

Royal Huisman Ensures Exceptional Yacht Quality with 3Dconnexion 3D mice

3D Mouse: SpaceMouse® Pro, SpaceMouse® Wireless, SpaceNavigator®

3D Application: Rhinoceros®, Autodesk® AutoCAD®, Inventor® and Navisworks®, SSI ShipConstructor®



Photo by Carlo Borlenghi

With a dedication to perfection and a world-leading reputation for crafting bespoke yachts, Royal Huisman use 3Dconnexion's 3D mice as they realise the very highest of expectations.

Yachts are a proud part of Dutch heritage so it's not surprising that some of the world's most beautifully crafted sailing vessels originate from the Royal Huisman shipyard in Vollenhove, in the North of the Netherlands.

Royal Huisman create bespoke luxury yachts that are truly unique. Each is a triumph of quality, functionality, craftsmanship, reliability and aesthetics. A combination of interlocking structural and component systems that adds up to more than the sum of its parts.

This is no happy accident. It is the result of unwavering commitment to an approach Royal Huisman call Intelligent Engineering™.

"Intelligent Engineering™ is a highly evolved process to bring together, in the most productive manner, the best people, facilities and systems to build the finest custom yachts."

Their trademark approach enables Royal Huisman to blend time-proven shipbuilding techniques with 21st

century engineering innovations, often inspired by other leading design disciplines. The result is 'no compromise' design and construction, and a finished vessel that could be considered a wonder and a feat.

The precision of Royal Huisman craftsmanship is evident in the hand-tooled woodwork, carved using traditional techniques in a joinery hall rich with the smell of sap. It can also be seen in the trendsetting 'vacuum bag only' technology used in the 80 metre composite hall of Royal Huisman's subsidiary Rondal. Here carbon fibre masts, that will contain their rigging neatly inside, are brought up to a curing temperature of 85°C for incredible strength and lightness.

Such is the pursuit of perfection that the construction phase typically takes two years. Like a work of art, there can be no compromises to the integrity of a Royal Huisman yacht. All elements, from the superstructure to the distributed systems, must work together in complete harmony.

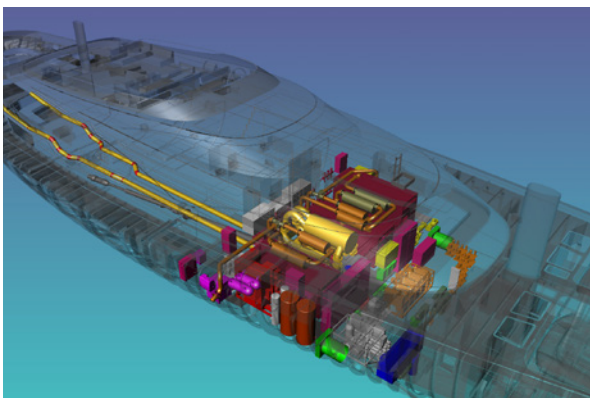


Photo by Franco Pace

Pre-engineering for perfection

At the beginning of a project, before engineering systems are planned in greater detail, Royal Huisman translate the Naval Architect's plans into a centralised 3D environment for preliminary structural design and space management.

Rhino pre-engineering 3D CAD software is typically used at this stage. These 3D models are very light, so the team is able to compare object positions, sizes and shapes rapidly. During this process, design reviews establish the composition of the yacht – down to the last centimetre.



Example of Rhino pre-engineering

The forces of the sea and wind can be excessive, particularly in heavy weather conditions, so a sailing yacht's structure must cope with a multitude of stresses from many directions. In addition to strength, the structure must satisfy the lofty performance and aesthetic expectations held of a Royal Huisman yacht, which dictate both a sleek hull shape and accommodation areas that are as spacious and comfortable as possible. These requirements involve matching the exterior to the naval architect's vision and organising the yacht so that it will be a pleasure for the owner, guests and crew to sail.

Balancing interior spaces against structural necessity and technical implementations is a critical process, particularly for a complex luxury yacht project where there can be no compromises.

Rigorous attention to detail

Engineering design begins once the space management details have been agreed. For this, Royal Huisman typically switch to ShipConstructor, an AutoCAD-based CAD/CAM application.

Although the flowing lines of the exterior might not suggest it, a complex collection of structures and systems exist within a luxury sailing yacht.



Photo by PrakArt Photography: Engineer using SpaceMouse Pro

Royal Huisman's Intelligent Engineering™ approach requires that even the smallest of details receive rigorous attention, so different departments divide up the work on these elements.

Mechanical elements – including the steering system, winches, anchor mechanism and doors – are planned and laid out using Autodesk Inventor. Structure, distributed systems (such as piping and HVAC) and other equipment are each laid out separately in ShipConstructor, and interiors in AutoCAD 2D/3D. These are all appended to one master file, with Navisworks the collaboration tool of choice.

“When working in 3D, using only a 2D mouse limits your capabilities. Adding a 3D mouse makes it much easier to position your models or views, increasing productivity and saving hundreds of mouse clicks a day. With a 3D mouse in one hand and a normal mouse in the other you are able to combine movements, motions and clicks. So a 3D mouse is an essential tool of an engineer and not just a gadget.”

Lambertus Oosterveen, CAD Manager at Royal Huisman

Tradition meets cutting edge engineering

Such extensive CAD modelling rapidly proves its worth. Every element of the yacht will be thoroughly considered in the 3D CAD environment and sometimes even tested, through to full assembly and assessment before the final installation. Physical 1:1 plywood mock-ups may be constructed to consider aspects such as sight lines and safety features, and in particular, ergonomics, to get a sense of the space and a practical insight into how the layout of the area would work on-board.

The benefits of the 3D CAD model even extend to the hull. Sheets of Alustar aluminium are precisely cut, shaped and catalogued before construction.



Photo by Ray Main

Once the hull is complete it is laser scanned thoroughly and this data is entered back into the 3D CAD model. Slight variances against the original computer model can then be assessed. All of the affected exterior elements are adjusted to fit the real hull exactly.

With the help of 3D CAD tools, these seasoned craftsmen continue their painstaking work to ensure that each Royal Huisman yacht leaving the shipyard is a triumph of quality, functionality, craftsmanship, reliability and aesthetics.