



Building yachts others do not dare to build

Dutch superyacht builder Feadship has been a customer of MARIN for many decades.

Feadship's iconic yachts are entirely custom-built to the best quality and have always pushed the boundaries of naval architecture to its very limits. MARIN has been alongside this unique yacht builder on many of its inspiring journeys, where nothing is deemed impossible. Report interviews Ronno Schouten, Head of Design.

Ronno Schouten



Every year Feadship launches a new design concept at the Monaco Yacht Show. Given the nature of its clientele, confidentiality is highly prized and its designs are always kept under wrap. But the new concept gives Feadship the chance to show clients what is possible and what R&D work it has been doing.

Although Feadship cannot reveal any details of the yachts it is working on it can talk freely about its Future Concepts. One extremely special concept is the "Feadship Royale". As the name suggests, this yacht is designed for the Dutch Royal family and as the official State vessel, it will show the world what this unique Dutch yacht building company is capable of.

Mr Schouten comments: "As the Feadship Royale will demonstrate, we build exactly to our client's wishes. This yacht is simply not suitable for anyone else. Other builders claim that they make custom-made vessels but we truly do. For example, with the new

propulsion system on this yacht, the blades point inwards so they are more efficient and quiet, there is no electric motor inside and no pod outside. It is very, very quiet and extremely comfortable. Our boats are fully customised. There are not even a handful of yacht builders out there that do what we do."

A recent example, the "Breathe" concept, certainly inspired one client and it highlights the partnership with MARIN. Breathe emerged when Feadship considered how superyachts can have improved propulsion and as a consequence, better fuel efficiency. With typical yachts having two propellers for easy manoeuvrability and reliability, Feadship took an unusual approach and considered what would happen if a yacht has only one propeller.

Mr Schouten says: "We considered that if there is one propeller there is better inflow and higher efficiency, but at the same time we wanted to have redundancy and

manoeuvrability." Feadship introduced a podded azimuthing propeller. "This electrically driven, contra-rotating propeller can spread the load better and it has 360 degree manoeuvrability. It has good inflow and higher fuel efficiency." The new concept design also had a medium speed diesel engine rather than a high-speed engine and two large rudders. Feadship was expecting fuel savings of 20-30%.

Following a concept desk study done with MARIN on the merit of such a propulsion system and possible alternatives, a model testing programme was undertaken to confirm the expectations. "The propulsion method is

very innovative, we were confident it would work but were concerned that maybe we couldn't achieve the levels of efficiency we thought were possible. We also had concerns about the manoeuvring and steering, given that the boat would have one propeller with a pod behind. We had to prove it and keep our promise to our clients. "We wanted to show them what could be achieved in terms of efficiency and sea-keeping. We were delighted that we did achieve the numbers and even better than we had originally thought!"

And this undoubtedly impressed the client as the first concept turns into reality. The

first yacht with this new hybrid system is underway. The hull arrived at the yard in October and the yacht will be completed in 2015.

Although the client can't be revealed, Mr Schouten says the owner was interested by the fuel savings, but more importantly, it was really about the flexibility of the system. "This yacht can sail diesel electric or diesel direct and is very manoeuvrable. And buying yachts of this type our clients are always supporting innovation. They are always pushing the boundaries, and what is learnt in this arena is also interesting for shipbuilding in general. "

The hybrid system will absolutely be chosen by other clients, he says, adding that even though it maybe a slightly higher investment in the first place, it will be earned back in a few years.

Feadship's superyachts are world-renowned and MARIN is often at the start of the process - when pioneering concepts are turned into reality



Aluminium yacht with an all-glass superstructure

Another ground-breaking project MARIN has been involved in was for a certain aluminium yacht - the name cannot be revealed - with an all-glass superstructure. "This was a really revolutionary project. Essentially, aluminium deforms and glass doesn't and could easily break. We had to combine simulations with a complex model testing programme in waves and measure the deformation of the model, which importantly, had the same stiffness as the real yacht. This was the first time we had used that much glass - 10 m long panes - so it was very risky." This amazing yacht has now been sailing for a year with no problem at all. "The stresses correlated with the measurements better than we had dared to hope," he points out.

Because there will be more yachts with an Axe Bow, Feadship has also been working with MARIN examining the seakeeping behaviour of these yachts in stern quartering



The Predator, the first Axe Bow superyacht

waves. "Calculations show that we can achieve the same seakeeping and steering capability as a conventional yacht. These calculations prove to our clients that the seakeeping and steering behaviour of the boat is more than good." The first Axe Bow superyacht, the Predator is pictured.

MARIN, Feadship, TNO and the Royal Netherlands Navy have also worked together on a very large study looking into comfort at sea. They examined which motions cause seasickness – if it is acceleration, heeling, rolling – and also considered if certain people are prone to it if they are a certain

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age/gender etc. The motions of the yachts were calculated, resulting in an in-house tool at Feadship, which can calculate the Comfort Rating.

"We can compare different yachts, new and old designs. This is a good prediction tool and we can combine it with all the information and data we have from our clients. We can prove the yacht will be more comfortable and this is used in the initial design to decide on the length, beam, location of owner's stateroom and if aluminium or steel would be better for example."

As well as this MARIN helps with full-scale measurements and their correlation with model testing and simulations and it offers advice to Feadship. "We have a huge database, it is always very valuable to get on board measurements and fundamental to build up our knowledge." Mr Schouten adds that they work together with MARIN to combine the Feadship and MARIN knowledge pool to optimise the yachts of the future. "You can walk around MARIN and find experts with 30 years plus experience, which is such a valuable resource."

In the short-term he expects clients to continue to focus on fuel consumption and propulsion, with more hybrid systems coming into development. "Clients want more flexibility, more efficient cruising speeds and high maximum speeds. This flexibility in speeds may require different propulsion options. And comfort will remain top of the agenda."

Feadship has 16 yachts under construction, many for repeat clients. Mr Schouten says Feadship's secret to success over the 100 years is having the ability to stay ahead, be innovative and to keep on pushing boundaries forward. "We offer true customisation of the highest quality and comfort standards. ▢