

# ENERGY-SAVING DEVICES

Driving green shipping forward: The impact of Becker's solutions on maritime sustainability.

The main energy-saving devices from Becker Marine Systems include the Becker Mewis Duct® and the Becker Twisted Fin®, two groundbreaking solutions that significantly contribute to increasing energy efficiency and to reducing power consumption and CO<sub>2</sub> emissions. Independent model tests and CFD simulations demonstrate that the use of these energy-saving solutions can lead to significant energy savings.

Reductions of up to 10% for tankers and bulk carriers and up to 4% for container ships are herewith realistic.

These significant efficiency improvements are crucial for complying with environmental and emission standards, especially in relation to the Energy Efficiency Existing Ship Index (EEXI) and the Carbon Intensity Indicator (CII). The energy-saving devices have a direct contribution to improve the EEXI (by an increase of the reference speed) and CII (by reducing the vessels CO<sub>2</sub> emissions).

Therefore, the Becker Mewis Duct® and the Becker Twisted Fin® are cost-effective measures for promoting an even more sustainable shipping – applicable during newbuild or as retrofit.

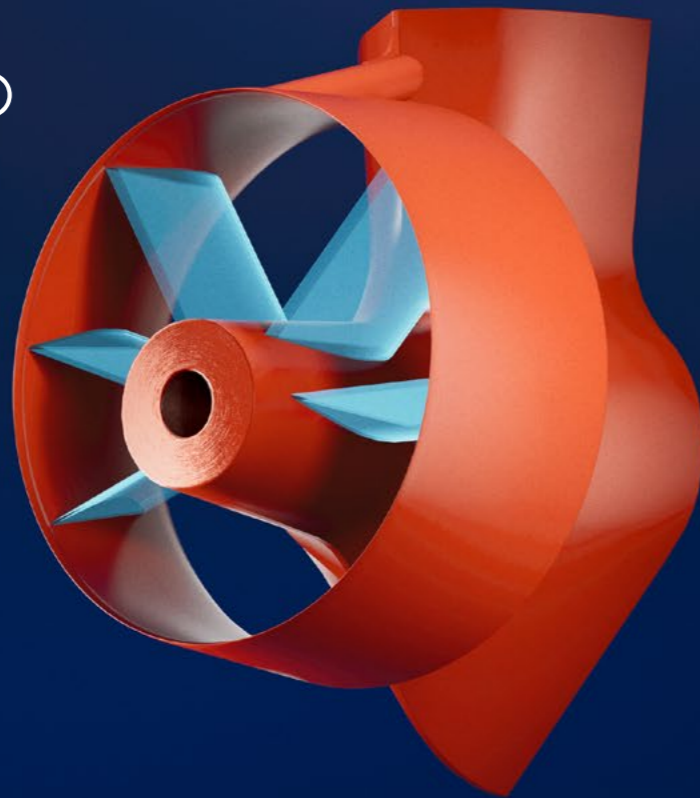


Becker Mewis Duct®	→
Becker Twisted Fin®	→

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ENERGY-SAVING DEVICES

# BECKER MEWIS DUCT®



## Leading the way in eco-conscious shipping

The Becker Mewis Duct® sets the benchmark for energy efficiency on slow and full-form vessels such as tankers and bulkers. By streamlining the inflow to the propeller, it cuts power consumption and CO<sub>2</sub> emissions by up to 10%.

This proven device delivers fast payback while helping operators meet EEDI, EEXI and CII requirements. Easy installation during newbuilding stage or regular dry dock makes it a cost-efficient step towards greener, more profitable operations.

