ERMATECH GROUP

From saving the oceans.
To safeguarding the planet.

ERMA FIRST FLEX SERIES

Energy Saving Devices for Hull and Propeller

WWW.ERMATECHGROUP.COM

FLEX SERIES

Energy Saving Devices for Hull and Propeller

ERMATECH GROUP

FLEX SERIES

Energy Saving Devices for Hull and Propeller

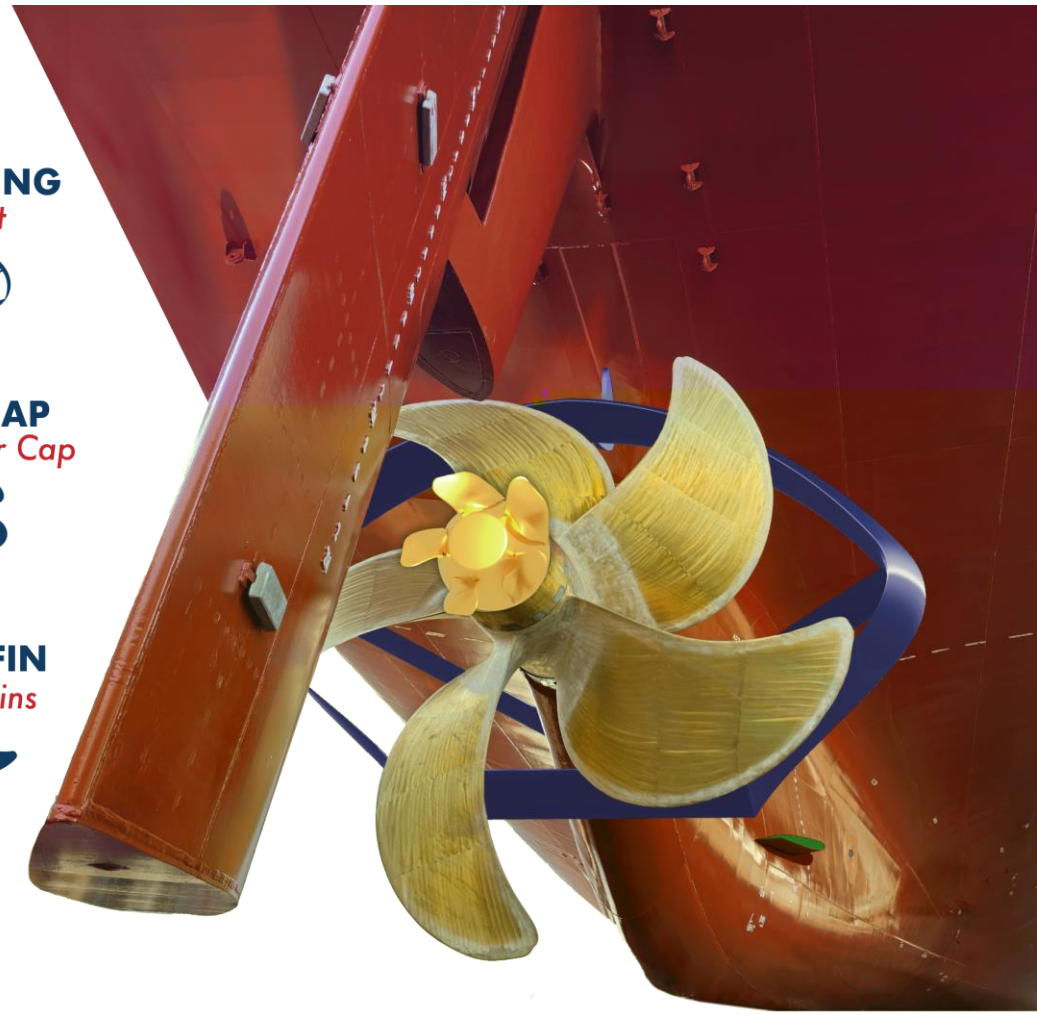
DECARBONISATION

The complete propeller efficiency solution via ERMA FIRST ESD Series with FLEXCAP, FLEXRING and FLEXFIN.

- Next-Generation ESDs
- Unique 3-part package solution
- Considerable fuel savings available
- FLEXFIN set complimentary with each FLEX Series order*
- Ship-specific design to secure maximum efficiency gains
- Future-proof for all energy-saving interventions, including wind-assistance propulsion
- In-house CFD calculations, based on operator's input
- CII / EEXI improvement, securing compliance for up to 4 years
- RightShip Zero Harm Innovation Partners

Ex Works deliveries in Europe and China.

***limited time offer**



FLEX SERIES

Energy Saving Devices for Hull and Propeller

DECARBONISATION

ERMA FIRST FLEXCAP

FLEXCAP Propeller Cap

FLEXCAP helps to reduce the formation of hub vortex, which can in turn reduce the propeller's efficiency, causing cavitation and noise.

The Cap fins cancel out the vortices generated at the root of each propellor blade, reducing the torque demanded for the same RPM and can occasionally generate additional thrust.

ERMA FIRST FLEXRING

FLEXRING Duct

FLEXRING guides the flow towards the propeller increasing the speed at the areas of obstructed flow and improving propulsive efficiency.

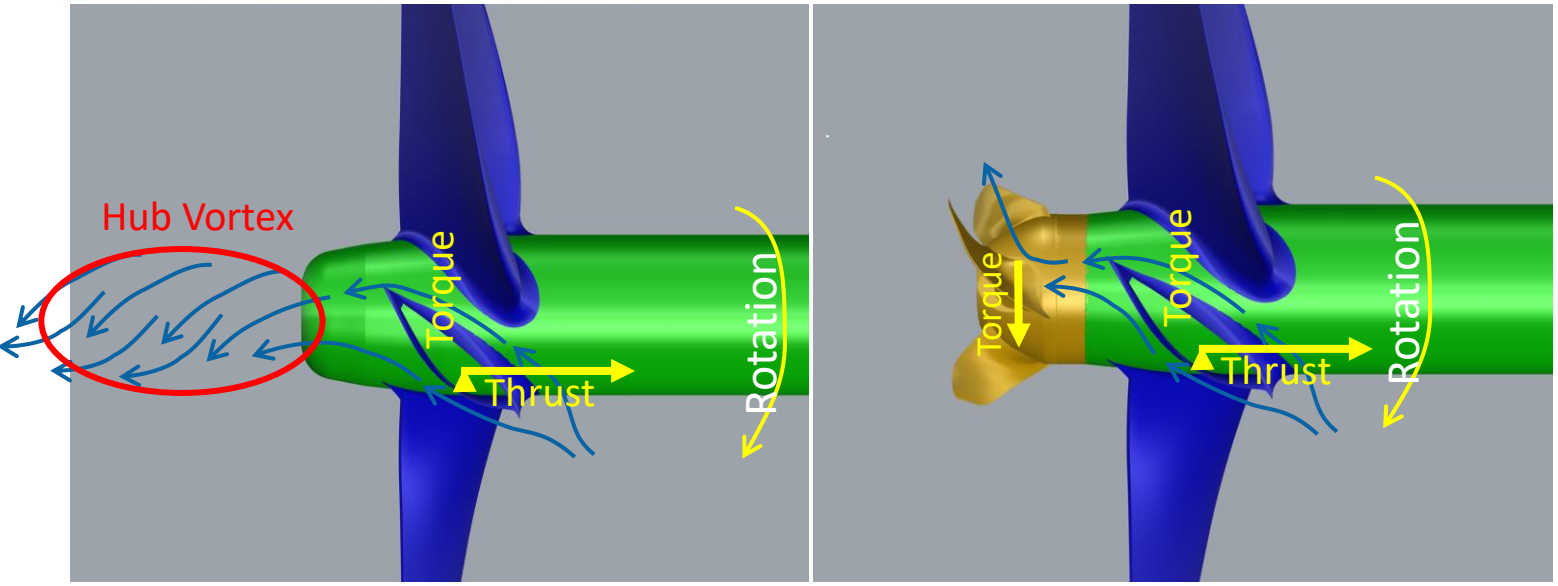
In addition to some thrust that develops on the duct, with proper alignment of the fins (*optional), a pre-swirl effect is created, further increasing the efficiency of the propeller.

