FACTSHEET – ABB DYNAFIN™

ABB Dynafin™

ABB Dynafin™ is an industry-first electric propulsion concept which breaks new ground for vessel efficiency. Based on a cycloidal propeller, the technology offers vessel designers unprecedented opportunities for innovation and contributes to shipping industry's goal of cutting greenhouse gas emissions.

Background

Around 90 percent of global trade is carried by ships.

Global shipping contributes almost three percent of the world's annual greenhouse gas emissions.

If no action is taken, shipping could be responsible for up to 13 percent of global emissions by 2050

The International Maritime Organization (IMO) has set the goal to cut annual greenhouse gas emissions by at least 50 percent by 2050, against 2008 levels.

From 1 January 2023, it became mandatory for all ships to calculate their attained Energy Efficiency Existing Ship Index (EEXI) to measure their energy efficiency and to start collecting data to report to the IMO in order to calculate their annual operational carbon intensity indicator (CII) and CII rating.

ABB Dynafin™ Technical

The ABB **Dynafin™** solution comprises a cycloidal propeller with individually controlled, vertical blades. Its main elements consists of:

- a main electric motor *that*
- powers a large wheel rotating at a moderate 30-80 rounds per minute *which is*
- fitted with multiple vertical blades, each regulated by an individual motor and control system *that*
- oscillate in a manner imitating the high efficiency movement of a fish tail

The **ABB Dynafin™** generates propulsion and steering forces simultaneously, offering immediate and stepless/gearless variation of thrust and its direction

The **ABB Dynafin™** concept will initially be made available in the power range of 1-4 MW per unit and aimed at medium-sized and smaller vessels, including ferries for passengers and vehicles, offshore support vessels and yachts.
The **ABB Dynafin™** configuration has low onboard systems height, allowing designers to optimize ship layout

ABB estimates the first **ABB Dynafin**™ prototype to be available in 2025.

ABB Dynafin™ Performance

The **ABB Dynafin™** concept delivers unprecedented propulsion efficiency of up to 85 percent open-water efficiency.

An independent study from OSK-ShipTech A/S confirms that using **ABB Dynafin™** can reduce fuel consumption by up to 22 percent compared to traditional propulsion systems.

Based on its simultaneous thrust and steering action, and its stepless operation, **ABB Dynafin™** delivers superior maneuverability and dynamic positioning performance.

As part of an electric propulsion power system, the **ABB Dynafin™** concept is fully compatible with zero-emission battery and fuel cell technologies. **ABB Dynafin™** enables ship's propulsion power plant and energy storages to be downsized. Smaller power plant means lower capital expenditure, more space for cargo and passengers and more flexibility for the ship's general arrangements.

ABB Dynafin construction allows access inside the main wheel, enabling inspection and service of major components inside the vessel, improving the ability to monitor components and increase the operational availability of the vessel. In addition to reduced fuel consumption and emissions-related costs, **ABB Dynafin™** offers lower total operating expenses.

Due to its moderate operating speed, mode of action and low pressure pulses, **ABB Dynafin™** generates low vibrations and noise, improving comfort and minimizing the impact of underwater radiated noise (URN).