SIEMENS

Sunseeker International

Sunseeker creates a seamless yacht-building enterprise with Siemens PLM Software portfolio, boosting yacht production rate 100 percent

Products
NX, Teamcenter

Business challenges
Maintain quality

Continue to innovate

Improve manufacturing speed as product line grows

Keys to success
Integrated CAD/CAM capability

Fully detailed design phase

Results
Eliminated two stages of the design cycle

Quicker customer decision-making and approval

Accelerated development of new models through re-use of parts

More than twice as much design detail captured in drawings

Streamlined procurement and optimized stocking

100 percent increase in production rate, from two models per year to an average of four per year

Sunseeker optimizes yacht design, parts procurement and build with NX and Teamcenter

Modern manufacture, classic beauty
With sleek lines, spacious decks and sport performance, Sunseeker yachts exude presence and power. In harbors all over the world, the external styling can be identified instantly, and the curvaceous interiors provide all the comforts of home.

The essential Sunseeker look is achieved by keeping the overall height of the boat low without compromising headroom. This involves optimizing the function of machinery below-deck so that it takes up minimal space. "What Sunseeker does very well is to make interiors larger and quieter, with less vibration," explains Ewen Foster, director of design and naval architecture, Sunseeker International. "If you consider every nuance that encourages someone to buy a boat – we have more of it."

The Sunseeker brand encompasses boats ranging from 40 feet to a stunning 155 feet in length. Through attention to detail, use of advanced composites and the application of technology, the company continues to make refinements and expand its product line. The design team is typically developing four new or refreshed models each year, and has been using NX™ software and Teamcenter® software from product life-cycle management (PLM) specialist Siemens PLM Software for more than a decade.

www.siemens.com/plm

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Ewen Foster
Director of Design and Naval Architecture
Sunseeker International

These solutions underpin a complex development process that seamlessly takes concepts from the design office through manufacturing in the boatyard, and out onto the water.
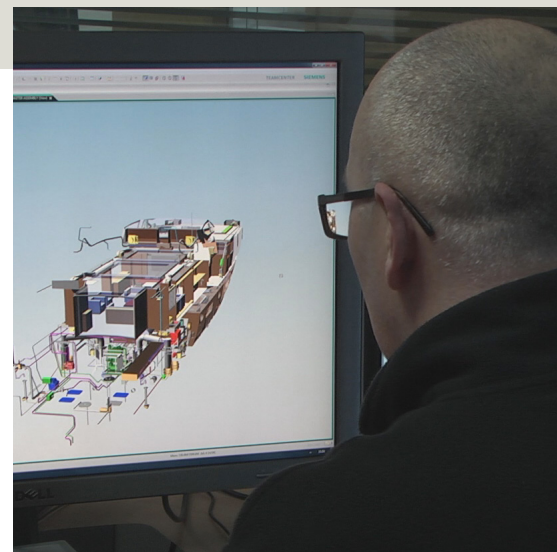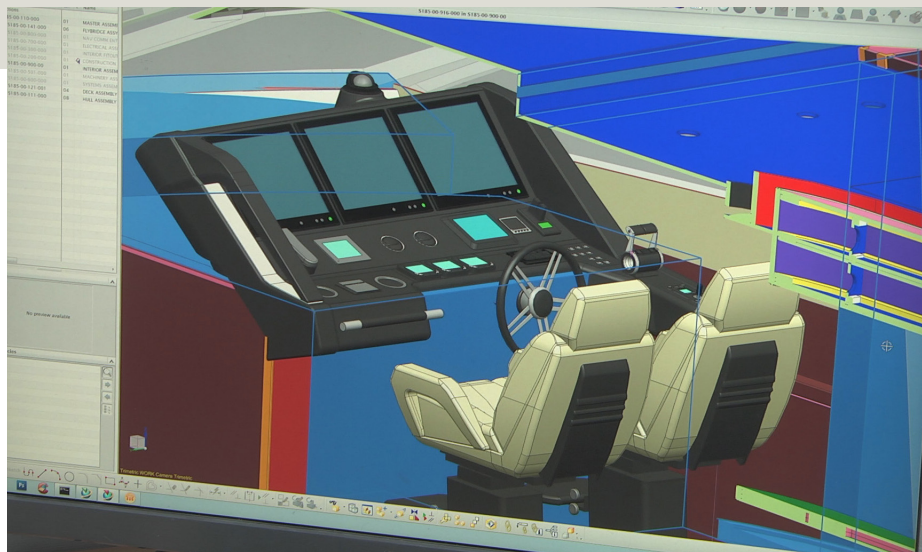
Design creativity and clarity
Sunseeker has more than 40 licenses of NX and Teamcenter, provided through Siemens PLM Software partner Prion Cutting Edge. "We have worked with the specialists at Prion Cutting Edge for 12 years, and their technical expertise is second-to-none," says Luke Stride, design office manager and principal design engineer. "They are always professional and exceptionally helpful. In particular we are very happy with the software training they provide, as we are able to learn using our own designs."

According to Foster, ease of use is a key benefit of NX. "It is intuitive - a new user can run at full speed within three months," Foster says. "It's easy to picture something in your head and model it straight using NX. It's great for early visuals and even very complicated freeform, double-curvature

surfaces, which would normally have to be done in specialist naval architecture software. We can interrogate data with NX, so we can cut out two significant stages in the design process, because there is no need to transfer information to another software and back again."

Once external surfaces are confirmed, the focus moves to interiors and the detail of cabinets, as well as moving objects such as doors and lifting platforms. "Ten years ago we used NX purely for the exterior," Stride says. "Now we use it for interior design, systems and laminates. It's absolutely fantastic for these. It gives clear and simple renderings." He notes that the design team's constant challenge is to make best use of available space, particularly as there are numerous systems such as air conditioning units, gear boxes, generators and radar equipment to fit into a boat. Some of these are procured from specialist suppliers, so Sunseeker designers create packaging envelopes using NX.

