

REINTRIEB

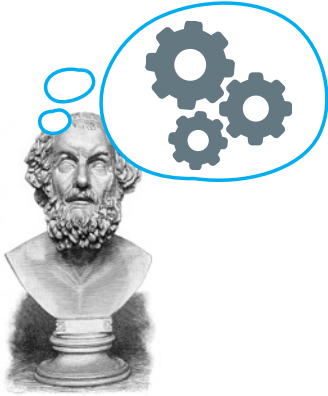
AMBIENT WATER TRANSMISSIONS

PRESENTATION

AMBIENT WATER TRANSMISSIONS & SIDE-BY-SIDE PROPELLER



A sticky problem ...



Since the Greeks
invented gears ...



... engineers have been trying to find
ways to use them without breakage.



Modern gears are lubricated (and
cooled) with highly noxious oil.



Sad but true: oil is highly
problematic for the environment,
the climate, humans and animals.

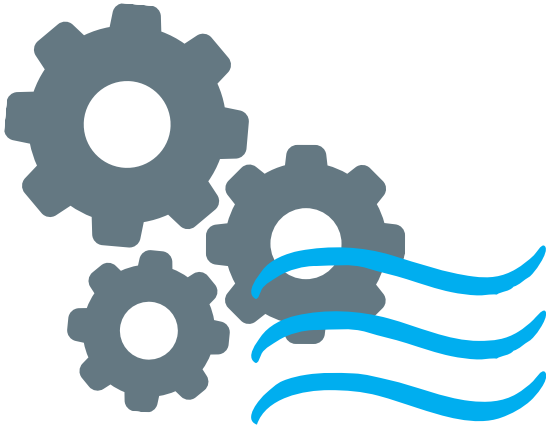


And: Oil is expensive to buy, to
store and to dispose off ...



Wouldn't it be great to replace the
expensive, toxic oil in gears with
something environmentally friendly
and cheap?

Our solution is water!



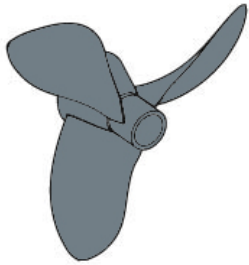
We have developed a method to lubricate gears with ambient water.

Based on this we are developing the first high-performance (!), oil free (!!), water lubricated gear box in the world.

This invention has enormously disruptive potential in the propulsion technology, particularly in maritime propulsion systems.

Welcome to the world of REINTRIEB

Water lubrication in maritime propulsion



1 Depending on the system one or several transmissions are used in maritime propulsion.



2 Due to a lack of alternatives, they are all lubricated with highly noxious oil.



3 Ensuring that no toxic oil escapes into the seas or the rivers is technically complicated and costs a lot of money.



4 But we all know that there are no perfect seals. Something always leaks. Everywhere, everyday, around the world.



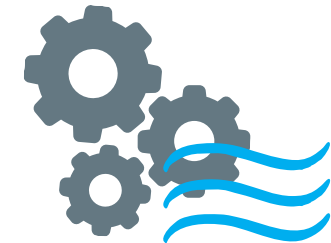
5 As a consequence ship owners and carriers are confronted with high fines, even bans for some waterways and a bad public image ...



6 ... and our fresh water reserves are being regulated and protected more and more.

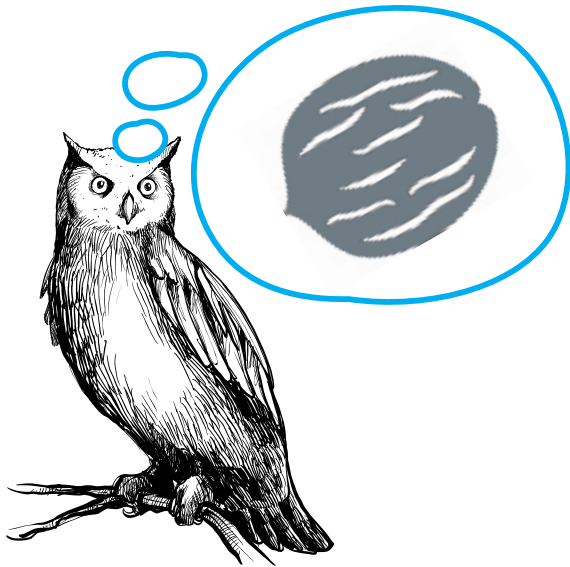


7 Vice versa: If tiny amounts of water leak into your gear, the consequences are costly: expensive repairs, even dry dock and business interruption.



