vane® was invented by Dr. Ir. Peter van Oossanen and is protected by patents in all major shipbuilding countries.

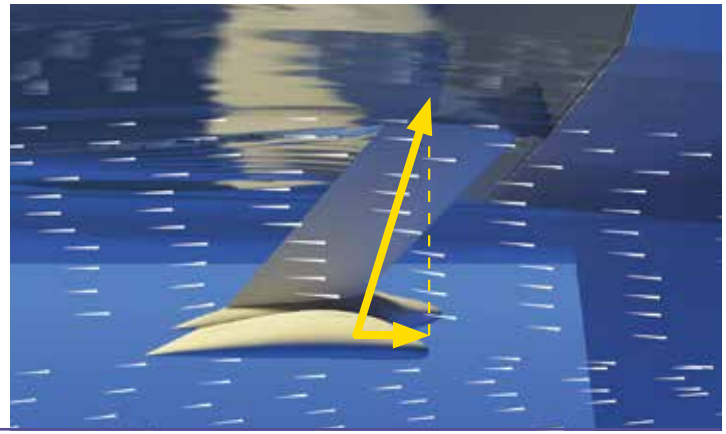


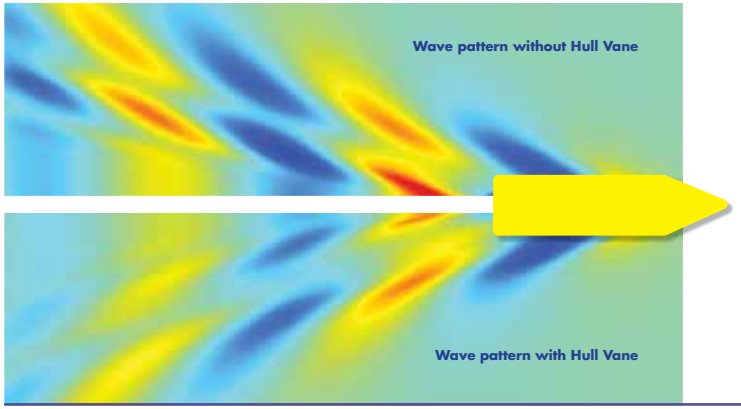
The fuel-saving effect of the Hull Vane® is due to four distinct aspects.

Thrust

The Hull Vane® is able to recover energy from the ascending water flow near the stern of the ship. The lift force that is generated by the Hull Vane® has a forward facing component. When the foil's own resistance is less than this forward thrust, the net result is an additional thrust force on the vessel.

1





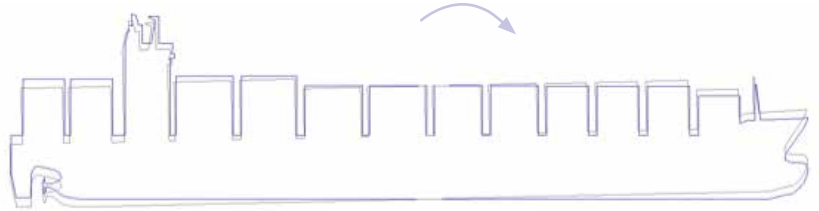
Wave reduction

By accelerating the water over the top of the Hull Vane®, the stern wave of a ship is reduced, much like a bulbous bow reduces the bow wave. The wave pattern generated by a ship is energy spent by the propulsion package. Reducing the stern wave therefore reduces the fuel consumption.

2

Trim correction

Many ships sailing relatively fast benefit from a trim correction at higher speeds. The upward lift generated by the Hull Vane® reduces the running trim and keeps the ship at or near even keel at higher speeds.



3

Reduced pitching

Moving a large horizontal plane vertically through the water requires a lot of force. The same goes for the Hull Vane®. Due to the vertical motions, the Hull Vane® generates even more lift and thrust, while reducing the motions of the vessel in waves therefore decreasing the added resistance. Added benefits are an increased level of comfort for passengers and crew onboard, and a reduced probability of cargo damage in heavy weather.

4

Effec-tive-ness

FUEL SAVINGS 6% WITH HULL VANE

FUEL SAVINGS 15% WITH HULL VANE

FUEL SAVINGS 20% WITH HULL VANE

While the Hull Vane® has a positive contribution to most ships, model testing has shown that it is particularly effective on ships that sail relatively fast. In naval architectural terms, this means Froude numbers between 0.2 and 0.7. For planing vessels, the Hull Vane® is not suitable, as it would generate too much lift. For relatively slow vessels, such as bulk carriers or tankers, the effect can be positive but the pay-back period will become longer, as the percentage of savings is smaller. The ideal candidates for a Hull Vane® are ferries, container ships, cruise ships, patrol boats, supply vessels, navy vessels, large motoryachts, reefer ships, car carriers and roro vessels. In these cases, fuel savings between 5% and 15% are common, and in some cases, fuel savings up to 20% have been achieved. Comparative sea trials on MS Karina, a 55 m Fast Supply Intervention Vessel, showed that a reduction in shaft power of 10% at 12 knots up to 15% at 21 knots with the application of a Hull Vane® can be achieved.

Design pro-cess

A comprehensive Computational Fluid Dynamics (CFD) study is the starting point. This study indicates how much the shaft power can be reduced with the addition of a Hull Vane® - for the most common loading condition and speed. It also provides ship-owners with valuable information about the flow around the vessel, which can result in optimisation of other appendages. Based on this preliminary study, the decision to proceed can be given for further development of a the Hull Vane® for the vessel in question. In the following design phase, the Hull Vane is further optimised and tested in CFD simulations, each time comparing the resistance of the hull with and without the Hull Vane®. On request, model testing in a towing tank can be carried out to validate the CFD calculations.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