SCHOTTEL REPORT

No. 21

75 YEARS

SCHOTTEL RudderPropeller

Everything new
Investments in Logistics and After Sales

URN
News from Research & Development

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The leading invention since 1950
50° 15' N, 7° 39' E

SCHOTTEL founder Josef Becker invented the fully steerable rudder propeller – marking the beginning of SCHOTTEL's global success as a manufacturer of innovative marine propulsion systems. This revolutionary invention is now celebrating its 75th anniversary. **Page 12**

Everything new
10° 23' N, 75° 30' W
26° 53' S, 48° 43' W
50° 8' N, 7° 34' E

SCHOTTEL is investing heavily to expand its global logistics and repair infrastructure. This will offer customers shorter distances, faster response times and cutting-edge technology. **Page 04**

Succeeding together
24° 58' N, 55° 4' E

Alikhan Sadik, Commercial Manager at SCHOTTEL Middle East, has been with the company for 14 years. With strategic foresight, technical expertise and a strong sense of teamwork, he supports the subsidiary's growth. **Page 18**

Content

No. 21 // November 2025

Investing in tomorrow
22° 21' N, 113° 5' E

The Jiangmen Hangtong Shipbuilding and Shipping Company exemplifies the advancing capabilities of the Chinese shipbuilding industry. The key to success for the progressive company lies primarily in its focus on research and development. **Page 16**

Dear readers,

Quality is never a coincidence – and 75 years of SCHOTTEL RudderPropeller are a powerful testament to that. At SCHOTTEL, we do not see quality as the responsibility of a single department, but as a shared commitment. Every team member contributes to ensuring that our products meet the highest standards.

As the quality assurance department, we support all SCHOTTEL employees with the right tools, methods and processes. A good example is our internal complaint management system: from simple internal reports to advanced 8D analyses, it offers a systematic and effective approach for every escalation level. This shared understanding of quality does not end at our factory gates – it also shapes the way we collaborate with partners. If quality deviations occur, we actively support the improvement process.

What does this mean for you as a customer?
You benefit from a culture of continuous optimization that focuses on sustainable solutions rather than short-term fixes. Deviations are identified early on, and their causes are eliminated. The result is a consistently high level of quality, from design to delivery.

The opening of our new logistics center in Dörth is a strong impetus for further strengthening our quality standards. By streamlining warehousing and using state-of-the-art logistics technologies, we not only enhance process reliability and transparency along the supply chain – we also ensure significantly greater spare parts availability. In this issue, you will learn more about the benefits of the new logistics center in Dörth, as well as our new workshops in Colombia and Brazil.

Enjoy reading,

Andrea Streng
Head of Quality Assurance & Logistics
SCHOTTEL Dörth

Photos: SCHOTTEL (4), Jiangmen Hangtong Shipbuilding and Shipping Company

Everything new

SCHOTTEL is investing heavily to expand its global logistics and repair infrastructure. This will offer customers shorter distances, faster response times and cutting-edge technology.

Every year, more than 500 propulsion systems of all sizes leave SCHOTTEL's production sites, bound for destinations around the globe. And it's not just the new build business that is experiencing significant growth; the after-sales segment is also benefiting from sustained momentum. Currently, over 10,000 vessels worldwide operate with SCHOTTEL systems – some with a single thruster, while others have multiple. Consequently, the demand for service and spare parts continues to rise steadily. In response to this growing demand, SCHOTTEL is launching three new workshop and logistics complexes in Germany, Brazil and Colombia. These new facilities will strengthen customer proximity, technical expertise, and sustainable site development. Customers will benefit from many enhancements, including significantly improved parts availability – even when supply chains elsewhere are unstable – as well as from improved service quality.

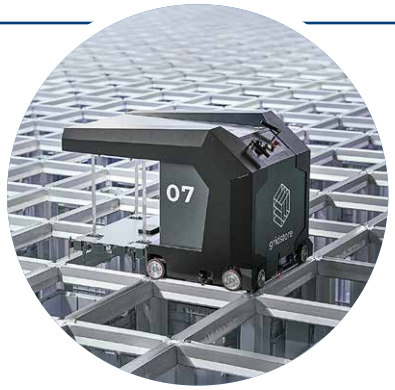
Dörth, Germany

Dörth, Germany: New logistics center enhances spare parts supply

At SCHOTTEL's production site in Dörth, a new logistics center is being commissioned. Connected directly to the existing facility, it offers 2,634 square metres of industrial floor space and 1,326 square metres of offices. An efficiently designed incoming goods processing system, cranes and a fully automated warehouse form the backbone of the state-of-the-art logistics setup designed to accelerate spare parts availability. The €10 million complex was built in accordance with sustainable construction criteria according to ESG specifications (Environment, Social, Governance). Regarding the shell and technology of the new building, the industrial insulation, heat pump technology and heat recovery system are all part of a high-quality sustainability concept. The new roof is structurally prepared to accommodate a photovoltaic system. This will further increase the 700,000 kWh of energy generated each year on the existing building. An adjoining three-storey office building provides space for employees in other departments.

12,414

The automated *Gridstore* small parts warehouse offers a highly flexible solution for block-based storage of various container types, each up to 50 kg. A structure measuring just under 1,900 cubic metres provides 13,794 storage spaces for a maximum storage capacity of 90 percent. This corresponds to 12,414 containers being stacked, resulting in an exceptionally high storage density. Dynamic item sorting ensures efficient processes, with goods receipt and picking largely automated.



Photos: SCHOTTEL (4), Gridstore Robotics

Itajaí, Brazil

Itajaí: New Service Hub in Brazil

SCHOTTEL do Brasil is sending a strong signal on the occasion of its 50th company anniversary with the new building in Itajaí, Santa Catarina. A modern workshop with a warehouse, administrative offices, and training facilities has been built on a 10,500 square metre site. More than 2,700 original spare parts are kept on site to ensure fast, high-quality service. Resource-saving solutions such as rainwater treatment, wastewater and waste recycling, as well as a large-scale photovoltaic system underline the company's commitment to sustainability. With sea logistics access via the port of Itajaí – the country's second largest – the new facility strengthens proximity to customers in South America and expands the global service capacity of the SCHOTTEL Group.

info@schottel.com.br

1975

Since its foundation in 1975, the former subsidiary with its own production facilities has evolved into a leading player in the maritime industry in Brazil and the neighbouring countries. SCHOTTEL do Brasil now manages newbuild sales and provides comprehensive after-sales services from its locations in Itajaí and Rio de Janeiro.

Cartagena, Colombia

1 for 18

Cartagena is home to the only workshop operated by a propulsion manufacturer in Colombia, and it serves as the central service hub for 18 Spanish-speaking countries across Latin America. Its proximity to major shipyards and direct access to the Caribbean make it a key logistics center for technical consulting, spare parts supply, and training throughout the LATAM region.

Cartagena, Colombia: Service Center for Latin America

The new workshop fills a significant service gap in the Spanish-speaking Latin American market. Located on a 4,700 square metre site near major shipyards, the facility features a cutting-edge workshop and office space for up to 35 employees. Customers can expect a greatly expanded range of services, including OEM-level maintenance. To facilitate this, dual overhead cranes with up to 60-tonne lifting capacity, and 3D scanning for complex part evaluation are available. The spacious layout allows for the simultaneous servicing of multiple propulsion units, complemented by turning, milling, and grinding machines.

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Shaping the future of mining

Located in Western Australia, the Onslow Iron project aims to set new standards in mining through world-first autonomous road trains, industry-leading dust-free transport and an innovative shipping concept – powered by SCHOTTEL.

