
hullvane
WE MASTER HYDRODYNAMICS

main benefits

NAVAL & PATROL VESSELS

- lower life cycle costs
- higher performance
- reduced noise and signature
- improved seakeeping

YACHTS

- ultimate comfort
- higher top speeds
- greater range
- reduced CO_2 emissions

COMMERCIAL SHIPS

- maximum operability
- reduced fuel costs
- future ready
- win public tenders

The Hull Vane® is a hydrodynamic wing attached to a ship's stern. It's positioned so that it suppresses the stern wave and angled so that the flow of water around it generates forward thrust. This also reduces overall resistance and dampens pitching, heaving and rolling when sailing through waves. Depending on vessel suitability and factors such as its length, speed and hull design, a Hull Vane® can reduce fuel consumption by anywhere between 5 and 26%.

HYDRODYNAMICS MASTERED

We started developing the **Hull Vane®** as a spin-off from research we originally conducted for the America's Cup. Nowadays, we use computational fluid dynamics (CFD) to customise and optimise the design for each vessel. Doing so reveals how a Hull Vane® would reduce the vessel's calculated resistance, suppress its stern wave and improve its hydrodynamics. Armed with this information, we can then calculate your return on investment. On new builds, naval architects can then even factor in smaller, lighter engines, exhaust systems and fuel tanks to achieve the same maximum range and top speed and thereby create more usable space below deck.

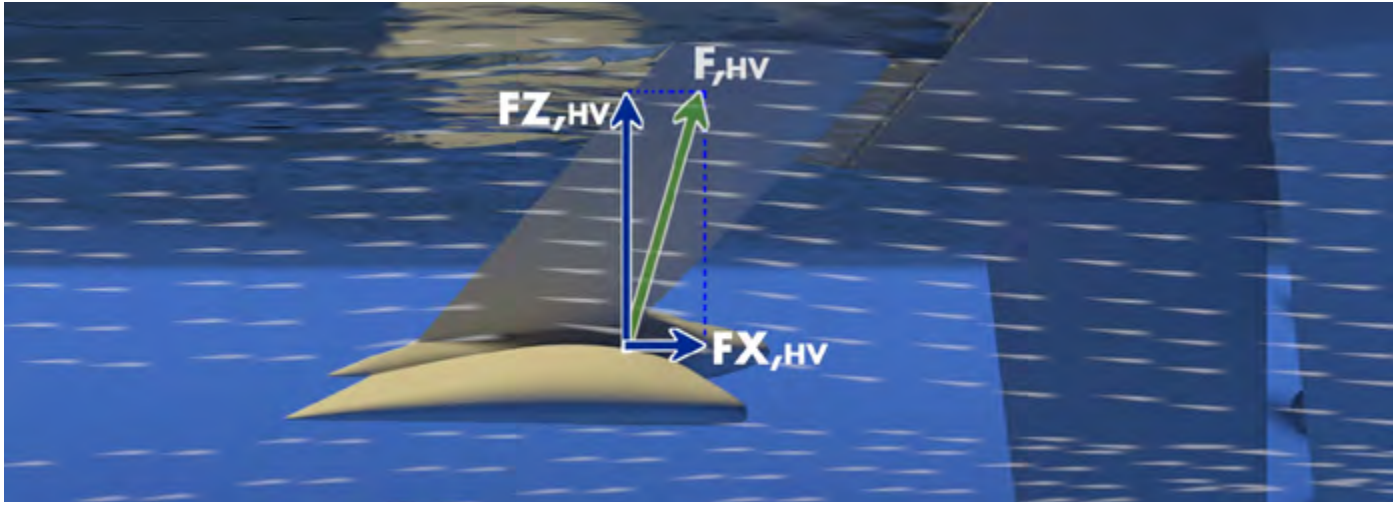
INNOVATION

Since 2014, we've installed our patented Hull Vane® on numerous vessels, and it has more than proved its effectiveness and durability. What's more, we've gone on to develop special-purpose variations, such as the **Dynamic Hull Vane®** (for increased pitch dampening) and the **semi-custom Hull Vane®** (for motor yachts up to 22 metres in length).

