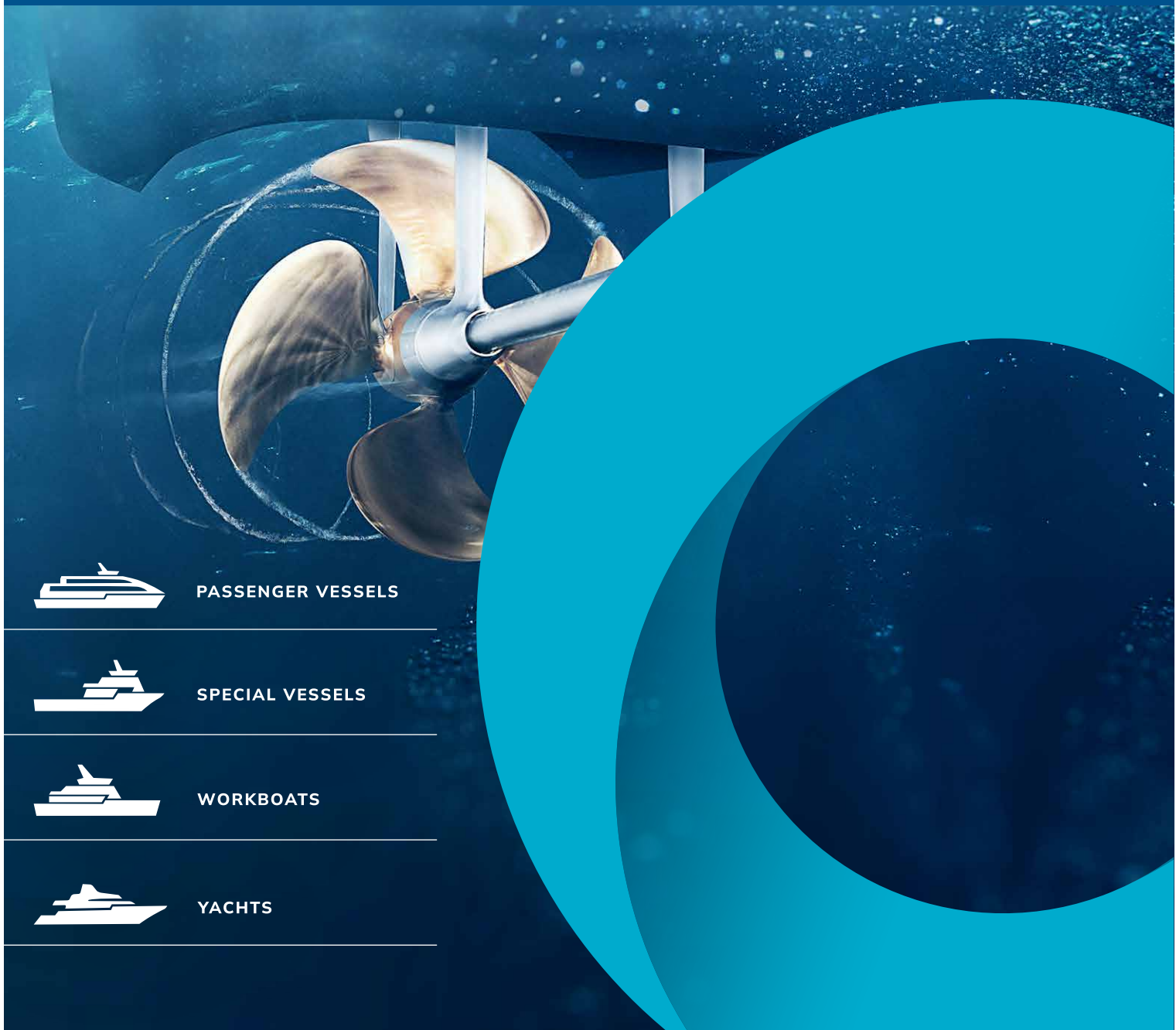




Part of BOS Power

PROPULSION EFFICIENCY

Servogear Ecoflow Propulsor™



PASSENGER VESSELS



SPECIAL VESSELS



WORKBOATS



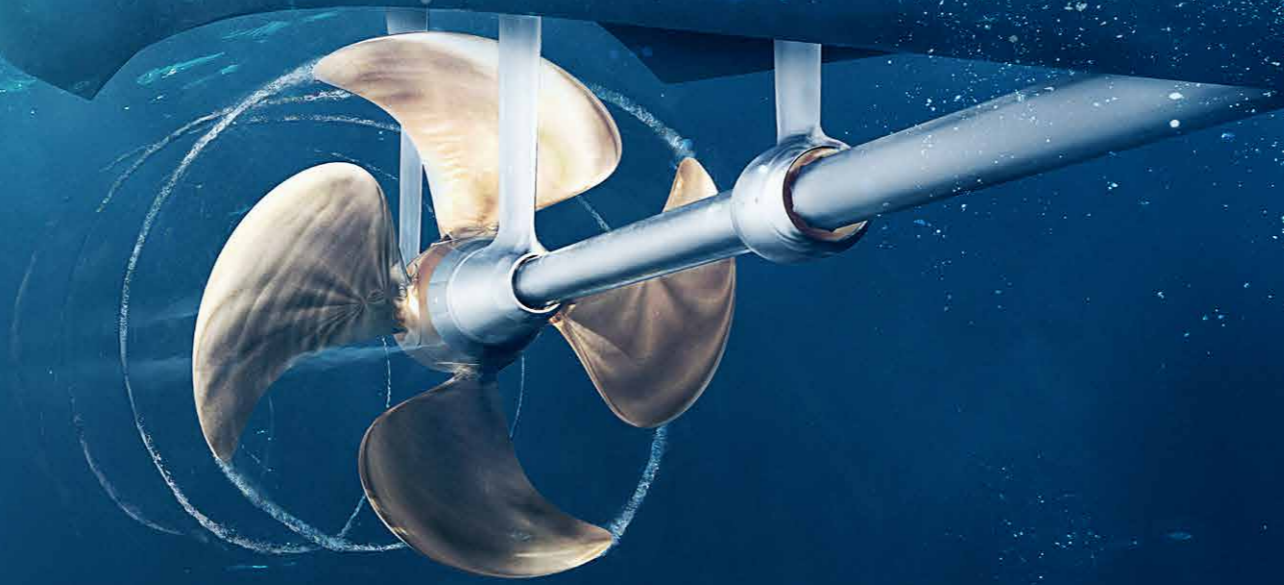
YACHTS

BEYOND BELIEF

Servogear Ecoflow Propulsor™ is the superior propulsion concept for fast moving vessels. “Propulsion efficiency beyond belief” is a bold statement, but the proven results are truly ground-breaking.

Both tank and full scale verification tests document that the Ecoflow Propulsor™ concept is more efficient than any other propulsion for high speed vessels operating in the range of 20–50 knots. This results in reduced fuel consumption, pollution and operating costs.

Ecoflow Propulsor™ provides a unique combination of high speed and thrust.



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SERVOGEAR ECOFLOW PROPULSOR™

SUPERIOR PROPULSION EFFICIENCY

Servogear Ecoflow Propulsor™ is a unique controllable pitch propeller system for high speed workboats, fast ferries, offshore vessels and yachts. The concept offers an optimal combination of speed, bollard pull, manoeuvrability and fuel efficiency.

Through continuous theoretical and practical research since 1973, we have developed an incredible efficient system, which today runs successfully on a large number of vessels worldwide.

Our unique propeller tunnel ensures an optimal water flow entering the propeller. Together with other detail improvements, this provides the best possible working conditions – resulting in a smooth and efficient propeller thrust.

Efficient propulsion leads to lower fuel consumption, more economic operation and less pollution. Servogear Ecoflow Propulsor™ combines its efficiency with a high level of comfort.

Servogear Ecoflow Propulsor™ covers an engine range of 300 to 4000 kW and speed up to 50 knots.