Amidst the remote expanses of the Pilbara region in Western Australia, where red sand dunes and rugged rock formations dominate the scenery, one of Australia's largest and most innovative iron ore projects is being implemented: Mineral Resources' (MinRes) Onslow Iron project. Utilizing cutting-edge technologies and an innovative mine-to-ship supply chain, the project is set to unlock around 35 million tonnes of previously untapped ore deposits annually over a period of more than 30 years, while minimizing the environmental footprint and increasing efficiencies of mining.

Mine-to-ship transport

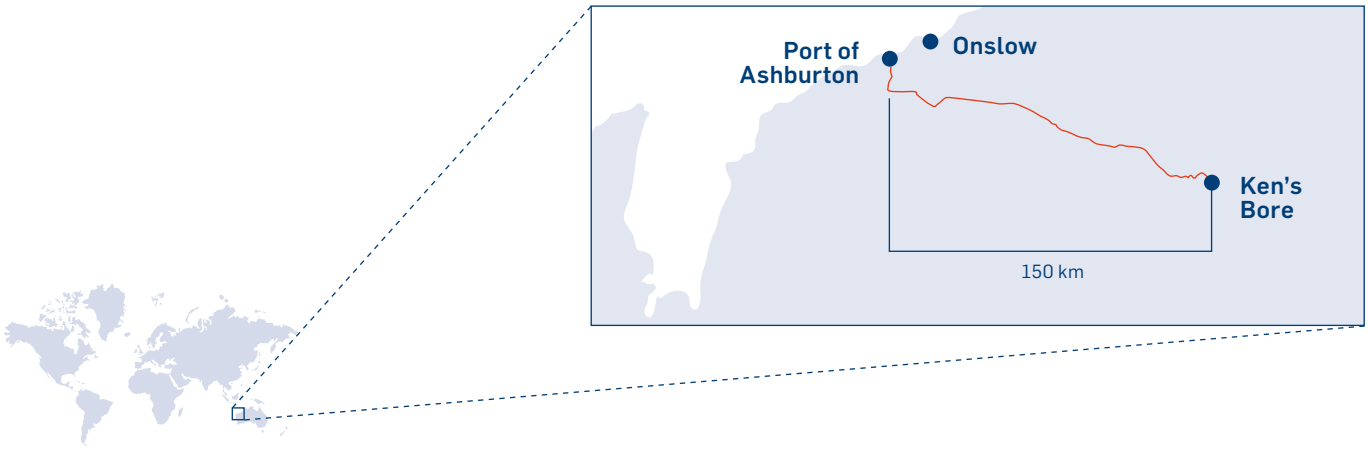
But what exactly makes this supply chain so special? It all starts with the extraction of ore at the Ken's Bore mine site, located about 150 kilometres inland from the coast. Here, drilling and blasting activities are conducted, before the ore is processed in modular crushing plants, which significantly reduce dust and noise emissions compared to conventional technologies. A dedicated truck load-out facility sets the haulage operation in motion, with autonomous road trains making the journey to the Port of Ashburton near the town of Onslow on a private purpose-built haul road. Currently, around 170 of these trucks are in operation, each with a load capacity more than 300 tonnes. Upon arrival at the port, the ore is automatically unloaded and stored in an enclosed 220,000-tonne capacity storage shed. Negative pressure in the facility prevents ore dust from spreading into the air, protecting both the environment and employees. The ore is then reclaimed onto an enclosed conveyer belt and loaded into transhippers, which transport it to awaiting Capesize bulk carriers anchored 40 kilometres offshore.

Transhippers with a unique control system

The innovative shipping concept forms the actual core of the supply chain. It was primarily developed to avoid the construction of a deep-water port for loading the bulk carriers, which would have impacted both the project's sustainability and economic viability. Instead, barges with a capacity of around 20,000 tonnes are used. Even when fully loaded, they have an extremely shallow draught of only seven metres. To enhance their manoeuvrability, the barges are linked to powerful tugs – forming a transhipper – via an articulated tug and barge arrangement (ATB). The control of the tugs is managed by a unique steering concept: as visibility from the tugs while pushing the vessels is limited due to their lower height, they are controlled from the wheelhouse of the barges.

MinRes Coolibah and *MinRes Airlie* commenced transhipping operations in May 2024.

Photo: Mineral Resources



Full propulsion package

To implement a project of this magnitude, MinRes needs strong partners – one of them is SCHOTTEL.

"MinRes commenced discussions with SCHOTTEL early in the design stage of the project. The combination of SCHOTTEL PumpJets and SCHOTTEL Controls for the tug Azimuthing Stern Drives has been fundamental to the success of the transhipping operation."

Jeff Weber – Executive General Manager MinRes Marine

All seven transhippers – named after the islands off the Pilbara coast – are being equipped with SCHOTTEL propulsion systems. To ensure the lowest possible draught, which is essential for loading the transhippers near the coast, two SCHOTTEL PumpJets type SPJ 320 have been selected for each ship. The modern shallow-water propulsion unit provides full thrust in all directions, even at minimum immersion depths. The 123-metre-long and 36-metre-wide barges are being built at COSCO Shipping Heavy Industry in Zhoushan and Guangdong, China. Five of the seven transhippers have already commenced operations at the Port of Ashburton.

When it comes to the propulsion systems of the tugs, MinRes also relies on SCHOTTEL: the two newbuilds, which are currently under construction at COSCO Shipping Heavy Industry, are equipped with two SCHOTTEL Rudder-Propellers type SRP 610 and one Transverse-Thruster type STT 1 each. For the remaining tugs, MinRes is using existing vessels – including three with SCHOTTEL RudderPropellers – which have been specially converted for their new operation purpose.

Maximum flexibility

The unique control system mentioned above was also developed in close collaboration with SCHOTTEL. It allows any tug – even those without SCHOTTEL propulsion – to be linked to any barge, ensuring that all transhippers can continue to operate even during downtimes or maintenance of a tug. "Since the propulsion units of the tugs have different features – for example, the new buildings are powered by an electric motor – we would normally need several different control panels in each transhipper wheelhouse. However, we have developed a much more practical solution," explains Björn Bender, Sales Manager Modernization & Conversion at SCHOTTEL. Instead of using multiple panels for the different thruster types, each transhipper is equipped with one identical panel. A logic system detects which tug is linked to the barge and only activates the functions on the panel that the thruster actually supports. "With this innovative control concept, we achieve maximum flexibility in the connection between barge and tug," concludes Björn Bender. "This ensures that the Onslow Iron project is well-equipped for reliable, efficient and long-term operation."

30+
years mine life

35
million tonnes p. a.

7
transhippers

Mineral Resources

MinRes is a leading pit-to-ship mining services provider, with extensive operations in lithium, iron ore, energy and mining services across Western Australia.

At the forefront of the all-electric tug market

Powering the future

Sanmar Shipyards, elkon and SCHOTTEL are reinforcing their position at the forefront of the all-electric tug market. With 15 fully electric tugs, the three companies demonstrate the strength of their long-standing collaboration and their shared commitment to innovation in zero-emission vessel technology.

Built at Sanmar Shipyards – a pioneer in fully electric tug construction – and equipped with SCHOTTEL propulsion systems and electrical integration by elkon, the new tugs meet the growing global demand for sustainable maritime solutions. Based on the ElectRA design by Canadian naval architect Robert Allan Ltd., the tugs feature either SCHOTTEL RudderPropellers SRP or SCHOTTEL CombiDrives SCD. The propulsion systems are complemented by elkon's advanced Multi Drive DC grid.

"Each tug features a fully integrated electrical system developed entirely by elkon – from ESS-based power distribution and converter technology to control consoles, alarm systems and the Power Management System. We are proud to help deliver vessels that are not only zero-emission but also robust, safe and ready for the operational challenges of tomorrow."

