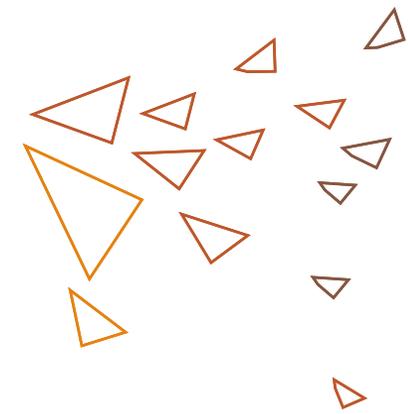




**AAA
PROPULSION**

Revolutionary Electric Podded Propulsion Systems

Our shared values: Ability, Agility and Accountability, part of our name, AAApropulsion leads us to a future where innovation, customers and the environment (people, planet, profit) can benefit to the maximum. Contribute to a cleaner environment while maintaining the best sailing conditions for your vessel.



Driven by

Ability

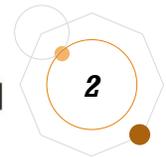
Growth through focus, innovation and simplicity. By creative cooperation with customer/third parties, we continue develop unique solutions.

Accountability

Accountability for our own actions and results. Caring for people, communities and the environment. Listen to the ideas of our customers and encouraging an open dialogue. Deliver on time.

Agility

Agility and finesse so that we can deal with unexpected events, market opportunities and customer needs.



About us

Started May 2017

Experienced group of people

More than 30 years in the Maritime Industry

Over 10 years of experience in pod propulsion

A forward-thinking company for forward moving vessels

AAApulsion is a Dutch marine propulsion company, which is also well represented with sales & agencies worldwide, so we always speak your language. With our revolutionary and patented POD propulsion solutions, we have built a strong reputation in both the national and international maritime industry when it comes to innovation, collaboration, environment and service.



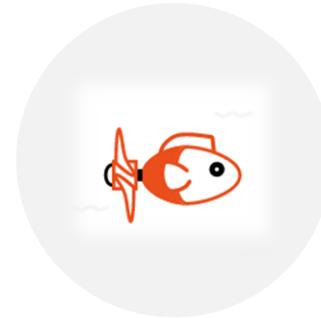
INNOVATION

The development of new technology, materials and software is moving fast. Our team of engineers is always alert to adapt our products to the latest technologies.



COLLABORATION

Our team of experienced engineers and technicians are working together with our customers, ship architects, classification societies and shipowners to develop sustainable innovative POD propulsion solutions.



ENVIRONNEMENT

Reduce of fuel consumption, maintenance costs and exhaust emissions is eminent. Thanks to our innovative POD propulsion technology, we maximize the environmental and economic performance of our client's vessels.



SERVICE & WARRANTY

All our clients are entitled to a full-service package. To underline our confidence in our own products, we offer a five-year warranty with a SLA.

Challenges

The maritime industry is changing rapidly. We are tasked with a difficult challenge, while at the same time we must stay competitive in the market.



Climate changes Zero Emission

CO2 emission of shipping is more than all cars together. True or false actions are required.



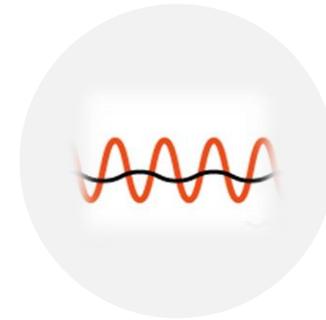
Low water levels

Water levels drop in the inland waterways. How can vessels stay operational and profitable.



Melting Arctic sea

Melting of the Arctic sea opens new and shorter routes. Ice classed vessels will be needed.



Underwater Radiated Noise

The URN due to shipping activity has resulted in an increase of at least 20dB of ambient noise.



Remote connection

Real time information of the operation parameters. Remote connection for updates and analyse problems.

Transition to a sustainable solution

Looking at today's market, there is a call for greener propulsion of vessels, especially near the coast and inland. A low CO2 footprint or even zero is the goal for many shipping companies on new-build vessels.

The solution; our electric pod propulsion systems, but of course without compromising the vessel performance.



