

MARINE AND OFFSHORE CASE STUDY  
**HEESEN YACHTS**



Photo © Jeff Brown / Heesen Yachts

### Challenge:

Heesen Yachts needed a unique across-the-board platform to support innovation and handle the complexity of today's custom-build luxury yacht design.

### Solution:

Heesen Yachts adopted Dassault Systèmes' solutions including CATIA 3D modeling applications and DELMIA digital manufacturing applications for yacht design and assembly.

### Benefits:

With a 3D-based development process and improved multi-discipline collaboration from ideation to yacht manufacture, Heesen Yachts meets ambitious delivery schedules and increases client satisfaction.

## HEESEN'S DNA

Sailing the seas in a luxury yacht is an extraordinary experience. And the experience begins in its owner's imagination. Luxury yachts are vessels customized to unique and precise specifications, so when Frans Heesen founded Heesen Yachts in 1978, he had one thing in mind: to create exceptional sailing experiences with yachts built to superior engineering standards and meticulous attention to detail. "The first yacht he built was a 24 meter aluminum high-speed motor yacht, which has since become part of the company's DNA," said Mark Cavendish, director sales and marketing at Heesen Yachts. "Since then, we've become well-known for our high-speed aluminum high range luxury yachts."

Heesen's yachts are fully customized 30 to 80 meter luxury vessels. In the past 30 years Heesen Yachts has designed, built and delivered over 170 yachts. No two of them are alike but all of them have one thing in common: they were all delivered on time. From the very first concepts and naval architecture to the interior design, the challenge is to always remain focused on the final product, keeping the owner's wishes at heart. Heesen Yachts clients are considered family from the day they walk through the door to years after they've taken possession of their new vessel. "Our number one challenge when a client orders a yacht is to make their dream come true," said Peter van der Zanden, general manager for design and development at Heesen Yachts. "We work closely with them throughout the design process to incorporate their desires while ensuring the highest level of quality even if this means making changes late in the design process."

Building such dreams is an extraordinary and unique privilege, requiring expertise, commitment and professionalism, combined with cutting edge technology, build technique

and quality anchored in tradition. It comes at a considerable investment, however, requiring perfect planning and execution at every step.

## MORE OF EVERYTHING EXCEPT TIME

In a demanding luxury yacht market, flexibility and the ability to collaborate with clients from the earliest stages are extremely important. "Our old 2D design methods and tools were just not up to scratch when it came to dealing with the complexities of large custom-built luxury yacht design," van der Zanden said. "Everything must be more: more room, more comfort, more amenities, and more luxury except when it comes to delivery times. This always has to be less. All this makes things very complex for us. We needed more power from our software solutions and Dassault Systèmes' solutions, including CATIA 3D modeling applications, was the answer. Keonys, a Dassault Systèmes partner, helped us to successfully implement the software. The relationship between our three companies is a strong one."

## MULTIDISCIPLINE COLLABORATION

Luxury yachts are like floating five-star hotels and the collaborative effort of many disciplines to design the structure, engines, piping, interior and exterior layout and amenities. "Our design, engineering and production people collaborate in a common environment, exchanging ideas and making modifications on the fly," van der Zanden said.

Working in 3D is a major advantage. "Designs are clearer so people can more easily express their ideas," van der Zanden said. "Our different departments depend on each other to come up with the best designs and working in 3D gives everyone a clearer understanding of the requirements of each discipline. Moreover, we can show our production



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— Peter van der Zanden  
General Manager, Design and Development

department the most optimized assembly sequences with instructions generated using the interactive 3D visualization and animation capabilities. CATIA also helps us to optimize the use of space inside the vessel. Since every discipline works on the same model in real time, they can make any necessary adjustments before sending the designs to production saving valuable time all around."