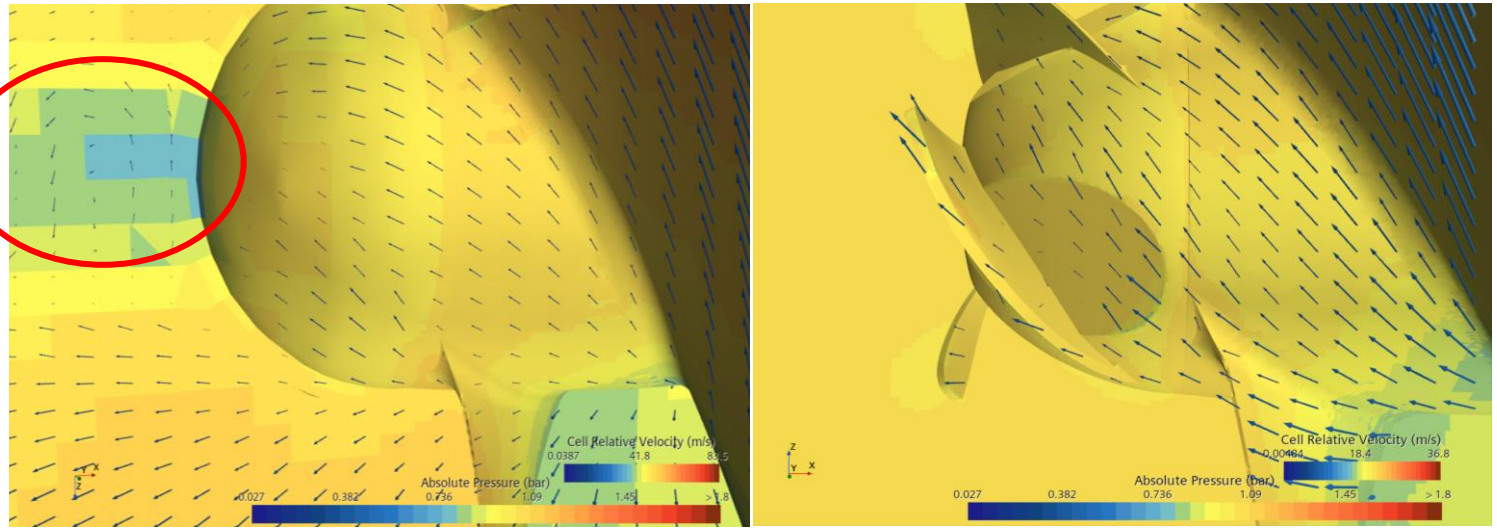
ERMA FIRST FLEXFIN

FLEXFIN Hull Fins

A set of fins properly placed and aligned, guide the flow around the hull in a way that it is more evenly distributed, reducing resistance and assisting in directing better flow to the propeller.

FLEXCAP Working Principle





- Simulation Results show vortex elimination with FLEXCAP.
- ERMA FIRST FLEXCAP Improves propulsive efficiency by weakening the propeller hub vortex while also reducing noise and vibration.

FLEXCAP Modular design

PARTS : Fin - Cap- Flange

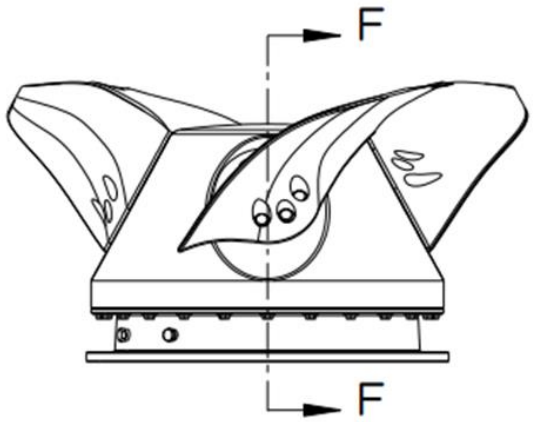
- CAP Size based on Hub size
- FIN Size based on Propeller Diameter
- Fin location and angle subject to CFD Optimization

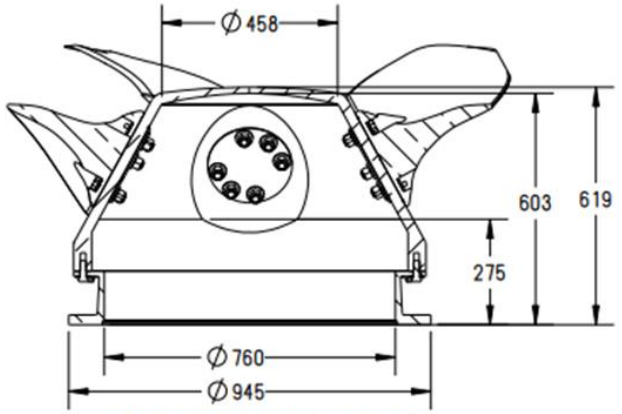
Upon order placement done in parallel

- Parts Fabrication
- Geometry optimization
- Class review (if needed)
- Assembly as per optimization

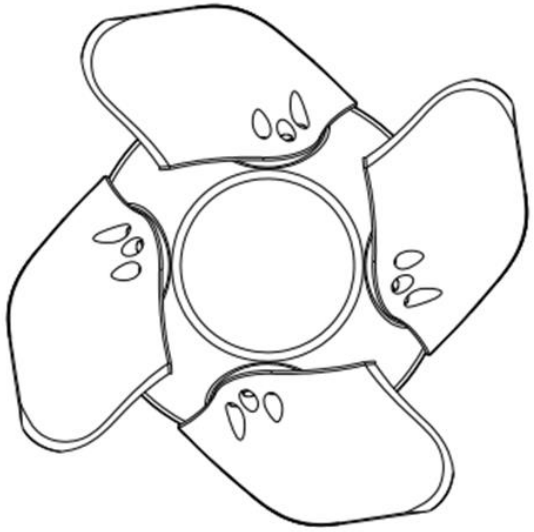
DELIVERABLES:

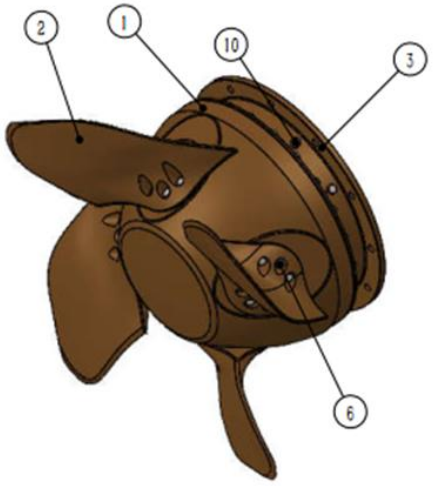
- ✓ Assembly drawings
- ✓ Class drawings package
- ✓ Rightship letter - CFD report – FEA analysis
- ✓ Compliant with IMO Rec147
- ✓ FEA -Checks per part and in total with criteria of the strictest class (ABS) are checked, and several cases have gone through approval with no comments.