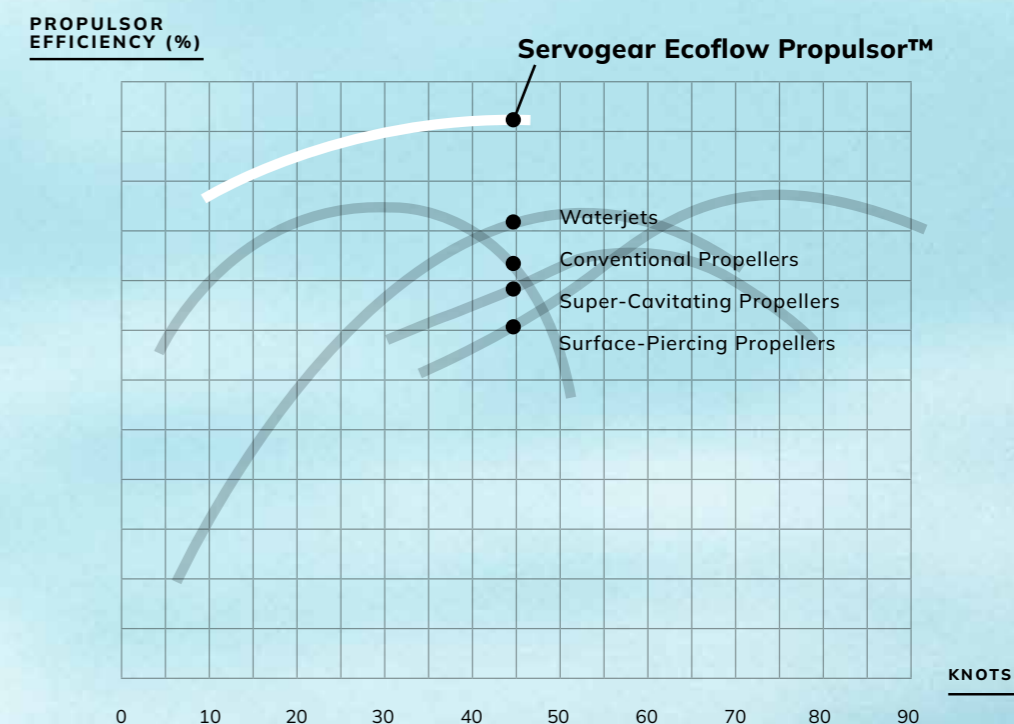
ADVANTAGES



- Improved fuel economy
- Reduced NOx and CO₂ emissions
- A unique combination of high speed, superb acceleration and ample bollard pull
- Wider operational range
- Reduced hull resistance
- Slimmer and more efficient equipment
- Reduced levels of noise and vibrations

PROVEN EFFICIENCY

Tank and full-scale verification tests have proven that the Servogear Ecoflow Propulsor™ is more efficient than any other known propulsor concept available for high speed vessels operating in the range 20–50 knots.

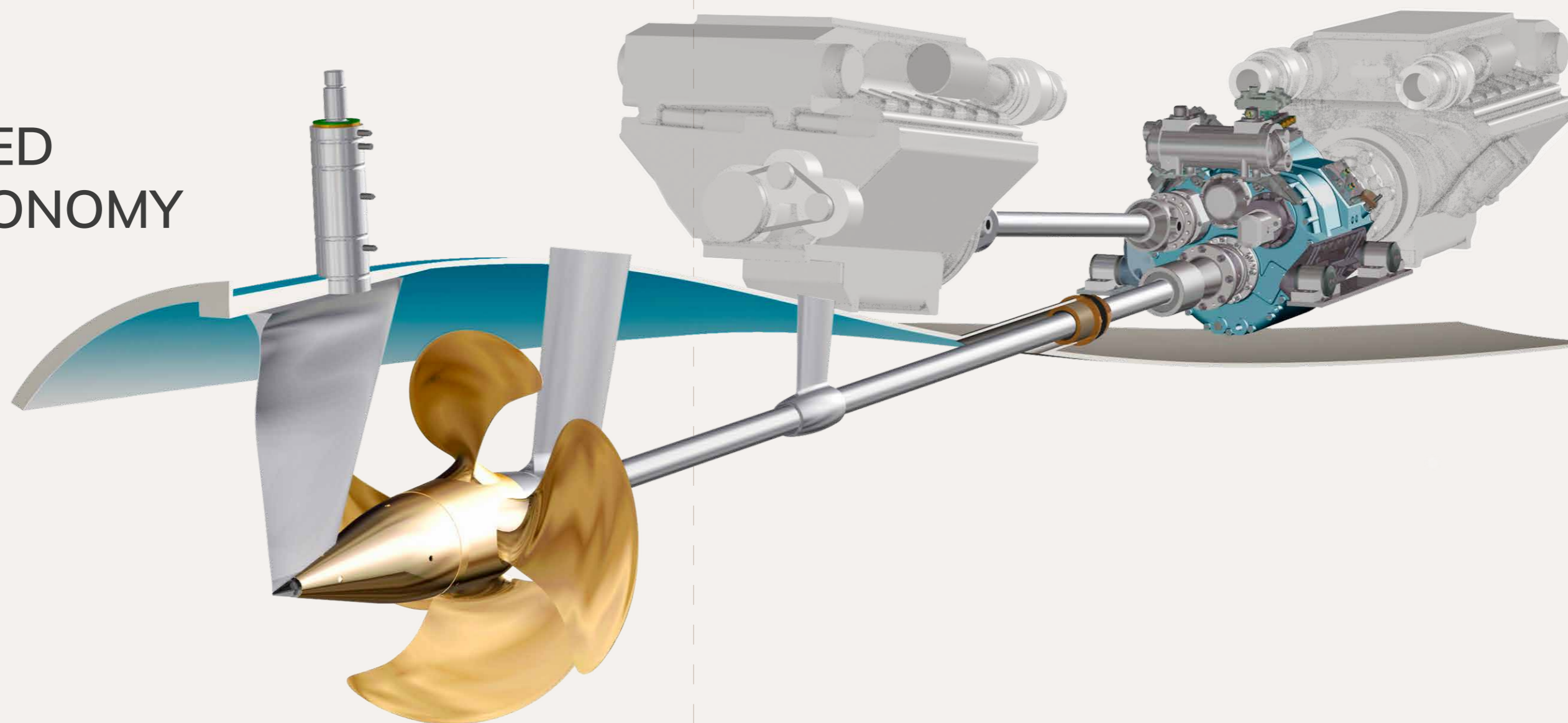


TEST RESULTS

This graph shows the typical efficiency of different propulsors (Marintek). Results from tank test and full scale verification tests with an optimized Servogear Ecoflow Propulsor™ have been plotted in for the purpose of comparison.