Seçkin Uz, Managing Director of elkon and SCHOTTEL Turkey

This integrated setup enables fully electric operations, tailored to a wide range of operational profiles and customer-specific requirements. BEWA solutions, a fellow company in the SCHOTTEL Group, contributed by supplying the complete propulsion control system, adding another layer of in-house expertise and integration.

Nine of the 15 electric tugs have already been delivered and are in service for several international operators, including HaiSea Marine (Canada), SAAM Towage (Canada and Chile), Buksér og Berging (Norway), Svitzer (Denmark) and Sanmar's own fleet. Their deployment will span a wide range of applications – from LNG terminal operations and harbor towage to comprehensive fleet modernization initiatives.

"We are dedicated to shaping a more sustainable future by delivering next-generation tugs that set new benchmarks in environmental responsibility and operational excellence. Partnering with SCHOTTEL and elkon means working alongside trusted industry leaders whose cutting-edge technologies and shared commitment to innovation perfectly align with our vision."

İpek Gürün, Corporate Strategy Director at Sanmar Shipyards

This milestone underscores the combined expertise of SCHOTTEL and elkon in delivering integrated propulsion and electrical systems – and highlights their role in shaping the future of sustainable maritime operations.

"Together with elkon and Sanmar, we've transformed forward-looking designs into reliable, high-performance and environmentally friendly propulsion solutions. This partnership demonstrates the power of integrated expertise and reinforces our commitment to sustainable shipping."

Roland Schwandt, Deputy CEO of SCHOTTEL

Photo: Sanmar Shipyards

Impressively versatile

A rendering of the state-of-the-art Multi-Purpose Vessel, scheduled for delivery in 2026.

Rendering: Damen

Equipping governmental and naval vessels with modern propulsion systems usually involves special requirements. This is also demonstrated by one of the latest projects in this segment: the newbuild *NRP D. João II* for the Portuguese Navy.

From oceanic research to emergency relief and naval support: the new Multi-Purpose Vessel (MPV) *NRP D. João II* is impressively versatile. The innovative ship concept includes not only a large flight deck for drones and helicopters and a stern ramp for surface and underwater vehicles, but also laboratories and accommodation for scientific staff. To ensure maximum flexibility, the design offers space for twelve 20-foot containers, which will permit the vessel to use modular systems such as containerized hospital facilities, hyperbaric chambers, or ROV equipment as required during its operations. The 107-metre long and 20-metre wide newbuild was developed by the Dutch Damen Group, based on a new concept and specific requirements of the Portuguese Navy.

Efficient, sustainable, flexible

To cover the ship's wide range of applications, the propulsion system also has to meet a number of specific requirements, including manoeuvrability, high efficiency and quiet operation. In order to achieve the desired flexibility, two SCHOTTEL EcoPellers type SRE 560 in the L-Drive version were chosen. "The SCHOTTEL EcoPeller is the ideal solution for this particular type of vessel. It combines manoeuvrability and powerful propeller thrust with high lateral force, is reliable and maintenance-friendly and thus meets all the requirements of a modern high-performance propulsion unit," explains Hermann Weber, Sales Manager Navy & Governmental at SCHOTTEL. "Thanks to its hydrodynamically optimized design, it produces maximum steering forces and thus enables top values in terms of overall efficiency and course-keeping ability. This reduces fuel consumption and lowers operating costs." To further optimize manoeuvrability and DP capabilities, the newbuild will also be equipped with a SCHOTTEL TransverseThruster type STT 3 FP.

Reduced noise emissions

The selected propulsion configuration is also a convincing solution when it comes to underwater radiated noise: the SRE has been particularly designed and tested for low underwater noise emissions to allow the vessel to meet DNV 'Silent A' class noise requirements up to a light survey speed of 10 knots.

"The acoustic signature emitted into the water is of great importance to navies worldwide. In addition to stealth and detection, reduced noise emissions play a key role in the use of onboard sonar systems and the deployment of drones,"

concludes Hermann Weber. The vessel is currently being built by Damen Shipyards Group in Galați, Romania and is scheduled for delivery in 2026.

At a glance

The DNV (Det Norske Veritas) Silent Class is a classification notation developed by DNV to assess the underwater noise emissions of ships. It applies to vessels that operate in environmentally sensitive areas or need to reduce noise emissions due to their own operating profile. There are several subcategories, including SILENT-A (Acoustic) which refers to vessels with hydroacoustic equipment.

Quieter oceans

How can underwater radiated noise (URN) be reduced? For over a decade, SCHOTTEL has been supporting various research projects and working closely with customers and partners to develop solutions for more sustainable shipping.

Reducing URN is becoming increasingly important in international maritime transport. The primary focus is on protecting marine life and ecosystems. However, quieter ship operations are also essential for enabling accurate acoustic measurements carried out by naval, research and oceanographic vessels. Furthermore, lower noise levels positively impact the physical and mental health of crew members and passengers.

IMO guidelines provide orientation for ship operators

To address these challenges, the International Maritime Organization (IMO) published revised, non-binding guidelines for reducing URN in July 2023. These guidelines not only support the development of technical and operational measures but also help assess potential impacts on the energy efficiency of vessels. Additionally, the IMO proposes future monitoring of URN which may lead to the implementation of thresholds alongside long-term monitoring requirements for specific regions.

Cavitation as one of the main causes of URN

But what actually causes URN? The reasons are varied. In addition to the gear meshing of propulsion systems, one of the main causes is cavitation on propellers: this occurs when water pressure drops below vapor pressure and small bubbles form. These bubbles collapse and generate pressure pulses that not only radiate sound into the water and the ship's structure but can also reduce its efficiency and even damage the propeller while collapsing.

Measuring, calculating and predicting URN

In order to minimize URN, SCHOTTEL uses CFD simulations during the design phase of propulsion systems. Computational Fluid Dynamics (CFD) has been an integral part of hydrodynamic design for years and is used to simulate the risk of cavitation and noise development, among other things. The insights gained are used to optimize the cavitation behaviour of the propeller. In addition, SCHOTTEL offers the support of model tests, in which reliable noise predictions are made and scaled up to the full-size version of the selected propulsion solution.

Furthermore, the company has been actively involved in a wide range of research initiatives for over ten years – beginning with ProNoVi (Propeller Noise Vibration). Within the scope of this project, SCHOTTEL and its research partners succeeded in improving numerical and experimental methods for predicting propeller-induced noise and in deriving practical recommendations for optimized product designs. Red-Emi (Reduction of hydroacoustic emissions from propulsion systems) takes this a step further. The initiative aims to increase the accuracy of noise predictions. This involves not only analyzing cavitating propellers using CFD simulations but also examining vortices and cavitation phenomena in the propeller wake as well as their interaction with surrounding structures. Additionally, the acoustic response to hydrodynamic alternating loads is investigated from a mechanical perspective. In contrast to previous research approaches, the dynamic vibration behaviour of the entire propulsion system is thus taken into account. These insights are used to optimize both the propeller design and the entire propulsion system: for example, the stiffness of selected components can be increased or reduced – with the goal of minimizing overall noise generation.