how

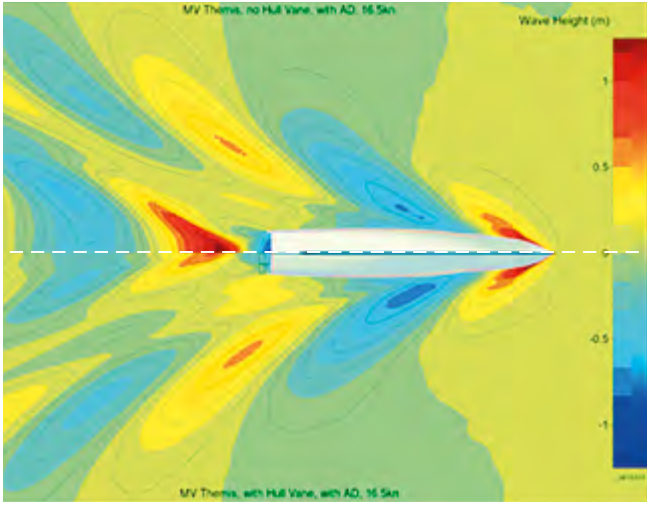
FORWARD THRUST

The water at a vessel's stern doesn't flow horizontally – instead, it flows at a slight upward angle. Because the Hull Vane® has a wing-shaped profile, it generates lift as the water flows around it. This lift force is angled forward and therefore has a forward-pointing horizontal component that acts as thrust, propelling the vessel forward.



WAVE REDUCTION

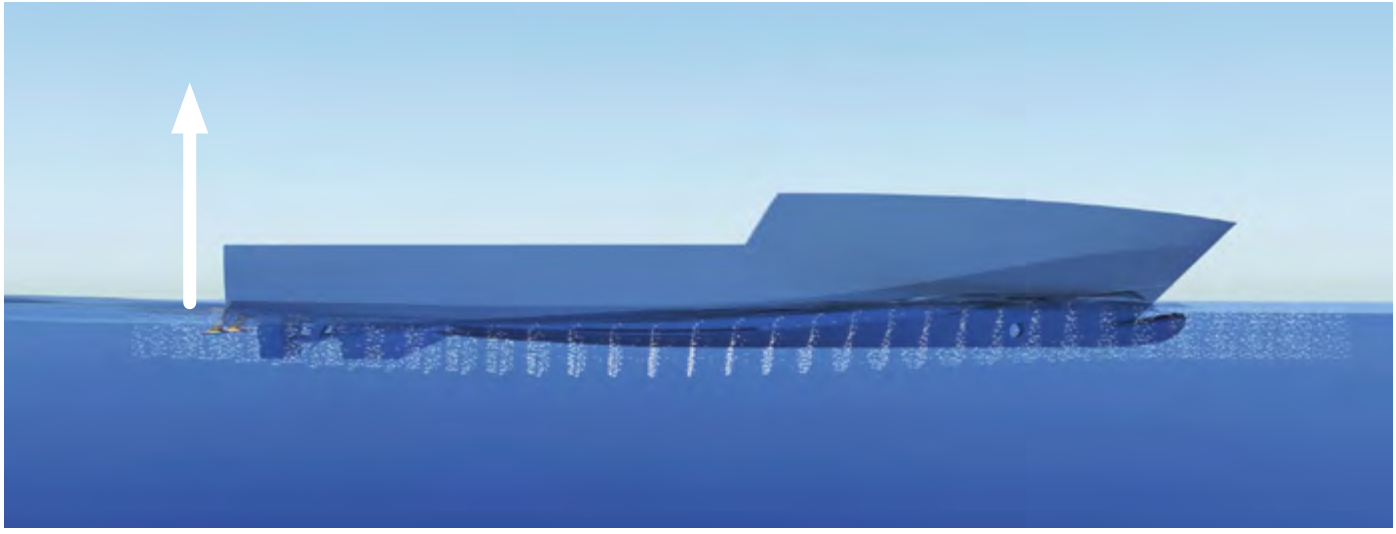
The Hull Vane's wing-shaped profile generates an accelerated flow of water over its upper surface, producing a low-pressure region behind your vessel. This interacts with your vessel's wake to suppress its stern wave in much the same way as a bulbous bow suppresses a vessel's bow wave. And there's a direct correlation between a vessel's wake, or wave pattern, and the power used for propulsion. Suppressing the stern wave reduces fuel consumption. What's more, a suppressed wake pattern reduces noise levels and creates less disturbance for others and–for a naval vessel–minimising its detectability!