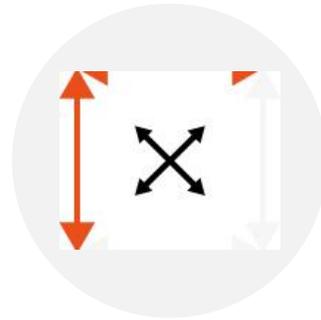
Energy efficient propulsion

- Electric driven
- Low friction losses
- High energy density



Low noise propulsion

- Minimize rotating parts
- High quality helical gears



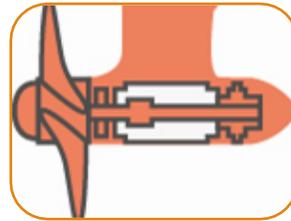
Tailor made

- Acceleration sensors
- Remote access



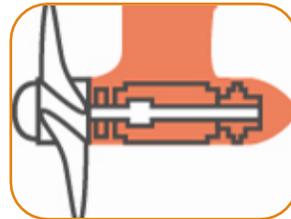
The solution

Our patented and compact A-Pod PG is the first electrically driven propulsion system with an integrated electric motor, hollow drive shaft and planetary gearbox. The extended propeller shaft runs through the whole POD housing. Due to the reduction ratio of the planetary gearbox, the propeller always runs at its most economical speed, resulting in optimal performance in terms of efficiency and thrust.



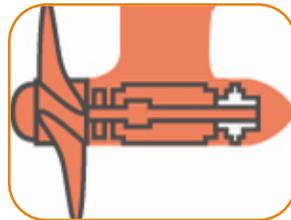
Integrated PM electric motor

The integrated Permanent Magnet motor with hollow rotor shaft. Cooling motor through outer water.



Long flexible propeller shaft

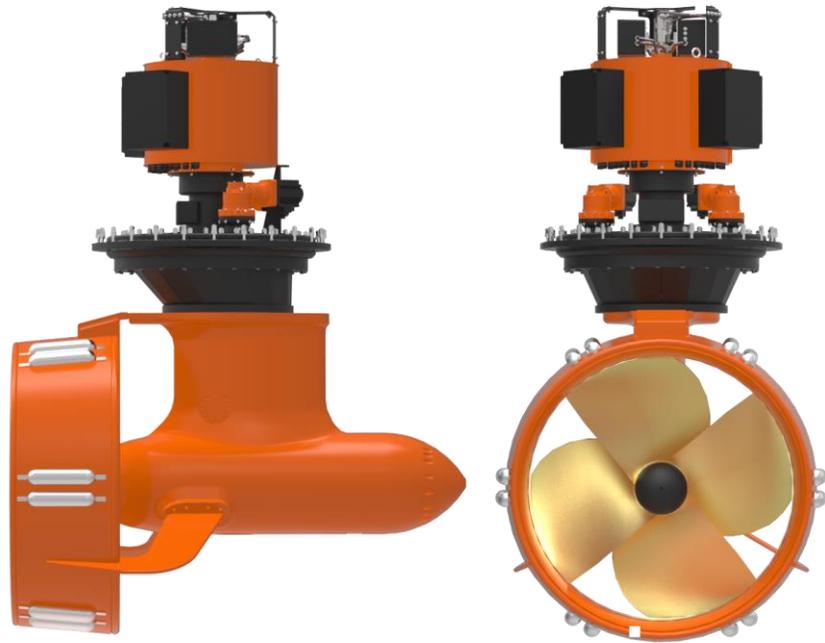
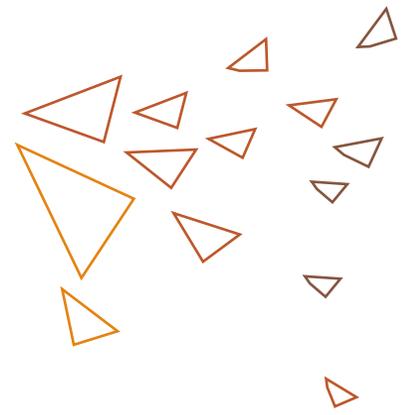
The long propeller shaft is perfect to absorb any shock load and has a low bending moment. The propeller shaft can easily be replaced.



Planetary reduction gear

Very robust planetary gear reduction for optimum propeller speed in any application.

