Westport Shipyard is a leader in the design and manufacture of luxury composite motor yachts. Until 2003, the company used AutoCAD® 2D CAD tools because boat design has historically paralleled architecture, traditionally relying upon 2D design methods. However, today’s motor yachts are moving to a production environment that presents many challenges when working off of simplified 2D information. By using a 3D CAD system, designers can more easily resolve interference issues prior to production, according to Jack Sanford, Westport configuration manager.

“Working in 2D limits one’s ability to integrate additional systems without running into interferences, collisions, and conflicting heights that require rework in the field,” Sanford explains. “We believed that by upgrading to a 3D parametric solid modeler with robust, large assembly capabilities, we would be able to address most of the fit and interference problems upfront, thereby saving time and money during assembly.”

The company also hoped to substantially cut the typical three-to-five-year delivery time for luxury motor yachts by designing and building most of the vessel in a production setting, and then adding customer-specified options and preferences just prior to delivery. “By having the base boat tightly defined using 3D modular design techniques, we could gain a competitive advantage, offering motor yachts that still had certain customizable features but with far shorter lead times,” adds Taylor Olson, engineering manager.

Westport designers conducted a three-month analysis of available 3D CAD applications, evaluating the Autodesk Inventor®, Solid Edge®, and SolidWorks® CAD software systems. The company selected SolidWorks Professional because of its ease of use, large assembly configuration capabilities, robust modeling, integrated SolidWorks product data management (PDM) software, and industry-wide acceptance.

Results:
• Established first production approach in domestic motor yacht industry
• Reduced customer delivery times by 75 percent
• Minimized fit and interference issues
• Automated cabinetry production operations

By implementing SolidWorks software on the design of a 164-foot luxury motor yacht with more than 30,000 components, Westport Shipyard was able to reduce delivery time by 75 percent.
Cruising ahead of the competition with faster customer delivery
The company implemented SolidWorks software on the development of a 164-foot luxury motor yacht that has more than 30,000 components in the boat structure alone. Olson says the added efficiencies of using SolidWorks software—especially its large assembly configuration capabilities—have helped Westport to become the only domestic shipbuilder to launch a production model yacht of this size.

“Using SolidWorks, we can design and assemble most of the boat based on a production schedule instead of resolving many fit and finish issues at the time of install in the boat, preventing expensive reconstruction and downtime,” Olson explains. “This allows us to quickly add customer-specified options to the production model, keeping our downtime to a minimum and maintaining a tight schedule, so we can deliver a boat tailored to the customer’s preferences in six months to a year as opposed to three years.

“The ability to have models in production on a continual basis, while using configurations to provide customers with choices and options on different parts of the boat—such as variations on the state room design—makes us more efficient. It also has a positive impact on profit margins,” adds Olson. “The impact of SolidWorks software is felt not so much in terms of development time, but in supporting a more cost-effective production paradigm that gives us an advantage in terms of time-to-delivery.”

Automating and customizing cabinetry production
SolidWorks software has enabled Westport to automate its joinery and cabinetry operations. With the assembly configurations found in SolidWorks software, Westport designers can alter cabinetry designs and automatically manage production in accordance with customer cabinetry selections, while addressing the impact of other options, such as the location of HVAC units and mechanical systems.

“We use SolidWorks software in conjunction with the SigmaNEST® automatic nesting and CNC programming system to drive our router and cut our cabinets,” Olson notes. “Driving CNC machining was a big part of our original motivation to move to 3D, and it has been very successful.”

Using the SolidWorks software open Application Programming Interface (API) and the Visual Basic® scripting language, Sanford has created automated routines for processing additional cabinetry properties, such as veneer side, edge banding, and grain direction, which help to automate Westport’s production process.

Improving communication with SolidWorks eDrawings and PDM software
SolidWorks eDrawings® and SolidWorks product data management software enhance Westport’s design communications capabilities, improving quality and reducing errors. The company’s Cabinet Shop extensively uses eDrawings files and the software’s redlining function for communicating details and changes, as well as for interacting with vendors. Westport’s interior designers also use eDrawings to visualize entire rooms to formulate different materials and finish options with the client as opposed to using a 2D plan.

“SolidWorks product data management software has been critical in our design work,” Sanford says. “The software has enabled us to know we are always working with the most current information, and has minimized design errors related to revision control and overwriting other people’s work.”

WESTPORT
Westport Shipyard
637 Marine Drive
Port Angeles, WA 98363
Phone: +1 360 452 5095
www.westportshipyard.com
VAR: CAE Northwest,
Portland, Oregon

Dassault Systèmes
SolidWorks Corp.
300 Baker Avenue
Concord, MA 01742 USA
Phone: 1 800 603 9000
Outside the US: +1 978 371 5011
Email: info@solidworks.com
www.solidworks.com

“SolidWorks product data management software has enabled us to know we are always working with the most current information, and has minimized design errors related to revision control and overwriting other people’s work.”
Jack Sanford
Configuration Manager

With SolidWorks eDrawings, Westport’s interior designers can fully visualize entire rooms to formulate different materials and finish options.