how

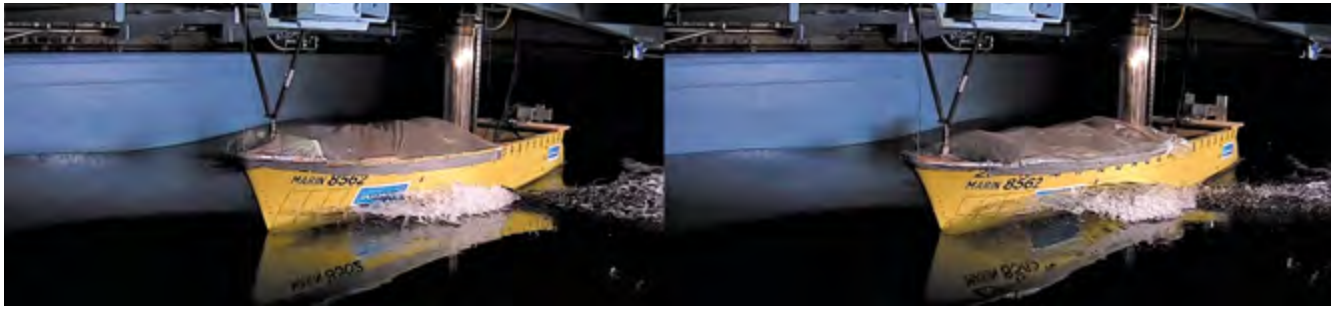
TRIM CORRECTION

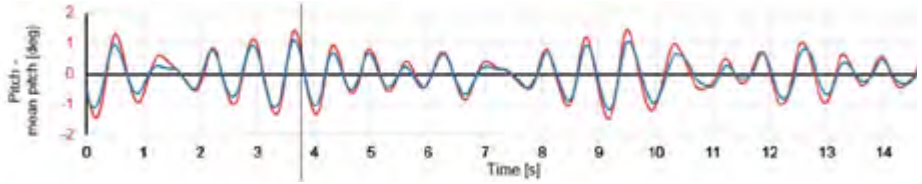
The Hull Vane® also reduces a vessel's running trim, keeping it at even keel throughout its entire speed range. Incorporating a Hull Vane® in the early design stages allows naval architects to design their vessels for minimal trim variations. In shallow waters, the vertical lift component significantly reduces a vessel's squatting effect, allowing for higher top speeds.



PITCH STABILISATION

The Hull Vane® dampens pitching in waves. This reduces added resistance from ship motions and, in turn, improves on-board comfort. Reduced vertical accelerations means less seasickness. Safety is also improved, for example, during helicopter operations or while launching/recovering daughter craft. And when a vessel is pitching, the Hull Vane® generates even more forward thrust – a phenomenon we call the pumping effect.





BARE HULL

HULL VANE®

Hull Vane types

CUSTOM HULL VANE®

Our patented Hull Vane® is a proven energy-saving device for medium-speed displacement vessels. Combining computational fluid dynamics (CFD) and our in-depth knowledge of hydrodynamics, we customise and optimise the design of each Hull Vane® for each individual vessel to achieve the highest level of performance.

SEMI-CUSTOM HULL VANE®

Recreational motor yacht owners are also becoming increasingly interested in the Hull Vane's benefits. This is why we developed a profile especially for displacement motor yachts between 10 and 22 metres in length. We analysed dozens of motor cruisers in this class and developed a tool to predict optimal Hull Vane® geometry and positioning. And to reduce build costs and installation time, we standardised most of its components, including aluminium extrusion profiles for wings and struts.

DYNAMIC HULL VANE®

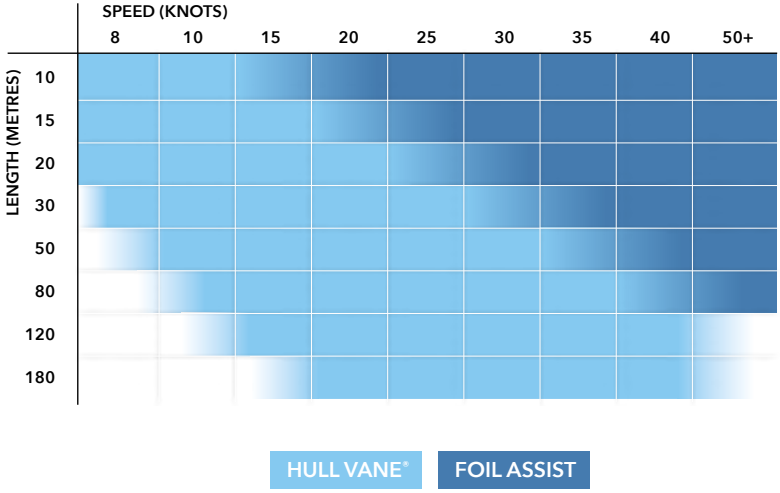
Many customers appreciate the improvements the Hull Vane® makes to their vessel's seakeeping characteristics as much as they do its energy savings. This is why we developed the Dynamic Hull Vane®, which dampens pitching even further. It has all the characteristics and benefits of a passive Hull Vane® except you can activate it with a flick of a switch. When dampening a vessel's vertical accelerations in waves, you create a more stable platform, which reduces seasickness, makes on-deck operations safer and improves systems performance all round.

effectiveness

The Hull Vane® is particularly effective when fitted to medium-speed displacement vessels or – expressed in naval architecture terms – at Froude numbers between 0.2 and 0.8.