Unique properties



- ✓ High maneuverability
- ✓ Compact and efficient – integrated gears and higher rpm e-motor
- ✓ Cheaper and efficient - smaller motor size and lower prop rpm
- ✓ Excellent braking / speed reducing characteristics
- ✓ Easy installation - no alignment
- ✓ Push and pull configuration available
- ✓ Reduced/minimal maintenance – reduced generator running hours
- ✓ Lowered fuel consumption and reduction of emissions (CO₂, NO_x en SO_x)
- ✓ Robust electric drive integrated in POD – no 90° gears
- ✓ Improved steering characteristics – rotation 360° at full propulsion speed

Discover our A-Pod's

With an emphasis on environment, sustainability and electrical technology, we develop and build a range of compact POD ship propulsion solutions, the most efficient patented single propeller propulsors currently on the market.



A-Pod PG

Electric Podded Azimuth with integrated planetary gear, reduces the outer diameter of the POD housing and reduces the total weight.



A-Pod DD

Electric Podded Azimuth direct driven, minimum of rotating parts and low in radiated noise.



A-Pod CRP

Electric podded Azimuth two counter rotating propellers by two independent controlled electric motors.

AVAILABLE 2021



A-Pod TT

Electric podded thruster compact installation, available in PG or DD execution, also available in FP or CPP.

Efficient electric propulsion

Compact, quiet, electric and efficient ship propulsion solutions. With its integrated electric motor, it is the ideal electric propulsion system for many ships, resulting in lower fuel consumption (up to 30%), lower exhaust emissions and lower noise production.

Available in power range up to 3300kW

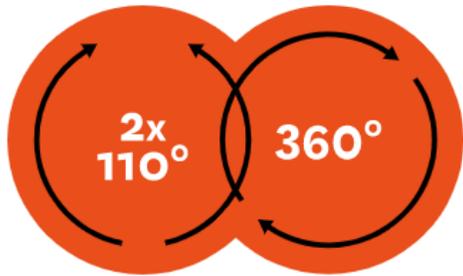


	Sea going	Coastal	Inland	Harbour & Ferries
A-Pod PG	✓	✓	✓	✓
A-Pod DD		✓	✓	✓
A-Pod TT	✓			✓
A-Pod CRP	✓	✓	✓	✓



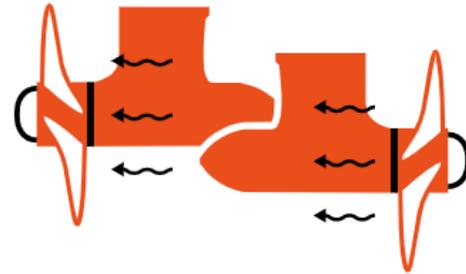
Executions

The A-Pod series resulting in a lower fuel consumption (up to 30%) and lower exhaust emissions. In addition, our electrical Azimuth thrusters have a minimum of rotating parts and a dry-sump lubrication system, which directly leads to lower maintenance costs and higher efficiency. The A-Pod's can rotate over 360° or 2x110° degrees and eliminate the need for a conventional shaft, rudder and nozzle.



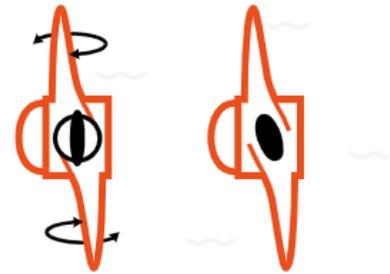
Steering

2 x 110° steering by cable
+360° steering by slipping



Push or Pull

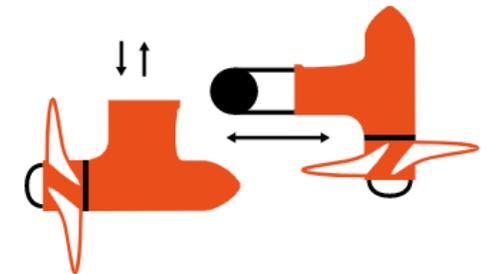
Push with or without nozzle
Pull version (open wheel)



CPP or fixed

Controllable Pitch Propeller
with feather option to reduce
drag

Fixed Pitch Propeller



Retractable or Swing-Up

Retractable execution
Swing-Up execution

Propulsion packages

AAApropulsion can offer you the complete propulsion package including frequency drive (tailor made), battery power and controls. Besides our own transverse thruster (FP & CPP) we can offer 'shallow draft' thrusters to complete the total propulsion scope.

The one stop package supplier working with recognized and proven maritime equipment.



Frequency Drive

Frequency drive for control rpm. Available in air-cooled or water-cooled. AFE or UNI. Build to your dimensions.



Batteries

Batteries for storage of energy. Charging through regenerative energy, peak saving, additional power.



