



RMRS class, Skipskompetanse design fishing vessels to be equipped with Becker Flap Rudders, under construction at Yantar Shipyard, photo © Skipskompetanse.no

DEVELOPMENT: BECKER RUDDER PROFILE FOR FISHING VESSELS

In the history of Becker Marine Systems, the international fishing fleet has always been an important market. Hundreds of fishing vessels are presently equipped with a Becker Flap Rudder.

The rudder is an integral part of a ship's propulsion package and, taking the needs and requirements from today's fishing vessels into account, is crucial to finding the right rudder design. The manoeuvring performance

required for successful fishing operation can only be achieved with a well-designed and customised flap rudder solution.

During fishing operations, it is necessary for the vessel to be able to follow a certain track at low speeds in all weather conditions. Strong currents, wind and waves impact the ability to keep course, which is why a rudder with improved lift capacity at lower speeds is required for successful fishing operations.

Becker's rudder design expertise and many fruitful discussions with operators led to the development of a new flap rudder profile specialised for fishing vessels.

The new flap rudder profile should combine excellent manoeuvring performance at lower speeds and a shorter stalling effect, with no drawbacks in propulsion performance.

Continued on page 2



MEMBER OF STAFF: GODEHARD GAUF

Director of Battery Systems at Becker Marine Systems in Hamburg

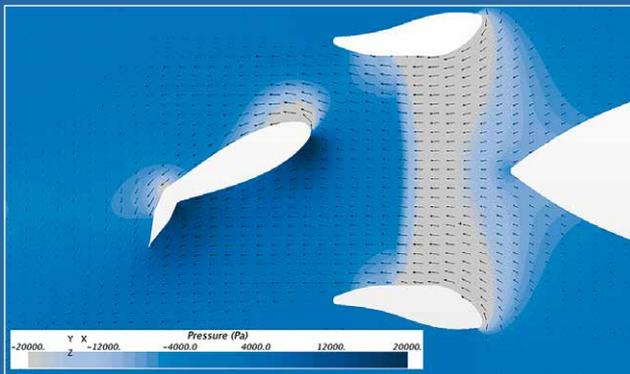
Godehard Gauf joined the Becker team in December 2016. He is responsible for setting up the new Battery Systems department, which is currently developing Becker's new COBRA Compact Battery Rack into a marketable product. COBRA is an advanced concept employing tried and tested 18650 lithium-ion cell technology while taking the special requirements of maritime operation and classification into account.

Mr. Gauf has more than 16 years of experience in the research and development of industrial electronic systems. In the past 10 years, he has led a development team and its organisation (in the disciplines of electronics, mechanics and software) in the maritime industry. Similar to COBRA, the focus was also on a customer-oriented product solution in a new market segment, from concept development, through production control to on-site customer testing.



DEVELOPMENT: BECKER RUDDER PROFILE FOR FISHING VESSELS

(continued from page 1)



Pressure Distribution resulting from CFD analysis
New Improved BMS Profile – 25 degree rudder angle at 2.5 kn

Over the years, Becker has continuously improved various details of the Becker Flap Rudder layout, such as bearing materials and linkage system parts, resulting in lower wear and tear. For example, Becker uses only high-pressure polymer bearing materials for their rudder solutions which work with no additional lubricants.

developed a specialised flap rudder profile for fishing operations. The CFD design process at IBMV involved hundreds of iterations and led to a promising result.

From an improvement in manoeuvring performance, the result requires smaller rudder angles and fewer rudder movements to keep

This allows Becker to deliver grease-free rudder systems, a huge benefit in terms of meeting the US Coast Guard's VGP requirements or simply saving expenditures on expensive, bio-degradable grease.

IBMV, a company affiliated with Becker and a CFD analysing specialist, analysed existing Becker Rudder designs and

the fishing vessel on course. Fewer rudder movements also mean less noise, which is of course another essential benefit for some fishing operations.

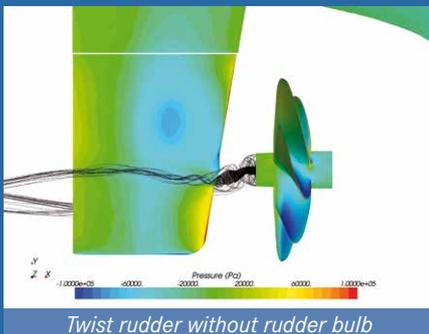
Becker's new rudder profile provides approx. 25% greater lift force at lower speeds. The stalling effect has also been reduced, increasing lift at higher rudder angles. Both improvements could be achieved without affecting propulsion performance.