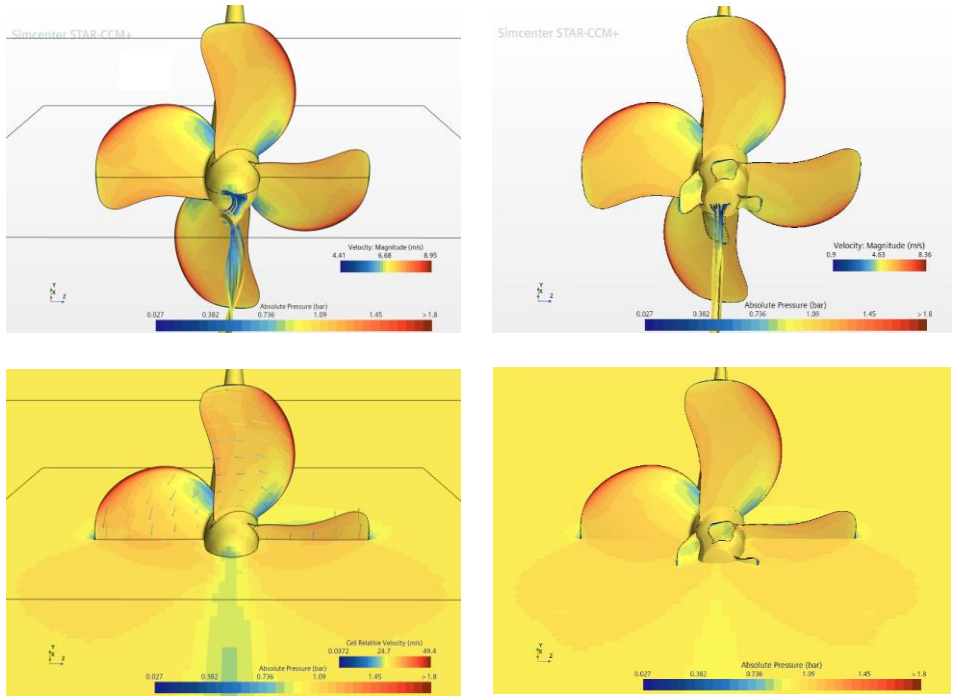
SECTION F-F





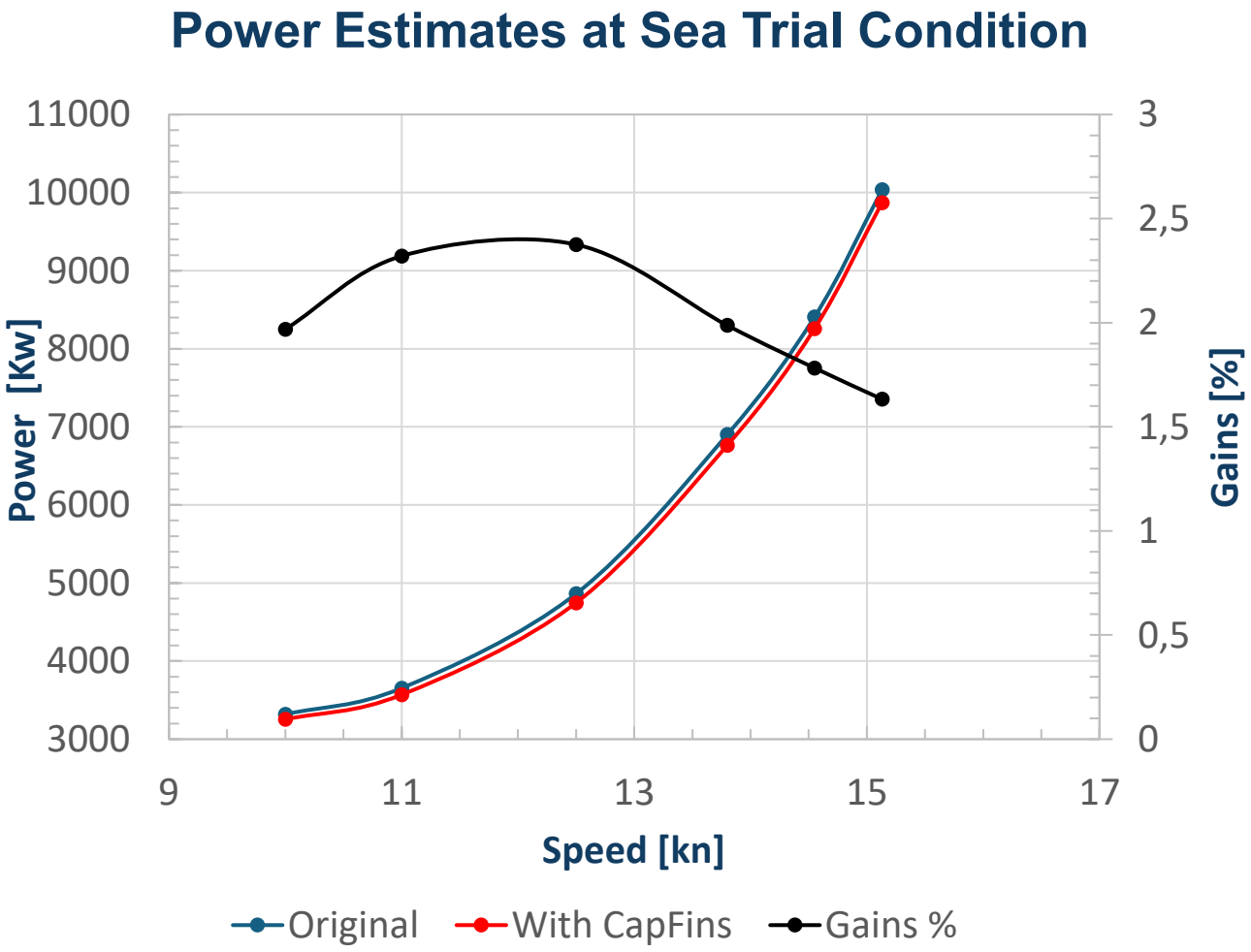
11	24
10	2
9	24
8	24
7	48
6	24
5	4
4	1
3	1

FLEXCAP ADVANTAGES



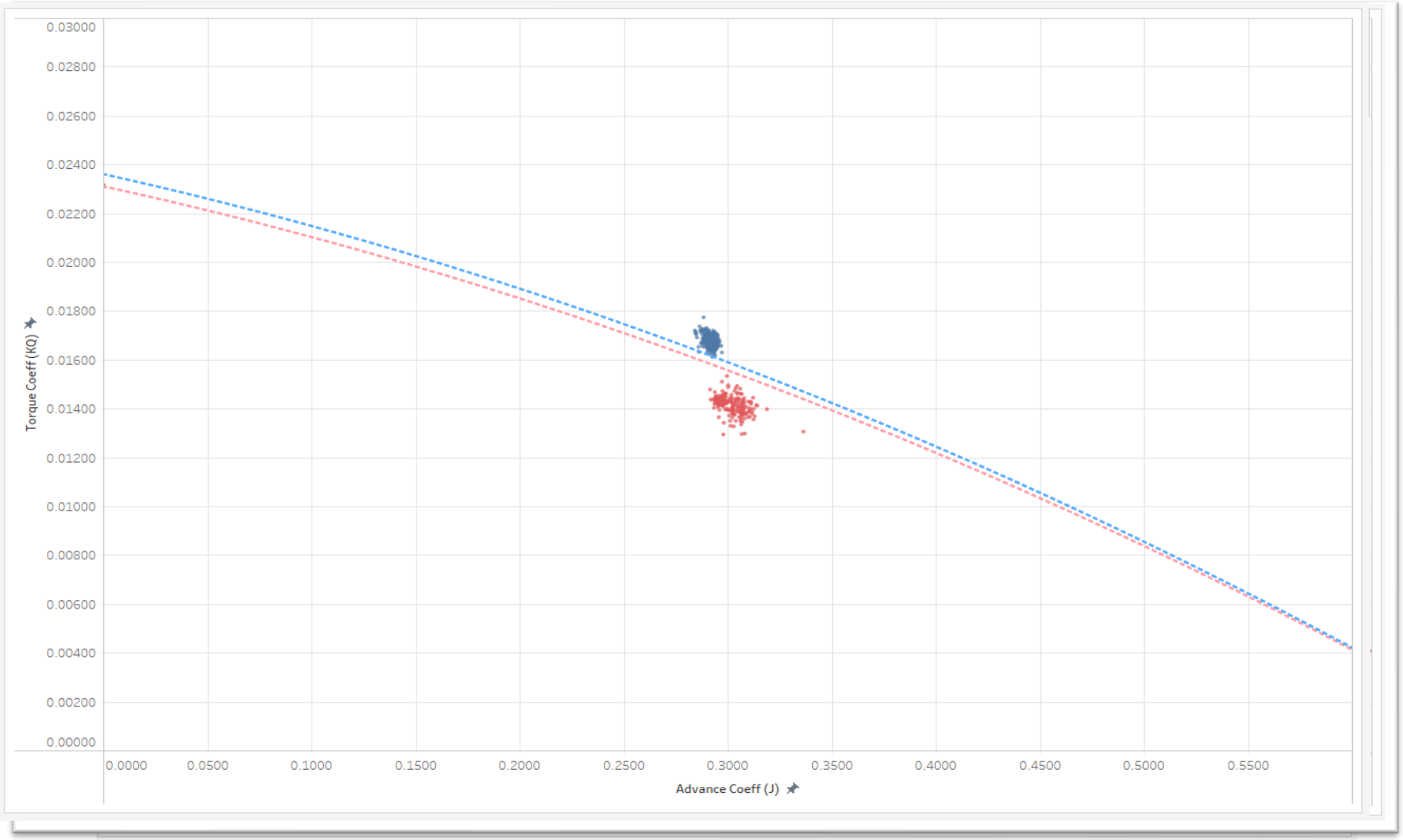
- 2nd Generation Propeller Cap
- The only propeller cap with adjustable fins in the market
  - ✓ Fin size and angle can adjust according to vessel's operating profile changes
- The only custom-made propeller cap in the market
  - ✓ Fins' size and angle are selected following a vessel's specific CFD ensuring maximum savings – We do not believe that one size and type fits all!
- Easily replaceable fins in case of changes to vessel operating profile or if the propeller / fins are damaged in some way
- The only propeller cap approved by RightShip under the Zero Harm Innovation Partner program
- Turnkey solution, including:
  - ✓ In-house open water CFD
  - ✓ Project management
  - ✓ Class approval engineering
  - ✓ Worldwide installation supervision
  - ✓ Underwater or afloat installation

PERFORMANCE GAINS



The open water gains, translate to 2.4% gains but may vary according to propeller loading. Point of maximum gains can move as a result of the optimization process.