Channel Thruster

Suitable for shallow draft. Horizontal propeller placed in rotating drum delivering thrust over 360° degrees.



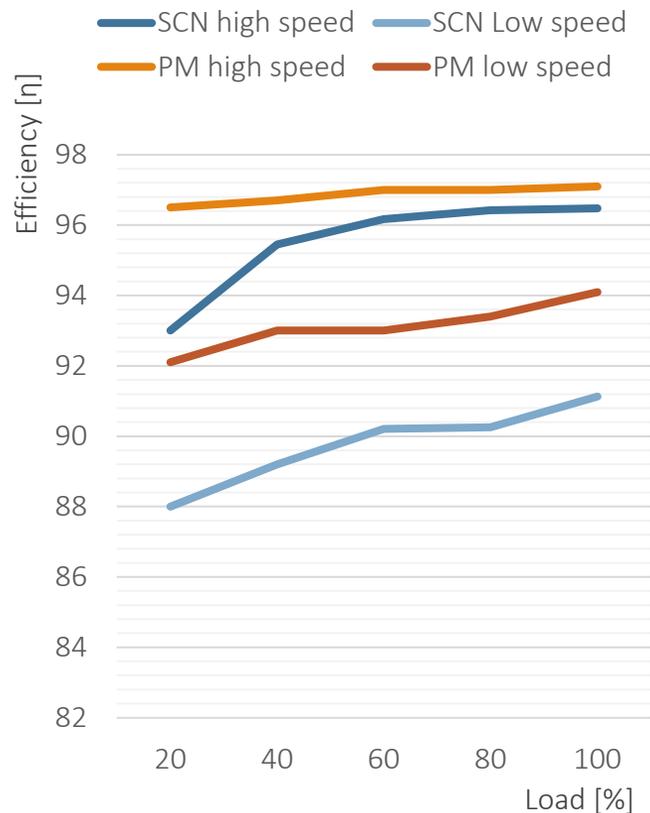
Steering Grid

Suitable for shallow draft. Horizontal propeller pushes water through compact housing toward a 360° steerable thrust grid.

Why Permanent Magnet Motor?

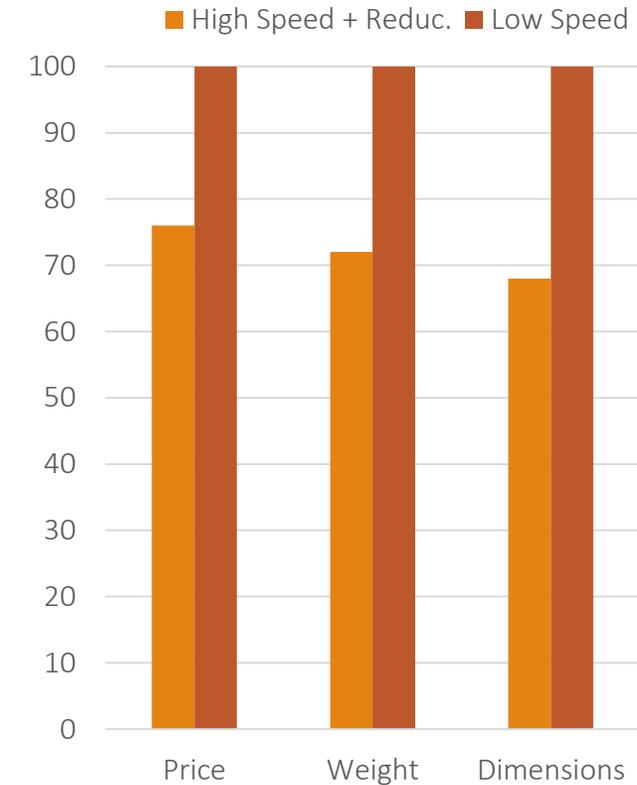
When efficiency plays a major role, the choice for a pm-motor due to its higher efficiency over total load range is logical. Furthermore taking into account that a high speed pm-motor is about 4-5% more efficient than a low speed pm-motor shows that the overall efficiency of high speed pm-motor with a planetary reduction is the most efficient combination and also in price, weight and dimensions.