The tests were conducted by SSPA in Sweden and Marintek in Norway. Servogear Ecoflow Propulsor™ operational range is 20–50 knots.

THE CONCEPT

IMPROVED
FUEL ECONOMY**PROPELLER
TUNNEL**

Servogear's unique propeller tunnel designs ensure optimal performance for the propulsor.

**EFFECT
RUDDER**

Asymmetric airfoil design rudders combine minimal drag with the creation of forward thrust.

**CONTROLLABLE
PITCH PROPELLER**

Servogear's unique, well-known and proven CPP design ensures a number of benefits compared to fixed pitch propellers and water jets.

**SHAFT
BRACKETS**

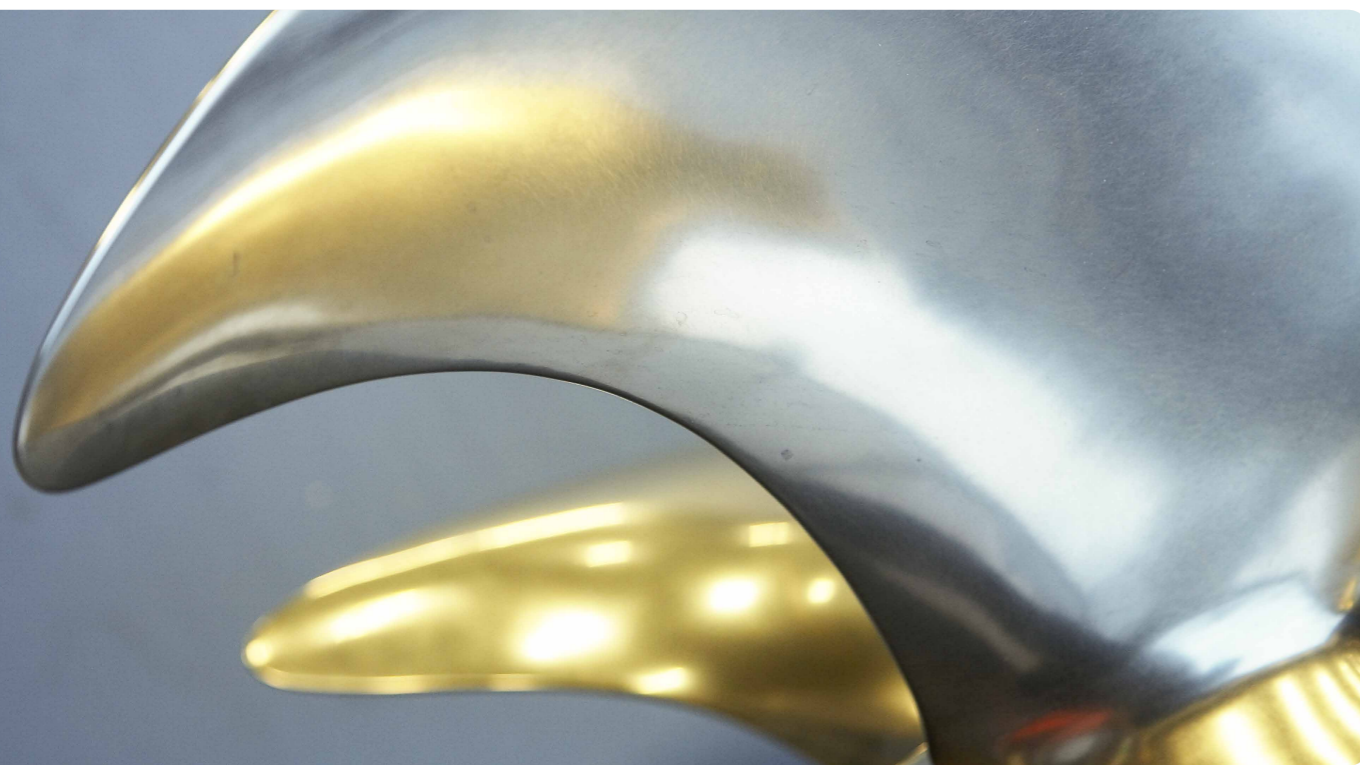
The slim design reduces drag for high speed operations up to 50 knots.

GEARBOX

Reduction gearboxes are part of the Servogear Ecoflow Propulsor™ solution. The special design offers advantages and possibilities for versatile configurations, with built in PTO's for auxiliary equipment.



