

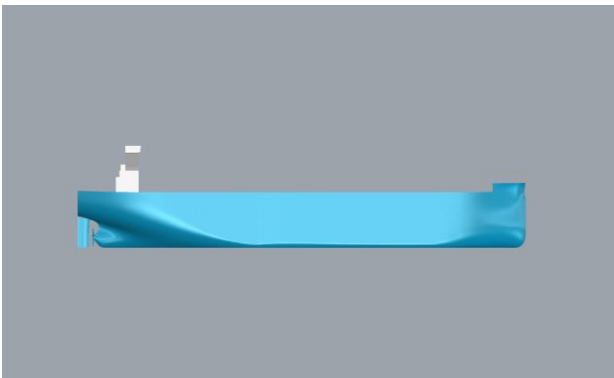


PERFORMANCE ENHANCEMENT VIA COMPUTATIONAL FLUID DYNAMICS

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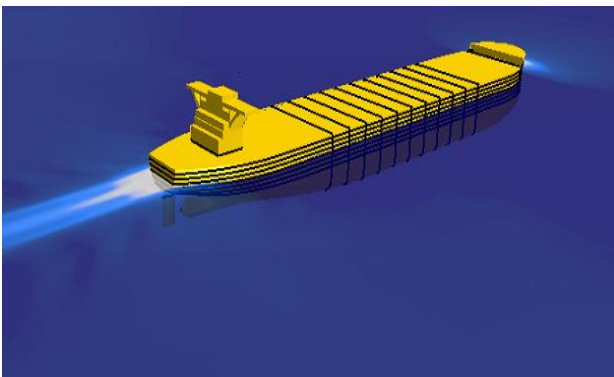
Advancements in Trim Optimization

Alpha Marine Consulting P.C. proudly introduces its latest achievement: the capability to compute Total Resistance (RT) for vessels of any type and speed. In the dynamic realm of ship design, where high efficiency is paramount, our consultancy harnesses state-of-the-art computational tools, to offer a comprehensive solution, facilitating ship design and paving the way for enhanced maritime performance.



Methodology

The journey towards optimal trim begins with a 3D design process that encompasses every aspect of the vessels, including but not limited to hull, rudder, propeller and superstructure.



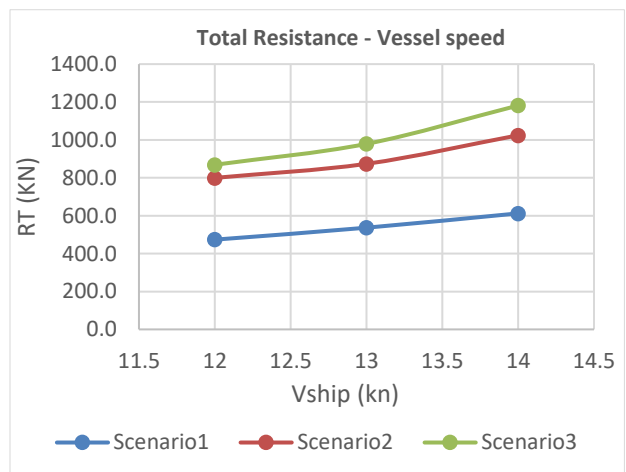
Leveraging SIEMENS STAR-CCM+ advance Computational Fluid Dynamics (CFD) capabilities, we conduct in-depth hull dynamics tests to gather essential data, crucial to this endeavor. These tests yield insights into the model's resistance across varying speeds, thereby equipping us with the necessary knowledge to attain the optimal trim configuration to maximize vessel's efficiency and performance.

Reference Study

In the subject study, three distinct loading scenarios and speeds were simulated to ascertain vessel's total resistance.

Scenario	Taft (m)	Tfore (m)
1	11.532	8.710
2	17.997	18.513
3	18.207	18.294

Throughout testing, the digital twin of the full-scale vessel underwent towing within a virtual tank. This process enabled concurrent measurements of resistance components, water speed, vessel trim, and sinkage. The resistance testing outcomes are graphically illustrated below, revealing the influence of trim and speed on the vessel's performance.



Conclusion

Resistance tests serve as a valuable tool to accurately predict the required engine brake horsepower (BHP) and fuel consumption. This methodology, enables **AMC Hydrodynamics Discipline** to optimize trim, thereby enhancing overall vessel's performance. Such practices not only contribute to operational efficiency but also propel maritime innovation towards new horizons.

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