Efficiency vs Load



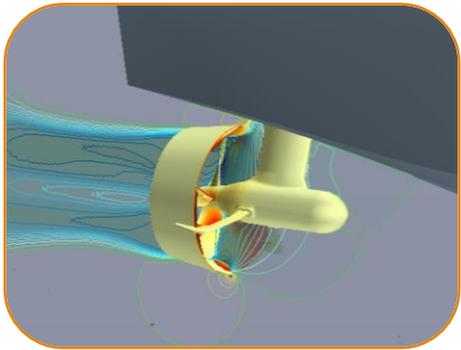
- Permanent Magnet motors used in the A-Pod series are generally 2-4% more efficient at full load compared to SCN motors.
- At partial load the superiority of these motors is even more apparent. Efficiency difference up to 7-8%.
- Higher speed PM motor is about overall 4% more efficient compared to a slow speed PM motor
- Low speed motors (direct drive) competitive for powers < 350kW.
- High speed motors requires a reduction to meet optimum propeller rpm.

High vs low speed



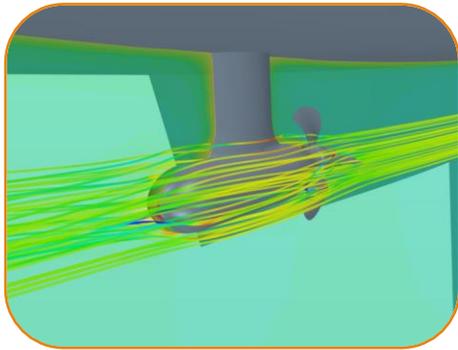
Optimization (CFD)

Optimization of the propulsion doesn't stop at the propulsor itself. There are various factors that influence the final result. Standard in our propulsion package a CFD analysis is included with optimization of the POD's (position, propeller etc.) as well as the hull.