NX is always on screen at weekly design review meetings, and it is easy to double-check dimensions, identify potential clashes, confirm compliance with rules and regulations and amend the master model on-the-spot, if necessary. Early visualization using screen shots and simple renderings is also helpful in discussions with customers. It is easier for them to make decisions about internal options and to identify possible adjustments, such as adapting steering controls to suit the height of the owner.

"A boat is a very, very complicated product, but I can find no limitation with NX," says Foster. "There is nothing I cannot do using NX and we are noticing that naval architecture software is being developed to integrate with it. Every release of NX provides a new arena in which it is quicker or easier to do something."

Intelligent re-use

The implementation of NX and Teamcenter gave Sunseeker the opportunity to begin standardizing components, and sharing these is now the norm. "A boat might have 4,000 to 5,000 components on it, and as we make a range of models it is important to have families of parts," explains Stride. "We share assemblies and subassemblies, particularly when they are functional systems that are not on view. It is extremely easy to locate parts with Teamcenter for re-use or resizing."

"By feeding more information into the design process, we can produce new models more quickly and get them to market faster."

Graham Lodge
Director of Manufacturing
Sunseeker International

Teamcenter holds all the data for each component; for example, it stores information on weight and keeps an accurate record as each boat is built. Every part fitted and every piece of waste removed is weighed. The build yard has a limit of 350 tons, so it is imperative to know when to pause, transfer a boat outside and hoist it into water. As Sunseeker's database of intellectual property, Teamcenter is only accessible to those with a logon and relevant permissions, and it manages all workflows, including the process of senior manager sign-off.

Supporting concurrent engineering

One of the original reasons for implementing NX at Sunseeker was to integrate design with manufacturing. "NX gives us styling intent and fine detail in one piece of software," explains Graham Lodge, director of manufacturing. "That means that we can go from concept to engineering with absolute accuracy, even on extremely complex shapes, which is particularly significant for us. Some industries, such as the automotive industry, build prototypes; we can't. We actually produce 95 percent of what we design. Essentially we have to go straight to 'first-of-type' product, which can be anywhere from 40 feet to 155 feet long. We can do this because NX enables us to include a phenomenal level of detail at the design stage."

The manufacture of a new product begins with the cutting of a plug to create a mold tool. Special glass-reinforced plastic is applied to the mold to form the basic shape of the boat. Specialist teams then install mechanical and electrical systems and build the interiors. When outfitting is complete, the boat is cleaned, inspected and tested before it is certified and dispatched.

One huge advantage for the company is the speed gained because computer numerical control (CNC) cutting starts as the design phase is still going on. "Our cutting machine came with a postprocessor," Lodge says, "but with assistance from Prion Cutting Edge, we installed Siemens NX postprocessor technology, which we've found to be quicker and more reliable. Within three or four months of first concept, we are cutting an exterior or machining parts." With regard to the integration with NX, Sunseeker's development plan includes the streamlining of 3-axis CNC operations.

An end-to-end digital process

The digital data available using NX includes all systems on the boat plus pipes, cabling and furniture, so the level of visibility available to the shop floor has increased

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Solutions/Services

NX
www.siemens.com/nx

Teamcenter
www.siemens.com/teamcenter

Customer's primary business

A global leader in the design and build of luxury motor yachts, Sunseeker International exports 99 percent of its product range and employs over 1,800 highly trained staff in the company's shipyards on Britain's South Coast. Sunseeker International is widely recognized as the preeminent marine brand in the world today.
www.sunseeker.com

Customer location

Poole
England

Partner

Prion Cutting Edge
www.prioncuttingedge.co.uk

dramatically over the years. Models created with NX are documented with 2D drawings so that all stages of the build process can be seen as 1:10 scale drawings. NX data is also turned into build manuals. "NX has made my life easier because I can interrogate a solid model as well as inspect a flat piece of paper," says Lodge. "We can, for example, run an animation to simulate a process. We can slice into a 3D model and produce drawings of numerous section views to illustrate a complex shape for everyone to see, including our manual craft teams. For the latest 86 model, a long-range yacht with large-volume tanks, we generated over 1,500 drawings. Previously, we would have had about 300 drawings and they would have been basic line plans. Drawing information has become part of our quality process. Quite often there are late changes, yet we can still apply them."

Using Teamcenter, Sunseeker produces Portable Document Format (PDF) documents from the hard data it stores and issues them, along with workflows, to the company's enterprise resource planning (ERP) software. Exploded drawings show the sequence of the build process and these assist with planning, enable streamlined procurement and minimize stock.

Streamlining new product development

Sunseeker has successfully accelerated the new product development process. "By feeding more information into the design process, we can produce new models more quickly and get them to market faster," states Lodge. "Before using NX, we were struggling to design and develop two new models per year. Now that there is less onus on the shop floor, NX is giving us the freedom to do what we do best and we are introducing between three and five new models per year."

The 86 yacht is a perfect example of this speed. It was created entirely using NX, with all options designed upfront rather than during the life of the yacht. All cutting was controlled with NX and it was brought to market in record time –18 months from initial concept to first-of-type being displayed at a boat show. After the model was launched in late 2013, 26 of these yachts were built in 14 months.

"The fact that Sunseeker is using the latest and best technology puts us on a level with the leading engineering companies in automotive and aerospace," Lodge concludes. "We can attract the right caliber of people, and I feel that we are developing them as well as our tools, materials and processes."