For details visit:
servogear.com



SERVOGEAR CONTROLLABLE PITCH PROPELLERS

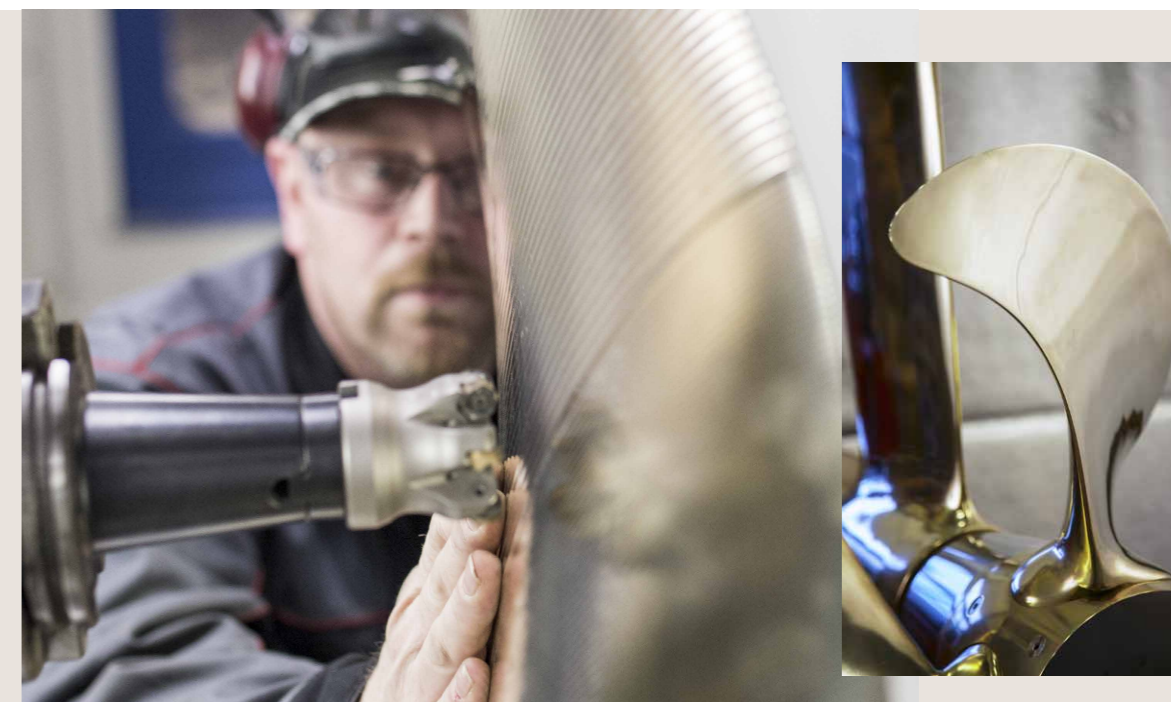
IDEAL FOR VARYING CONDITIONS

The controllable pitch propellers (CPP) are the centrepieces of our Ecoflow Propulsor™ systems. It's a thoroughly tested and proven design, with both hubs and blades made of strong and durable NiAlBz material.

The Servogear Ecoflow propellers are ideal for vessels operating under varying load and speed conditions.

Pitch actuation is performed through a mechanical connection from the propeller blades to a hydraulic actuation system inside the gearbox. This is a very simple and robust solution, which requires minimal maintenance work.