8 If maritime gears are lubricated with water instead of oil, all these problems would be addressed and solved at once.

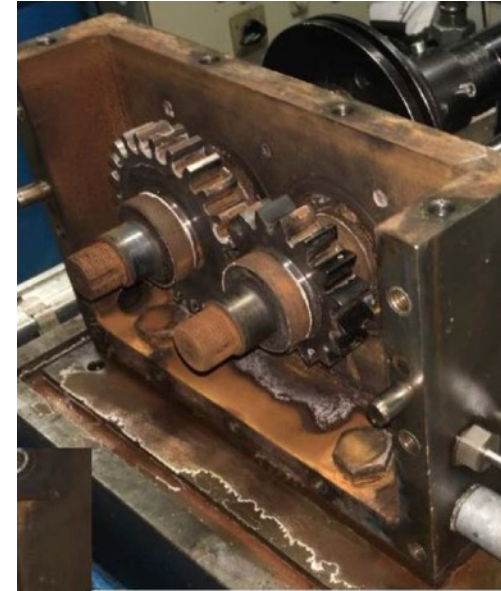
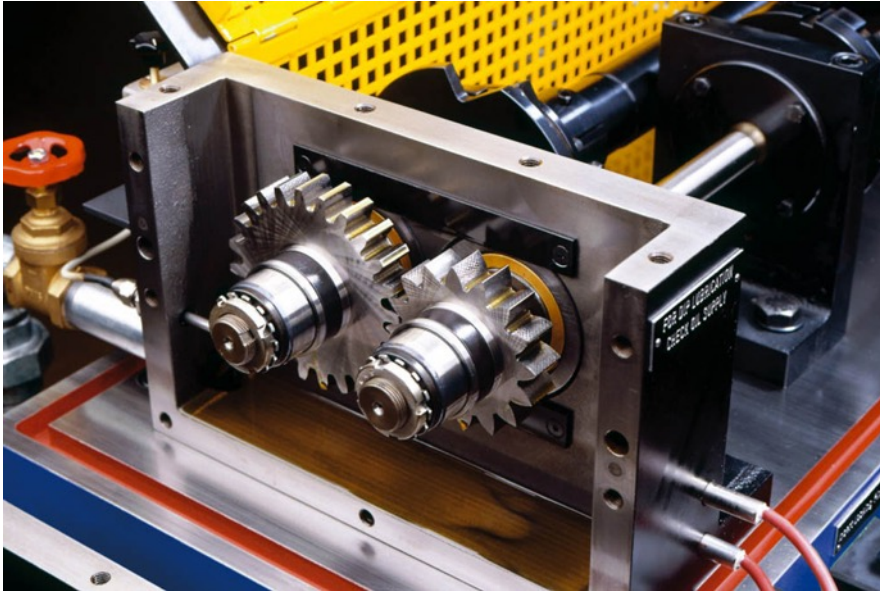
A hard nut to crack...



Before any ship in the world is launched with an ambient water transmission, we need a proof-of-concept.

We have assembled a team of maritime engineers and conducted many, many tests to make sure that our water transmissions work ...

Where we stand...



- ⚙ The most important hurdle on the way to the proof-of-concept has been taken: The scuffing safety test conducted by the FZG institute of the Technical University Munich.
- ⚙ Our asset: European Patent EP 2 614 000 B1 awarded to Reintrieb on 14 February 2018 (more patents pending)

Roadmap for „Proof of Concept“ and beyond

Already achieved:

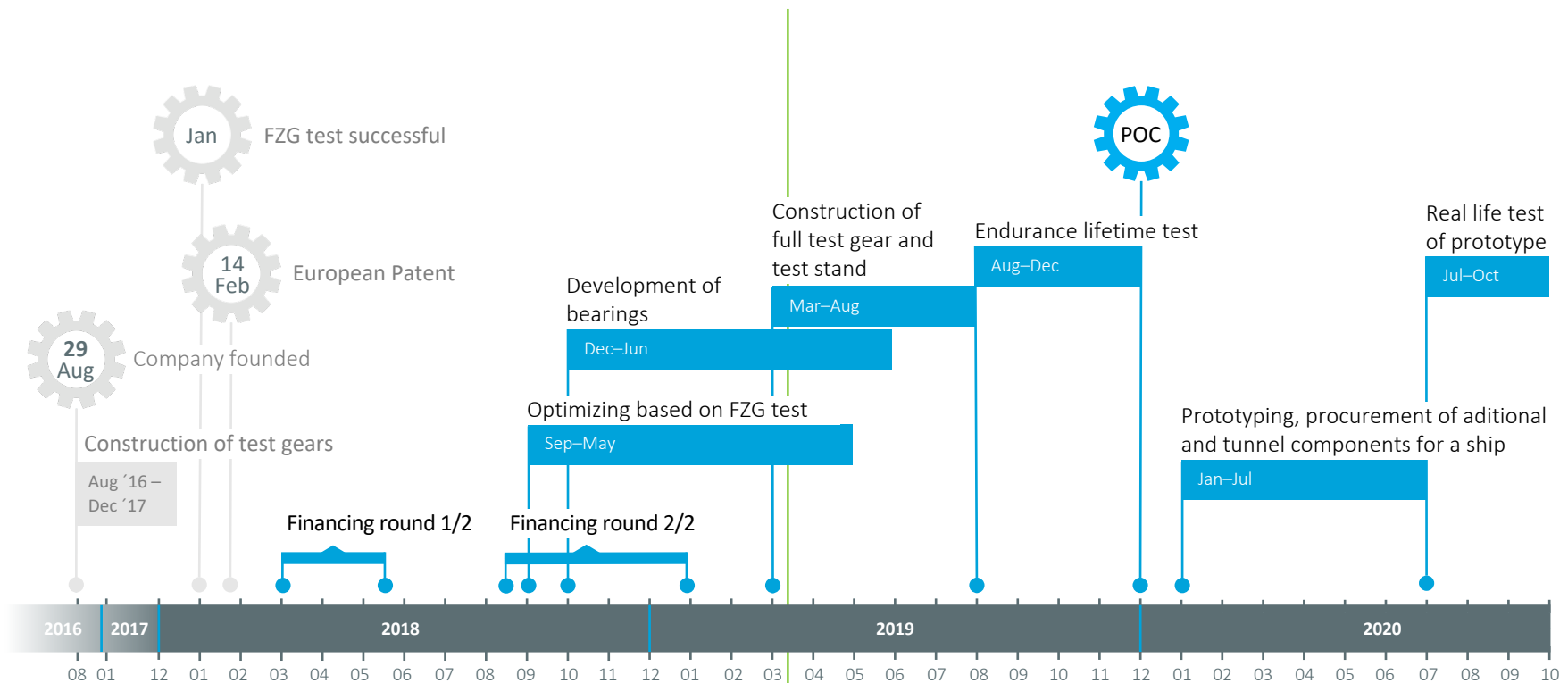
- Scuffing Safety
- Corrosion free gear casing

