

Sailing the Seven Seas

Serving innovation and improving engineering

With increasing demand for larger, unique, multi-utility, environmentally-friendly and more comfortable yachts, the industry answers with incredible developments applying state-of-the-art naval architecture. MARIN has collaborated extensively in the development of these innovative and ever-more demanding projects. Looking ahead, MARIN's ambition is to build upon its role as a leading knowledge institute and to assist owners, designers and yards with its consultancy services and advanced research facilities. Report outlines MARIN's extensive consultancy services and announces the soon-to-be launched YACHT JIP FORUM.

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In recent years, luxury yacht designs developed substantially affecting both the look and performance. The introduction (or revival) of straight and reversed bow shapes, hybrid main and auxiliary propulsion, roll stabilisation systems and integrated DP/Joystick control systems are some of the more obvious developments. Variety in design solutions has increased immensely, facilitating even further customisation levels. The main driver for these innovative and unique designs is the demand to “stand out from the crowd”. A trend for increasing vessel size is another important development that brings with it an inherently stronger requirement for operational safety and capability.

From MARIN's perspective the market is being driven by a demand for innovative and unique design solutions, higher standards in terms of quality and comfort and performance-enhancing motion control systems. Even in this prestige market MARIN sees a stronger focus on cutting the fuel bill and emissions, as the market becomes increasingly environmentally aware.

Innovation

Innovative and unique designs are obtained by being both creative and by being aware of developments and their potential impact, as well as by being flexible in the concept design process. MARIN is able to provide a designer with an overview and evaluation of different design solutions, considering general performance aspects such as comfort, safety, sustainability and efficiency. Through our consultancy

Rasselas - pressure distribution on the submerged hull based on MARIN RAPID calculation.



standards in luxury yachting

service MARIN's extensive know-how is made readily available in those most important (pre-contract) concept design stages.

In recent years, much effort has been put into enhancing the comfort onboard luxury motoryachts. Some examples include the application of fin-stabilisers and other roll stabilisation systems, as well as vertical and reversed bow designs. The latter reduces possible slamming induced vibrations during transits in exposed areas.

Opportunities for further improvement include possibilities to optimise roll stabilisation concepts, bow design for comfort, the use of DP systems to avoid roll-resonant and slamming sensitive conditions and the use of main and auxiliary propulsors with a low vibration and noise excitation. The integration of the different control systems onboard may improve the ride of the vessel even further, for example using the rudders to reduce roll and using the fins for steering.

DP/DT

Complex in its technical requirement but simple to use Dynamic Positioning (DP) and Dynamic Tracking (DT) systems enhance the ease and safety of operation in confined and busy areas such as harbours, bays and shipping lanes. It also increases the capacity of the vessel to maintain its position without anchoring and it can be used to reduce ship motion-induced discomfort. The ship concept and the allocation between different propulsors and actuators

can be optimised for DP/DT purposes. Lessons can be learned from the developments in the offshore and cruising market.

Fuel consumption and emissions

Speed, range performance and fuel consumption are initially the main subjects when designing the concept. Further fuel cuts can be achieved by streamlining the hull and appendages using state-of-the-art CFD technology. As a concept, possible solutions and flexibility may be found exploring the diesel-electric platform. Besides a more efficient use of diesel engines, propulsion concepts such as pods facilitate better fuel consumption, increased manoeuvrability and reduced propeller induced vibrations and noise.

Joining forces

To support the increasing interest for innovation and advanced hydromechanical design, MARIN offers its multi-disciplinary expertise gained in the naval, cruising, merchant and offshore industries. Our combination of consultancy, research and monitoring services can assist from the initial design stage, right throughout the trials.

Bearing in mind that innovation is a key focus for yards and designers, MARIN intends to take a leading role by using its expertise to serve the industry as a whole. This can be realised by launching Joint Industry Projects based on the same successful principles applied in the offshore, naval or cruising industries. Joining forces on dedicated pre-competitive subjects facilitates important R&D work, yielding a significant step forward for the industry, while keeping each participant free to use the knowledge and insight gathered. In fact, such a platform - YACHT JIP FORUM - will be launched by MARIN in the near future. Feel free to show your interest and we look forward to hearing from you!



In this special yachting section of Report we would like to highlight a few of our clients' experiences from past projects:

David Elson, Senior Naval Architect of DEVONPORT Royal Dockyard Ltd.,
comments: "Having worked with a number of tank test facilities around the world, DEVONPORT took the decision to place the contract for its latest superyacht with the MARIN facility. The decision proved to be beneficial both from the perspective of the yard and the owner's team. The superyacht, in excess of 90m, included novel features and the support and advice offered by the experts within MARIN proved valuable during design development. The programme itself was extensive with a scope including powering, seakeeping, manoeuvring and wind tunnel tests. DEVONPORT's experience throughout this process was that the MARIN facility provides excellent quality and the expert knowledge within the company can benefit any project. We look forward to a continued alliance."

Captain A.J. Andersson, Director of Wright Maritime Group, states:
 "Our experience with MARIN was of the highest value not only in the actual results of the hull designs, but also in how our knowledge developed during the process. It was most interesting to see how MARIN separated the three main elements of tank testing to be lead by three competitive experts in each field. MARIN allowed powering, manoeuvring and seakeeping to be given what ever priority the vessel owner determined to be most important for his operation. Given today's yacht market reaching into more complicated appendages and running gear, tank testing is more regularly employed and our experience with MARIN was completely satisfactory."