THORSTEN TILLACK
Head of Hydrodynamics and Propeller Design at SCHOTTEL
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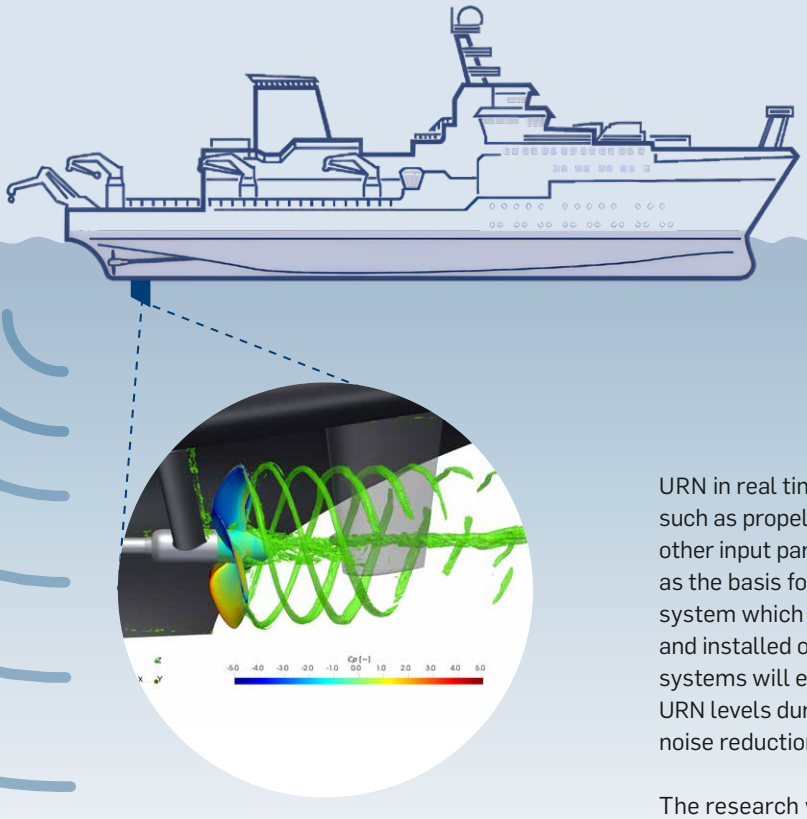


Visualization of the pressure coefficient distribution (Cp) on the propeller blade to determine cavitation tendency. Also shown are the vortex structures (green) of the shaft bracket arms and the propeller.

Reducing URN during operation: monitoring and retrofit

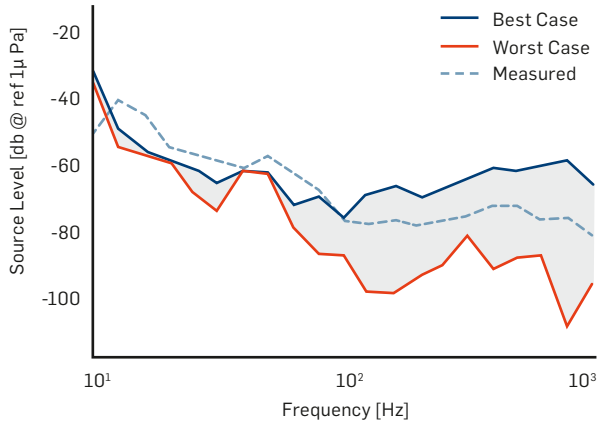
The research project HyPNoS (Hydrodynamic Propeller Noise Monitoring System) focused on existing propulsion systems. Together with the project funder Transport Canada and partner BC Ferries, SCHOTTEL investigated URN reduction on a series of Canadian double-ended ferries. The methods used included hull vibration analysis and underwater noise measurements using hydrophones. Through extensive research, a quantitative correlation between the vibrations and the emitted noise was established. Based on this pattern, SCHOTTEL engineers developed an algorithm for calculating and predicting URN in real time, taking into account factors such as propeller speed, pitch, vessel speed, and other input parameters. This algorithm served as the basis for a calibrated live URN monitoring system which was developed as a prototype and installed on board the ferries. Such feedback systems will enable operators to react to high URN levels during operation and initiate targeted noise reduction measures.

The research was carried out on vessels equipped with both original and retrofit propellers. This not only confirmed the applicability of the HyPNoS system but also demonstrated the effectiveness of retrofitting propulsion systems with noise-optimized propeller designs: despite a smaller propeller diameter of 4.7 metres instead of five metres, the retrofit solution achieved an average reduction in URN of five decibels.

The project's advanced approach also gained recognition beyond the research community: HyPNoS has recently been named 'Hydro-Efficiency Technology of the Year 2025'.

Pioneering research

"These research projects have provided us with valuable insights into the analysis and prediction capabilities of URN," summarizes Thorsten Tillack, Head of Hydrodynamics and Propeller Design at SCHOTTEL. "The data collected is already being incorporated into our product designs and is also paving the way for future developments. Together with our customers and partners, we are continuously working to reduce URN from ships and thus protect marine ecosystems and wildlife."

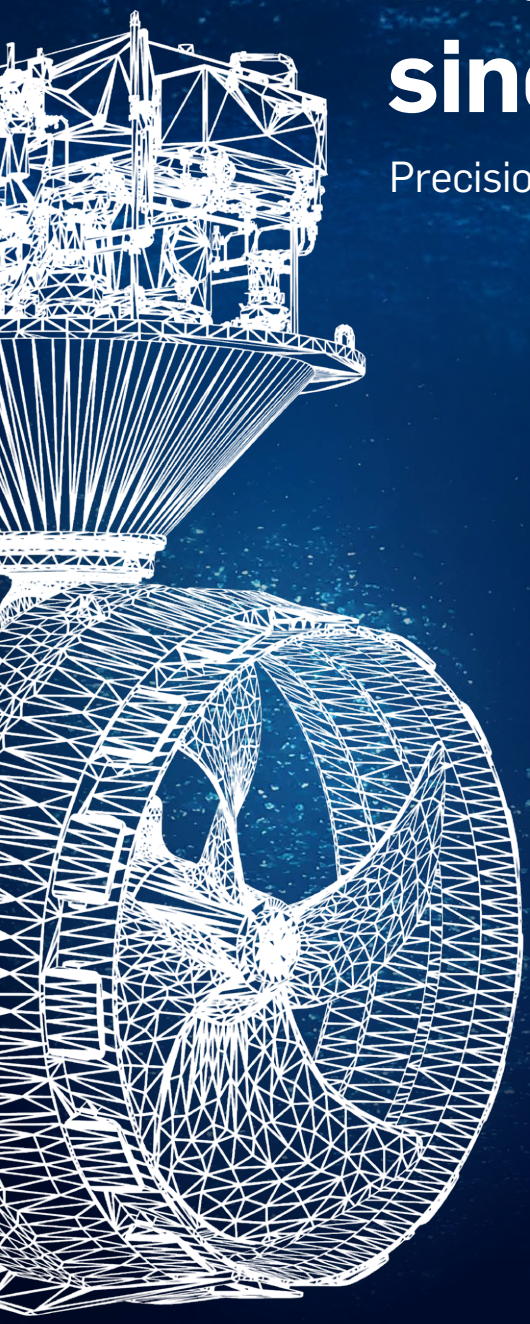


A comparison of prediction accuracy (grey area) and actual URN (dashed line): The applicability of the HyPNoS system was tested on board a series of Canadian double-ended ferries.

Photos: SCHOTTEL

The leading invention since 1950

Precision in every manoeuvre



Late **1940**s

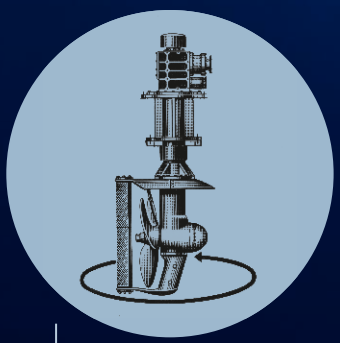
Driven by a deep interest in technology and shipbuilding, company founder Josef Becker sets out to develop a new combination of propulsion and steering despite never having formally studied engineering. Model tests are carried out in a bathtub.

1950

The first rudder propeller (150 hp/110 kW) is installed in the company's own boat *Magdalena*, named after Josef Becker's wife.