## Optimised for:

Bulker

Gas Carriers

General Cargo

Tanker

**CUSTOMISED FINs**  
Guides water flow into the propeller, each vessel is optimised through CFD-simulations for maximum efficiency

**UPPER BRACKET**  
Provides structural connection and stability between duct and hull

**DUCT**  
Accelerates and equalises the inflow, improving propeller performance and reducing power consumption

**PROPELLER SHAFT**  
Transmits engine power to the propeller, driving the vessel forward

**HULL**  
Main body of the vessel – integrated design ensures smooth hydrodynamic transition



ENERGY SAVINGS  
OF UP TO  
**10%**

## Sustainable performance for every voyage

- ✓ Reduction of power consumption and CO<sub>2</sub> emissions by improving the hydrodynamic efficiency of the propeller
- ✓ Supporting ship owners in fulfilling IMO requirements regarding EEXI and CII
- ✓ Easy installation during regular dry docks
- ✓ Reduction in operating costs through savings in propulsion power of up to 10%
- ✓ Wide range of applications and proven effectiveness: over 1,800 ships already successfully equipped with Becker Mewis Duct®



# EASY INSTALLATION FOR NEWBUILDINGS AND RETROFITS

## Newbuildings

Installation of the Becker Mewis Duct® can easily be performed during the docking or block stage with minimal effort on part of the shipyard. The yard is able to implement the installation in the production schedule.

The Becker construction team adapts the interfaces of the Becker Mewis Duct® and the ship according to the ship's steel structure.

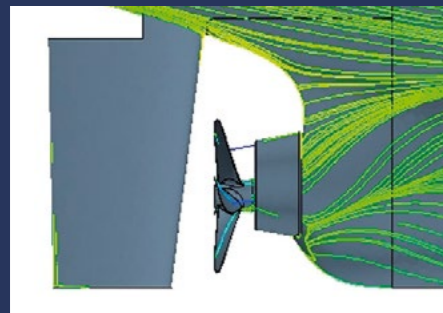
## Retrofits

The Becker Mewis Duct® can be retrofitted during regular dry dockings or even intermediate dry dockings, the propeller does not have to be dismantled for this.

Becker's expertise ensures that installation is performed as quickly as possible, taking five days on average. Installation is carried out by the yard under Becker's supervision to ensure professional installation.

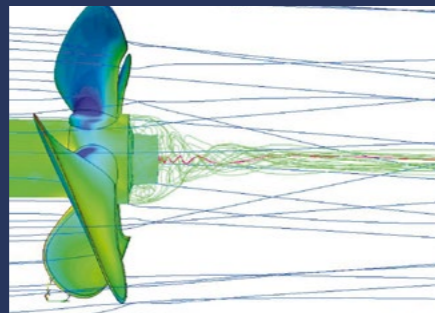
The Becker Mewis Duct® design provides the highest strength and stiffness in accordance with classification societies.

## Optimisation of ship propulsion with the Becker Mewis Duct®



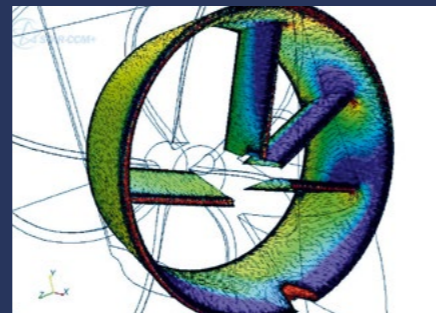
### 1 Wakefield equalisation

The Becker Mewis Duct® straightens the hull's wake, accelerates the flow towards the propeller and usually produces additional forward thrust.



### 2 Reduction of propeller hub vortex

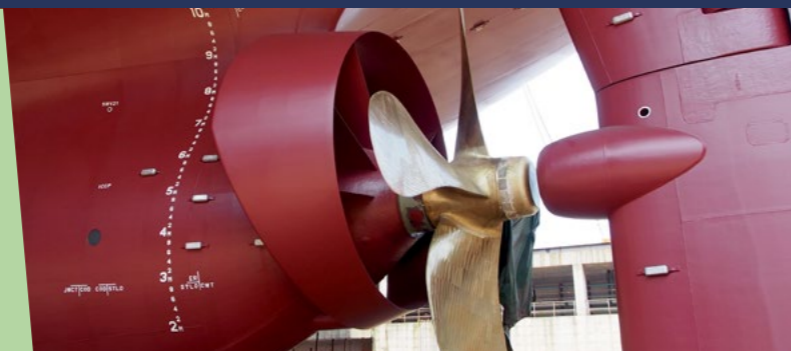
An optimised flow field behind the duct significantly reduces the hub vortex, leading to improved thrust and flow towards the rudder.