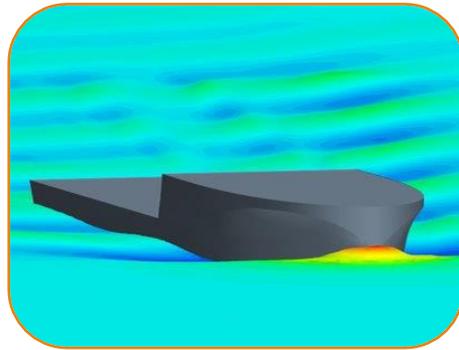
Propulsion

Resistance calculations
Propulsive coefficients
Optimize wake



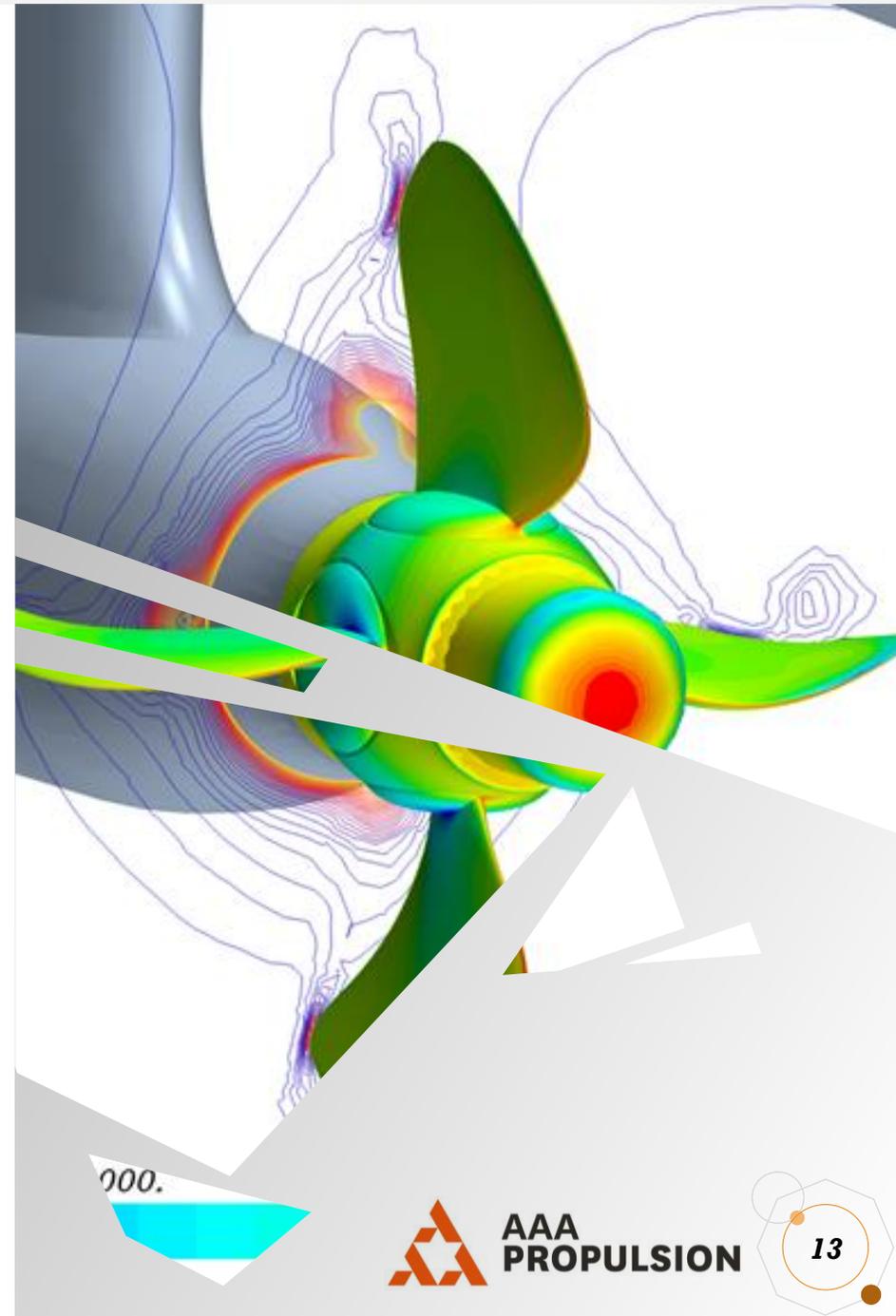
Drag

Analysis added drag
Pull or push execution
Feathering propeller
Free spinning

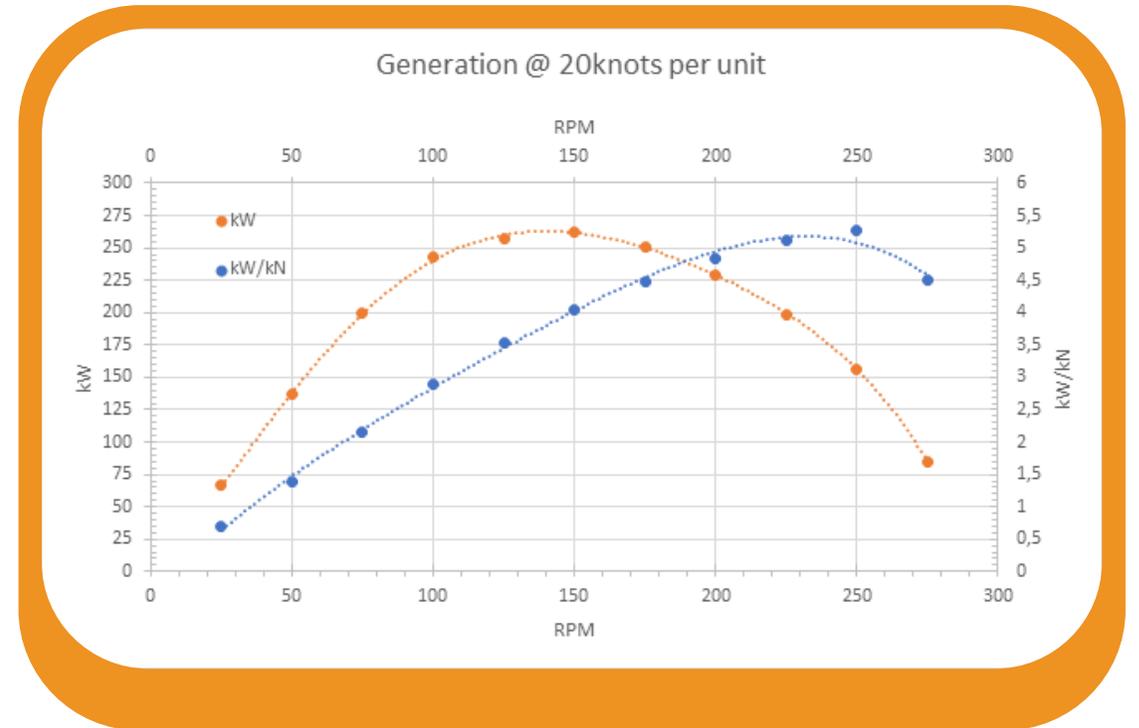
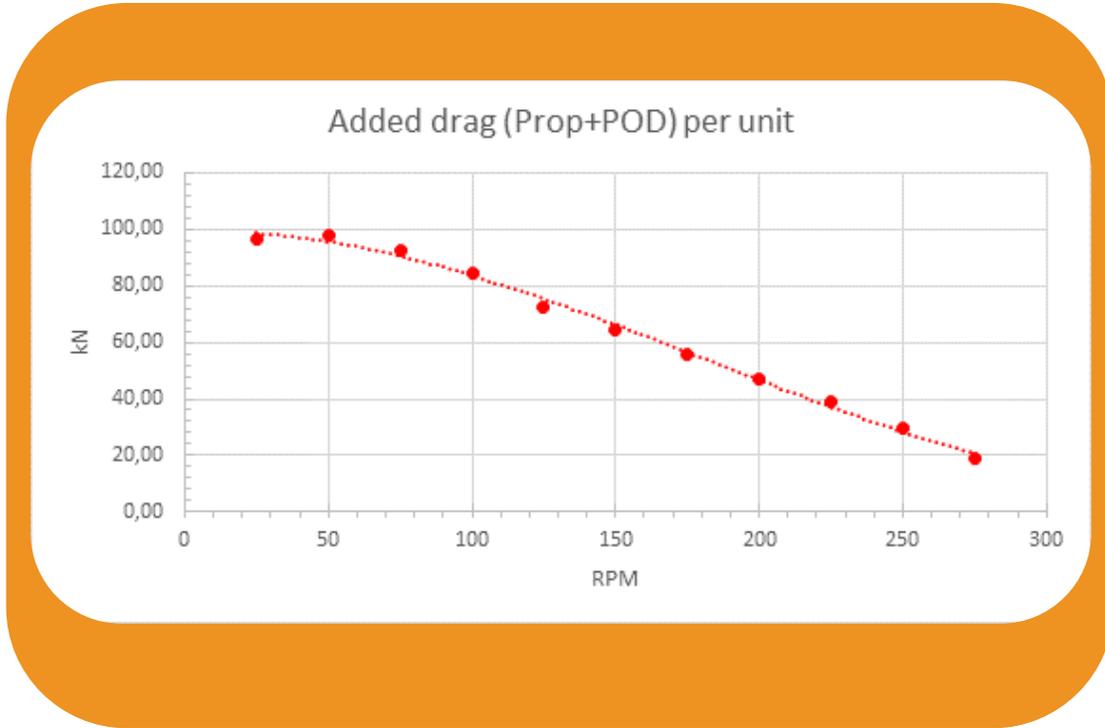