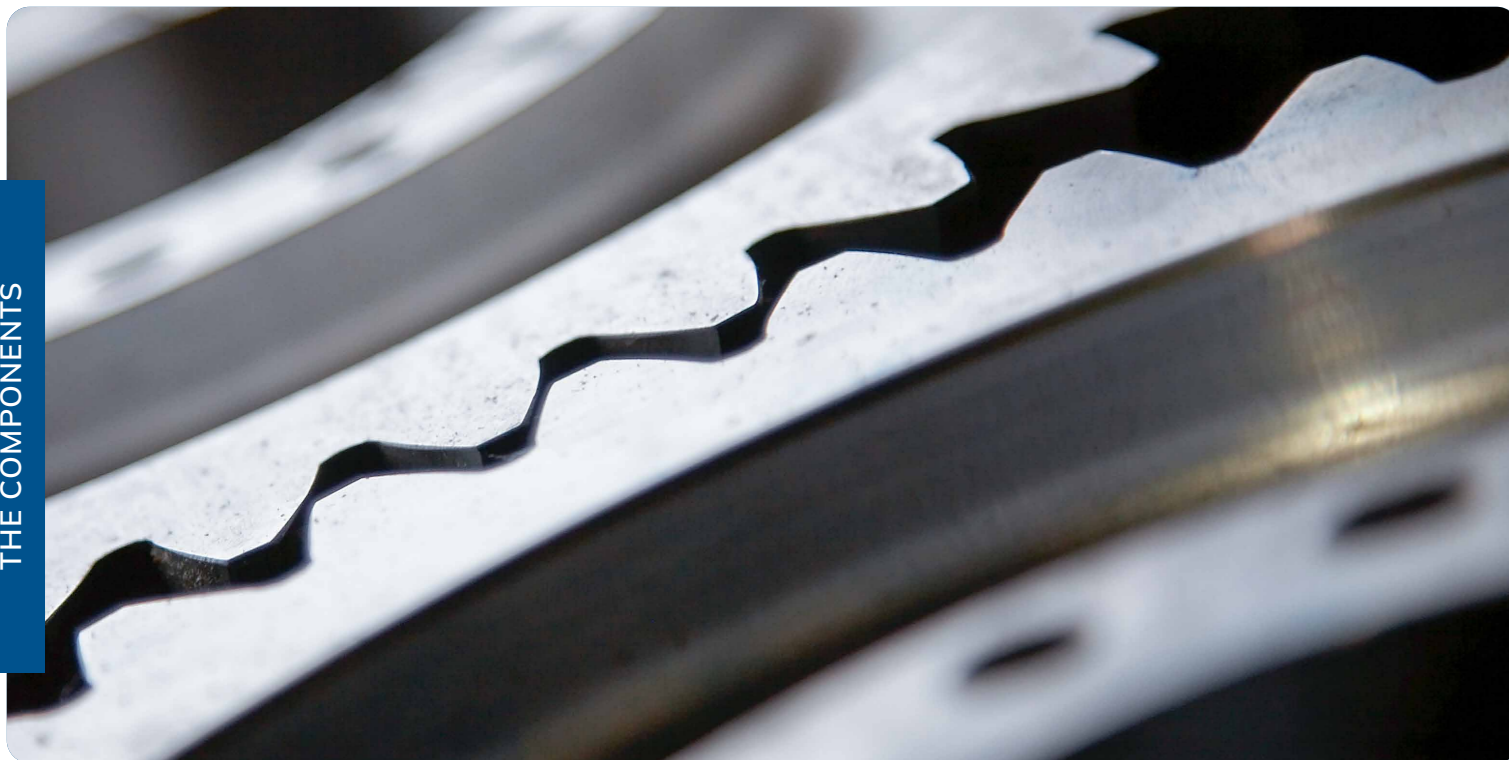
Our CPPs also have feathering position capabilities. This feature can be used by sailing vessels to minimize resistance and speed loss while sailing – or by multi-screw motor vessels for special operational conditions.



SERVOGEAR ECOFLOW PROPELLERS COMPARED TO FIXED PITCH PROPELLERS

- BETTER ACCELERATION**
 Acceleration of a vessel with CPPs is considerably better than with fixed pitch propellers (FPPs). With CPPs the pitch can be increased as the vessel speed and load increase. For a FPP the pitch will be too high during acceleration. This causes severe cavitation and can overload the engine more easily.
- HIGHER EFFICIENCY**
 In general, when operating a vessel in various off-design conditions, the efficiency of a CPP is far better than for a FPP. If there are high variations in the displacements on the vessel, i.e. if a vessel is going from running fully loaded in strong wind ahead to running empty in tailwinds, a CPP provides much higher total efficiency than any other propulsion system.
- SMOOTH AND PRECISE STEERING**
 CPPs ensure smooth and precise steering at all speeds, with no sudden movements. When running in harbour areas, the vessel speed can quickly be reduced all the way down to zero knots.
- AUTOMATIC OVERLOAD CONTROL**
 Most of today's vessels are equipped with automatic overload control systems as integrated parts of the propulsion control systems. Should the engine be overloaded, a propulsion system with CPP can reduce the pitch automatically down to the programmed load curve.
- OPTIMAL ENGINE PERFORMANCE**
 With a CPP the engines can run optimal in different loads and weather conditions.



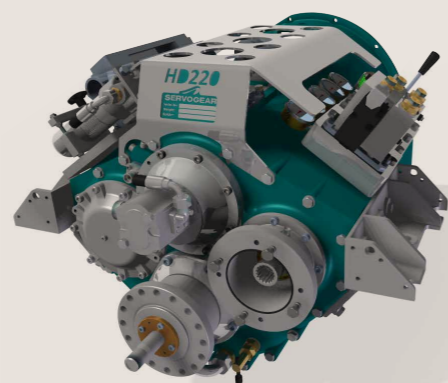


SERVOGEAR REDUCTION GEARBOXES

THE RIGHT SPEED AND THRUST

Servogear supplies reduction gearboxes as an integrated part of our Ecoflow Propulsor™ systems. Our special gearbox design offers advantages and possibilities, especially if space is a limitation.

All gearboxes are class approved by DNV, have an integrated servo system for CP propellers, and are available with PTO's.