Actual RESULTS using METIS

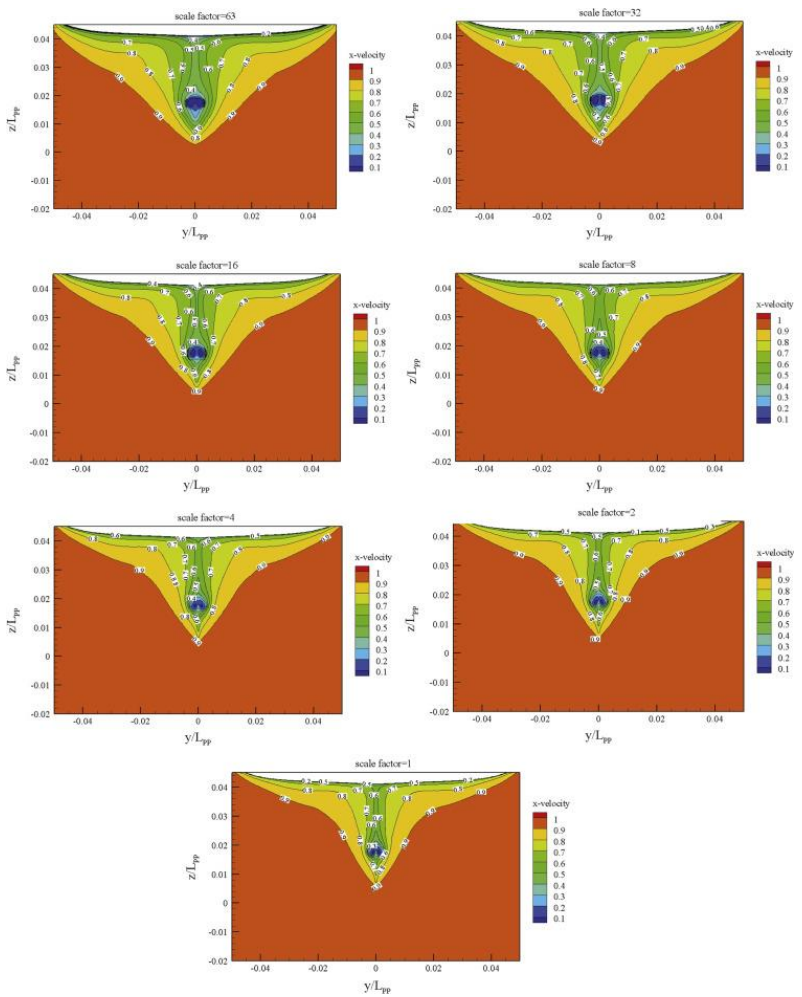


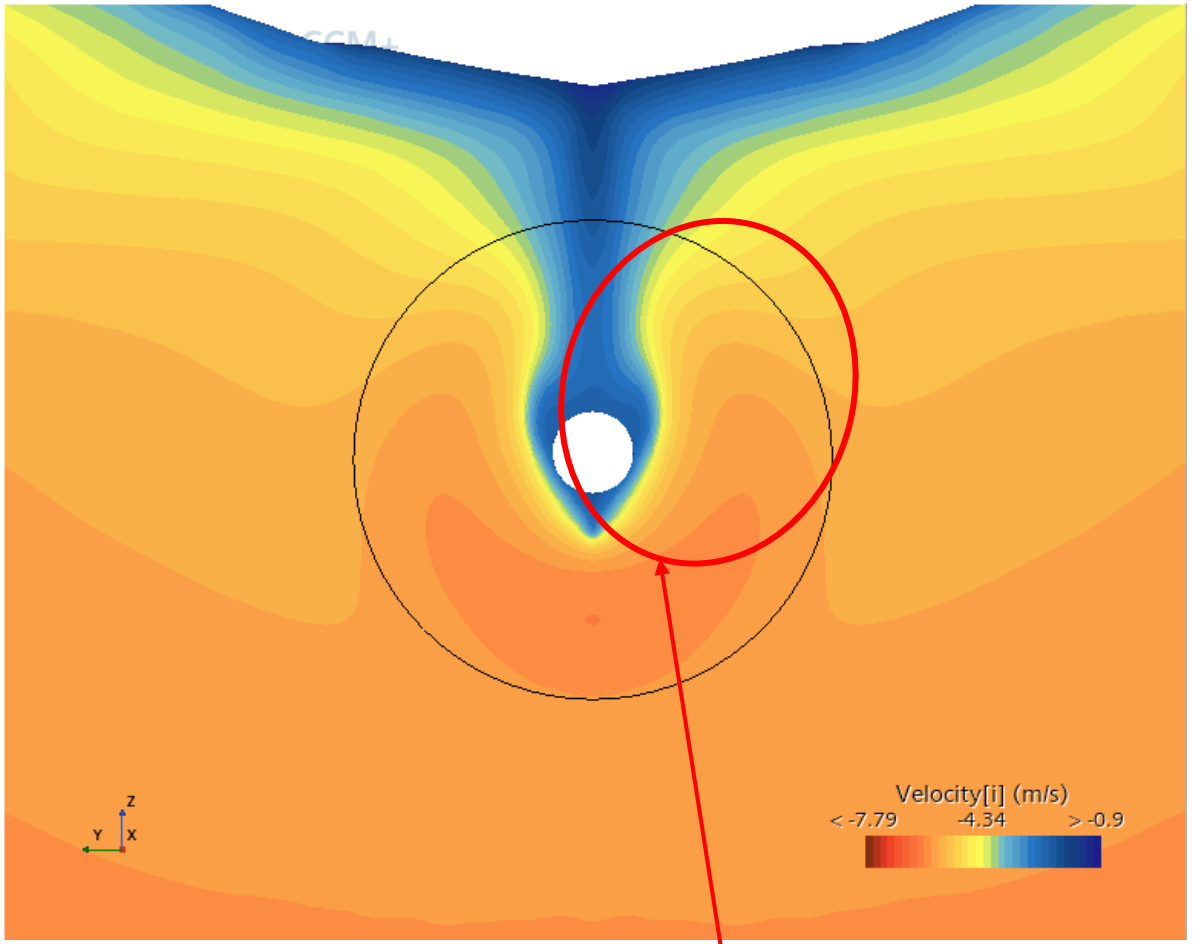
Data from two vessels, having done the same drydock, except for FLEXCAP.

