Exactly on Course.
Range of Marine Products and Services
The Right Propulsion System for Every Situation.

Be it out at sea or in port, on rivers or lakes – Voith’s custom-tailored propulsion systems ensure precise, prompt and safe maneuvering. Our propulsion solutions are specifically designed for all maritime tasks and requirements.
Propulsion system technology is key to operate vessels efficiently and with a high degree of safety. Matching the propulsion system to the vessel design is equally important. With more than 86 years of experience, Voith provides both: Propulsion systems tailored to the application in question and complete vessel concepts designed by Voith Engineering.

In addition to the proven Voith Schneider Propeller (VSP) with its stepless, precise and prompt generation of thrust in all directions, the Voith Radial Propeller (VRP) is part of the Voith propulsion system portfolio. One of the vessels the VRP is installed in is the Castoro Sei, a 152-meter work boat used for pipe-laying.

Voith Inline Thrusters (VIT) and Voith Inline Propulsors (VIP) are CFRP-based propellers used as propulsion systems or thrusters. They require neither axles nor shafts or gearing. The Voith Linear Jet combines the best properties of propellers with the best properties of waterjets. As is the case with VSP and VIT/VIP, the Voith Linear Jet can for example be used on ferries and yachts. Voith Turbo Marine Engineering designs complete vessel concepts.
Propulsion and steering – ahead, astern and sideways: The Voith Schneider Propeller (VSP) developed more than 86 years ago generates thrust in all directions. Propulsion and steering are combined in one unit, thus allowing prompt, safe and precise maneuvering, even under adverse conditions.

Successful worldwide
The VSP is suitable for a wide range of applications – from harbor tugs to offshore supply vessels. And it has been operating successfully in all these applications for decades. The VSP is distinguished by its high reliability and low maintenance requirements. Its low fuel consumption translates into minimum power requirements while at the same time maximizing safety for the vessel and the environment.

The VSP principle is strikingly simple and fascinating at the same time: A rotor casing fitted with four, five or six propeller blades rotates about a vertical axis. As is the case with the tail fin of a dolphin, a superimposed oscillating motion of the blades around their own axis generates thrust. The magnitude of thrust is determined by the rotational speed of the rotor casing; the blade angle determines the direction of thrust.
Voith Radial Propeller

To safely position drilling vessels, semi-submersible platforms and special vessels for offshore applications against current, wind and wave forces, Voith restarted a project from the 1970s and developed the Voith Radial Propeller (VRP).

Maximum power and safety
The result is a new generation of thrusters for dynamic positioning. Special Voith 8° gearing permits the propeller axis to be tilted downwards, thus preventing any interaction between the thruster and the vessel hull. This leads to an increase in the effective propulsion force. Voith offers 360° VRPs which can be mounted under water and cover a power range from four to more than eight megawatts.

Six to eight of these pivotable thrusters enable a drilling platform to remain in position without the need to lay anchor. Oil can thus be extracted safely even in water depths of more than 3,000 meters. Four fully pivotable Voith Radial Propellers for example drive the Castoro Sei, a 152-meter work boat used for pipe-laying.
Voith Inline Thruster and Voith Inline Propulsor

Minimum vibration and noise emissions, prompt steering response and efficient thrust generation – these were the targets set by Voith for the development of a new propulsion system. The results are the Voith Inline Thruster (VIT) and Voith Inline Propulsor (VIP) rim drive systems. The VIT is the ideal transverse thruster for use in the bow or stern. It significantly improves the vessel’s maneuvering. Together with a steerable nozzle, the Voith Inline Propulsor (VIP) is designed as a main propulsion system.

Prompt, efficient, silent
VIT and VIP require neither axles nor shafts or gearing. The propeller blades made of carbon-fiber-reinforced polymer (CFRP) are attached to a hollow shaft which houses the electric motor. The motor transfers a large torque without transmission losses. The unit is cooled by seawater, i.e. an additional cooling system is not required. Thanks to the seawater-lubricated radial and axial bearings, the motor is completely maintenance-free.