KEY ADVANTAGES/FEATURES

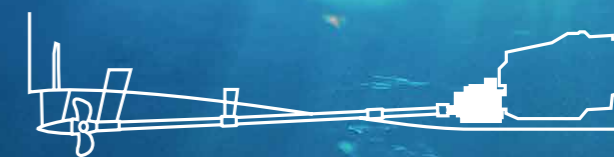
- Gear housing in cast iron ensures low noise excitation
- A very compact design, with a rounded bottom to obtain a limited shaft angle
- Possibilities for PTO drive
- High quality gear wheels ensure low noise levels
- Integrated servo system for pitch alteration
- Custom built gearbox mountings
- Tailor-made gearboxes

FLEXIBLE CONFIGURATIONS

WE OFFER FULL CUSTOMIZATION OF SHAFT ARRANGEMENTS. THE FOLLOWING ILLUSTRATIONS SHOW SOME OF THE MOST USUAL CONFIGURATIONS.

H-GEAR CONFIGURATION

This configuration is recommended wherever the space in the vessel, or the vessel's trim, allows it. The arrangement is simple and light. It also has normal reduction of noise and vibrations.



U-GEAR CONFIGURATION

This is the best solution if space considerations or the vessel's trim require the engine to be located as far as possible towards the stern.



PTI-GEAR CONFIGURATION

This is the most flexible configuration. The propeller can be run optimally on one or two engines, depending on the desired speed. This arrangement provides extra good operational reliability. Because of the position of the engines, this configuration fits well into the hull of a catamaran.





SERVOGEAR TUNNEL DESIGNS

OUR UNIQUE HULL SOLUTION

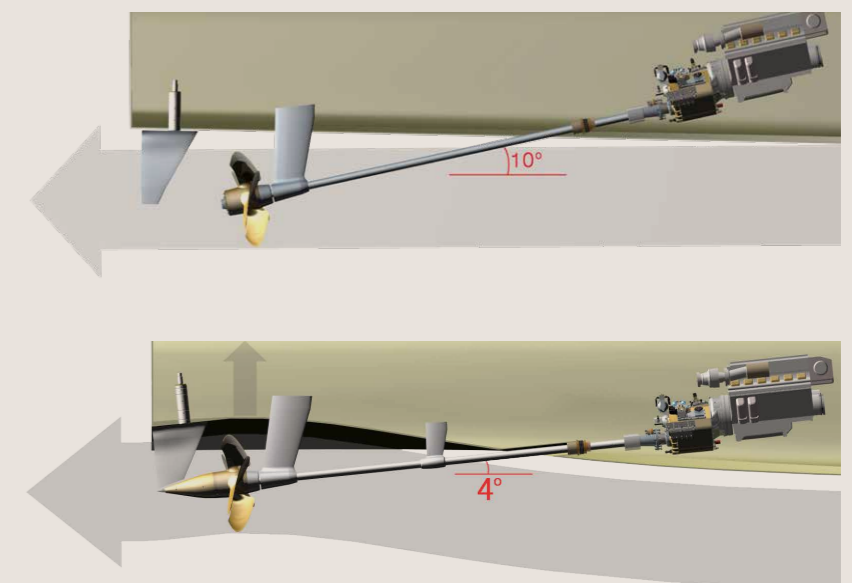
Conventional propulsors, such as propellers or water jets, work most efficiently in open water conditions.

In Servogear we develop tailor-made propeller tunnels which actually provide greater propulsion efficiency below a hull than in open water. The propeller tunnel itself also reduces hull resistance.

OUR PROPELLER TUNNELS OFFER SEVERAL ADVANTAGES



- OPTIMAL FLOW INTO THE PROPELLER**
 A Servogear propeller tunnel is designed according to the propeller momentum theory and will therefore secure optimal water flow through the propeller. The shape of the tunnel is designed in accordance with the contraction of water flow calculated from the propeller momentum theory. The tunnel is tailor-made for each project.
- REDUCED SHAFT ANGLE**
 The propeller tunnel also minimizes the shaft angle and reduces the thrust variation on the propeller. This increases the lifetime of the equipment significantly. The reduced shaft angle also decreases drag caused by shaft, brackets etc.
- REDUCED HULL RESISTANCE**
 Based on experience from sea trials and model tests, a propeller tunnel normally reduces the hull's resistance in water. The reduction in resistance is caused by less transom area, which again reduces the loss in stern wave energy.
- OPTIMAL PROPELLER DIAMETER**
 Normally, the propeller diameter is limited by the tip clearance and the draft. Servogear's propeller tunnel provides space for a propeller diameter that enables the largest possible diameter with minimum shaft inclination. This result in higher propulsion efficiency, as well as low noise and vibration levels.





SERVOGEAR EFFECT RUDDERS

SUPERIOR STEERING WITH ADDITIONAL THRUST

Our effect rudders are designed as an airfoil, providing a lift in the water flow which again produces a forward thrust. This results in a minimum drag on the rudder.

