



NORSEPOWER

Norsepower Rotor Sail™ **Saving fuel – and** **the planet**

For bulkers, tankers, RoRos, ferries,
LNG carriers, RoPaxes, passenger ships
and peace of mind



LinkedIn



Bringing sails
back to shipping

→ More information at norsepower.com



Norsepower Rotor Sails™ save fuel, cut emissions, help with compliance – and make your crew smile

Harness the winds of the future – right now

The product uses a minimal amount of the ship's electric power to rotate the cylinders on the ship's deck. These rotating cylinders use the wind to generate powerful thrust. This allows the main propulsion to be throttled back. The whole auxiliary wind propulsion system is called the Norsepower Rotor Sails™. The sails can be installed on newbuilds or retrofitted to existing ships. The solution is particularly suited to vessel types such as tankers, LNG carriers, RoRos, RoPaxes, general cargo ships, bulk carriers, as well as cruise ships and ferries. It is easy to use, fully automated – and makes the crew happy.

18 commercial installations, 35+ to follow

As of February 2024, 16 Norsepower Rotor Sails™ have already been installed on eight ships including tanker, bulker, RoRo and passenger vessels. Repeat orders and new deals are being signed at an ever-growing pace – the installed base will be around 50 within next 18 months.

Make the energy efficiency regulations your friend

Whether you are a ship owner, ship designer or a shipyard, you need to be future proof. By improving the energy efficiency of the ship, the Norsepower Rotor Sails™ support the compliance with both the operational (CII), and the technical (EEDI/EECI) energy efficiency regulation. The expected index improvement depends on the vessel, the operational profile, and the Norsepower Rotor Sails™ configuration. Norsepower can provide an indication of the expected compliance improvement upon request.

Years of data & third-party verified savings

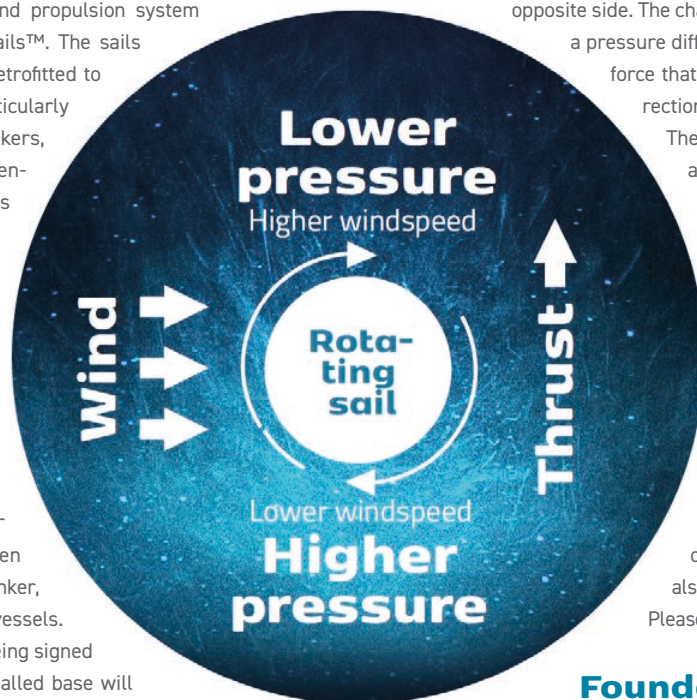
Don't just take our word for it; the considerable savings have been verified during extensive measurement and analysis campaigns by well-known third-party companies including RISE, LR, NAPA and ABB. The product is proven to perform according to expectations in harsh, demanding, real-life operating conditions.

The magic of advanced physics

Norsepower Rotor Sail™ technology is based on a physical phenomenon called the Magnus effect. When wind meets the spinning cylinder, the airflow accelerates on one side of the cylinder and decelerates on the opposite side. The change in the speed of air flow results in a pressure difference, which creates a considerable force that is perpendicular to the wind flow direction. The force pushes the ship forward. The same Magnus effect principle can also be observed in curve balls in golf, tennis or football.

How many sails is enough?

On a global scale our plan is to sell thousands of Norsepower Rotor Sails™. The recommended number and size on a particular vessel depends on the size, speed, and operating profile of the vessel – and also the wind conditions on the route. Please don't hesitate to contact us for details!