With an optional swing-out unit, the VIT and VIP can be extended from the vessel hull when needed and rotate through 360° in their end position. VIPs are used as propulsion systems for ferries and megayachts. VITs can either be used as auxiliary propulsion systems or transverse thrusters. On jack-up vessels for example, VITs complement the main propulsion system.
Voith Linear Jet

The Voith Linear Jet (VLJ) combines the best properties of propellers with those of waterjets. Low installation complexity, low sensitivity to marine fouling, sustained high efficiency at low vessel speeds and high bollard pull are borrowed from the propeller side.

Reduced vessel draft thanks to its integration into the hull, the ability to reach high speeds with high efficiency and low noise and vibration levels are borrowed from the waterjet side.

A new propulsion standard
The nozzle specifically designed for the VLJ is a very stiff construction encasing the main rotor pressure fields. Combined with the vessel-specific optimization of the nozzle and rotor profile, this results in a delay of the cavitation inception point as well as in minimal noise emissions.

The VLJ is suitable for a wide range of applications: It achieves a high degree of efficiency both at high speeds as well as when cruising at low speeds. This makes the VLJ ideally suited for high-speed catamarans, yachts, coast-guard vessels and ferries.
Voith offers various vessel propulsion system products and services. They allow ferries, water tractors, offshore supply vessels, yachts and special vessels to be operated more efficiently and more sustainably.
Numerous shipping companies rely on Voith technology which has proven its worth for decades. If a Voith propulsion system is chosen, further Voith components are frequently installed – an observation that holds true for a wide variety of vessel concepts. The Voith Turbo Fin for example is often used to stabilize Voith Water Tractors.

The same applies to the different mechanical and electronic control systems. The Voith Roll Stabilization makes dynamic positioning even easier. Voith propulsion systems, components and engineering expertise not only make vessels worldwide safer but also significantly more efficient.
Voith Turbo Fin

When escorting, Voith Water Tractors (VWT) transfer immense towing forces to the big vessels via the tow line. The Voith Turbo Fin (VTF) at the skeg of the VWT increases these forces by up to 25 percent.

Increased safety during escorting
The VTF is a rotating cylinder at the leading edge of the fin. It reaches speeds of up to 245 revolutions per minute. The VTF prevents flow separation, even at large angles of attack, thus significantly increasing the steering forces as well as the safety of the escorted vessel.

A VTF can easily be retrofitted. It is driven by a hydraulic motor positioned directly on top of the fin inside the hull.
Voith offers the mechanical or electronic control system tailored to the propulsion system. For Voith Schneider Propellers, Voith Radial Propellers and Voith Linear Jets, Voith offers an electronic control system consisting of a modular hardware and software architecture with numerous control and assistance features. Fast actuation and exact propulsion system control, remote diagnostics via the Internet and human-engineered control elements are just some of the advantages of this control system.

**Control Systems**

**Precise and efficient propulsion system control**
Absolutely reliable, straightforward to use and easy to maintain – these are attributes that have made the Voith mechanical control system stand out. It is primarily used in applications with a very short distance between the wheelhouse and the propulsion unit. Additional electronic features, such as an autopilot, can be integrated via actuators. Various optional components such as auxiliary servomotors are available for increased ease of handling.

1. The Voith Turbo Fin can easily be retrofitted.
2. Handling made easy – even the largest VSP-equipped vessels can be controlled using a joystick.
Voith Roll Stabilization

Voith Schneider Propellers are the epitome of precise, safe and efficient maneuvering. If the vessel is additionally equipped with an electronic control system and the intelligent Voith Roll Stabilization (VRS), the VSPs compensate for up to 90 percent of the vessel roll: Both at standstill as well as at full speed. For offshore supply vessels for example this means that they can continue to operate even in rough seas. At the same time, the reduced movement on board increases comfort for crew and passengers – on work boats, ferries and yachts.

