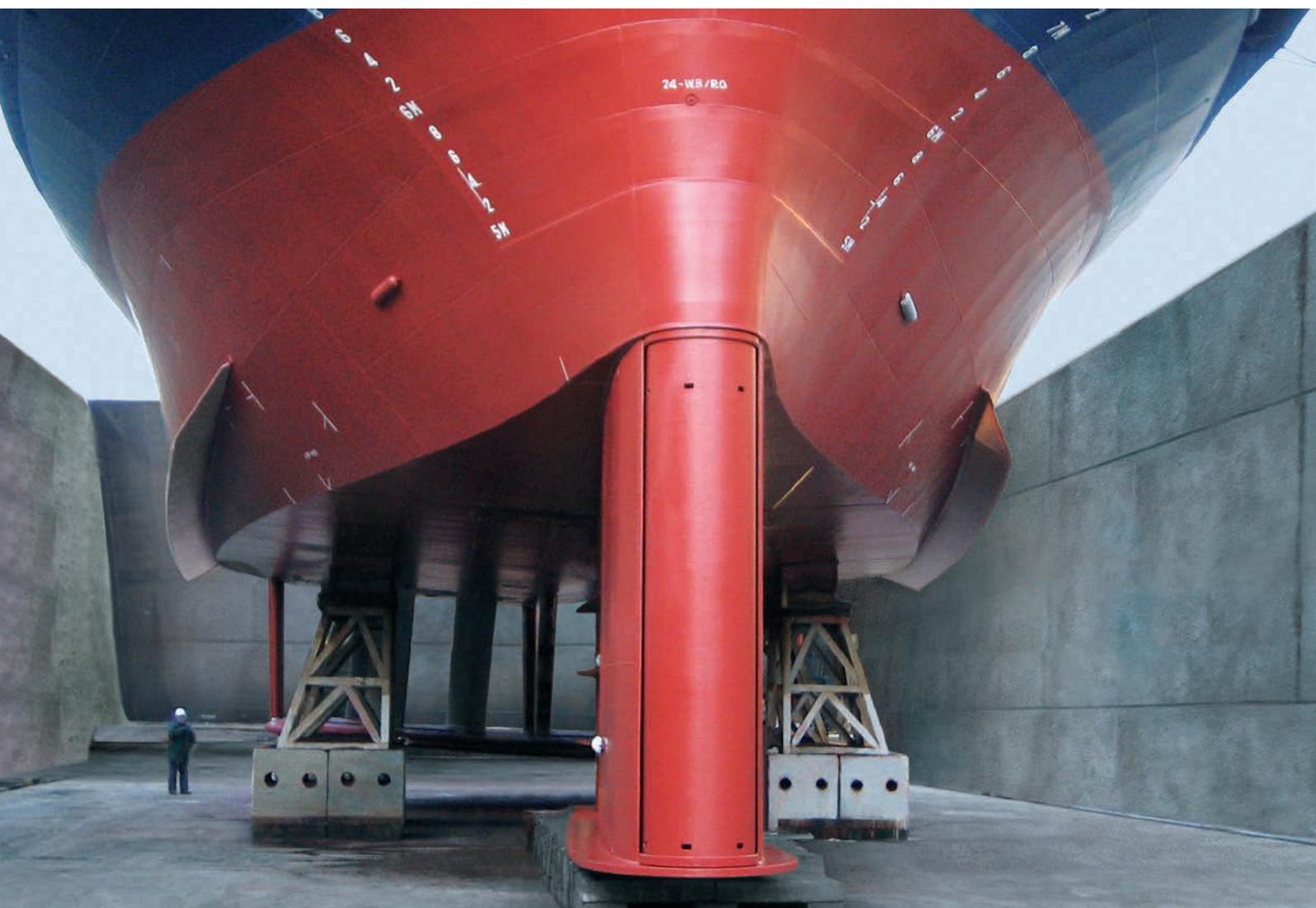


# More safety during escorting Voith Turbo Fin



# Small effort – great effect

The Voith Water Tractor (VWT) is a synonym for safety when it comes to escorting ships in difficult waterways.

Especially after the introduction of the indirect method, during which the VWT assume the function of an external rudder, ship assistance has been revolutionized further. Thanks to the indirect method, steering forces of more than twice the tow-line pull can be achieved.

These forces are primarily generated by the unique underwater design of the VWT in combination with the Voith Schneider Propeller. Thanks to the very fast steering times of the VSP, the VWT can be sailed with utmost safety during such maneuvers. Its outstanding characteristics earned the VWT concept the BAT award for Best Available Technology certificate by the Alaskan Environment Authorities.



VWT model with VTF for test tank



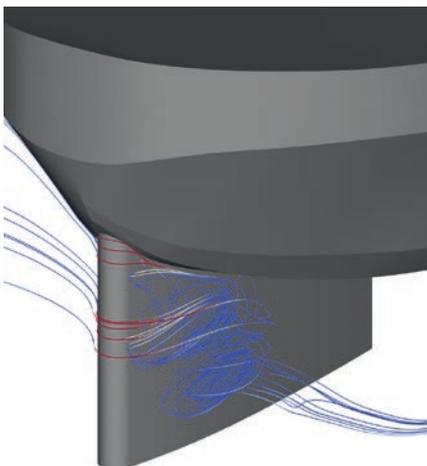
Voith Water Tractor with Voith Turbo Fin