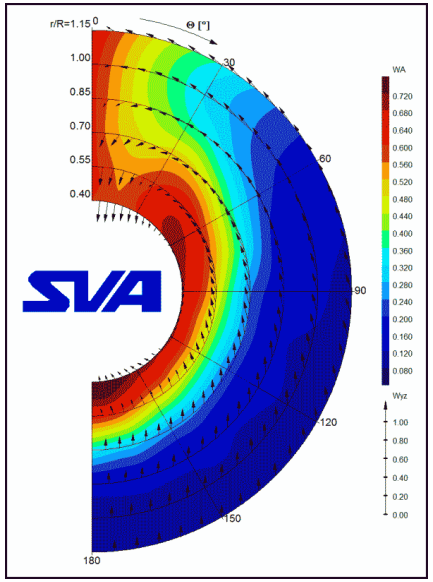
Blue - Original

Red - FLEXCAP

SHIP WAKE

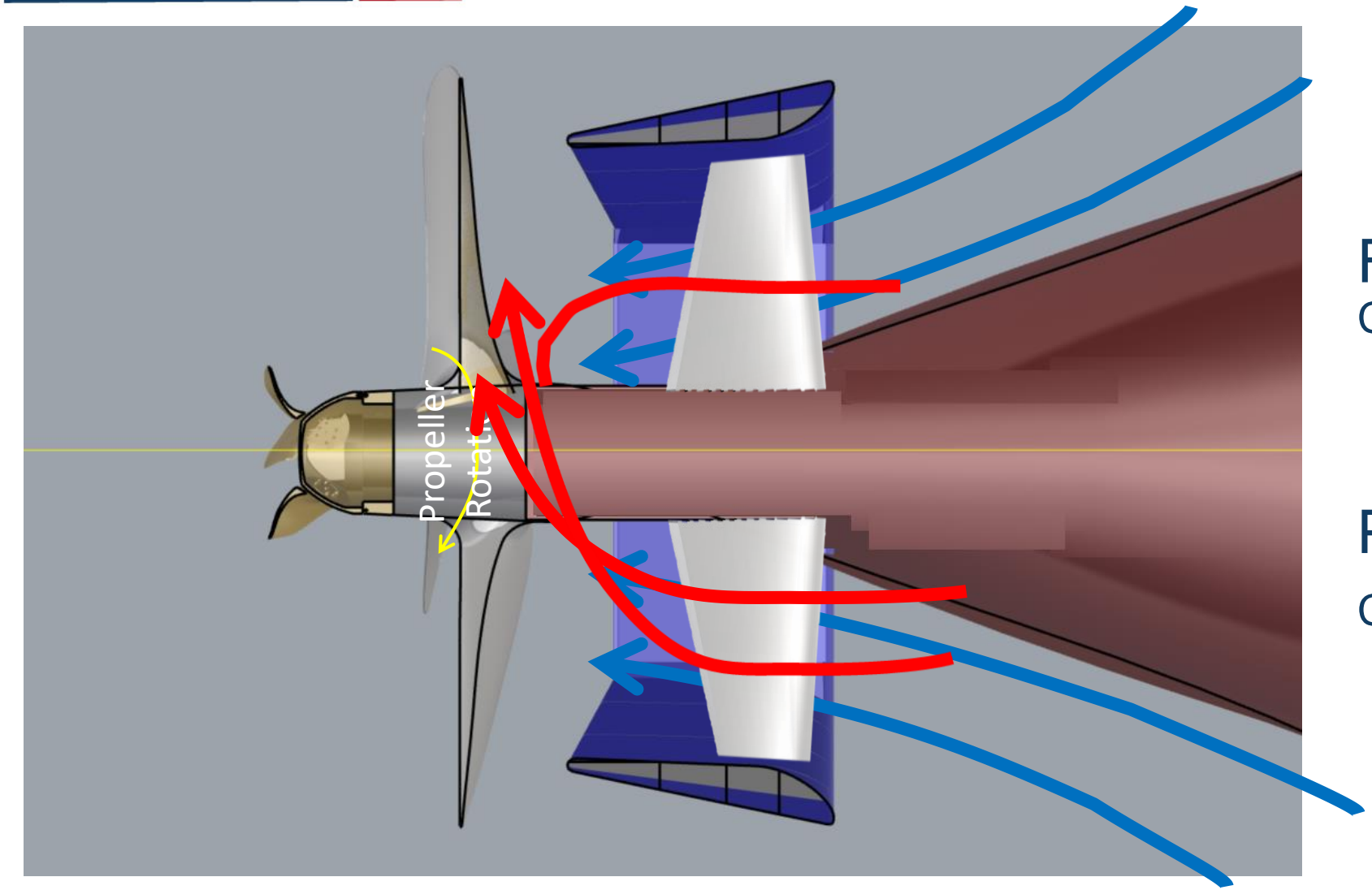






Strongly affected area in Propeller plane

FLEXRING WORKING PRINCIPLE



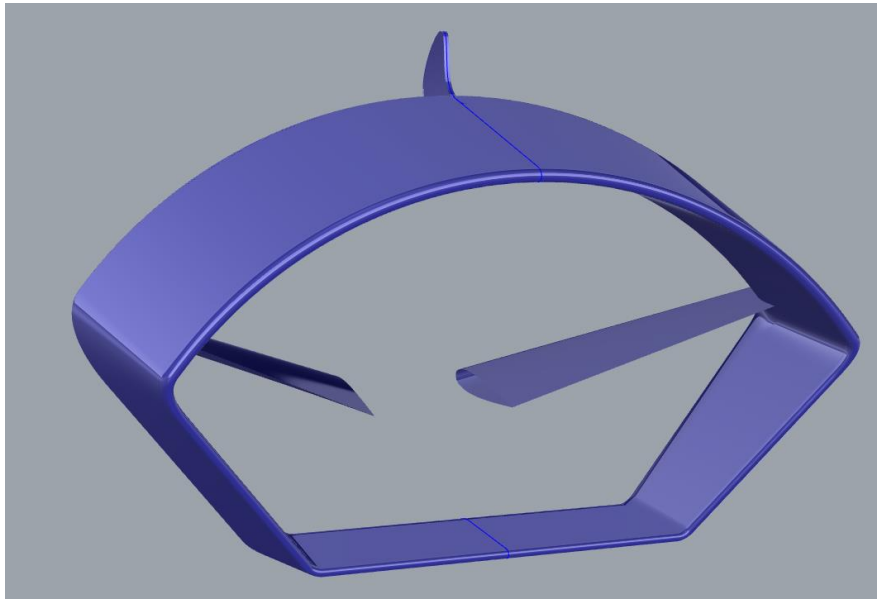
Funnel Mode

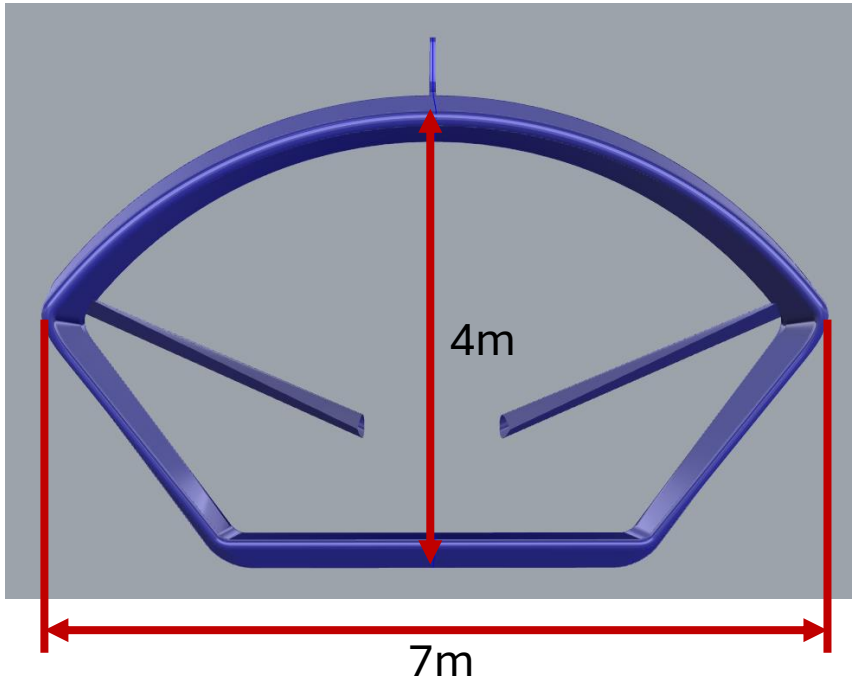
Concentrates flow to propeller

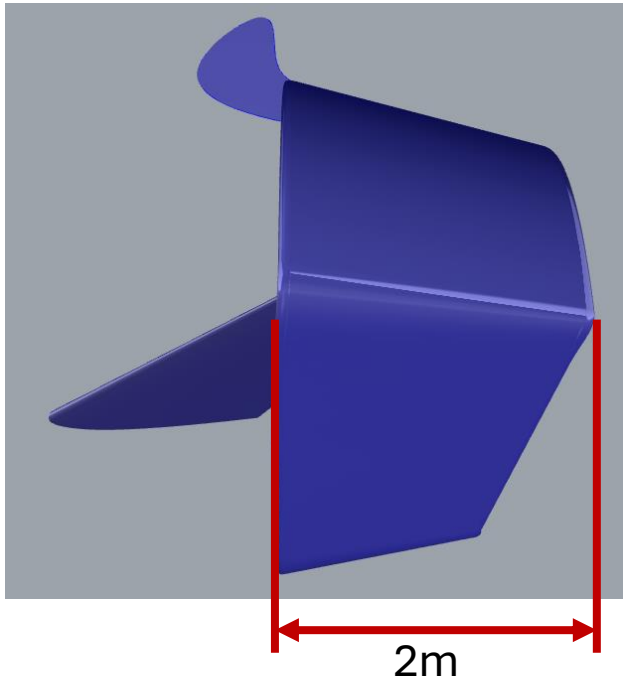
Pre-swirl Mode

Counter rotates flow

FLEXRING INITIAL GEOMETRY
(Dolphin57 example)