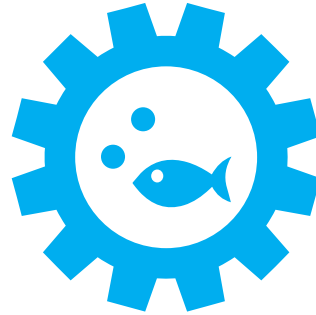
Currently testing:

- Water lubricated bearings

Still to do (Fall 2019):

- Endurance lifetime test



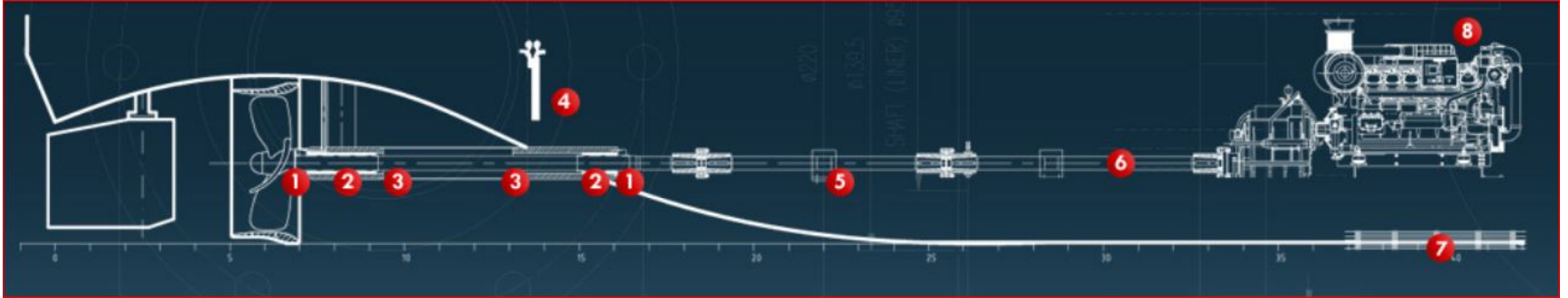


REINTRIEB
AMBIENT WATER TRANSMISSIONS

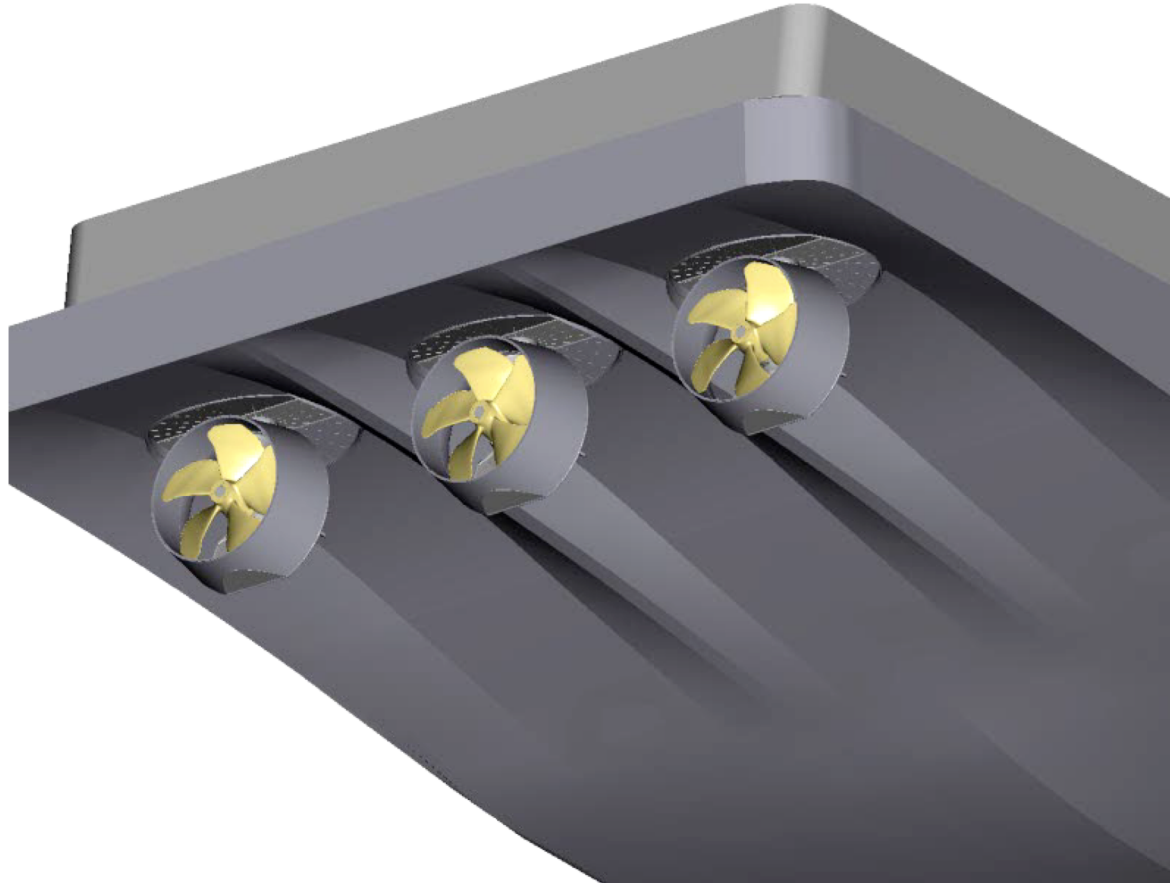