In summary, the main benefits of the new Becker Flap Rudder profile are:

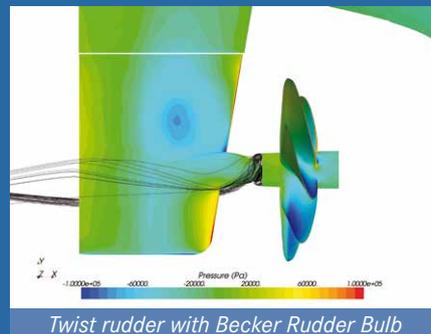
- **Increased rudder forces during fishing operations**
- **Reduced underwater noise**
- **Lower wear and tear**
- **Environmentally-friendly material**

SERVICE & CONVERSION: RUDDER BULB REFIT

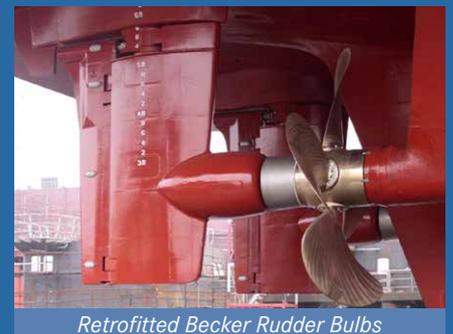
Improving efficiency by retrofitting a custom-made Becker Rudder Bulb



Twist rudder without rudder bulb



Twist rudder with Becker Rudder Bulb



Retrofitted Becker Rudder Bulbs

To improve a vessel's efficiency it is crucial to reduce fuel consumption and lower emissions during ship operation. In order to do so, Becker Marine Systems offers ship owners and shipyards several energy-saving product solutions. In addition to Becker's well-known energy-saving devices such as the Becker Mewis Duct®, the company also offers rudder upgrades to refit bulbs on all kinds of rudder systems.

A rudder bulb retrofit will reduce hub vortex losses as well as propeller rotational losses. Depending on propeller loading, refitting a Becker Rudder Bulb may result in efficiency gains approaching 2-4%.

By employing sophisticated CFD analyses, Becker's IBMV subsidiary is specialised and highly experienced in establishing the most efficient rudder bulb design for each

individual vessel. During the design process, various rudder bulb configurations are checked by iterative calculations, eventually leading to the best system setup.

The final step for installing the vessel's new, custom-made Becker Rudder Bulb can easily be done during normal class docking. Becker Service engineers will be on site to ensure a smooth retrofit.



BECKER PRODUCTS: RECENT ORDER HIGHLIGHTS

Product: Becker Flap Rudder (SA)
Ordered by: Vyborg Shipyard

Vyborg shipyard is building four new ST-118L ship design trawlers, to be delivered by Skipsteknisk of Norway, for Arkhangelsk Trawler Fleet. The Russian shipyard has placed orders with Becker for the delivery of a new flap rudder setup with a specialised trawler profile. The four heel-supported Becker Flap Rudders (SA-type) will have a rudder area of 15.4 m² each, offering excellent manoeuvrability in all areas of operations. Becker Marine Systems is proud to have been awarded the order and warmly welcome the promising strengthening of cooperation with Russian shipyards.



GENCO SHIPPING & TRADING



Product: Becker Mewis Duct®
Ordered by: Genco Shipping & Trading

American-based Genco Shipping & Trading has installed Becker Mewis Ducts® on sixteen bulk carriers of different types within the last four years. Based on the good performance of Becker's energy-saving device, Genco has placed another Becker Mewis Duct® order, continuing the excellent cooperation between Genco and Becker. The 17th vessel of Genco's fleet to receive a Becker Mewis Duct® is the 177k *Genco London* capesize bulk carrier, built in 2007 by SWS China. Four sister vessels have already been fitted with Becker Mewis Ducts®.

Product: Becker Flap Rudder Twisted
Ordered by: Jinling Shipyard, DFDS

Jinling Shipyard and DFDS have selected Becker to supply twin Becker Flap Rudder Twisted systems for two new vessels scheduled for delivery in 2019. The Knud E. Hansen ship design represents a new generation of environmentally-friendly Ro-Ro vessels for DFDS, carrying 6,700 lane metres. Becker's Flap Rudder Twisted was selected to ensure energy-efficiency combined with top manoeuvrability. Becker Marine Systems is very proud of the ongoing good cooperation with Jinling Shipyard, DFDS and Knud E. Hansen ship design.