No vessel roll – even in rough seas
Roll stabilization requires prompt adjustment of the magnitude and direction of thrust. This is possible with the help of the electronic control system and VRS module. In addition to the thrust and steering forces, the VSP then automatically creates an opposing moment to the wave movement, thus compensating the vessel roll.
Voith Engineering provides a comprehensive range of project planning services, from concept design and classification planning to consulting services and building supervision. In addition, Voith Engineering develops integrated vessel concepts tailored to the customer’s requirements – for example an individually adapted Voith Water Tractor (VWT). Another vessel design is the Voith Offshore Shuttle, a maintenance and supply vessel for offshore wind farms.

**Customer-specific, ideal system solutions**
The Voith Engineering services comprise CFD-optimized vessel hulls, stability and strength calculations, project planning of the vessel structure and the design of the machinery systems and equipment. Retrofits to increase power and proposals to optimize existing vessels are also offered. Customers thus receive the ideal system solution for their economic and technical requirements.

To optimize a vessel’s operating efficiency, the degree of propulsion efficiency must be known when designing the underwater hull. To date, experience gained in the field as well as special tests were used to determine the optimum resistance.

**Optimum resistance as a key to efficiency**
Voith Sim Ship now makes it possible to calculate the optimum degree of propulsion efficiency by means of simulation using computational fluid dynamics. Voith Sim Ship compares the values of the possible hull shapes and generates the most efficient version for the current vessel design based on this data.
For Safe and Environmentally Friendly Shipping Worldwide.

Be it in narrow waters or out at sea: Vessels for all applications are equipped with Voith technology – worldwide. More than 900 Voith Water Tractors are for example in operation in 215 ports.
Voith supplies propulsion systems and concepts for various vessels in the offshore energy sector. In addition to semi-submersibles, drilling rigs and offshore construction vessels (OCV), wind farm installation vessels and FPSO units are also equipped with Voith technology. Ferries ensure that commuters can reliably cross rivers and lakes. Be it on the Upper Arrow Lake in Canada or on the Bosporus in Turkey: ferries all over the world are equipped with Voith Schneider Propellers. In addition, Voith offers propulsion and system solutions for yachts in line with the individual requirements of their owners and equips special vessels such as floating cranes or research vessels.
Voith Water Tractor

More than 900 vessels in 215 ports say it all: The Voith Water Tractor (VWT) is tried and tested. It is used wherever compact, agile harbor tugs are required which can be maneuvered precisely.

One of the most successful vessel concepts worldwide
Voith Water Tractors are renowned worldwide for their outstanding safety concept, reliability, speed and precision: Be it as a fireboat in Los Angeles or as a harbor tug in Haifa. The Voith Schneider Propeller (VSP) forms the heart of each VWT. From full speed ahead to full speed astern in three seconds or turning on the spot – the VWT combines the properties of a VSP with those of an optimum vessel design.

Voith Technology for Ferries

Be it with or without a car – people want to cross rivers, lakes and straits safely. And wherever there are no bridges, ferries are required. As floating bridges in an integrated traffic system, ferries are future-oriented, economical solutions.

Perfectly matched
Safety, profitability and environmental compatibility are key. Ferries with Voith Schneider Propellers are reliable and efficient and meet the requirements of the operators. They can be steered precisely and promptly, even in strong currents, crosswinds, tidal changes and varying water depths.
VSP for Offshore Applications

Strong and changing winds, towering waves, dangerous currents: Conditions out at sea are often rough. And yet, offshore supply vessels equipped with Voith technology are stable in the water, can be maneuvered precisely and do not present difficulties during dynamic positioning. Driven by Voith Schneider Propellers, offshore supply vessels (OSV) such as the “Forte” in the Gulf of Mexico are very profitable due to their high degree of efficiency. Thanks to the high maneuverability and short response times, they can keep their position directly at the drilling rig with safety and precision. In high waves, the Voith Roll Stabilization (VRS) ensures, that the offshore supply vessel can continue to work safely.

