



The EcoFlettner rotor onboard „Fehn Pollux“

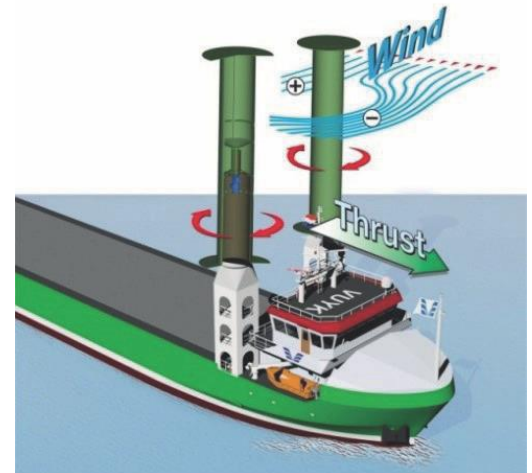
How can ships run in an efficient and environmentally friendly way? One possibility is to use power of the wind to support the main propulsion system – for example with a Flettner rotor. This type of drive uses the wind to create additional thrust for ship propulsion: a Flettner rotor is a high cylinder that stands vertically on a ship and rotates on its own axis. It is driven by an electric motor. The optimum rotational speed depends on the wind speed and direction.

The interaction between rotor surface and wind flow creates a lift force so that the ship receives additional thrust. This not only saves fuel but also emissions. The rotors were already developed in the 1920s, but did not prevail at that time due to the low oil price. However, greater environmental awareness and rising fuel prices have made this type of engine interesting again in recent years.

Currently the EcoFlettner Rotor is being installed onboard the MV Fehn Pollux in Leer. The wind assisted propulsion system was developed by a consortium of 15 partners from the project region under the projects MariTIM and MariGreen at SEC Shipperservices. At the beginning of May, a heavy cargo transport from Ulferts-Neermoor shipped the Eco-Flettner rotor to the shipyard's pier. The rotor is 18 meters high and has a diameter of three meters. The installation on MV „Fehn Pollux“, a 90-metre long multi-purpose freighter, is underway at the moment.

EcoFlettner: Main characteristics

Height	18m
Diameter rotor	3m
Diameter endplate	6m
Weight	16t
Motor	74 kW
RPM max	280
Avg. power consumption	20-30 kW
Material	GRP



Basic Principle

The Eco-Flettner rotor system is based on the utilization of the Magnus-effect. Contrary to conventional sail systems the Flettner rotor actively generates a rotating air cushion around the cylinder to superimpose the wind. This results in an intensified pressure distribution as indicated in the graphic, creating impressive aerodynamic performance. The rotor thrust in sailing direction contributes to the ship's propulsive power.

The Eco-Flettner rotor is designed to combine optimized aerodynamic performance with a robust and costs saving technology. The Rotor is built of lightweight fibre composite reducing the impact on ship stability. Wind tunnel tests have proved the high aerodynamic lift at reduced drag, thus improving propulsion performance especially in upwind conditions. This is statistically the most common sailing situation.

The partners



Further information at: www.marigreen.eu

Background

The Eco-Flettner wind propulsion system was developed by a Dutch-German joint industry project partnership of 15 maritime companies and research institutions under the framework of the project MariGreen. The second project phase is currently being implemented. The rotor is trialed on board the coastal vessel "Fehn Pollux" owned by Fehn Shipping Management based in Leer, Germany. The main objectives of the second phase will be performance validation at sea and the refinement of control, automation and routing elements to increase overall efficiency.

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