Hull

Wave train
Vortex shedding
Press. field distribution
Free sink and trim

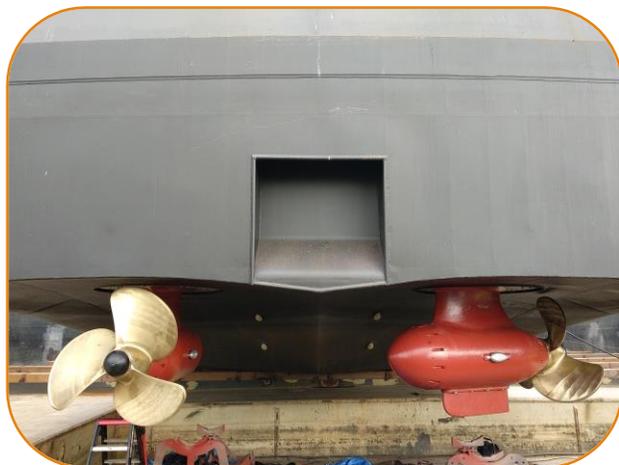


Generation of energy



- ⚠ Generation of energy possible in combination with feather propeller (CPP)
- ⚠ Optimizing software between generation energy (kW) and drag

References



RAIN EMPRESS

Model : A-Pod600DD (2x)