Product: Becker Mewis Duct®
Ordered by: Precious Shipping

Thai Precious Shipping has ordered a Becker Mewis Duct® for one of their 57,000 dwt bulk carriers. The vessel was built at the Chinese Yangzhou Guoyu shipyard and christened the *Baranee Naree*. It is one of four handsized, SDARI 57 Dolphin design bulk carriers owned by Precious Shipping. Becker Marine Systems has already equipped 48 vessels of the same SDARI design with Becker Mewis Ducts®, convincing Precious Shipping to order Becker's best-selling energy-saving device for their *Baranee Naree* as well.



Product: Becker Flap Rudder
Ordered by: ARTCO

In 2015 American River Transportation Company (ARTCO), a wholly-owned subsidiary of Archer Daniels Midland with a fleet of 77 vessels, refitted one push boat with a Becker Flap Rudder system. Based on the excellent results of the refit, ARTCO has ordered additional rudder sets for two more push boats in their fleet. Suitable for refit and new construction projects, the Becker Flap Rudder continues to be the leader for US inland waterways, improving the manoeuvrability, safety and fuel efficiency of river push boats.

Product: Becker Mewis Duct®
Ordered by: New Times Shipbuilding

Becker has been awarded two more orders for the Becker Mewis Duct® by the New Times Shipbuilding shipyard in China. Located on the Yangtze River, the shipyard has over the past several years built a series of 30 Aframax and Suezmax design tanker vessels for several ship owners, including Frontline and Dynacom. Even with the tanker design's optimised hull lines and state-of-the-art propellers, Becker was able to supply customised Becker Mewis Ducts® that provided verified, additional energy savings of 6% for both tanker designs.





Picture © Bröring

HISTORIC SHIP: TAURUS

The 35 m long and 6.5 m wide *Taurus* oil product tanker (IMO no. 6620149) was built as *Emstank 10* at German shipyard Julius Diedrich and entered service in 1966. During construction the vessel was equipped with a Becker Flap Rudder – the files on that rudder can now be found in the Becker archives as order no. 32. Since then, several

thousand rudder orders have followed for Becker and although more than five decades may have passed by, the faithful *Taurus* is still in tanker service today. She is owned by Bröring, located in Cuxhaven at the estuary of the Elbe River. Becker has just received an order to deliver an exact copy to replace the original rudder.

PRODUCT LAUNCH: COBRA COMPACT BATTERY RACK

In order to meet the growing demand for environmentally-friendly energy solutions Becker has launched a new product range, offering sustainable and high-end energy-saving battery systems such as COBRA.

The COBRA Compact Battery Rack is an advanced battery system tailored to marine requirements. By incorporating a unique battery interconnection and design technology COBRA offers a modular energy storage system with outstanding performance. The system can easily be scaled to the customers' needs by connecting the appropriate number of COBRA battery modules in standardised cabinets. Proven 18650 Li-ion cell technology enables the choice of the Compact Battery Rack for a wide range of ships and applications, ranging from full electric drives to hybrid concepts or peak shaving operation.



The ability to install high-energy as well as high-power battery cells in the COBRA modules guarantees setup flexibility. A multilayer safety concept incorporating a battery management system and a sophisticated cooling technology ensures maximum safety.

In Winsen (Luhe), near its Hamburg headquarters, Becker is building a new production facility for its battery systems. The new factory will start market production of COBRA in June.

The first COBRA-fitted vessel will be a small ferry carrying up to 50 passengers. The ferry will operate in the German Wadden Sea from midyear, equipped with a 104 kWh COBRA for silent and emission-free operation by powering the ship solely on battery power, especially during harbour operations.

JAPAN: NEW BECKER OFFICE

Branch office in Kobe, cooperation with Murakami

Becker Marine Systems is continuing its successful entry into Asian countries such as China, Japan and South Korea. This is the reason why Becker is now opening its own branch office in Kobe, Japan.

From a partnership alliance with propeller producer Nakashima, Becker has already been represented on the Japanese market for approximately 30 years. Due to the significant increase in orders for Becker products from the Japanese market, Becker Marine Systems decided to continue to

expand its knowledge of the market and its presence on the ground in Japan.

Initially, two employees will be working at the new office in Kobe. They will be primarily acting as a technical support team, but will also be doing commercial tasks.

Additionally, Becker is starting a production partnership alliance with rudder maker Murakami Iron Works. The first orders have already been placed for 2,800 TEU container ships being built in Japan.

UPCOMING EXHIBITIONS



Nor-Shipping
German Pavilion, hall C, booth C01-04b
Oslo, Norway
30th May - 2nd June 2017



INMEX SMM India
Joint booth with Dolphin Consultants
Mumbai, India
3rd - 5th October 2017



Kormarine
BEXCO Exhibition Center, hall 4, N4-13,
Busan, Korea
24th - 27th October 2017

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Schilling® Rudders are available in Japan only under the designation Becker SHARC Fishtail Rudder.