### 3 Contra-rotating swirl

Due to individually placed fins, a counter-rotating pre-swirl is generated, optimising the loads on the propeller blades.

The Becker Mewis Duct® harmonises and stabilises the flow, generating a pre-swirl to reduce the rotational losses in the propeller slipstream.



**A RETROFIT SUCCESS**

Our Becker Mewis Duct® references span all vessel types – demonstrating reliable CO<sub>2</sub> reduction and energy efficiency.

**ALEXANDER BRAZIL, OIL TANKER**  
Becker Mewis Duct®

**RYSTRAUM, CHEMICAL TANKER**  
Becker Mewis Duct® (retrofitted)

**HOWARD O. LORENZEN, RESEARCH VESSEL**  
Becker Mewis Duct® (retrofitted)

**BOW TRIUMPH, CHEMICAL TANKER**  
Becker Mewis Duct®

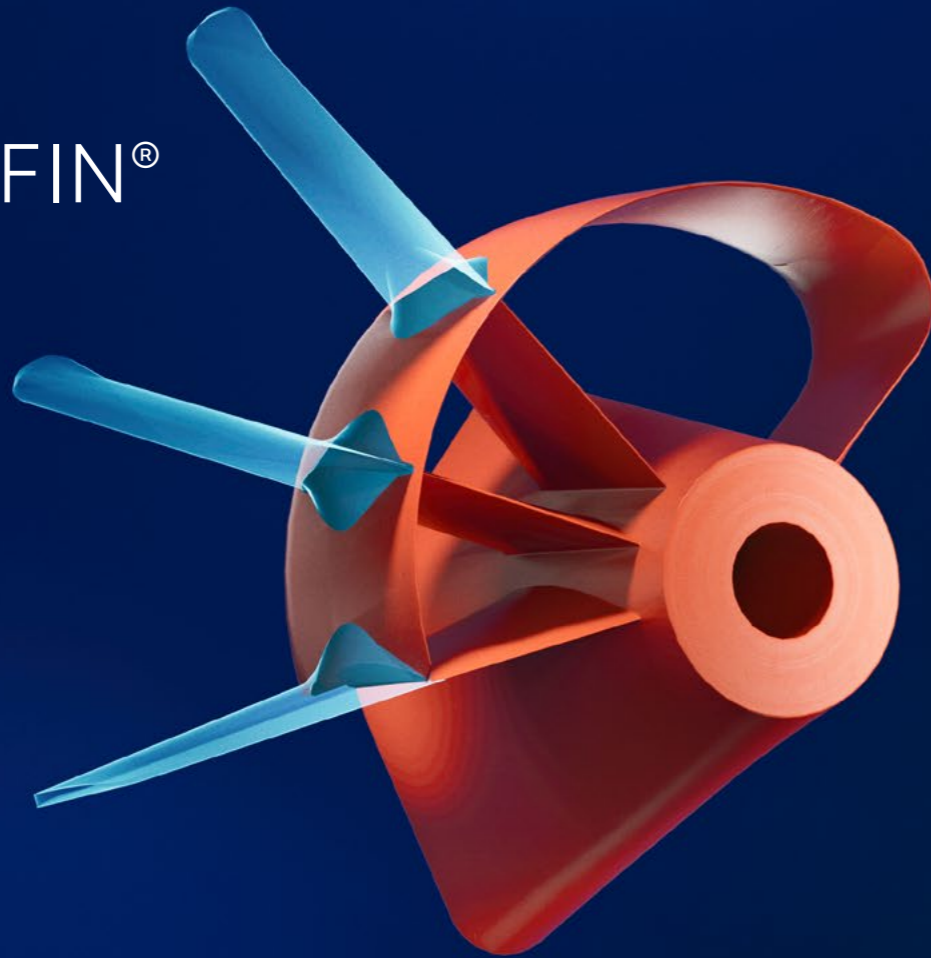
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**BECKER  
MEWIS DUCT®**