Suitable candidates for a Hull Vane® include coastguard/naval vessels, passenger ships, ro-ro ships, expedition cruise ships, fast supply vessels and motor yachts.
For these types of vessels, energy savings of between 5% and 20% are typical, and in some cases even 25% savings are attainable.

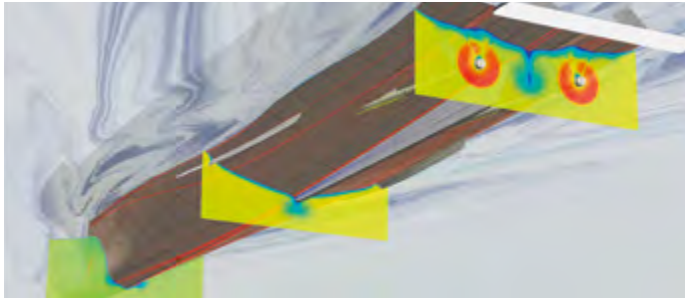
APPLICATION RANGE



design & build

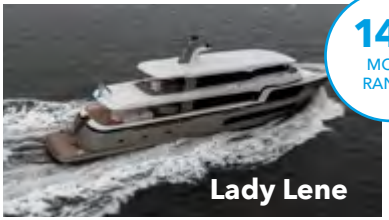
We custom design the Hull Vane® and Dynamic Hull Vane® for each vessel, using computational fluid dynamics (CFD) and finite element analysis (FEA) software, and build them from steel or composite materials. The semi-custom Hull Vanes are made from extruded aluminium profiles.

The **design phase** starts with a CFD analysis. This allows us to calculate how much we can reduce a vessel's resistance by attaching a Hull Vane® and gives us insights into the vessel's fuel consumption, dynamic trim and wave-making characteristics. In the next stage, we conduct FEA to ensure the Hull Vane® will be strong enough for a lifetime of trouble-free operation. During the **build phase**, our certified welders fabricate the Hull Vane® to our exacting exacting technical specifications and the highest-level finish imaginable.



proven results

YACHTS

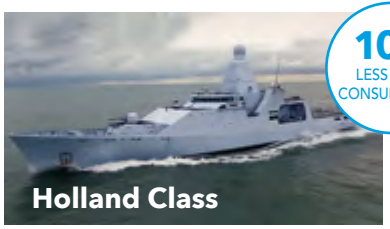


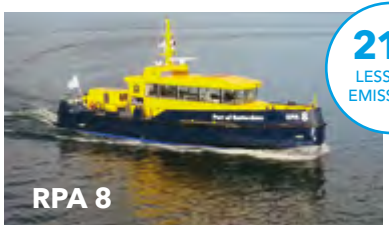
MOTOR YACHTS UP TO 22 METRES

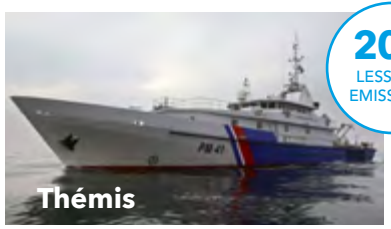
DETERMINE WHICH IS THE RIGHT DEVICE FOR YOUR VESSEL BY USING OUR CONFIGURATOR

COMMERCIAL

NAVAL & PATROL







about us

hullvane

‘We believe in continuous improvement, high efficiency and sustainable design.’

Hull Vane BV currently designs and builds four hydrodynamic devices to improve your vessel’s performance, comfort and seakeeping.

- **custom Hull Vane®**
- **semi-custom Hull Vane®**
- **Dynamic Hull Vane®**
- **Foil Assist** (ask for the specific brochure)

When we say we provide full service, we really do mean full service. From design to delivery anywhere in the world. Drop us a line to find out more.

New build or retrofit … find out just how big an impact a Hull Vane® could make to your vessel’s performance, comfort and sustainability.


M.C.DUFF

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