REINTRIEB SIDE-BY-SIDE PROPELLER



Typical (direct) propulsion configuration

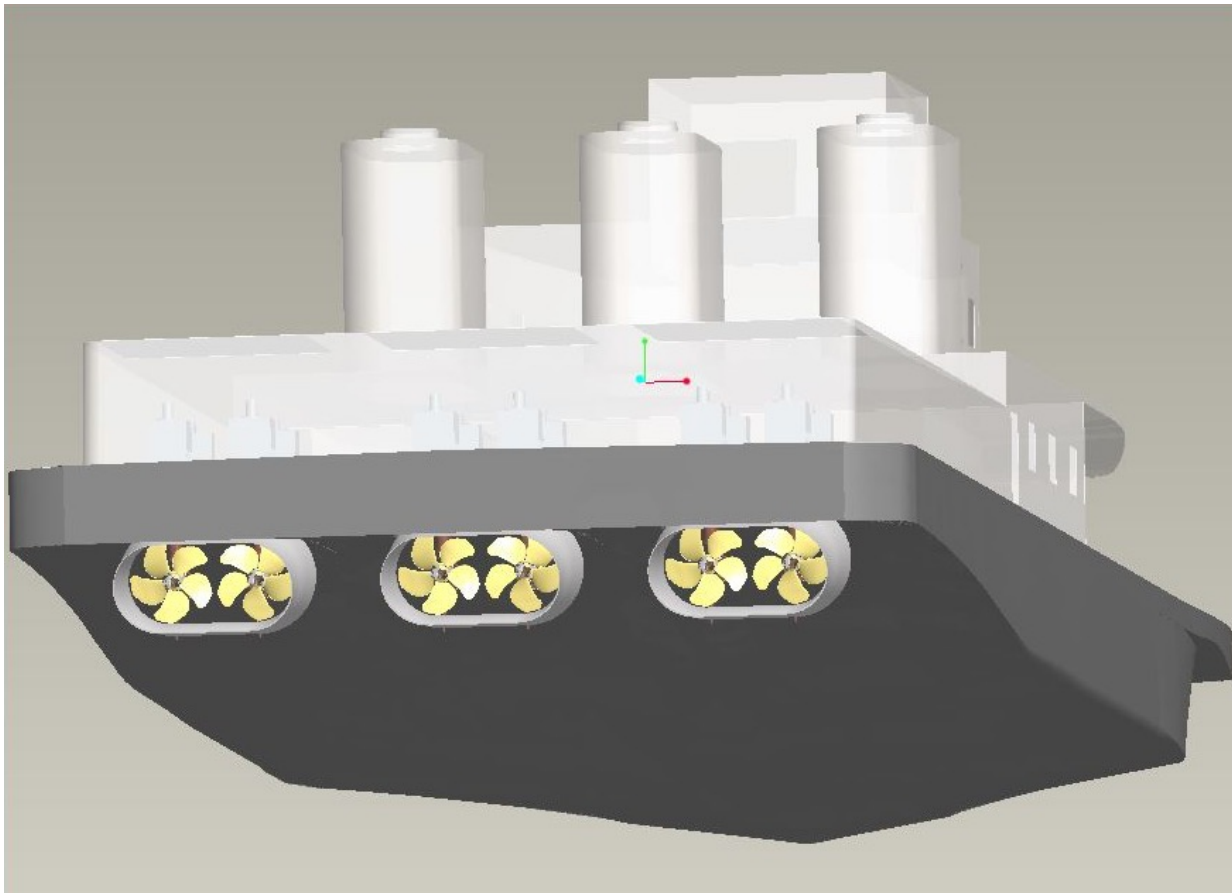


Current Rudder Propeller Systems



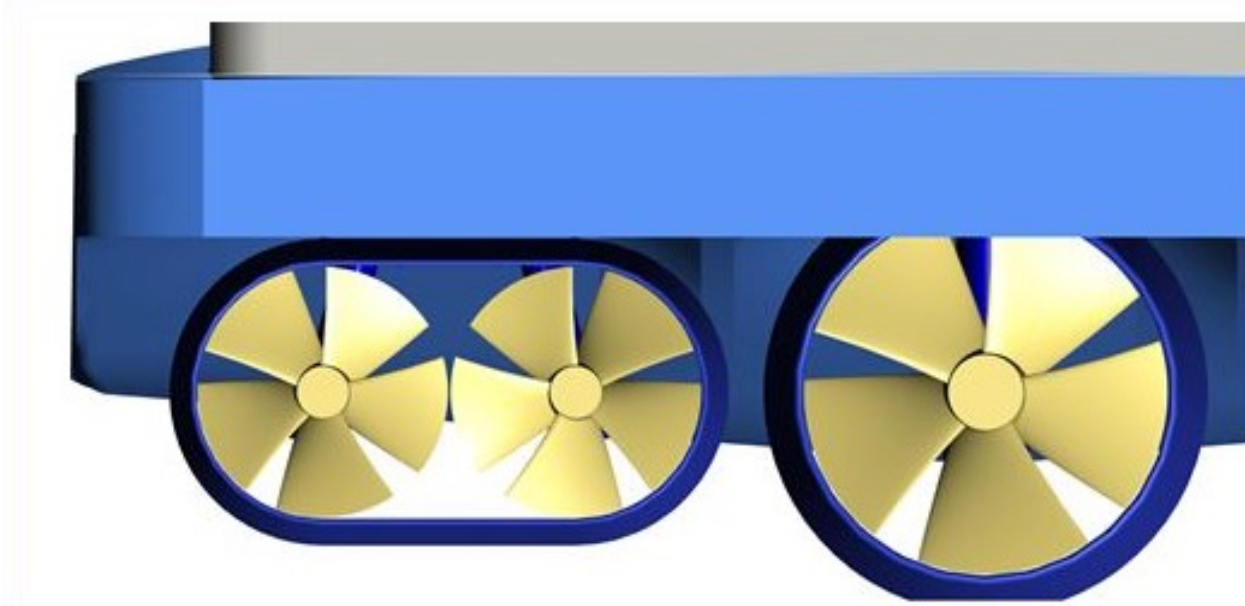
⚙️ Actual cargo vessel on Rio Tinto

Possible Side-by-Side Construction