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ENERGY-SAVING DEVICES

# BECKER TWISTED FIN®



## Elevating efficiency: best practice solution for slender vessels

The Becker Twisted Fin® is the smart choice for faster vessels like container ships with slender sterns. Positioned ahead of the propeller, it generates a pre-swirl that boosts efficiency, lowers operational costs and reduces emissions by up to 4%.

Its compact design with no moving parts ensures easy integration and long-term reliability. Fully class-approved, the system strengthens EEXI and CII ratings and delivers measurable savings for forward-looking ship owners.

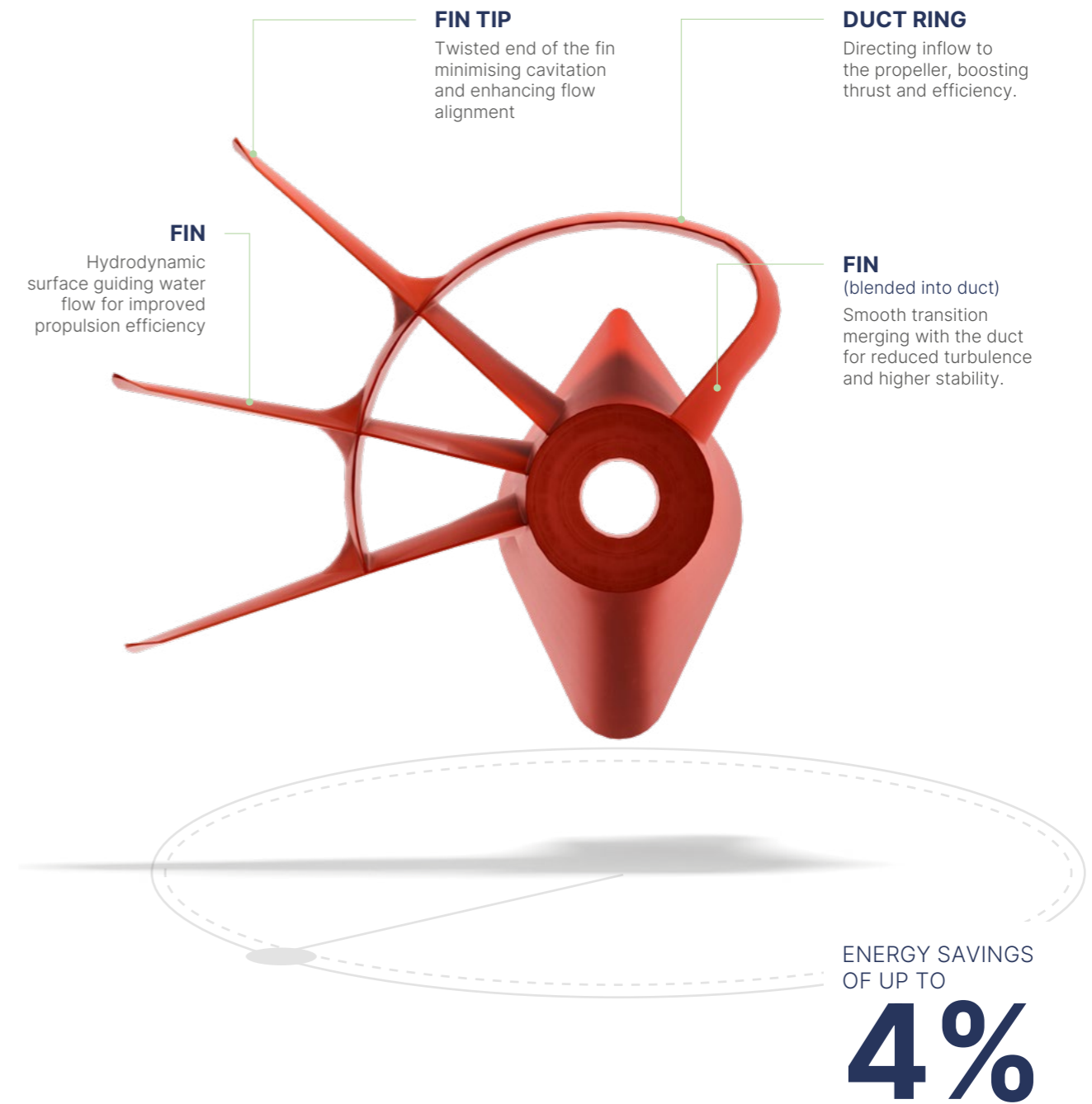
## Proven efficiency gains for

Container Vessels

Gas Carrier

Ferry & Vehicle Carrier

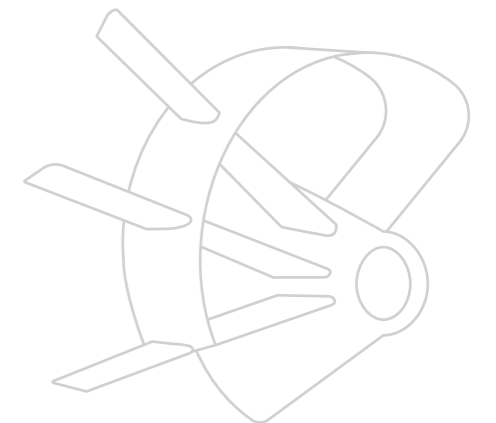
Navy Vessels



STRUCTURE OF THE  
BECKER TWISTED FIN®