1952

Ships equipped with SRPs belonging to the Rhineland-Palatinate water police are deployed during a flood disaster in the Netherlands. Their exceptional manoeuvrability causes a sensation and leads to several orders from the local water police. The following year, the first major order for 15 ships for the French Rhine Army is received – marking an international breakthrough.



With the SRP, a ship has the full power of its propulsion engine available for manoeuvring for the first time without the need for a separate rudder blade. The police boats (see 1952) turn at full speed in just 1.5 boat lengths and turn almost on the spot at slow speed. A 180° turn of the propeller is sufficient to change from "full ahead" to "full astern".

SCHOTTEL founder Josef Becker invented the fully steerable rudder propeller – marking the beginning of SCHOTTEL's global success as a manufacturer of innovative marine propulsion systems. The SRP has been in use worldwide ever since. This revolutionary invention is now celebrating its 75th anniversary.

Photos: SCHOTTEL

The orders from the Dutch authorities represent the start of the SRP's international breakthrough.

1955

On 23 November 1955, the then-SCHOTTEL shipyard receives patent no. 1025293 for the 'steerable propeller propulsion system for ships with outboard motors'.

1963

Offshore oil production requires vessels that can be positioned with absolute precision. The French core drilling vessel *Trebel* is thus equipped with the world's first dynamic positioning system. Two SRP 150 units ensure maximum manoeuvrability.

Numerous further developments of the SRP followed for almost all types of vessels used in oil and gas exploration: they keep production platforms, support and supply vessels, cable and pipe layers, and specialized vessels such as hydrographic survey vessels and diver support vessels in position, even under the most challenging weather conditions. By 2015, the market share for platform supply vessels will grow to 20 percent. The offshore market is just one of many whose development has been significantly influenced by the SRP – both then and now.

1967

Together with a Hamburg, Germany-based shipping company, SCHOTTEL develops the first harbour tug with a rudder propeller: the *Janus*, which is still in service today as *Jan Leenheer*. Market acceptance is reflected in good sales figures.

First harbour tug with rudder propellers: the SRPs installed in the rear third of the vessel, enable the *Janus* to perform a whole range of new manoeuvres.

1980s

The Azimuth Stern Drive (ASD) tug offers the advantage of a lower draft compared to tractor tugs and can be steered and handled more precisely. By the end of the 1980s, 80 percent of the tugs equipped by SCHOTTEL are stern tugs.

The development of the newly designed stern tug, whose requirements are perfectly met by the SRP, and the simultaneous internationalization of the company fill the order books.

1986

The world's largest offshore crane vessel, the *Micoperi 7000*, is fitted with underwater-mountable SRP 4500 units – the most powerful rudder propellers in the world at the time.

The SRP 1515 is launched with a propeller diameter of 2.6 metres. In the first year alone, twelve tugs are equipped with this new thruster type, which will become the most successful model in SCHOTTEL's product history.

Ever larger container ships demand ever higher bollard pull from harbour tugs. The new SRP 1515, designed to meet these demands, is an instant success. By 2025, around 1,300 units of this thruster, now renamed SRP 460 / SRP 490, will have been delivered thus making it the most successful azimuth thruster in the world.

1998/ 1999

With over 600 equipped tugs, SCHOTTEL is the market leader with its SRP.

2005

2016

After intensive research and development in cooperation with the Dresden University of Technology, Germany, the HTG high-performance gearbox is introduced to the market in 2016. Among other improvements, it enables drive torque to be increased by up to 15 percent with the same bevel gear dimensions.

The HTG (High Torque Gear) extends the service life of the gearbox, resulting in significant gains in performance and safety. State-of-the-art milling and calculation methods are used to achieve shapes that enable a highly efficient, robust and safe gearbox with an ideal gear geometry.

The anodes required for corrosion protection are repositioned in the rear cross-section of the nozzle. The "ProAnode" enhances hydrodynamic flow characteristics and offers economic advantages. Additionally, it lends the SRP a distinctive and recognizable appearance.

2017

From the origin to the complete solution

The design principles of the SRP have had a significant influence on azimuth technology in the global maritime market. At SCHOTTEL, it has paved the way for the development of additional main and auxiliary propulsion systems, each of which is tailored to the diverse operational profiles of modern vessels. Alongside the SRP, customers choose other main drives, such as the controllable pitch propeller (SCP) or the azimuth pull propeller (SCHOTTEL EcoPeller), as well as a wide range of auxiliary drives. The entire portfolio is available at **www.schottel.com**.

Photos: SCHOTTEL

17,000+

For 75 years, the SRP has demonstrated its reliability across a wide range of vessel designs and operational profiles requiring maximum manoeuvrability, exceptional bollard pull, and/or outstanding course stability during free sailing. With more than 17,000 units installed in over 120 different vessel types, the SRP has become the benchmark in propulsion systems.

"Throughout its 75-year history, the SCHOTTEL Rudder-Propeller has been instrumental in the development of new maritime markets, providing decades of value to our customers. We greatly appreciate the loyalty and trust our customers place in us, and look forward to continuing to serve them as their preferred partner for ship propulsion solutions."

Stefan Kaul, Chief Executive Officer
SCHOTTEL GmbH

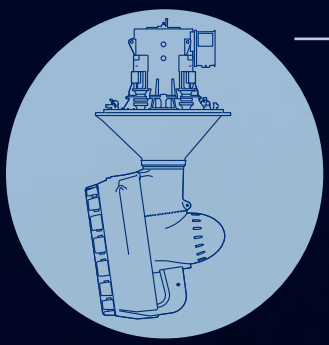
2019

SYDRIVE offers both mechanical and electrical hybrid drive solutions for the SRP, delivering numerous operational and environmental advantages. The new concept is successfully introduced to the market. In 2025, the delivery of four SRP 710 units equipped with SYDRIVE-M, each providing a bollard pull of up to 120 tonnes, marks SCHOTTEL's most powerful hybrid propulsion system to date.

2023

The responsive SRP-D is launched. By the anniversary year, more than 50 units have been sold. It provides indispensable support for vessels involved in the commissioning and maintenance of offshore wind farms.

The SRP-D features a propeller shaft inclined at eight degrees and a vertically integrated electric drive motor ("embedded L-Drive"). Its shorter response times enable faster and more precise reactions to external forces such as wind and currents, resulting in improved vessel positioning accuracy. Vessels equipped with the SRP-D operate more efficiently and safely, with extended operational availability throughout the year.



2025

RudderPropeller
SINCE 1950

According to recent market studies, SCHOTTEL rudder propellers power well over half of the world's fully electric tugboats and also hold a leading position in the hybrid tugboat segment.

More about the unique invention of the SRP

Investing in tomorrow

Operated under the aegis of the CCCC Fourth Harbor Engineering Co., the Jiangmen Hangtong Shipbuilding and Shipping Company exemplifies the advancing capabilities of the Chinese shipbuilding industry. The key to success for the progressive company lies primarily in its focus on research and development.

With its long coastline, the Chinese city of Jiangmen is a prime hotspot for the shipbuilding industry in Guangdong Province. The city, whose name means 'river gate' in English, is home to around five million people. It is located west of the Pearl River and about 60 kilometres southwest of Guangdong's capital, Guangzhou. Jiangmen's Xinhui district is where one of the most advanced and versatile shipyards in the region is headquartered: the Jiangmen Hangtong Shipbuilding and Shipping Company (or simply "Hangtong").