- ⚙ Study for same cargo vessel with Reintrieb Side-by-Side Propellers

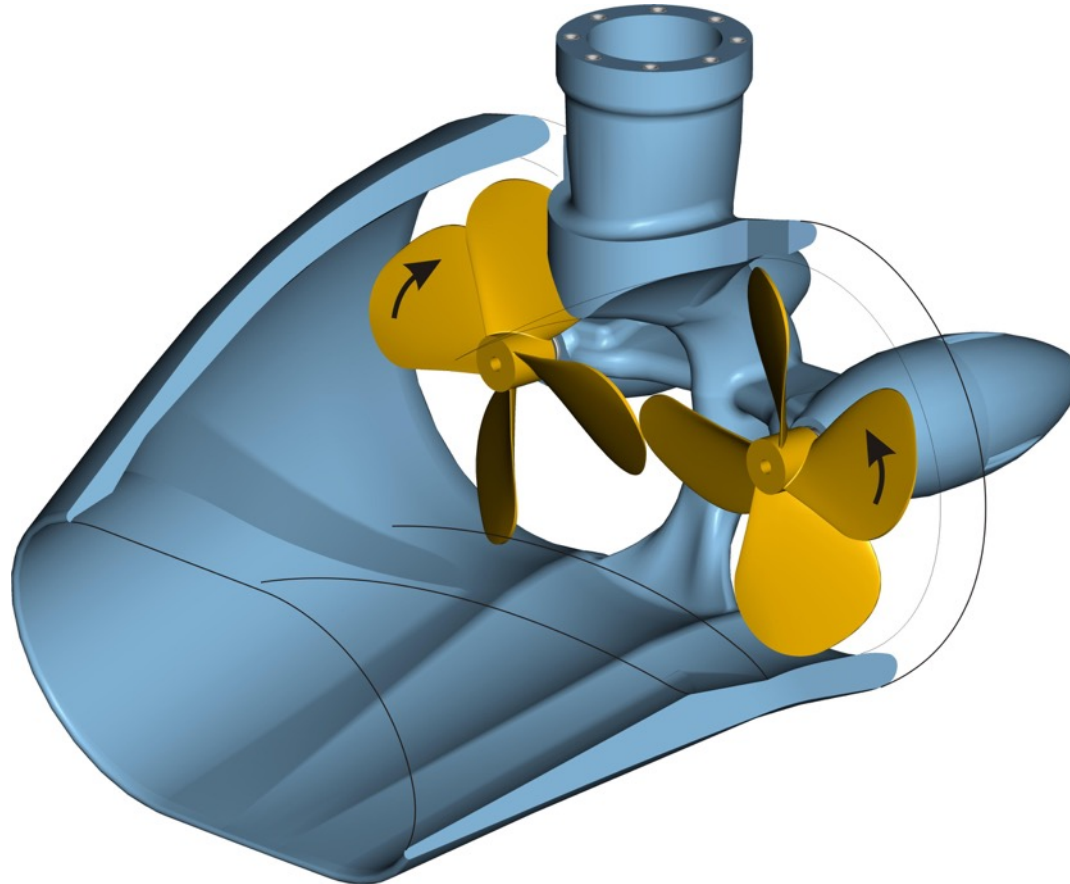
Advantages Side-by-Side Construction



- ⚙ Same efficiency with shorter build (75% of current propeller diameter)
- ⚙ Able to operate at lower water levels (i.e. draught)