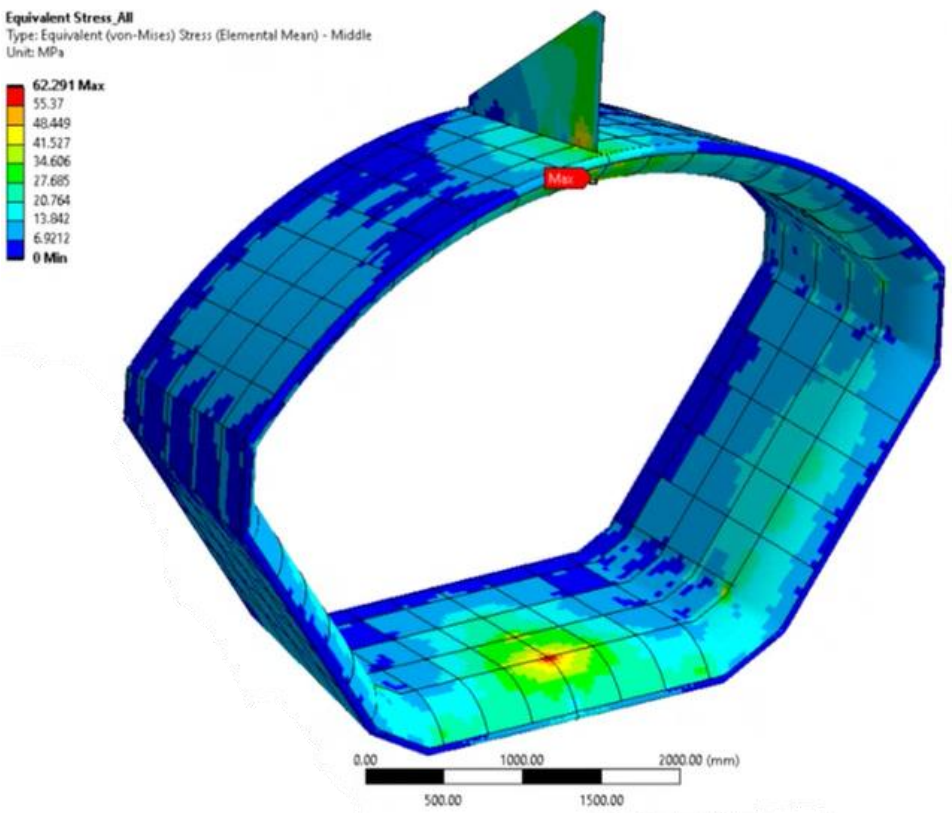


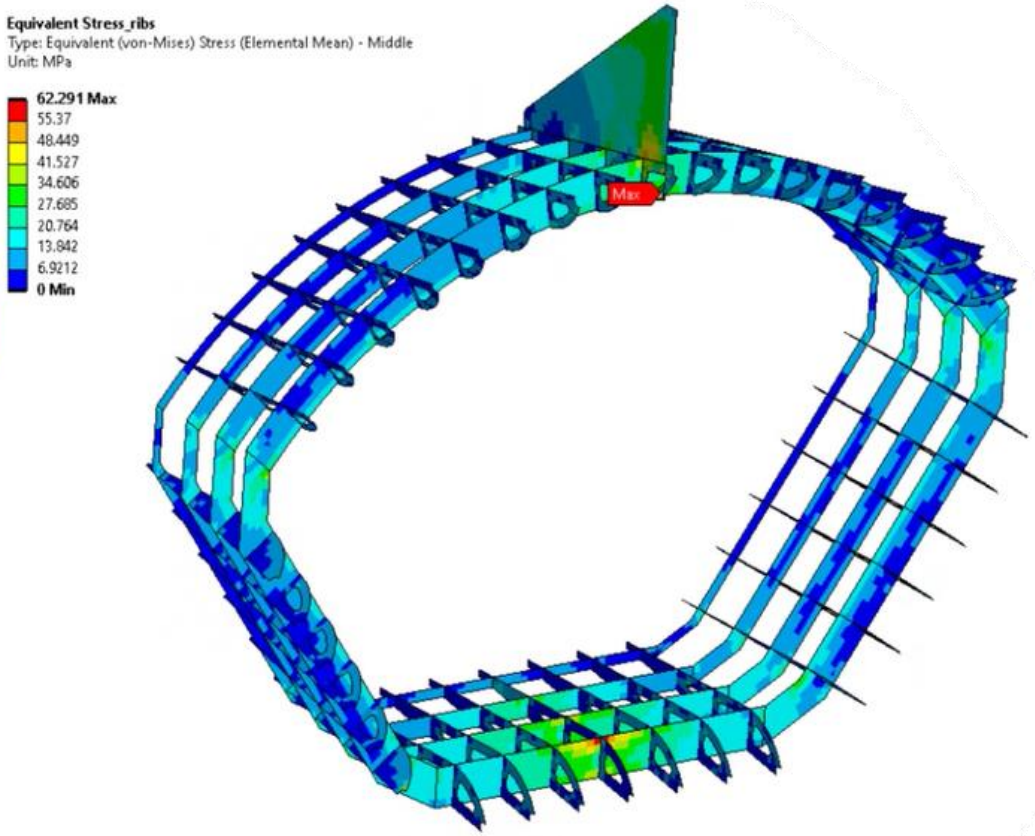




FLEXRING STRUCTURE

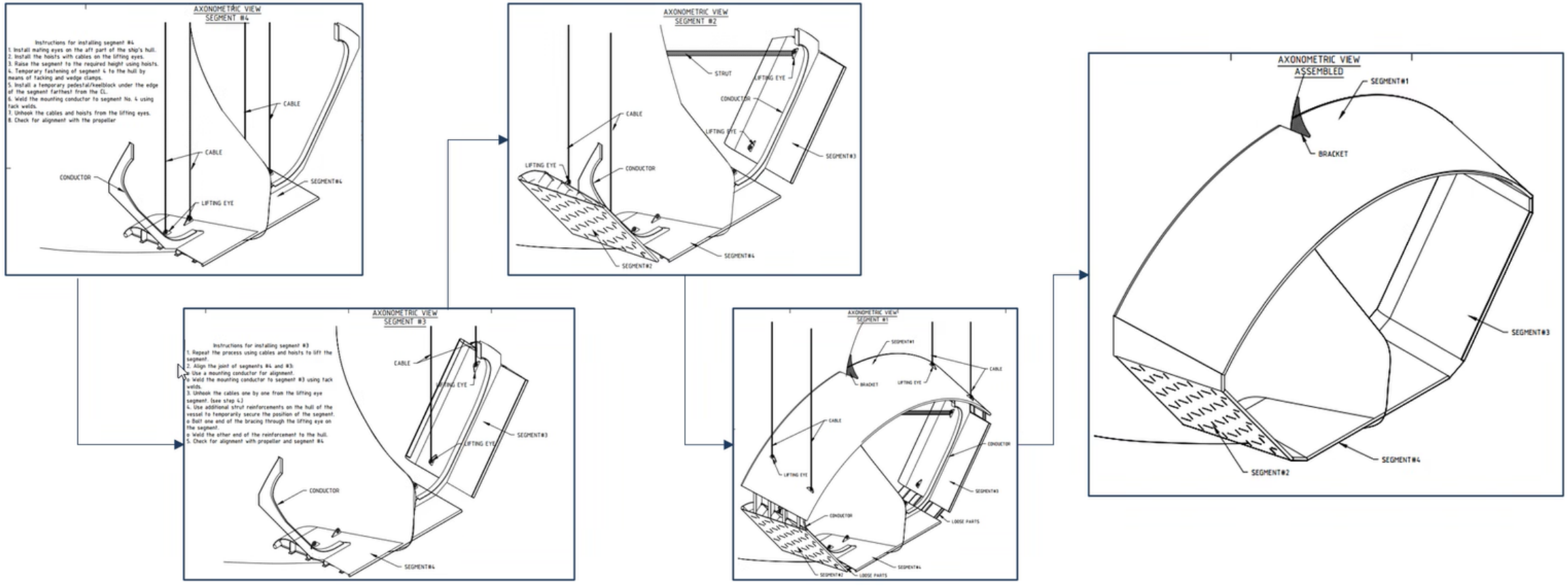
FEA Verification results



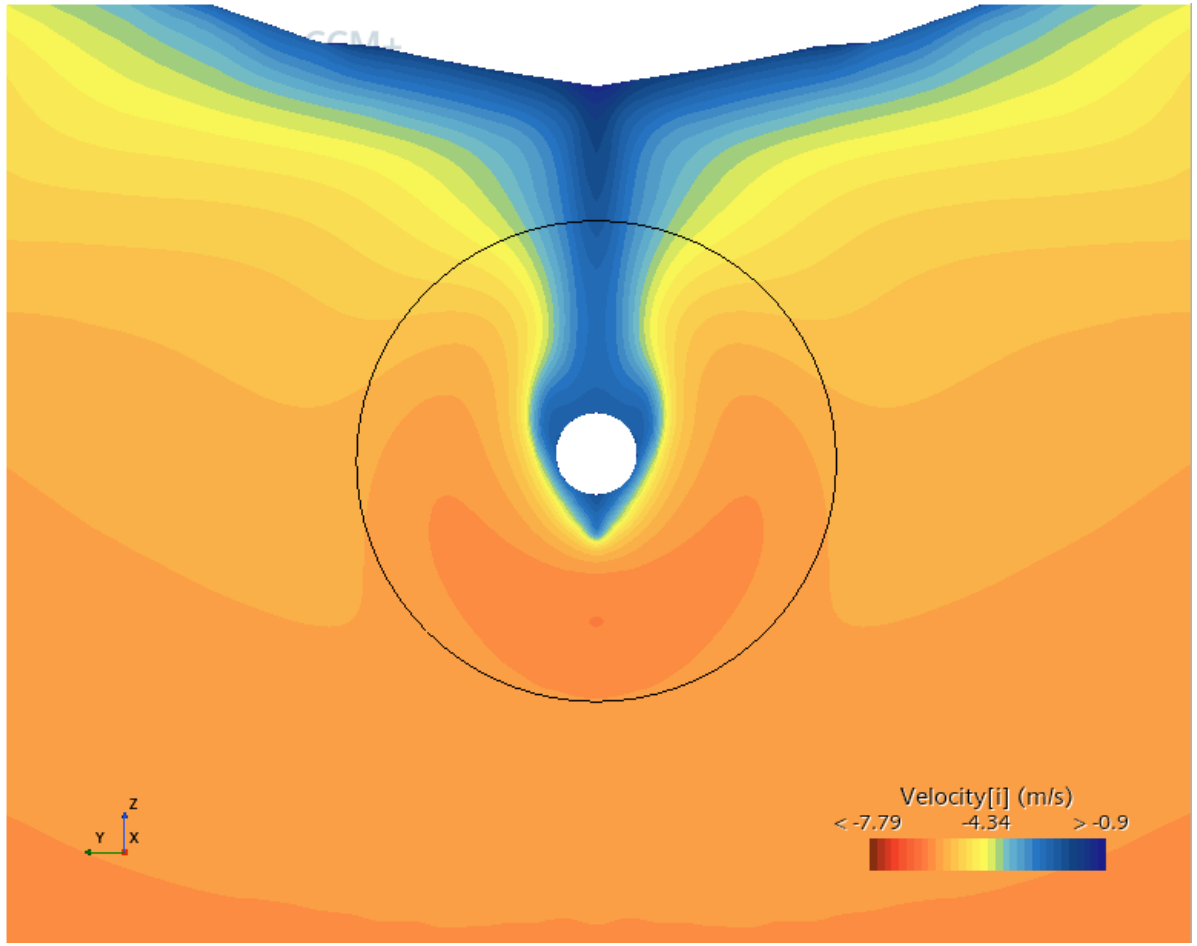


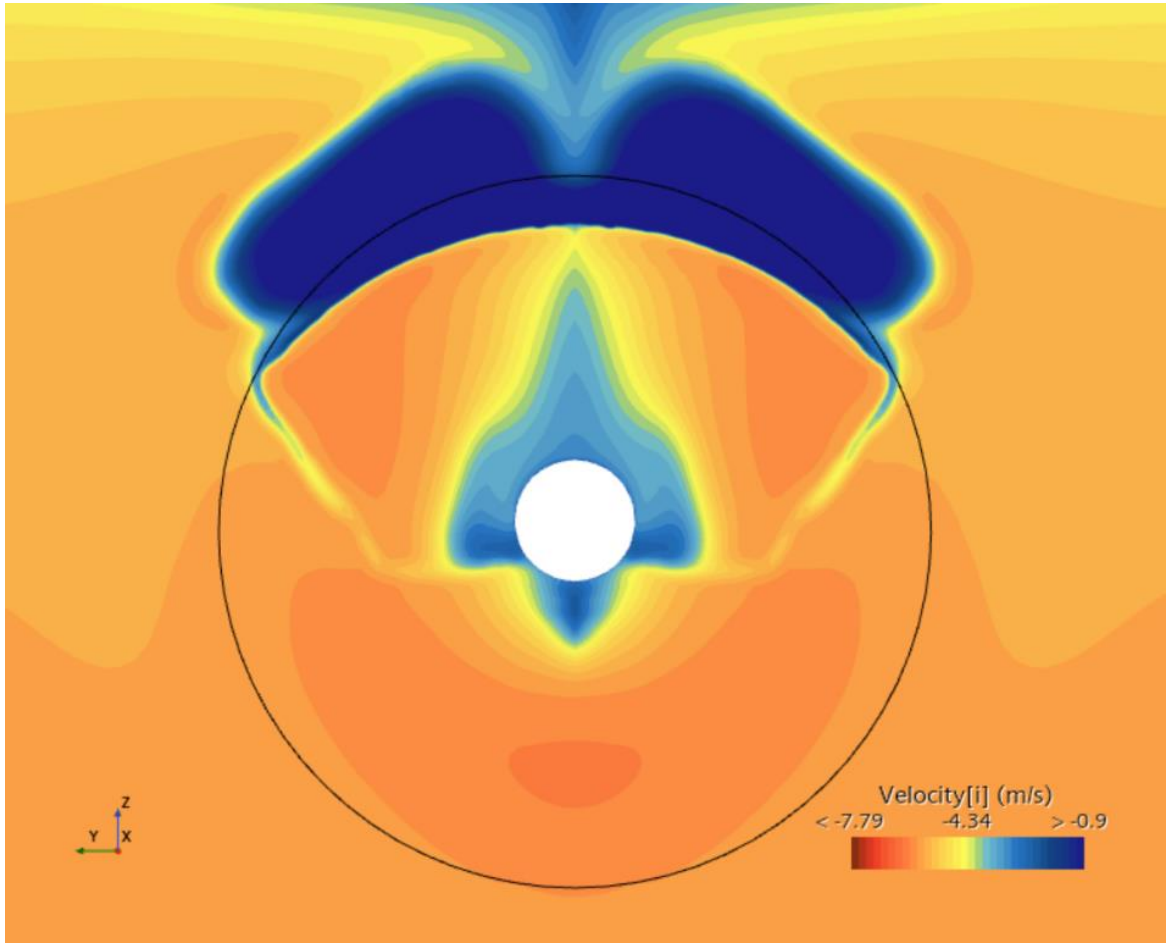
FLEXRING MODULARITY / PARAMETRIZATION

Lifting & Installation Procedure

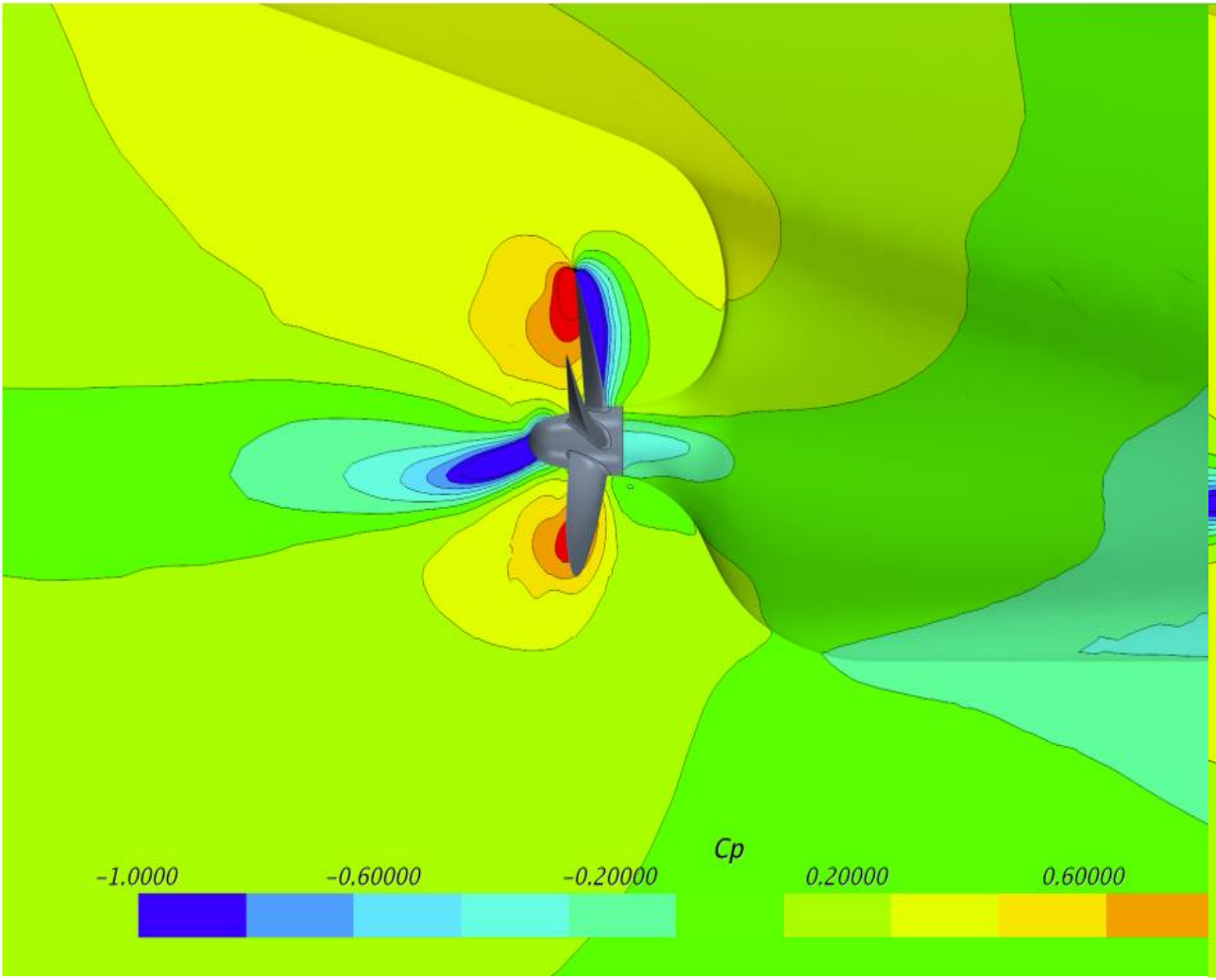


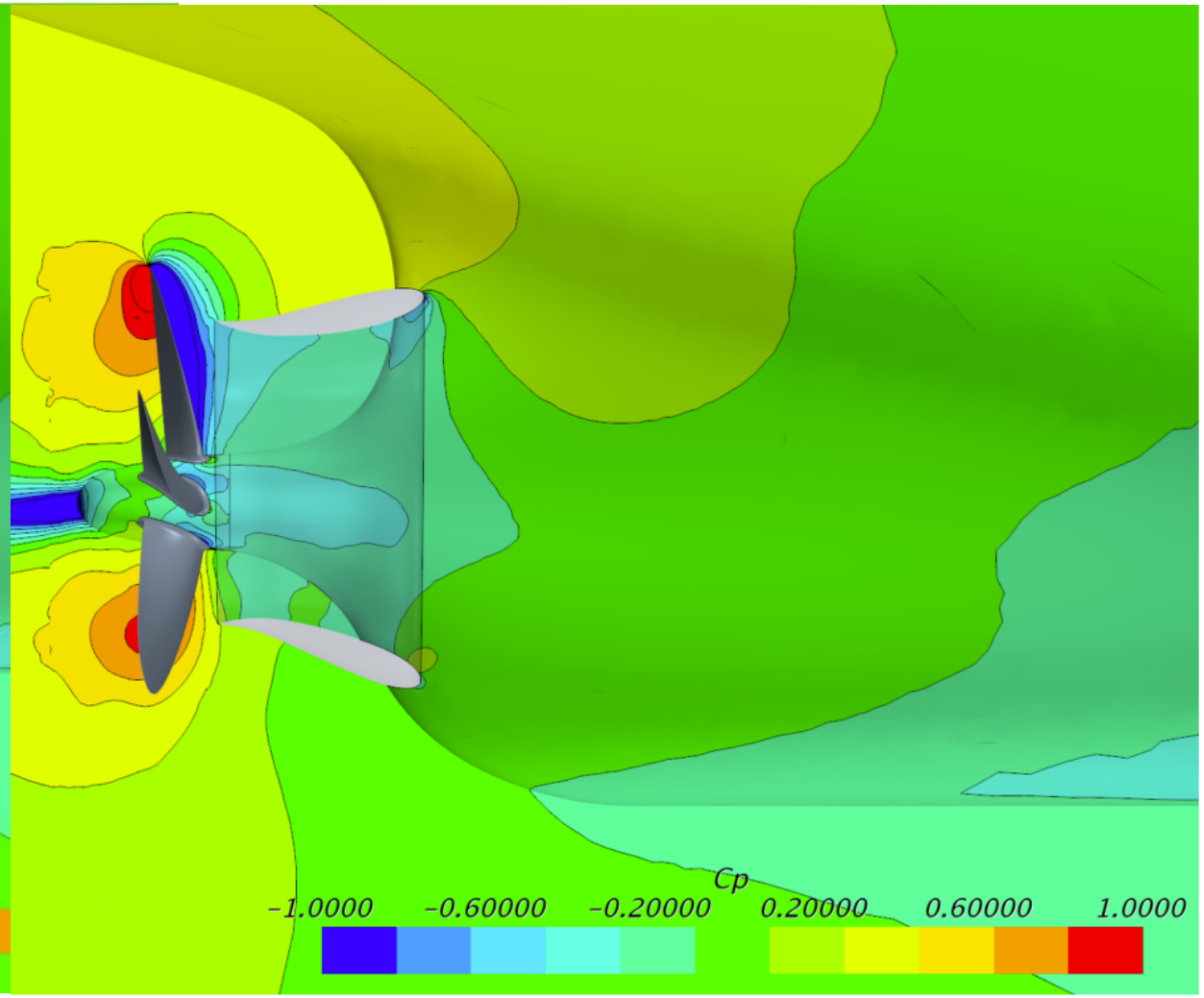
CFD RESULTS



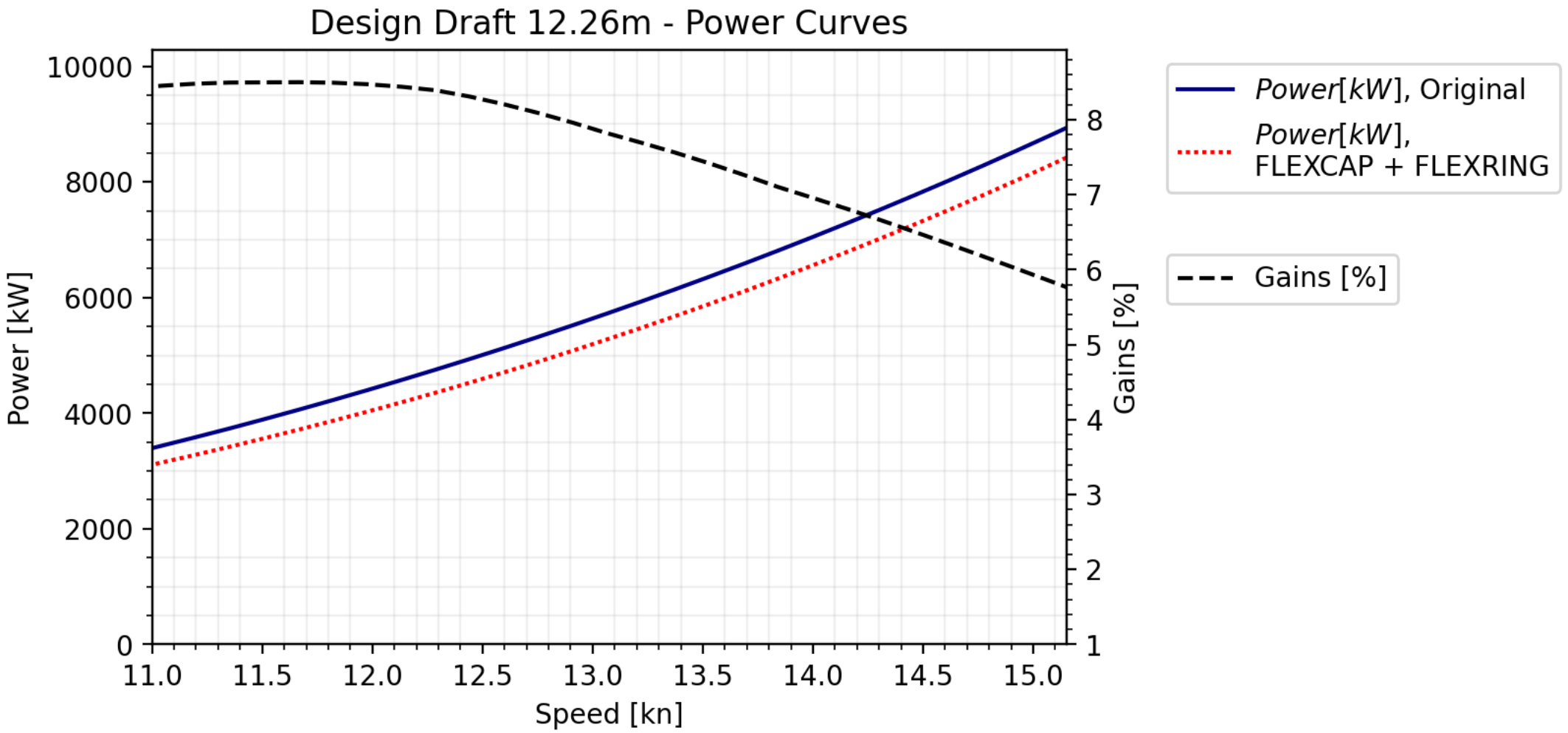


CFD RESULTS


Cp
-1.0000
-0.60000
-0.20000
0.20000
0.60000


Cp
-1.0000
-0.60000
-0.20000
0.20000
0.60000
1.0000

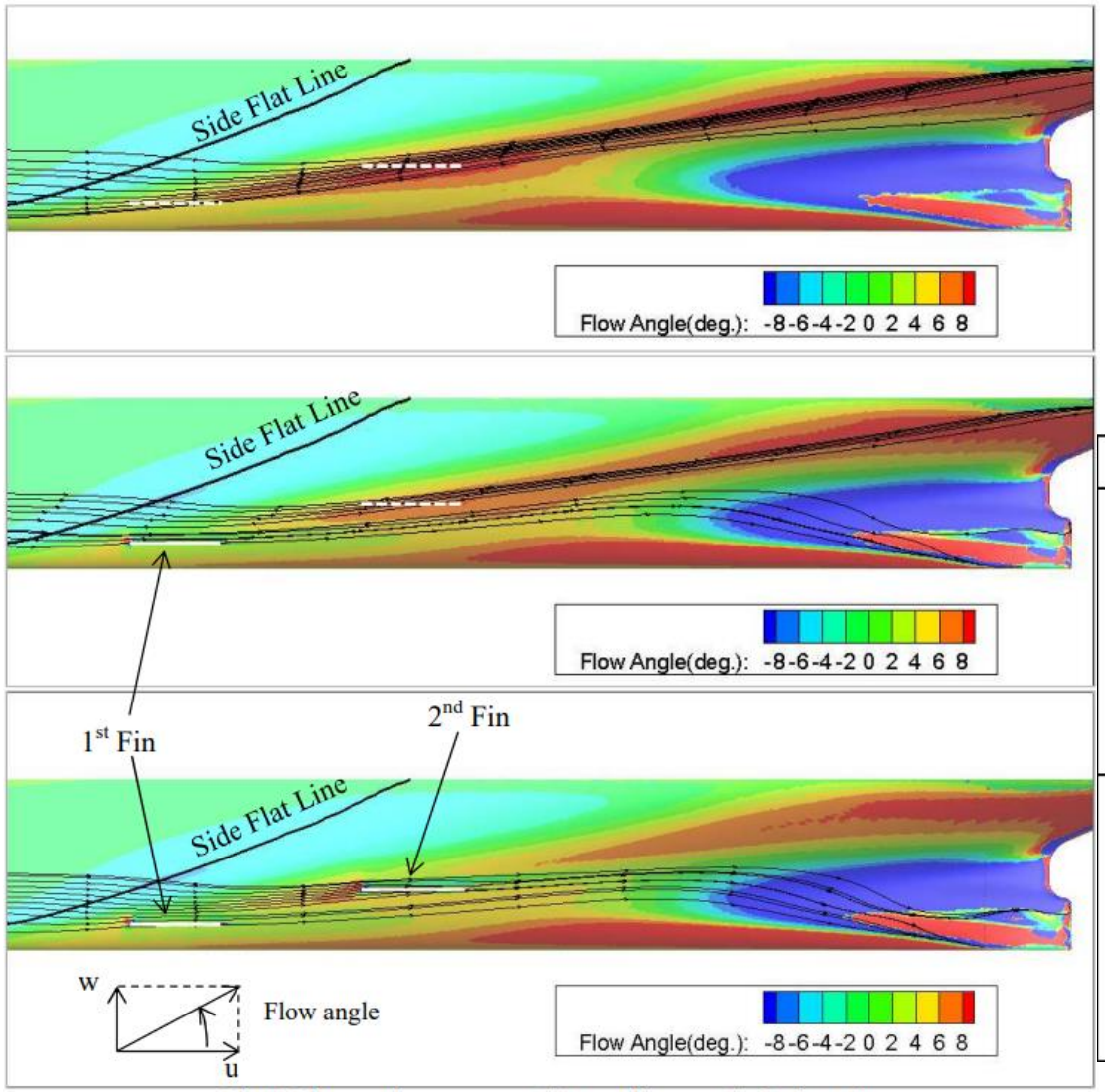
SAVINGS WITH FLEXRING



FLEXRING ADVANTAGES

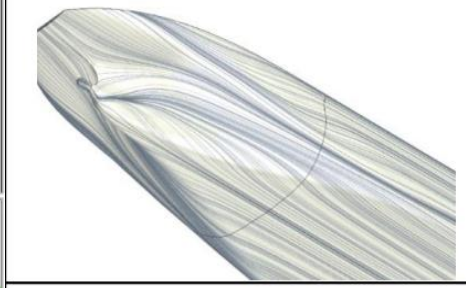
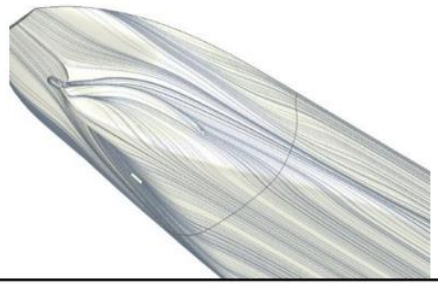