Broad portfolio

Founded in 1993, Hangtong is part of the CCCC Fourth Harbor Engineering Company Co., Ltd., a subsidiary of the listed, state-owned China Communications Construction Company, Ltd. (CCCC). CCCC specializes in the design, construction and operation of infrastructure, such as motorways, airports and seaports. In 2016, CCCC was included in *Fortune* magazine's Global 500, which annually ranks the world's 500 largest companies by revenue. Within the group, Hangtong, with around 500 employees, is mainly focused on the design, construction and repair of ships. In addition, the company's business activities constitute the manufacture and installation of steel structures, among them bridges and buildings, as well as electromechanical equipment for highways, ports, railway platforms and much more.

Hangtong's shipbuilding portfolio is extremely broad. In addition to tugs, it includes a wide range of port and channel construction workboats, such as cement mixing vessels and piling barges. Cargo transport ships for various types of liquid goods like LPG, oil and chemicals also feature among Hangtong's products – and that's not all: a wide variety of offshore platform multi-purpose workboats, such as offshore service vessels, marine survey ships and multi-purpose marine workboats, round off the shipyard's versatile

Photos: Jiangmen Hangtong Shipbuilding and Shipping Company

range. In over 30 years, the company has built and delivered more than 300 vessels. Its customers come from all over the world – from Southeast Asia, the Middle East and Europe to the United States.

State-of-the-art production plant

In order to perfectly cater for its broad portfolio, Hangtong has a modern 290,000-square-metre production facility at its headquarters. Built in 2006, it has a 465-metre slipway, a 700-metre berthing quay and several crane systems with lifting capacities ranging from 40 to 400 tonnes. In addition to state-of-the-art steel processing equipment, such as CNC cutting and punching machines, the site also houses project-supporting workshops, including several painting shops. With this equipment, the yard is capable of building eight to ten vessels simultaneously.

"SCHOTTEL is our long-term partner"

Hangtong has enjoyed a long and successful partnership with SCHOTTEL that now spans almost 20 years. Together, the companies have implemented numerous major projects, including ASD tugs, platform supply vessels (PSV), bunker ships and container vessels. "SCHOTTEL is our long-term partner and has always supported us with newbuilds and service," explains Jiang Chuanjian, Marketing Manager at Hangtong and responsible for sales and procurement of key equipment. "Our customers benefit first and foremost from the high quality of SCHOTTEL propulsion units. In addition, we particularly appreciate the interpersonal aspect of our cooperation – both the respect that SCHOTTEL shows us and the regular visits to Jiangmen, which are also attended by representatives of the top management. For us, personal contact is of great importance for a long-term partnership."

The shipyard is very familiar with the wide range of SCHOTTEL products and has been successfully using equipment such as the SCHOTTEL RudderPropeller or TransverseThruster for many years. Recent milestones in the cooperation include projects such as an ASD tug, a series of 7700 DWT bunker ships for methanol supply and a series of six small container ships for waste transport. One particular highlight are platform supply vessels, which are equipped with SCHOTTEL RudderPropellers. PSVs are used to provide logistical support to offshore oil and gas platforms and other such installations and to transport goods, tools, equipment and personnel to and from offshore sites.

290,000 m²

Hangtong has a modern 290,000-square-metre production facility at its headquarters.

High investment in research and development

Hangtong's business strategy is always oriented towards future trends – a key success factor. The focus is on providing innovative solutions to the major challenges facing the shipbuilding industry: environmental protection and digitalization. Therefore, Hangtong continues to invest in research and development in order to offer its customers a modern and environmentally-friendly portfolio. Just recently, Hangtong established five innovative labs for shipbuilding and intelligent equipment manufacturing, as well as a smart electromechanical equipment engineering center. The company is also committed to implementing smart technologies in production, including investing in a green, automated assembly line for heavy steel structures. At Hangtong, the way has been paved for a successful future.

Jiangmen

With its long coastline, the Chinese city of Jiangmen is a prime hotspot for the shipbuilding industry in Guangdong Province.

Hercules Harriet, a 7700 DWT bunkering vessel built by Hangtong, is equipped with SCHOTTEL RudderPropellers.

Succeeding together

Alikhan Sadik, Commercial Manager at SCHOTTEL Middle East, has been with the company for 14 years. With strategic foresight, technical expertise and a strong sense of teamwork, he supports the subsidiary's growth.

I'm incredibly proud to have been part of the founding of SCHOTTEL Middle East in 2011. Back then, we started out with just four employees – today the team has grown to 17," recalls Alikhan Sadik. The subsidiary was established in Dubai – one of the world's major maritime hubs – to improve access to markets in the Middle East, on the Indian subcontinent and in English-speaking Africa. With great success: in recent years, SCHOTTEL Middle East has expanded its presence beyond the Gulf region into Africa and Asia. "We've also succeeded in entering highly regulated markets, navigating complex bureaucratic requirements," he reports with pride.

Finding customer-oriented solutions

After completing his studies in business administration and mechanical engineering, Alikhan Sadik started his career in the offshore oil industry, initially focusing on protective coatings. What ultimately drew him to SCHOTTEL? "Above all, it was the company's excellent reputation in ship propulsion, its customer-oriented approach and the forward-looking product portfolio," he explains. His early responsibilities centered on preparing quotes and managing logistics. Over time, he increasingly took on greater responsibility in after-sales – a role that allowed him to combine his engineering expertise with strategic business development. "The trust placed in me to identify new market trends and develop innovative solutions has significantly strengthened my strategic skills."

Today, as Commercial Manager, Alikhan Sadik is responsible for the after-sales business, which encompasses a broad spectrum of customer support services – from providing essential spare parts and service solutions to developing and implementing customized retrofits tailored to changing customer needs and market requirements. "The most important part of my work is to ensure that customers feel confident in their choice of our propulsion systems," he explains. "This includes providing our customers with time-efficient and cost-effective solutions to minimize downtime and maintain smooth operations." In order to meet this standard, Alikhan Sadik works closely with various departments, including the After-Sales team at SCHOTTEL Middle East and the Purchasing, Logistics and Sales departments at the SCHOTTEL GmbH headquarters in Germany. "This allows us to ensure a seamless customer experience from the initial inquiry to post-delivery support."

Photo: SCHOTTEL

SCHOTTEL Middle East
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“Teamwork isn’t an empty phrase at SCHOTTEL. There’s a genuine culture of collaboration, mutual respect and support.”

Alikhan Sadik, Commercial Manager at SCHOTTEL Middle East

True team spirit

When asked what drives him in his daily work, he has a clear answer: “It’s incredibly rewarding to know that our work enables vital transportation in regions of Africa where conventional infrastructure is lacking. Ferries with our propulsion systems are often the only link for entire communities – connecting people to schools, workplaces, medical care – or simply to each other.” But it is not only the social impact that motivates him – the strong sense of community also inspires him every day. “Teamwork isn’t an empty phrase at SCHOTTEL. There’s a genuine culture of collaboration, mutual respect and support.” To actively promote this team spirit, Alikhan Sadik, known to everyone as Ali, regularly organizes team-building activities. He firmly believes that shared experiences outside of day-to-day work are essential for strengthening bonds and improving teamwork overall.

In addition to regular meetings with his colleagues, the father of a five-year-old son is passionate about cooking and making flavoured chocolate in his free time. He keeps active by playing badminton. His hobbies provide him with new impetus and help him solve problems in his work life, he explains.

“People are fundamental to SCHOTTEL’s continued success”

For his professional future, Alikhan Sadik has clear goals: he aims to further expand his leadership skills and drive the company’s expansion into new markets. He considers Dubai’s strategic geographic location, favourable government regulations and the region’s robust economic growth to be key success factors. Yet for him, SCHOTTEL’s greatest competitive strength remains its workforce. “We’re fortunate to have exceptionally bright and dedicated people whose hard work and expertise are fundamental to the company’s continued success.”