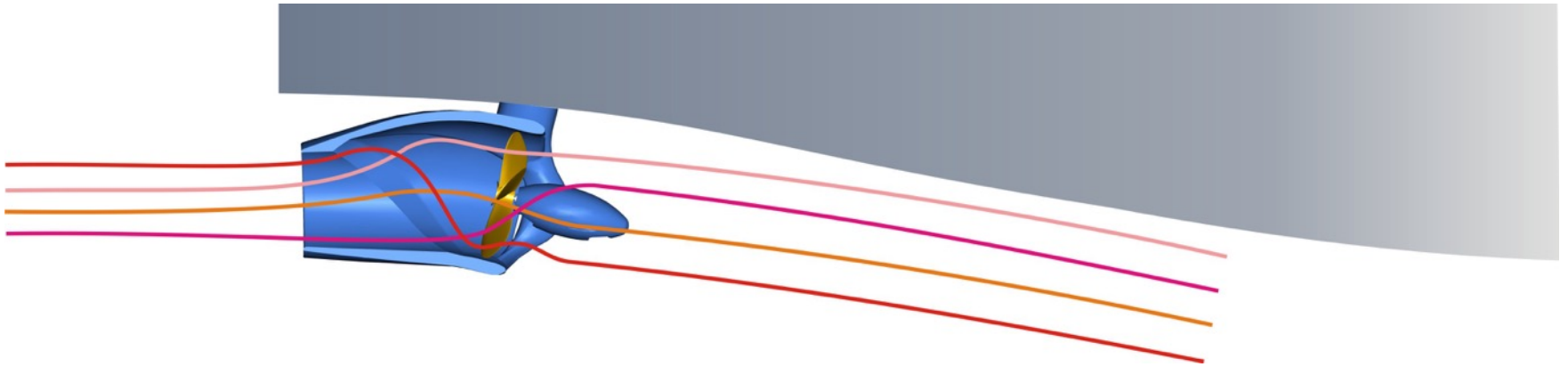


Side-by-Side 3D test model



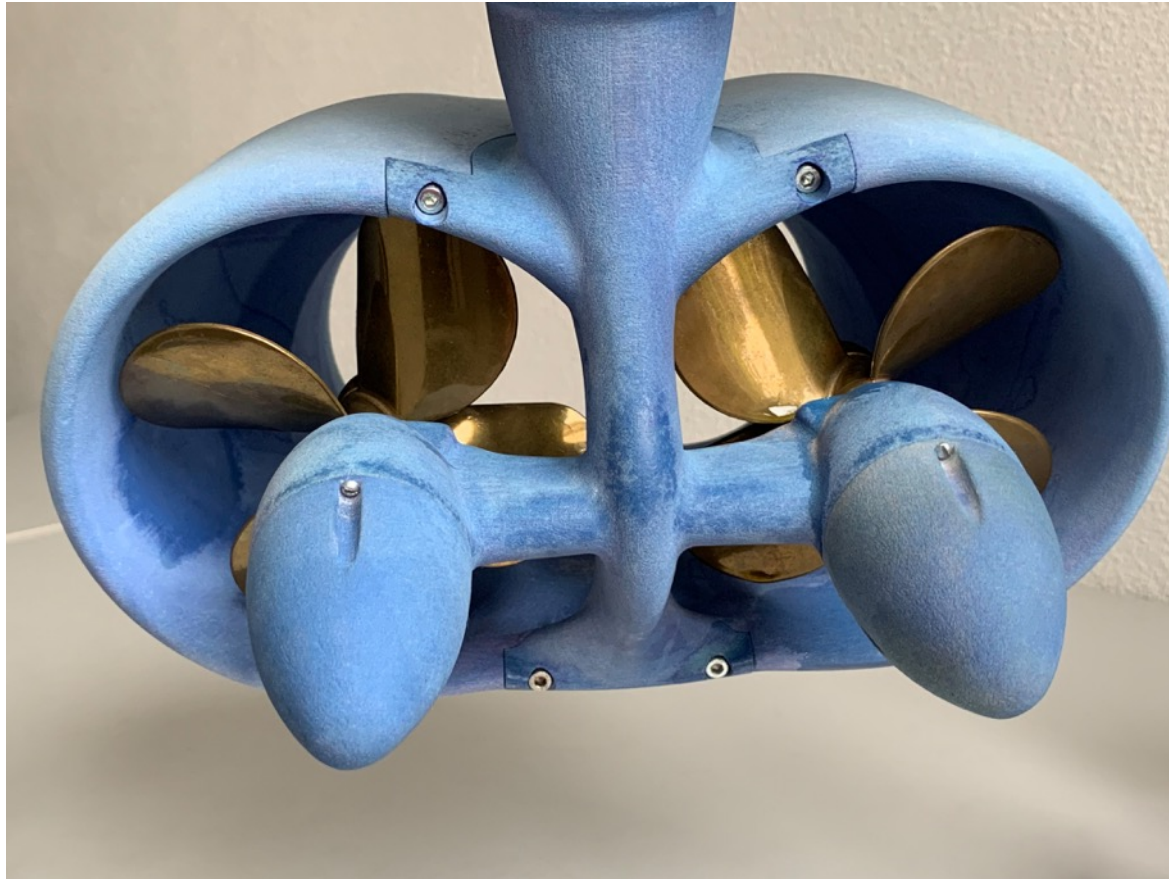
 Schematic

Side-by-Side 3D test model



Water Flow Calculations

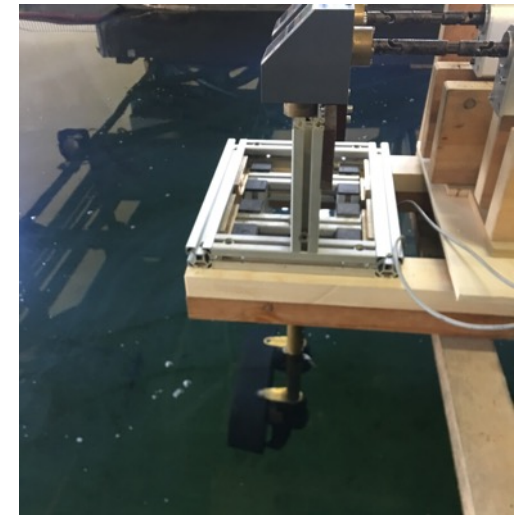