## Smarter flow, smoother operation

- ✓ General energy savings of up to 4%
- ✓ Less cavitation and reduced vibration
- ✓ Improved propulsion efficiency and course keeping
- ✓ Reduction of CO<sub>2</sub> emissions
- ✓ Suitable for newbuildings and retrofits
- ✓ No moving parts, no maintenance required
- ✓ Fast installation



# EASY INSTALLATION FOR NEWBUILDINGS AND RETROFITS

The Becker Twisted Fin® is designed for seamless integration into both newbuildings and existing vessels.

Thanks to flexible interfaces and Becker's proven expertise, installation can be carried out quickly and reliably with minimal disruption.

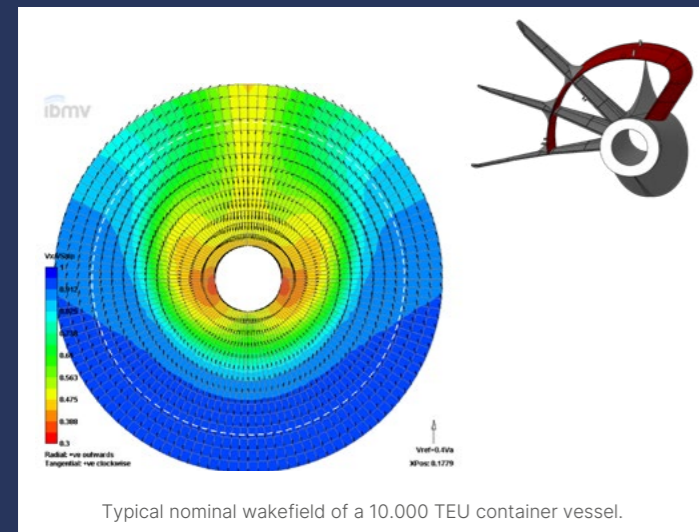
## Newbuildings

- Installation during docking or block stage with little extra effort for the shipyard
- Fully adaptable interfaces to match the ship's steel structure
- Simple integration into the production schedule

