Manoeuvring produces net forward thrust. The Becker Mewis Duct® straightens and accelerates the jet’s sides. The propeller hub produces net forward thrust.

**Contra-Rotating Swirl**

The Becker Mewis Duct® harmonises and stabilises flow imperfections above in a non-linear interaction:

1. The Becker Mewis Duct® combines all three of the principles above in a non-linear interaction:
   - The Becker Mewis Duct® straightens and stabilises flow and generates a pre-swirl counter to the direction of rotation.
   - The integrated fins have a stator effect by generating a pre-swirl counter to the direction of rotation of the propeller slipstream. The integrated fins have a stator effect by generating a pre-swirl counter to the direction of rotation of the propeller slipstream. The integrated fins have a stator effect by generating a pre-swirl counter to the direction of rotation of the propeller slipstream. The integrated fins have a stator effect by generating a pre-swirl counter to the direction of rotation of the propeller slipstream.
   - The Becker Mewis Duct® harmonises and stabilises flow.

2. The combination of the Becker Mewis Duct® with a Becker Rudder and a Becker Mewis Duct® or Becker Mewis Duct® Twisted enables maximum possible energy savings in front of and behind the propeller. Both products are available from a single company and are thus perfectly harmonised. The Computational Fluid Dynamics (CFD) calculations for optimised manoeuvring and maximum energy savings.

3. The total performance improvement is based on two parts, the active part related to the improvement of flow towards the propeller, the reduction of losses, and the passive part for minimising drag and improving course stability.

Becker Marine Systems constantly reviews the best combinations of a Becker Rudder and a Becker Mewis Duct® or Becker Mewis Duct® Twisted with a rubber system such as the Becker Flap, Becker Twist, or Becker Schilling® Rudder, resulting in the best combination of manoeuvrability and efficiency.

**BECKER PERFORMANCE PACKAGE (BPP)**

The Becker Performance Package is a complete system that combines a Becker Rudder and a Becker Mewis Duct® or Becker Mewis Duct® Twisted with a Becker Marine Systems energy-saving device. It is designed to be the ultimate performance package for ships of all sizes and types, from small ferries to large container liners.

1. With optimal rudder profile
2. Reduced weight
3. Reduced noise
4. Reduced cavitation
5. Improved course keeping
6. Reduced wear and tear
7. Reduced vibration
8. Optimised rudder profile
9. Reduced wear and tear
10. Optimised rudder profile
11. Reduced vibration

**ADVANTAGES:**

- Improved rudder performance
- Reduced weight
- Reduced noise
- Reduced cavitation
- Improved course keeping
- Reduced wear and tear
- Reduced vibration
- Optimised rudder profile
- Reduced wear and tear
- Optimised rudder profile
- Reduced vibration

**COMBINED ENERGY SAVINGS**

With maximum energy savings resulting from the Becker Rudder and a Becker Mewis Duct® or Becker Mewis Duct® Twisted, the BPP can be used to achieve any hull form as well as virtually any propeller.

**ALL IN ONE – BECKER MEWIS DUCT®**

The Becker Mewis Duct® combines all three of the principles above in a non-linear interaction:

1. The Becker Mewis Duct® straightens and stabilises flow and generates a pre-swirl counter to the direction of rotation.
2. The integrated fins have a stator effect by generating a pre-swirl counter to the direction of rotation of the propeller. The propeller hub produces net forward thrust.
3. The Becker Mewis Duct® harmonises and stabilises flow.

**CONTRA-ROTATING SWIRL**

The Becker Mewis Duct® harmonises and stabilises flow.

**REDUCTION OF PROPELLER HUB VORTEX**

An improved efficiency behind the hub significantly reduces the hub vortex, leading to improved thrust and reduced noise.

**WAKEFIELD EQUALISATION**

The Becker Mewis Duct® straightens and accelerates the jet’s sides. The propeller hub produces net forward thrust.
The Becker Mewis Duct® is an energy-saving device developed for full-funnel ships enabling significant power savings at a given speed, and allowing the vessel to travel faster at a given power level.