Foundations for the greener future

A tilting foundation is available as an option. It allows the Norsepower Rotor Sails™ to be lowered to a horizontal position when reduced height (air draft) is required. The Norsepower Rotor Sails™ are mounted on vessel-tailored foundations. The foundations can be integrated to a new build hull or installed during a yard stay as a retrofit. When the installation of the foundations has been completed, the Norsepower Rotor Sails™ can be lifted on the vessel and attached to the foundations during a regular port call. Easy, fast, robust and high-quality installations await!

Accurate, verified simulations to get you going

Our custom-made simulations are based on your specifications and input – and our real-life performance data since 2014. We use the best weather data (by NASA, naturally), and our existing fleet supports the simulations' accuracy: we keep what we promise.

Interested? Order a custom-made pre-study for your fleet
sales@norsepower.com

Fully automated, self-optimising control system

An integral part of the Norsepower Rotor Sail™ solution is the Norsepower Control™ automation system. It gives crew control of Norsepower Rotor Sail™ via the control panel on the bridge. With it the crew can choose the desired operating mode. In automatic mode the system monitors the wind speed and direction, and automatically selects the correct rotational direction and optimal RPM (revolutions per minute) of the rotors to maximise the fuel savings and minimise the emissions of the vessel.

Real-time performance measurement enables savings & exact cost sharing

Whether you are a ship owner or charterer, we can provide you with exact real-time data on how our product is producing thrust and making savings. Norsepower Rotor Sail™ has a patented way of using the air pressure measurement for control – and this can add the savings by approximately 20 %.

Do test our simple simulator
norsepower.com/simulator

Spinning rotor part:
 glass fiber composite

About
 247.000
 recycled
 PET bottles
 used for
 each rotor

Inside:
 welded
 steel
 support
 tower



5 – 25 % typical savings, even 70 % in good conditions.

Proven track record:
 310 000+ operating hours

16 units delivered since 2014,
 30+ more within 18 months

3rd-party verified performance

For newbuilds and as retrofits

Fleet-wide regulatory benefits

Remote control and monitoring

Options: EX-compliant,
 Ice prevention, Tilting system

VLOC Sea Zhoushan, Pan Ocean

Five tilting 24m x 4m
 Norsepower Rotor Sails™,
 May 2021



LR2 Epanastasea (ex Maersk Pelican)

Two 30m x 5m
 Norsepower Rotor Sails™,
 Aug 2018



Hybrid Ferries M/V Copenhagen & M/V Berlin, Scandlines

One 30m x 5m
 Norsepower Rotor Sail™ each,
 from June 2020



RoRo SC Connector, Sea-Cargo

Two tilting 35m x 5m
 Norsepower Rotor Sails™,
 January 2021



Norsepower Rotor Sail™

Technical Specifications

Model	18m x 4m	24m x 4m	28m x 4m	30m x 5m	35m x 5m
Material	Composite	Composite	Composite	Composite	Composite
Rotor speed [rpm]	0-225	0-225	0-225	0-180	0-180
Foundation height (indicative) [m]	2.5	2.5	2.5	3	3
Weight of typical foundation [tons]	12	13	15	17	24
Electric motor nominal power [kW]	60	80	100	115	143
Variable speed drive voltage & input frequency [V/Hz]	380-690V, 50/60 Hz	380-690V, 50/60 Hz	380-690V, 50/60 Hz	380-690V, 50/60 Hz	380-690V, 50/60 Hz
Total weight without foundation [tons]	27	33	36	50	56
Maximum continuous thrust force [kN]	175	175	205	300	350

Ambient conditions

Operational temperature [C°] (basic version)	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50
Maximum operational wind speed, [m/s]	35	35	35	35	35
Survival wind speed [m/s]	70	70	70	70	70

Norsepower Rotor Sail™ deliverables

- Norsepower Rotor Sail™
- Norsepower Control System™
- Norsepower Control Panel™
- Electrical power supplies
- Assembly, testing
- Installation, supervision and commissioning

As additional options, Norsepower can provide foundation design and manufacturing, transportation and installation services.

Norsepower Remote Support Service Agreement™ includes:

- Wear parts
- Remote monitoring with monthly reports
- Remote expert support
- Training for the ship's crew and technical superintendents during the installation and commissioning phase.

Example: Thrust in 10 m/s wind. Recap: Wind from side is good.



This is a simplified example, we are happy to provide you with actual performance data and custom-made simulations, just ask!

Our global offices and sales & service partners



Finland Global HQ, Hong Kong Asian HQ, Poland production hub, China production hub, Germany, Greece, Turkey, Japan, Singapore, South Korea, Canada, and Brazil.

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We are here to help
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