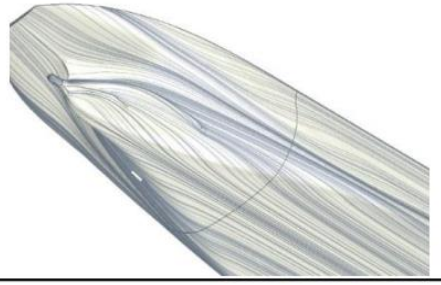
- The only adjustable pre-swirl duct in the market
- The vertical parts of duct's angle are selected based on specific vessel's design and operating profile, ensuring maximum performance
- Modular design allowing easy installation
- Due to the geometry of the ring, no drag risk is introduced on the vessel
- Turnkey solution, including:
  - ✓ In-house open water CFD
  - ✓ Project management
  - ✓ Class approval engineering
  - ✓ Worldwide installation supervision

FLEXFINS



ESD Optimized - modular and tailor-made to the operational profile of the ship.

- Maximum savings since FLEXFINS are optimized for the best geometry applicable to each vessel.
- Maximum compatibility since all existing devices are considered in FLEXFINS optimization.
- Combined with FLEXCAP can extend the “life” of a vessel in the safe zone by over 3 years.

w/o Fin	No.1 Fin	No.2 Fin
		
		

WHY FLEX SERIES

DECARBONISATION

- Tailor-made ESDs , individually optimized per vessel.
- Complete propeller efficiency solution via ERMA FIRST's ESD Series, which includes FLEXCAP, FLEXRING and FLEXFIN
- ERMA FIRST in-house R&D Department dedicated to the FLEX SERIES development.
- Unlimited access to the ERMA FIRST globally established network of Procurement and Aftersales Support.

FLEXCAP
Propeller Cap

FLEXRING
Duct

FLEXFIN
Hull Fins

ERMATECH GROUP

THINK DECARBONISATION …

THINK ENVIRONMENTAL PROTECTION …

THINK ERMA TECH GROUP!

Contact us:

sales@ermatechgroup.com