# Higher steering forces by influencing the boundary layer

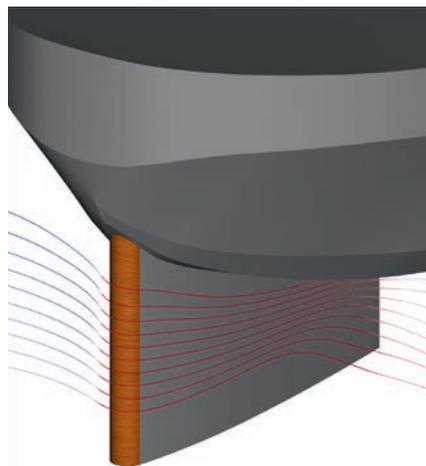
During escorting in the indirect method, the VWT can transfer very high steering forces to the tanker via the tow line. In principle, the VWT assumes the function of an external rudder. A safety relevant fact is that the VWT generates higher steering forces than the actual rudder of the ship to be escorted across the entire speed range of 0–12 kn. This ensures that the VWT keeps the ship safely on course, even if the ship's steering system is damaged. The special fin (skeg) of the Voith Water Tractor produces the largest share of the steering forces.

The course of the VWT to the tanker influences the flow to the fin and has hence a direct effect on the magnitude of the steering forces. The VTF has a rotating tube at the leading edge of the fin, which significantly improves the flow at the fin on the low pressure side. Higher operating angles are possible without separation of the flow. Compared to the steering force of conventional VWTs, this system offers an improvement up to 25%. This results in the significantly enhanced safety of vessels with hazardous cargos that are escorted by Voith Water Tractors (VWT).

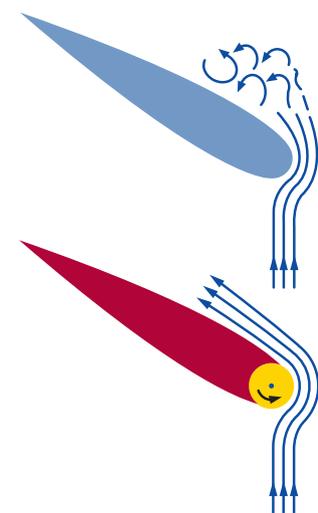
Normal Fin



Voith Turbo Fin



Boundary layer influenced by Voith Turbo Fin



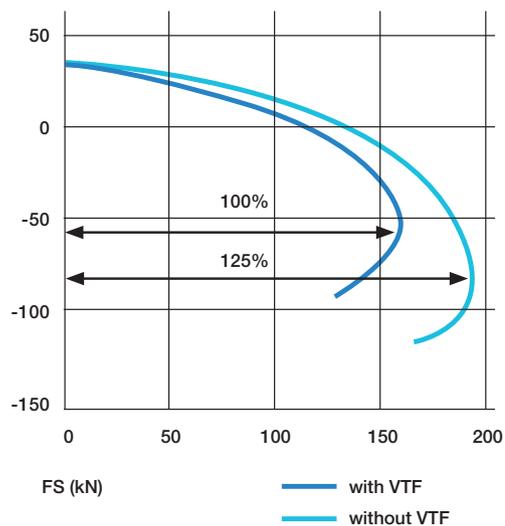
# 25 % more steering force

The dimensions and the performance of the Voith Turbo Fin (VTF) depends on the size of the fin at the VWT. The VTF for the Velox is, for example, 3.7 m long and has a diameter of 0.8 meters. The additional steering force of approximately 30 tons at a speed of 10 kn is achieved with additionally installed power of 45 kW for the drive of the VTF. Similar to the Voith Schneider Propeller, the VTF can be controlled very simply and safely. The VTF is started at certain positions by the pitch levers and the steering wheel in the relevant direction of rotation.

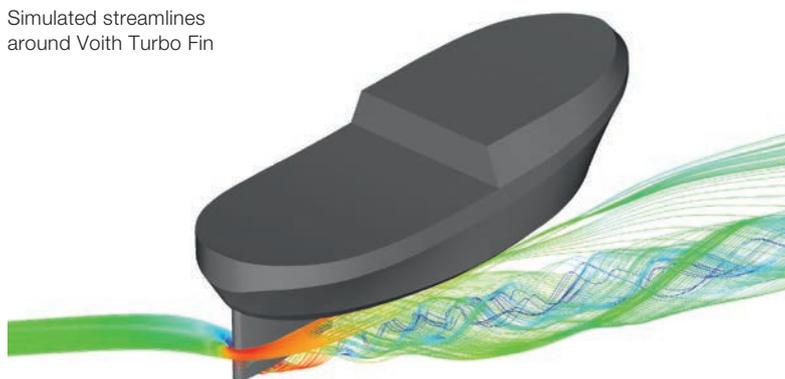


Voith Water Tractor for Østensjø Rederi AS, Haugesund, Norway

## Increasing the steering force with the Voith Turbo Fin



Simulated streamlines around Voith Turbo Fin



# Low investment for higher safety

The conversion of a standard skag to a VTF is extremely simple. The installed power is very low and can often be covered by the existing hydraulic system.

The only requirement is the adaptation of the shape of the fin and the provision of a small machine room for the hydraulic motor above the VTF in the stern area of the ship.



Installation Voith Turbo Fin



Voith Group  
St. Poeltener Strasse 43  
89522 Heidenheim  
Germany

[www.voith.com/marine](http://www.voith.com/marine)

Contact:  
Phone +49 7321 37-2055  
[marine@voith.com](mailto:marine@voith.com)



**VOITH**