## Retrofits

- Installation during regular or intermediate dry dockings without propeller removal
- Average installation time of only five days
- Yard execution under Becker supervision for highest quality standards
- Interfaces designed for maximum strength and stiffness in line with class rules

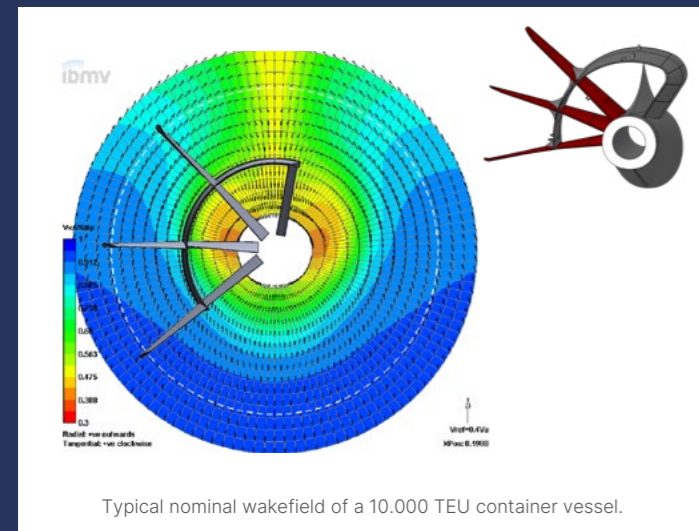
## Pre-swirl optimisation



## Wakefield equalisation

Tailored engineering for measurable results – every Becker Twisted Fin® is designed with customised CFD simulations to unlock maximum efficiency for your vessel.

- Duct ring accelerates and harmonises inflow with surrounding water
- Improves overall flow towards the propeller and generates thrust
- Tailored CFD simulations for each vessel ensure maximum efficiency gains



## Pre-Swirl for optimised propeller load

Smart flow solutions made to fit – Becker Twisted Fin® designs are customised through advanced CFD simulations, perfectly matching hull and propeller geometry for superior performance.

- Fins re-direct flow counter to propeller rotation for optimised load
- Increases propeller efficiency and reduces hub vortex formation
- Customised CFD simulations deliver the best design for every ship



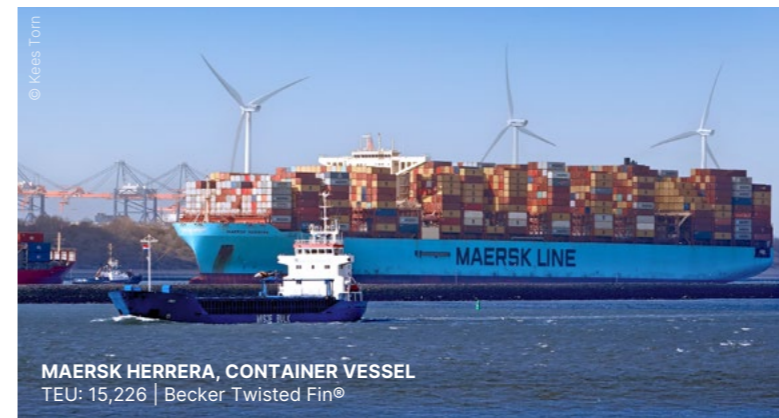
## PROVEN POWER SAVINGS

A look at successful applications where the Becker Twisted Fin® reduces propeller losses and saves energy.

CMA CGM BRAZIL, CONTAINER VESSEL  
TEU: 15,128 | Becker Twisted Fin®



EVER APEX, CONTAINER VESSEL  
TEU: 23,888 | Becker Twisted Fin®



MAERSK HERRERA, CONTAINER VESSEL  
TEU: 15,226 | Becker Twisted Fin®

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**BECKER  
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