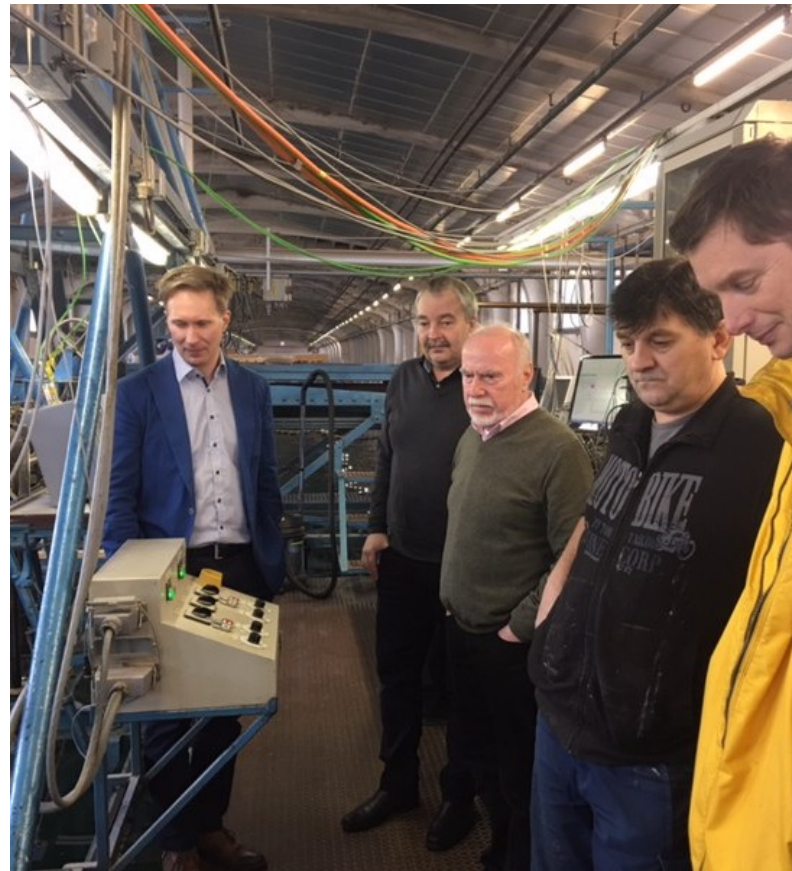
Side-by-Side 3D test model



⚙️ Test Model – Front View



Side-by-Side tests



⚙️ Primary air tests

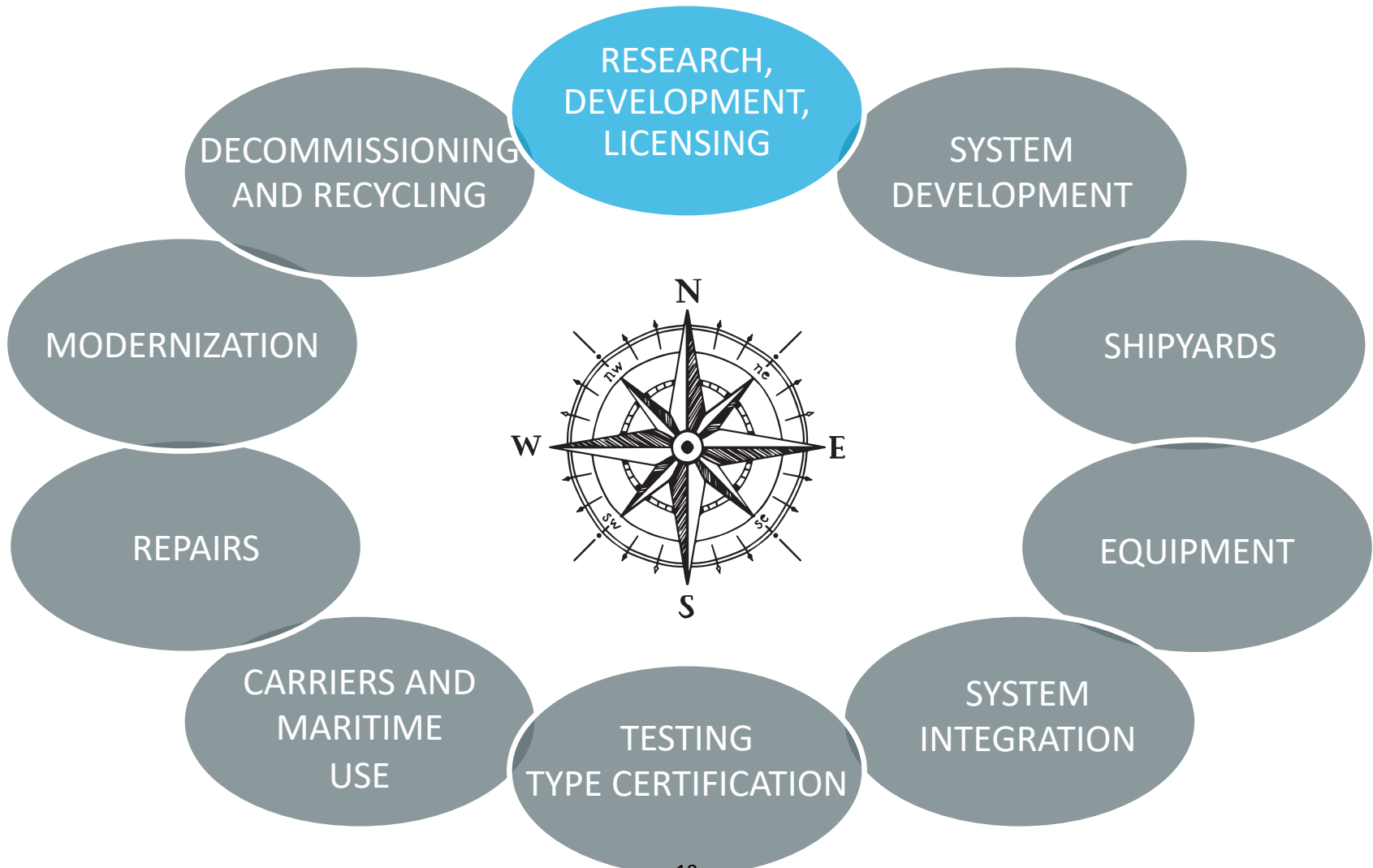
⚙️ Current water tests (Feb 2019)

