

Norsepower News

June 25, 2018

Dear Reader,

You are reading the first edition of Norsepower News, a newsletter informing of our latest deliveries and developments with Rotor Sail technology.

We will publish the newsletter 3-4 times a year providing news and information we would like to share with you. We are happy to receive your comments and suggestions for making the newsletter as interesting and informative as possible. Please send your comments and feedback to contact@norsepower.com.

Recent deliveries

The *M/S Viking Grace* was transformed into a sailing ship on April 10 and she set sail for her first Rotor Sail assisted cruise on April 12. The preparation works for the Rotor Sail installation, including cabling for power and automation system as well as the welding of the steel foundation on deck 13, were done in January during a maintenance dry-docking. *Grace* is the first passenger ship in the world equipped with a Rotor Sail. The single Rotor Sail unit is expected to reduce the annual LNG fuel consumption by approximately 300 tons and reduce carbon emissions by up to 900 tons. Viking Line continues to operate the *Viking Grace* on wind-assisted voyages with daily departures between Turku (Finland) and Stockholm (Sweden).

The Rotor Sail unit installed on *M/S Viking Grace* is the model 24x4, which is 24 m in height and 4 m in diameter. The Rotor Sail is a modernised version of the Flettner rotor; a spinning cylinder that uses the Magnus effect to harness the power of wind to produce thrust for ship propulsion. The solution is fully automated and senses whenever the wind is strong enough to reduce propulsion power demand from the propulsion machinery and deliver fuel savings, at which point the rotors start automatically – optimising crew time and resource.

A 12 months measurement campaign is under way and results will be eventually analysed to verify operational performance. In addition, valuable information is gathered continuously from the crew and passengers of how the Rotor Sail is experienced. Although the technical solution has been tried and proven, our engineering team is focused on further developing and improving the performance of the Rotor Sails to achieve the best possible benefits for the customer.



Viking Grace after installation of the 24x4 Rotor Sail.

Future deliveries

Norsepower's first Rotor Sail installation on a tanker is planned to take place during 2018 with an installation of two model 30x5 Rotor Sails.

The project is done in partnership with Maersk Tankers, The Energy Technologies Institute (ETI), and Shell Shipping & Maritime. The ship is a Long Range 2 (LR2) product tanker owned by Maersk Tankers. The Rotor Sails are expected to reduce the ship's average fuel consumption on typical global shipping routes by approximately 7-10%.

The first newbuilding order for Norsepower's Rotor Sails was signed with Xiamen Shipbuilding Industry Co. Ltd for delivery of two model 24x4 Rotor Sails. They will be installed on Viking Line's cruise ferry scheduled to start operation in 2021.

Meet us at the coming industry events

Norsepower will be exhibiting in two major industry events in the next few months.

The Electric & Hybrid Marine World Expo will be held in Amsterdam on June 27-29, 2018.

Please visit our stand E9075 where we'll have a ship model with two Rotor Sails and a full scale control panel ready for you to be tried out. We have also a presentation in the technical presentation area on June 27 at 12.00.

The next event we will be present as an exhibitor is the **SMM in Hamburg on Sept. 4-7**. You will find us in hall A5, stand 302. We hope to see you there!

Find out the fuel saving potential of Norsepower's Rotor Sails for your ships

If you are interested to find out the potential for fuel savings and reduction of exhaust emissions with the help of Norsepower's Rotor Sail technology, please send us information with the following details:

1. Ship type, main dimensions and preferably a general arrangement drawing for evaluating the available deck space and optimal locations for Rotor Sails
2. Ship's service speed and corresponding propulsion power
3. Ship's typical route (itinerary with ports or global operation)
4. Average annual share of time at sea vs. time in port/anchor

With the above information, we can prepare a simulation -based case study giving estimates for potential average fuel savings and reduction of CO2 emissions with a proposed configuration of Rotor Sails.

The Norsepower team wishes you safe sailing and favorable winds!

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