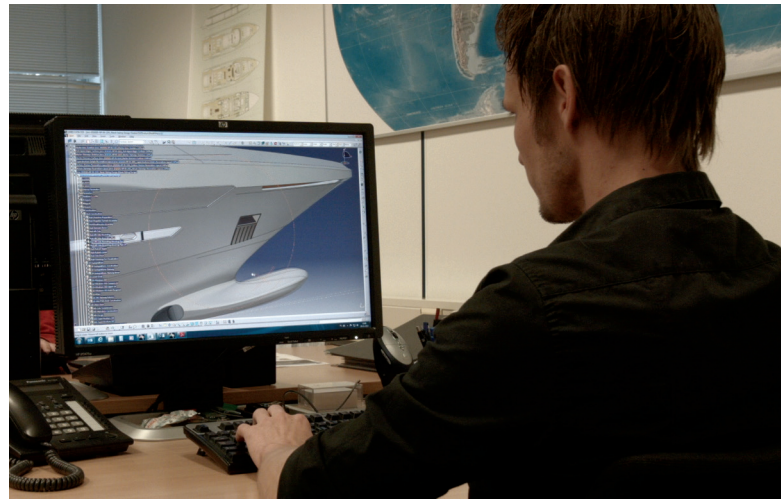
Space inside any yacht is limited and must be shared between the various disciplines that need to work together to position their equipment. "This includes all mechanical engineering systems, ventilation, sanitary systems, fresh water lines, electrical, window wipers and pneumatics," said Piet van der Linden, mechanical engineering department manager. "Our role in mechanical engineering is to ensure that all systems are positioned and functioning correctly, and that we make efficient use of the space we have available. CATIA is used to design all the systems, and with the digital 3D mock-up, we are able to verify that everything fits and that there are no interferences before finalizing the routing assembly drawings."

### SETTING NEW PERFORMANCE STANDARDS

Dassault Systèmes' integrated environment has been a valuable asset for the design of Heesen Yachts' award-winning luxury superyacht. "The Galactica Star is a revolutionary 65-meter luxury yacht," Cavendish said. "She's a very important yacht for us and the first vessel of her kind because based on the innovative Fast Displacement Hull Form (FDHF) patented concept. The most striking feature of this impressive vessel is her phenomenal speed. She has a top speed of nearly 30 knots, which really sets her apart from the world's top 200 largest yachts. Beyond speed, another advantage of the FDHF is its exceptional performance. The Galactica Star performs more efficiently over a wider range of speeds using 20% less fuel than any other yacht in her class."

### COMPLEX CUSTOMIZATION

Building a one-of-a-kind yacht like the Galactica Star poses many challenges. "One of the biggest is managing the vessel's many designed and assembled parts," said Jos Verbruggen, manager shipbuilding engineering at Heesen Yachts. "Every part has its own strength, stiffness, and vibration requirements, which makes it unique but also very complex to design and manage. We can't just take a part from another boat and use it in this yacht. To assemble all these parts, CATIA helped ensure a smooth assembly sequence by enabling us to first verify in a virtual environment that parts fit together without interference. It was a clear illustration of successful interdisciplinary collaboration, working simultaneously in 3D to



Top image: The revolutionary Fast Displacement Hull Form, designed in 3D with Dassault Systèmes' solutions allows Galactica Star to perform more efficiently over a wider range of speeds than any other yacht in her class.

Bottom image: Heesen Yachts adopted Dassault Systèmes' solutions including 3D modeling application CATIA to allow naval architects to create, analyze, modify and optimize the interior design of the Galactica Star more rapidly and accurately, accelerating the pace of innovation.

### Focus on Heesen Yachts

Dutch shipyard building refined superyachts known for their exceptional performance, cutting-edge technology and timeless design

**Products:** fast displacement, displacement and semi-displacement yachts

**Employees:** 400

**Headquarters:** Oss, The Netherlands

**For more information**  
[www.heesenyachts.com](http://www.heesenyachts.com)

### Focus on Keonys

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produce the optimum design before releasing it to production. In essence, it was right the first time," Verbruggen said.

CATIA was also used to create flattened views of the aluminum sheet metal for the hull, which was then passed on to the DELMIA digital manufacturing applications to cut the contours. "For the Galactica Star's hull we had complex curved forms – single and double curved plates – which are normally very difficult to work with. CATIA automatically generated the flattened views from the 3D design parts, which were then cut out with extreme precision," Verbruggen said.

The Galactica Star has ample outdoor living spaces including a big open sundeck, a large open foredeck and a fully equipped duplex beach club with a swimming pool in the half deck. "The openings for these facilities, which were serious challenges during construction, were easily designed and planned for with CATIA. This helped to avoid running into problems, which would have set back delivery of the yacht to the client," he said.

### CLIENT EXPERIENCE

The interior design department is Heesen Yachts' "dream factory" working closely with clients to transform their desires into reality. "Our job is to create a pleasant atmosphere for the owner and we usually have to walk a fine line between what they want and what is feasible," said Perry van Hirtum, manager of interior engineering at Heesen Yachts. "We can present the client with a virtual 3D mock-up of their future yacht interior, which helps us understand what the client wants, and for the client to clearly visualize what we propose in response."

Over the last 30 years, Heesen Yachts has been transforming its clients' dreams into reality with yachts built to exceptional engineering standards. While the company has made a name for itself over the past few decades, Heesen Yachts intends to keep pushing the limits of yacht design innovation, efficiency and performance and continue to make dreams come true.

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