Braving adverse conditions
The offshore construction vessel (OCV) “North Sea Giant” is equipped with five Voith Schneider Propellers. The vessel has a length of 161 meters and a width of 30 meters and is used to install platforms and rigs as well as to lay pipes. In addition to the Voith Schneider Propellers, the corresponding electronic control and VRS, offshore supply vessels can be fitted with the rim drive propulsion systems Voith Inline Thruster (VIT) and Voith Inline Propulsor (VIP).

VSP Keep Vessels on Position

Dynamically positioned semi-submersibles and drilling vessels explore and access raw material reserves in water depths of up to 3,000 meters. Offshore wind farm installation vessels operate in a similar way as drilling vessels. To complete their tasks, the forces of currents, wind and waves out at sea must be compensated.

Successful offshore projects
VSP and VIT/VIP are also suitable for use in semi-submersibles and drilling vessels. On the wind farm installation vessel “Sea Installer”, the VIT installed in the bow section and the three VSP ensure safe navigation even in high waves.
When extracting oil from reserves in deeper waters, the oil is stored and processed in a “floating refinery,” a so-called floating production, storage and offloading unit (FPSO). These vessels replace cost- and labor-intensive pipeline infrastructures.

**Oil production out at sea**
The oil is then transported by tanker. For them to berth, the FPSO must be stable and safe in the water, independent of wind and weather. This is where the Voith Radial Propellers come in. The thrusters compensate the environmental forces, thus ensuring reliable, continuous operation.

Dynamic positioning of a drilling rig is typically done by six or eight of these pivotable thrusters, each with a power of up to eight megawatt. These thrusters therefore play a significant role in the success of an offshore operation.
Research vessels, floating cranes, pipe layers and bow steering modules cover great distances during operation. To be profitable, they must be able to operate in any weather. In addition, precise maneuvering and positioning is key for these special vessels. Voith propulsion systems meet these requirements with maximum reliability.

Vessels for all applications
Depending on the type of vessel and its task, the Voith propulsion systems VSP, VIT/VIP, VLJ and VRP are used. The “Castoro Sei” which laid large parts of the Nord Stream pipeline in the Baltic Sea is for example equipped with four freely movable Voith Radial Propellers.

Voith combines sophisticated technology and maximum engineering expertise to achieve an unparalleled combination of performance and comfort. To do this, the proven propulsion system and vessel concepts are combined individually. The results are megayachts that set standards and meet any customer requirements.

Elegance even in rough seas
Even in rough seas, yachts equipped with Voith technology glide through the waves and maintain their elegance – be it at full speed or when resting out at sea. Depending on the individual requirements, VSP with VRS, VIT and VIP, VLJ or VRP are used.
Partnership Throughout the Entire Life of the Product.

Voith offers a customized service package accompanying the customer throughout the entire product lifecycle. Benefitting from 86 years of marine experience, Voith customers are in good hands – both before and after the purchase.
In addition to providing innovative service solutions and product support, Voith offers personalized training courses to ensure optimum professional training of the operating personnel.

The focus is always on customer satisfaction, efficient operation of the Voith product, and on short repair and maintenance times. Vessels equipped with Voith technology are in use all over the world. To ensure optimum service and minimize response time, Voith has set up a global service network. Experienced service technicians provide support during installation, commissioning, and during maintenance and upgrade work. Spare parts availability is a matter of course to Voith and is ensured long-term for all products.
Voith Training

Safety and efficiency are paramount, both for the operation as well as for the maintenance of vessels and propulsion systems. To ensure this, Voith offers training courses tailored to the individual customer requirements. These courses are held by specially trained and experienced staff. In addition to the indispensable theoretical background knowledge, practical handling of the Voith technology forms part of these courses.

Theory and practice to ensure optimum handling
When it comes to efficient vessel handling and training of the operating staff, practical questions such as “How do I control the vessel most efficiently?” or “Which feature supports me in which situation?” are just as important as the theoretical knowledge regarding the propulsion system and its control components. The practical part of the training is done on the Voith simulator or on site by experienced training captains.

