

Courtesy Amels Holland BV.



With more demand for quality, the latest generation of Mega Yachts face even more rigorous research and development. Besides the traditional design speed requirements, performance in operational conditions is one of the new areas where further extension of the design quality can be achieved.

Mega performance for Mega Yachts

In a bid to address this luxury ocean-going motor yacht builder AMELS Holland, stabiliser systems' supplier KoopNautic, designer Seahorse and MARIN, have started a new joint industry project called Mega Yachts@Sea.

Mega Yachts@Sea will investigate the performance of the latest generation of mega yachts in operational conditions, largely with respect to resistance and propulsion. The project aims to develop acceptance criteria and tools to verify the resistance and propulsion performance of the yacht, next to the traditional contract speed. An extensive full-scale, measurement campaign, model tests and CFD calculations, will be carried out.

Full-scale measurements will establish the operational profile and the performance in service conditions. Four yachts will be tested extensively during sea trials. Besides the traditional speed trial and manoeuvring measurements, specific measurements will be carried out to determine optimum fin settings at various sailing speeds. In addition, two yachts will be monitored permanently during one year of operation.

This monitoring campaign will provide sailing profiles, motions of the vessels in various conditions, vibration and speed power curves for the operational conditions. To improve predictions, modifications will be carried out to the calculation tools used during the hydrodynamic design.

Additional calculations

Together with KoopNautic, alignment of the stabiliser fins in the full speed range will be investigated, plus the performance of anchor will be examined. The measured alignment will be compared to the additional calculations and model tests. It is then possible to conclude whether these can be used to predict appendage alignment in calm water in order to minimise appendage drag, noise and vibrations and hull resistance.

Seahorse will investigate the implications of modification in calculation, model tests and design methods, on the overall design process.

With a combination of improved tools and better correlation, a further improvement in appendage alignment is expected, together with more accurate calm water performance prediction over a broader speed range. These improvements will provide a better starting point to design for service. With these criteria, seakeeping and manoeuvring characteristics can be better optimised at an earlier stage of the design.

A change in contract specifications is expected in the future, shifting the focus from trial conditions and design speed, to service conditions and operational profiles. Mega Yachts@Sea will provide the tools to design for service.

MARIN

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