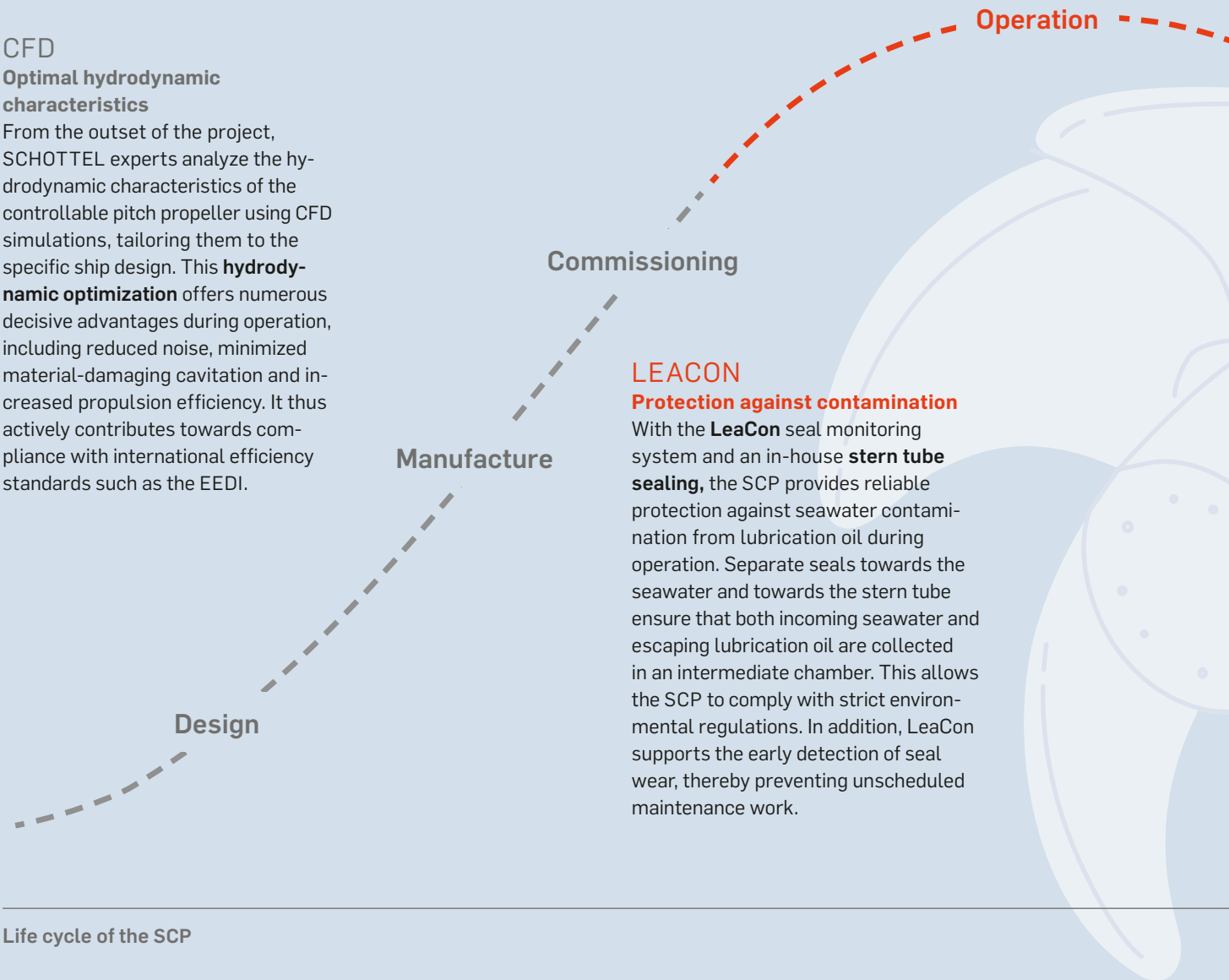
Sustainable at every life stage

Whether it's a trawler, cargo ship, yacht, or naval vessel – solutions for sustainable construction and operation are becoming increasingly important across all ship types. Modern propulsion systems such as the SCHOTTEL ControllablePropeller SCP make a decisive contribution to this. From the hydrodynamically optimized design during the project planning phase to the retrofit of propeller blades for long-term efficient operation: the SCP offers numerous advantages throughout its entire life cycle, making it a particularly environmentally friendly propulsion system.

CFD

Optimal hydrodynamic characteristics

From the outset of the project, SCHOTTEL experts analyze the hydrodynamic characteristics of the controllable pitch propeller using CFD simulations, tailoring them to the specific ship design. This **hydrodynamic optimization** offers numerous decisive advantages during operation, including reduced noise, minimized material-damaging cavitation and increased propulsion efficiency. It thus actively contributes towards compliance with international efficiency standards such as the EEDI.



LEACON

Protection against contamination

With the **LeaCon** seal monitoring system and an in-house **stern tube sealing,** the SCP provides reliable protection against seawater contamination from lubrication oil during operation. Separate seals towards the seawater and towards the stern tube ensure that both incoming seawater and escaping lubrication oil are collected in an intermediate chamber. This allows the SCP to comply with strict environmental regulations. In addition, LeaCon supports the early detection of seal wear, thereby preventing unscheduled maintenance work.