In addition, training courses regarding maintenance, repair and troubleshooting are part of the program Voith offers to its customers. Be it for engineers, captains or technical staff – Voith offers hands-on, practical training courses with the necessary technical knowledge for everyone involved.
On-site training using the product complements the theoretical knowledge.

Using the Voith simulator, vessel handling can be optimized.

Voith Simulator

On the Voith simulator, various maritime maneuvers can be imitated using a fully equipped control stand. With the help of software, the control signals are applied as they would be by the selected control system. Monitors display the view from the bridge onto the realistically modeled environment. Vessel speed, current propulsion system settings as well as fuel consumption are also indicated.

Practical experience not just out at sea
The Voith simulator is used for example for the training of nautical staff. This practical application focuses on the efficient use of the propulsion system and on the correct handling of the control system. In addition, fuel-saving vessel operation and maneuvers to prevent accidents can be practiced. The simulator can also help to plan complex maritime projects such as port expansions.

Spare Parts

Voith has been supplying propulsion systems to customers since 1928. And no matter how long these propulsion units have already been in operation: Suitable OEM spare parts are being stocked by Voith in large warehouses, ready to be delivered to the customer as soon as possible. Should a spare part be unavailable contrary to expectations, it is immediately manufactured by a highly skilled team of experts.

High availability and reliability
Efficient operation of the Voith components throughout their entire lifetime is paramount. To safeguard this efficiency at all times, the Voith spare parts management excels by ensuring high availability and reliability.
Following their installation, the durable Voith products are often used for decades. Over the years, product design and degree of efficiency change dramatically, making it worthwhile to upgrade the propulsion systems to state-of-the-art technology using spare service parts.

State-of-the-art technology for greater efficiency
Upgrades and retrofits allow fuel to be saved and plant efficiency to be increased. Voith specialists can draw on decades of experience to provide recommendations and technical support to their customers when it comes to conversions and vessel modifications. No matter whether the propulsion power output is to be increased, a DP classification is to be obtained or the control system is to be replaced: Voith offers a wide variety of upgrade solutions to ensure that customers can operate their vessel with maximum efficiency.
Global Service Network

Experience counts
Be it for repair or service work – upon request, Voith provides experienced personnel to help customers anywhere and at any hour. Voith operates a global service network with numerous service technicians. They receive regular training and are in close contact with the experts based in Heidenheim. Customers thus receive prompt and flexible support at all times.

Health Check

Minimizing service costs
With its global service network, Voith can offer customers a status check for their propulsion system: The Health check. A qualified service technician examines the system with the vessel afloat or in dock. This technical inspection determines the optimum scope of service work and provides data for the next maintenance or overhaul. Any such work can thus be planned ahead of time, thereby reducing dock times. And for the bottom line: Service costs are minimized.

1 Modern warehouse management ensures quick deliveries.
2 Numerous Voith service technicians within the global service network are always on hand to help the customer.
Double-ended ferries Suhulet and Sahilbent for IDO in Istanbul.

Courtesy of Tersan Shipyard
## Products and Services

### The right propulsion system for every situation
- Voith Schneider Propeller (VSP)
- Voith Radial Propeller (VRP)
- Voith Inline Thruster (VIT)/Voith Inline Propulsor (VIP)
- Voith Linear Jet (VLJ)

### For safe and environmentally friendly shipping worldwide
- Voith Water Tractors (VWT)
- Ferries and passenger ships
- Offshore supply and construction vessels
- Wind farm installation vessels
- Semi-submersibles and drilling vessels
- Floating production, storage and offloading units (FPSO)
- Yachts
- Special ships

### Components
- Voith Turbo Fin (VTF)
- Control system
- Voith Roll Stabilization (VRS)
- Voith Engineering
- Voith Sim Ship

### Partnership throughout the entire life of the product
- Voith training
- Voith simulator
- Spare parts
- Refit and upgrades
- Service network
- Health check