The Becker Mewis Duct® consists of two strong fixed elements mounted on the vessel: a duct positioned in front of the propeller along with an integrated fin system. The duct straightens and accelerates the hull wake into the propeller, while the fin system provides a yaw correction to the ship wake which reduces losses in the propeller and also produces a net forward thrust. The fin system is pre-set to the ship wake which reduces forces on the propeller blades, resulting in an increase in propeller thrust at a given power level.

The power savings attainable from the Becker Mewis Duct® are strongly dependent on propeller thrust, loading, and the size of individual hull/propeller interaction.

The Becker Mewis Duct® is ideally suited to both new-builds and retrofit applications (e.g. toners, breakers and MPCFs).

- Energy savings of up to 9%
- Less NOx and CO2 emissions
- No moving parts

EASY INSTALLATION FOR NEWBUILDINGS AND RETROFITS

Newbuildings: Installation of the Becker Mewis Duct® can be performed during the basic stage of the dry dock and/or at sea, according to the ship's steel structure and the availability of standard steel girders to build the Becker Mewis Duct® installation. Approximate installation takes five days.

Retrofits: Becker designed the Becker Mewis Duct® to be also used during, or after, the basic stage of the dry dock. Becker Marine Systems has developed a similar device, but with a smaller nozzle, which has extended upwards beyond the nozzle – the Becker Mewis Duct® Twisted for faster hull optimised ships with speeds above 18 knots.

Because savings from the Becker Mewis Duct® are reduced at speeds below approx. 20 knots, Becker Marine Systems can be at its simplest when used on multipurpose vessels. The Becker Mewis Duct® Twisted is designed in accordance with the existing propeller setup.

The Becker Mewis Duct® is an energy-saving device for fast vessels with bulbous stern. Becker Marine Systems has responded to the heavy demand of shipping companies for an energy-saving device for faster vessels. After two years of research and spanning nine years of operational experience with the Becker Mewis Duct®, a new energy-saving concept for a new generation of fast vessels with bulbous bow has arrived on the market - the Becker Mewis Duct® Twister. In combination with a new propeller, the Becker Mewis Duct® Twister can be part of a complete hydrodynamic performance package. The Becker Mewis Duct® Twister is designed in accordance with the existing propeller setup.

The Becker Mewis Duct® Twister is designed in accordance with the newest strength, fatigue and vibration requirements from classification societies.

The design takes into account the newest strength, fatigue and vibration requirements from classification societies.

BECKER MEWIS DUCT®

ADVANTAGES:
- Increased propeller efficiency
- Reduced vibrations
- Improved course keeping
- Improved propulsion efficiency
- Reduced NOx and CO2 emissions
- Average energy savings of 3%

BECKER MEWIS DUCT® TWISTED

ADVANTAGES:
- Increased propeller efficiency
- Reduced vibrations
- Improved course keeping
- Improved propulsion efficiency
- Reduced NOx and CO2 emissions
- Average energy savings of 3%

POTENTIAL SAVINGS AND THE CORRELATION BETWEEN POWER SAVINGS AND SHIP SIZE

WITH A BECKER MEWIS DUCT®

WITH A BECKER MEWIS DUCT® TWISTED

ADVANTAGES:
- No moving parts, no maintenance required
- Simple installation
- No interferences to the existing propeller setup
- Simplified maintenance
- No moving parts, no maintenance required
- Simple installation
- No interferences to the existing propeller setup
- Simplified maintenance

ESPECIALLY SUITABLE FOR:
- Container vessels
- LNG/LPG carriers
- Container vessels
- LNG/LPG carriers
- Navy ships
- Bulk carriers
- Car carriers
- Multipurpose vessels

AVANTAGES:
- No moving parts, no maintenance required
- Simple installation
- No interferences to the existing propeller setup
- Simplified maintenance
- No moving parts, no maintenance required
- Simple installation
- No interferences to the existing propeller setup
- Simplified maintenance