The arrangement of the effect rudder and propeller cone is designed to gain some of the loss of rotational energy in the slip stream. The inclined water flow from the propeller generates a pressure and a suction side on the rudder blade.

The seal between the rudder and the propeller cone forces the pressure balance to work in opposite direction of the rotating water flow from the propeller. This reduces the loss of rotational energy.

All Servogear effect rudders are made of high tensile stainless steel castings to reduce the blade thickness to a minimum, and they are also designed with progressive strength (For explanations, see the chapter about shaft brackets).



SERVOGEAR SHAFT BRACKETS

LESS DRAG AND RESISTANCE

Due to design and location, our shaft brackets causes minimum drag and resistance. They also ensures no cavitation and improved steering performance..

The brackets are of heavy-duty single leg design. They are cast in high tensile stainless steel, the same material we use for our rudders, and are mounted into the hull structure by use of Chockfast.

Servogear shaft brackets are also designed with progressive strength. This means that the section modulus of the bracket leg is decreasing from the hull intersection to the bracket barrel. Should a severe grounding occur, the bracket will deform as a "J" – avoiding serious damages like cracks and leakages in the hull. This is an important safety feature. Normally, the shaft brackets can be straightened easily – without the need for replacements.

WE PROVIDE OPTIMAL PROPULSION FOR YOUR VESSEL



PASSENGER VESSELS

Servogear Ecoflow Propulsor™ offers a number of advantages for high-speed passenger vessels. Our all-inclusive approach makes the concept more efficient than any other known concept on the market. It enables the most economical operation, generating extensive savings for the owners of the vessel without compromising speed and regularity.

Lower fuel consumption also protects the environment from harmful emissions.

Servogear Ecoflow Propulsor™ combines efficient propulsion with a high level of comfort. It is most reliable in operation and non-sensitive to load changes – an important feature for regular scheduled services. Safe, reliable and environmentally friendly transports are vital to success in today's passenger transportation.



SPECIAL VESSELS

Speed, range and the ability to operate in rough weather are key features for fast offshore vessels. Servogear Ecoflow Propulsor™ propulsion concept delivers in all these areas.

Compared to other propulsors, an offshore vessel with Servogear's solution has higher top speed, higher bollard pull and superior towing capabilities, as well as a significantly better ability to keep up the speed in severe weather conditions. Vessel speed is also affected less by heavy loads.

Our system also provides a larger distance range and a much higher efficiency at off-design conditions and heavy displacements.



WORKBOATS

Depending on the type of operations, workboats have highly variable propulsion requirements.

Servogear Ecoflow Propulsor™ has all the necessary properties needed for most fast multi-purpose workboats: High speed, superb towing capability, excellent manoeuvrability and superior vessel control in adverse weather conditions.

Our propeller tunnel also reduces the draught and gives the propeller better protection against floating debris.



YACHTS

Servogear Ecoflow Propulsor™ concept has been developed especially for high-speed vessels, where economical running with light equipment of high quality and finish is essential.

Our solutions reduce draught and allows for smooth and precise manoeuvring without abrupt movements. A vessel can be operated optimally in all conditions, right down to zero knots.

Servogear Ecoflow Propulsor™ is quiet-running and efficient, resulting extended operating time between each refuelling.


Our state-of-the-art, strong and light propeller can also be supplied with feathering position capabilities for sailing. With its minimal resistance it is highly suitable for sailing yachts. The controllable pitch propeller provides a unique combination of long range when running on engines, and minimal loss of speed when sailing.

AFTER SALE & SERVICES

WORLDWIDE & 24/7

Servogear's service division is there for you whenever you need it, and we always have a large selection of spare parts in stock. Our service personnel are well qualified and dedicated persons with long experience in the business.

Our After sale & Service organization allows for some of the service work to be carried out by experienced local mechanics who receive assistance or training from our service office. You can contact our after sale office either directly or through our local agent at any time.

AGENT OVERVIEW 

AUSTRALIA

DENMARK

ENGLAND

FRANCE

THE NETHERLANDS

SINGAPORE

TURKEY



OUR MISSION

SOLVING CHALLENGES

The ocean never runs out of challenges to send our way ... It's just as well we enjoy solving them.

We meet our challenges through our customers' wishes and requests which we listen to with great enthusiasm. To achieve the best results we seek to establish close and fruitful collaboration with all the involved parties at the earliest possible stage of each project. For our calculations and designs we use the very latest computer technology, including specially developed software.

Servogear puts great importance on job satisfaction and professional development opportunities for our capable employees. This has resulted in a loyal and innovative staff with a high level of integrity and service-mindedness, serving the best interests of our customers and partners. Today, this enables us to offer our customers the very best total concept customised to fit the requirements of each individual craft.



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