Life cycle of the SCP

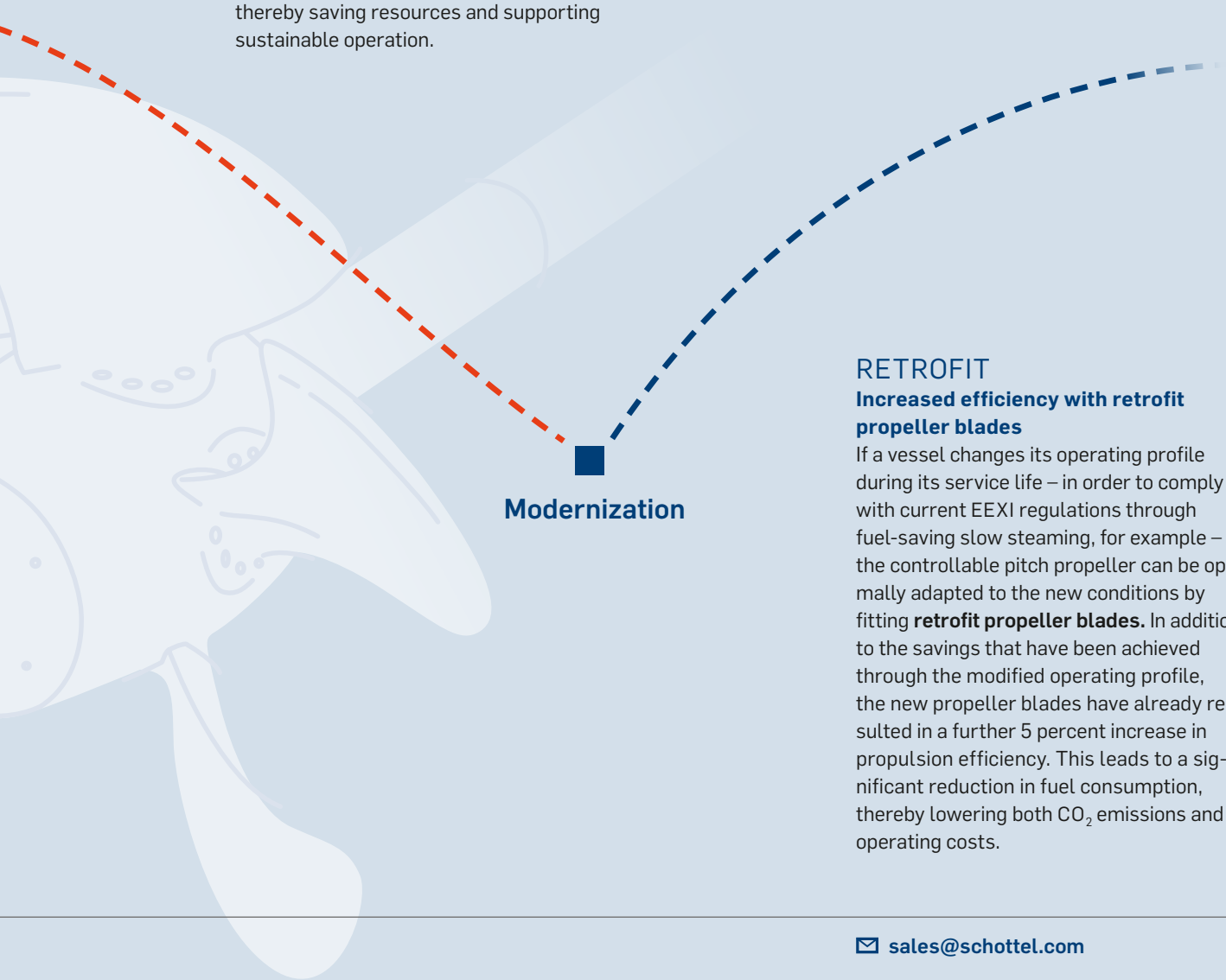
EEDI & EEXI

With the EEDI (Energy Efficiency Design Index) and the EEXI (Energy Efficiency Existing Ship Index), the IMO has introduced two key instruments to reduce greenhouse gas emissions in international shipping. The aim is to cut carbon dioxide emissions by at least 40 percent by 2030 and to zero by 2050. The **EEDI,** which has been in effect since 2013, sets mandatory standards for new ships. It defines a maximum CO_2 output – measured in grams of CO_2 per tonne of capacity and nautical mile – and thus promotes the use of efficient technologies already during the design phase. The limit is tightened every five years to encourage innovation. Introduced in 2023, the **EEXI** complements the EEDI and applies to existing ships with a tonnage of 5,000 GT and above operating internationally. It assesses the energy efficiency based on actual ship data and requires operators to retrofit their fleets with technical measures such as propeller optimization.

DURABLE CONSTRUCTION

Robust design

The SCP is based on over 60 years of engineering experience and is designed to be both robust and user-friendly. Thanks to its **high maintainability,** it ensures a long service life, thereby saving resources and supporting sustainable operation.



RETROFIT

Increased efficiency with retrofit propeller blades

If a vessel changes its operating profile during its service life – in order to comply with current EEXI regulations through fuel-saving slow steaming, for example – the controllable pitch propeller can be optimally adapted to the new conditions by fitting **retrofit propeller blades.** In addition to the savings that have been achieved through the modified operating profile, the new propeller blades have already resulted in a further 5 percent increase in propulsion efficiency. This leads to a significant reduction in fuel consumption, thereby lowering both CO_2 emissions and operating costs.

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News

Trade fairs 2025 / 2026

2 – 5 DEC 2025 // MARINTEC CHINA
Shanghai, China

3 – 5 DEC 2025 // INT. WORKBOAT SHOW
New Orleans, USA

3 – 5 FEB 2026 // EUROMARITIME
Marseille, France

25 – 27 MAR 2026 // ASIA PACIFIC MARITIME
Singapore

19 – 21 MAY 2026 // INTERNATIONAL TUG & SALVAGE CONVENTION
Gothenburg, Sweden

1 – 5 JUN 2026 // POSIDONIA
Athens, Greece

1 – 4 SEP 2026 // SMM
Hamburg, Germany

500 tugs

With the successful completion of 500 joint tugboat projects, Canadian naval architect Robert Allan Ltd. and SCHOTTEL recently celebrated a significant milestone. Tug number 500 is one of a pair for KOTUG Canada, built based on the RAsalvor 4400-DFM design and equipped with rudder propellers with SYDRIVE-M. Mike Fitzpatrick, President and CEO of Robert Allan Ltd., emphasizes: “Decades of working together with SCHOTTEL on 500 different vessels has given us a high degree of confidence in their ability to consistently deliver on their promises.”

500 TUGS

ROBERT ALLAN

SCHOTTEL

Worldwide: update

With the opening of a new subsidiary in the United Kingdom, SCHOTTEL continues to expand its international network. This strategic move strengthens the market presence in the UK and Ireland and lays the foundation for closer collaboration with local customers. Sebastian Sachs has been appointed Managing Director of **SCHOTTEL UK LTD** while continuing in his role as Managing Director of SCHOTTEL Nederland. As in the past Sales Manager **Jordan Soltys** remains the primary point of contact for customers in the United Kingdom and Ireland.

Jordan Soltys
SCHOTTEL UK
jsoltys@schottel.com

News from Asia as well: on 1 July 2025, **Holger Trecksel** became Managing Director of our subsidiary **SCHOTTEL Far East.** He brings with him 23 years of experience in the maritime industry and has previously worked for SCHOTTEL earlier in his career. In his new position, Holger Trecksel supports customers and partners in Southeast Asia, East Australasia and Oceania. He succeeds Joachim Schein, who has played a pivotal role in the company's development and success over the past two decades. Joachim Schein will continue to contribute his expertise in a new capacity, focusing on engineering and service matters.

Holger Trecksel
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Outlook

Expensive ticket

According to the media company *Bloomberg*, the most expensive passage through the Panama Canal to date cost 4 million US dollars. An unnamed shipping company won the bid for the ticket, which allows vessels to bypass the queue at the entrance to the canal. Liquefied gas and liquefied natural gas transport companies are particularly known for bidding on these high-priced passages. The lowest price was paid in 1928 by American Richard Halliburton. He was the first person to swim through the 82-kilometre-long canal, paying only 36 US cents. 1*

14.6 million

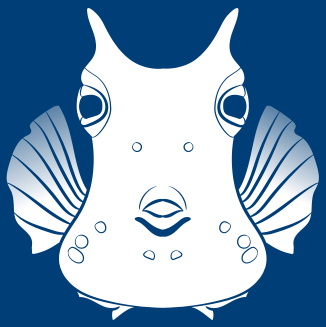
litres of water fill the deep Dive Dubai which reaches a depth of 60 metres. With its abandoned worlds and diverse underwater landscapes, it often serves as a film set. The facility is so vast that it takes multiple dives to fully explore it. 2*

13

is the number of times the Burj Khalifa, the world's tallest building at 828 metres, could be stacked into the deepest abyss on Earth. The Mariana Trench, located in the western Pacific Ocean, measures approximately 11,000 metres from its lowest point to the water's surface. 3*

Boxfish with propeller

The Horned Boxfish is not a piece of travel luggage, but a member of the boxfish family. Because it can move its pectoral fins like ship propellers, it is a particularly agile swimmer. 4*



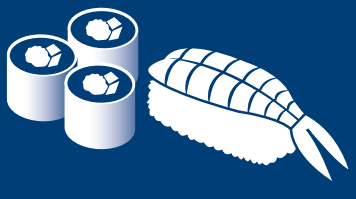
150-

metre-high layer of salt

If all the salt from the world's oceans could be extracted, it would form a 150-metre-high layer covering the entire land surface of the Earth. 5*

Sushi ≠ fish

The word is made up of "su" meaning vinegar and "meshi" meaning rice. The fish is merely a side ingredient and can be replaced with vegetables or eggs. 6*



Sources:
1* Richard Halliburton: New Worlds to Conquer. Garden City Publishing, New York 1929; 2* www.deepdivedubai.com; 3* www.nationalgeographic.de; 4* www.hagenbeck.de; 5* www.wissenschaftsjahr.de; 6* www.japan.travel

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