Side-by-Side tests

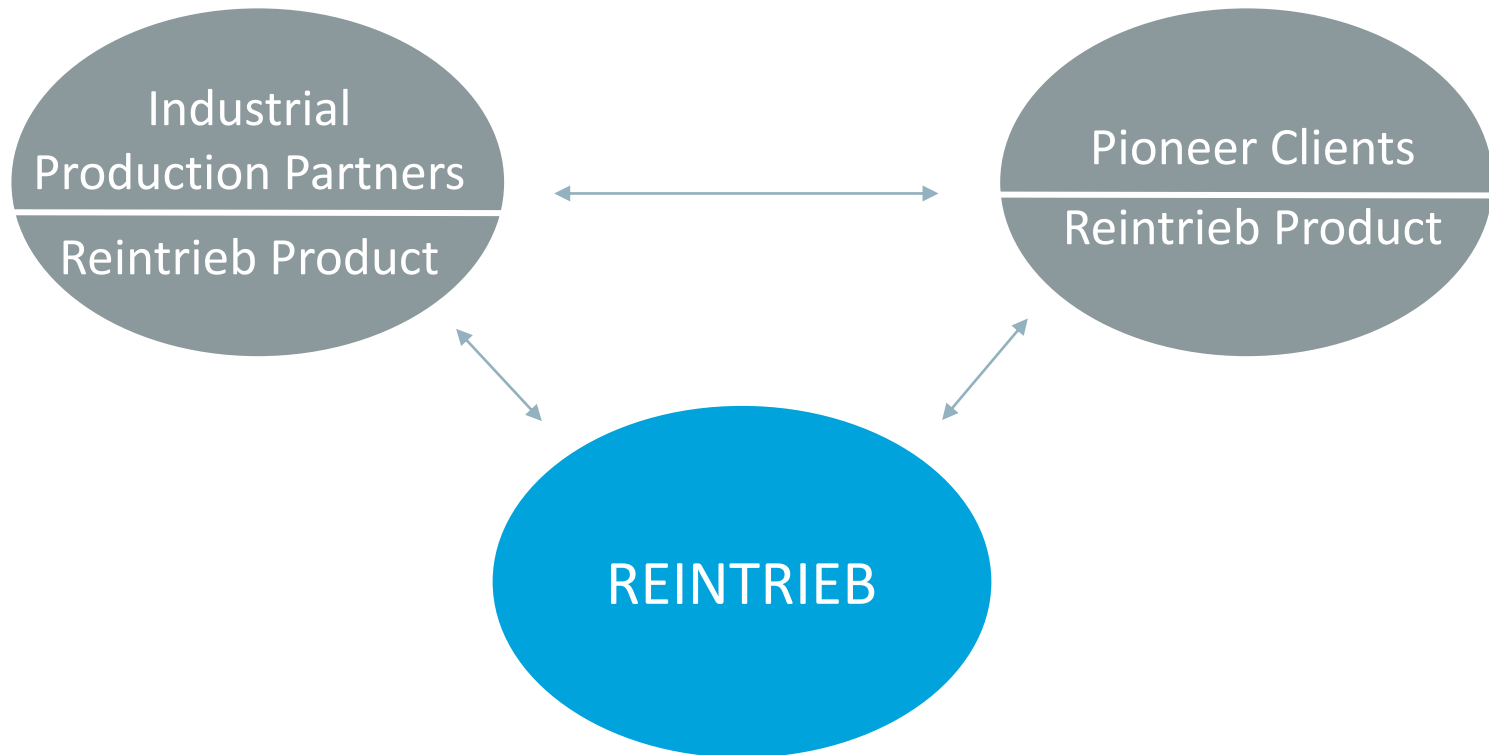


⚙️ Current water tests

Reintrieb in the maritime value chain



What we are looking for...



Thank you for your interest and attention

Please fill out our questionnaire!

Legal Disclaimer



Quelle: Hafen von Triest 1912 / Alexander Kircher

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