Power : 250kW



References



SOLUTION

Model : A-Pod670PG (2x)
Power : 650kW

Model : ST624.1200
Power : 400kW

Model : A-Pod600PG-SW
Power : 400kW



References



Merwestroom
Waddenstroom
Scheldestroom

Model : A-Pod600PG (2x)
Power : 600kW

Model : SG1000
Power : 300kW



References



Norse Celik – NB.15

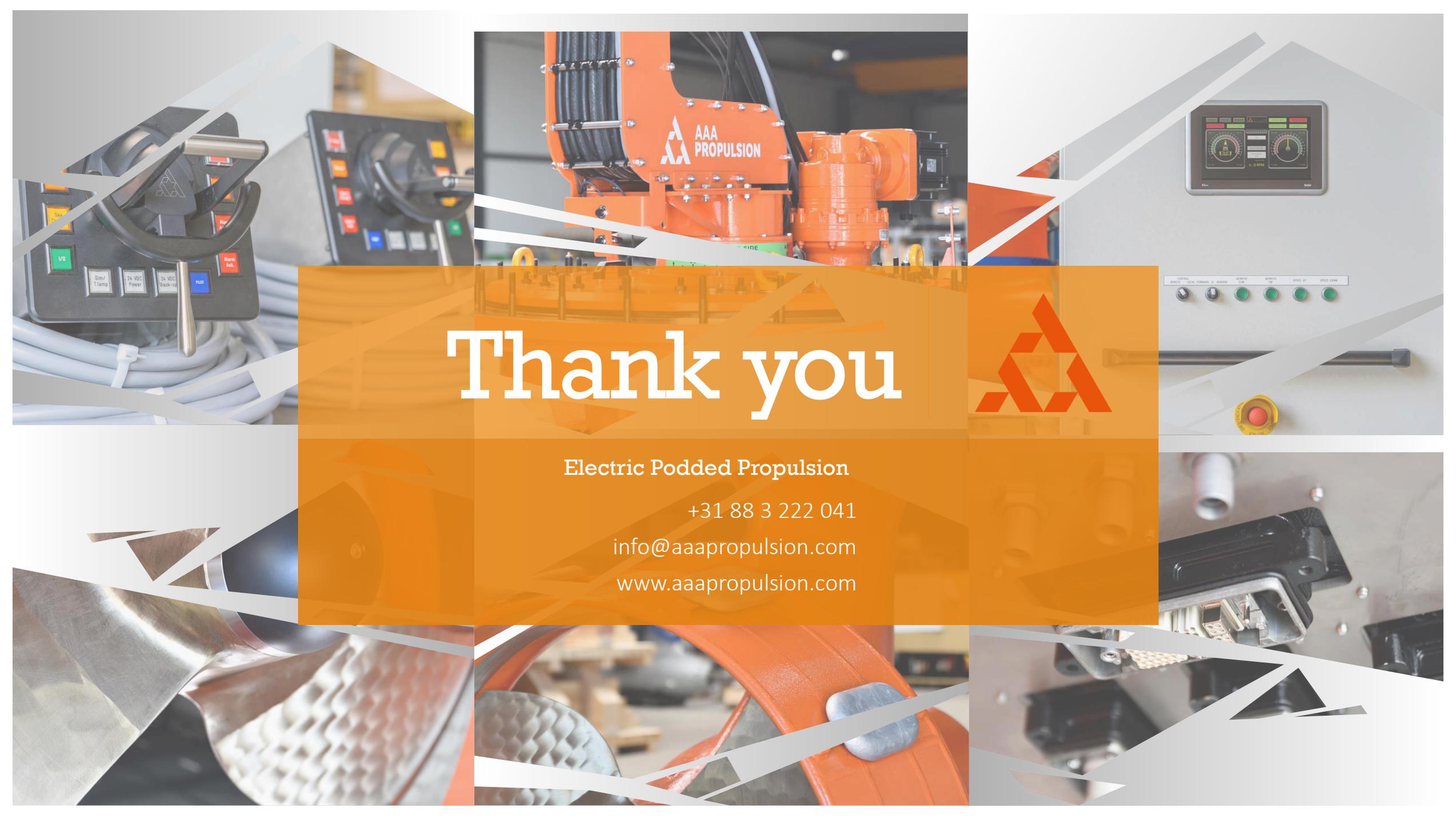
Model : A-Pod600DD (2x)

Power : 320kW



Summary

- △ Contributing to a cleaner environment while maintaining the best sailing conditions for your vessel.
- △ Compact, quiet, electric and efficient ship propulsion solutions, resulting in lower energy consumption.
- △ With an emphasis on environment, sustainability and electrical technology, we develop and build a range of efficient POD propulsion systems.
- △ Practice what you preach, with each propulsion package we offer a 5-year warranty in combination with an SLA-contract.
- △ Optimize each individual project with CFD to get the most out of the propulsion package.



Thank you

Electric Podded Propulsion

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