

## Industrial machinery and heavy equipment

# Whale

Innovative pump manufacturer uses Solid Edge to optimize design and cut development time

### Products

Solid Edge, Femap

### Business challenges

Continue to improve and expand the range of products  
Grow the business by providing design and prototyping services

### Keys to success

Surfacing tools for complex shapes  
Easy design of pipe networks  
Full simulation capabilities

### Results

Early analysis supports the optimization of design  
Product development time 20 percent faster  
Design time for complex products cut from 12 months to four months  
In some cases design and prototyping done in 48 hours  
Intellectual property fully protected when sharing files



### Siemens PLM Software solution enables Whale to quickly and easily make and test prototypes

#### Sanitation, recreation, irrigation and medication

From domestic washing, cooking and heating to infection prevention and crop care, pump technology supports all areas of daily life. Whale is a specialist in this field, and the company's reputation for innovation is built on decades of expertise, from the ground-breaking design of brass pumps for the UK navy in the 1940s through to 21<sup>st</sup> century intelligent control.

The company continues to register world-wide design patents at the average rate of five per year for the company's range of freshwater, bilge and waste pumps, and water and space heating systems.

Part of Brunswick Corporation, Whale supplies leisure, domestic and industrial markets around the world. It is particularly known for products that fit boats, caravans and motorhomes. It also specializes in drainage for domestic wet rooms with level access, for which there is growing demand from people with limited mobility.



**“The design process took about four months instead of 12 to 14 months ... We managed to cut overall development time to less than half what it would normally have been.”**

Richard Bovill  
Engineering Director  
Whale

Whale designs and manufactures its range of gas and electrical products from sites in Bangor, Northern Ireland and California. It also provides design consultancy, 3D printing and rapid prototyping services to other companies. Whale’s design team has been using Solid Edge® software from product lifecycle management (PLM) specialist Siemens PLM Software since 2001. Siemens PLM Software Platinum Partner, Majenta PLM Limited, handles software distribution and support for Whale.

“Solid Edge is thoroughly embedded in the company as a design tool,” says Richard Bovill, engineering director at Whale. “It enables us to speed development through early analysis, clear communication with customers and rapid prototyping.”

#### **Designing to strict regulatory standards**

Whale’s new product development cycle ranges from nine months to three years, depending on complexity. Because gas products, for example, are subject to strict regulation, parts and assemblies for these typically take longer to develop. Solid Edge provides tools for all aspects of design. “The surfacing tools are very handy when modeling complex forms,” says Andrew Peoples, product design engineer at Whale. Also of notable assistance to Whale is the special functionality of Solid Edge that enables easy design of pipework.

At different stages in the development process, Whale utilizes both the 2D and 3D capabilities of Solid Edge. For example, 2D mode is used when partners and suppliers need technical drawings. Use of 3D for individual parts provides Whale with the confidence that they will function as anticipated and ultimately all fit together. “Solid Edge is great for working on assembly models,” says Peoples. “It’s particularly good for quickly changing various components and checking how these interfere with other parts.”

#### **Analyzing strength and performance**

According to Bovill, the simulation capabilities of Solid Edge provide Whale with stress analysis tools that enable quick design comparisons: “We can easily see what changes we need to make to a product. For example, if we are designing a stainless steel tank for a water heater, we can confirm how strength is affected by a





“With regard to timescale, quality and regulatory compliance, we have definitely improved in the output of our own products.”

Richard Bovill  
Engineering Director  
Whale

change in wall thickness. We can also check performance out at different pressures.”

Using Solid Edge for analysis in this way enables designers to minimize time spent on setting up test rigs and undertaking physical testing. As Solid Edge integrates perfectly with Femap™ software, a powerful finite element modeling tool from Siemens PLM Software, advanced analysis can also be conducted when it is appropriate.

#### **Communication and confidentiality**

Working in close co-operation with leisure and marine manufacturers, Whale often needs to share design information with

clients, partners and suppliers. Design data from Solid Edge is used to create renderings that provide photorealistic images. Not only do such images support communication with customers, they form the basis of marketing material. Design data can also be exported to various graphics applications, including KeyShot® 3D rendering software. “Integration with KeyShot in Solid Edge has dramatically increased our ability to generate lifelike images for use in presentations and marketing literature,” comments Peoples.

Manufacturers often incorporate complete Whale products into their boats and caravans and sometimes request a design to fit

“Solid Edge is thoroughly embedded in the company as a design tool.”

Richard Bovill  
Engineering Director  
Whale





a specific size or shape. Bovill explains, "Solid Edge allows us to send simplified models that confirm all the external dimensions without revealing internal design data. In this way we can easily protect our intellectual property."

#### **Cutting development time in half**

Having installed a suite of multi-material 3D printers, Whale can make plastic and rubber parts that are each created as a single piece and are waterproof and transparent. The 3D printers complement Solid Edge and Whale's physical test rigs to form a combined system that provides a comprehensive prototyping capability.

Whale has established an efficient iterative process by which the design team can create 3D models, and then print and test them very rapidly. This process supports the design of complex products, enabling designers to ensure, for example, that products can ignite at various wind speeds and then operate without emitting harmful gases.

Whale typically manufactures parts in plastic. The process of designing, producing and testing a mold, and then making parts, previously took 16 to 24 months. Not anymore. Bovill cites one example when the engineering team developed a gas and electrical water heater with a natural flue that would allow combustible products to escape through the top. Everyone involved expected that it would be quite a complicated process to get the design passed by the authorities, yet the team was able to assess 18 or 19 digital designs quite quickly, refining and proving each one. "The design process took about four months instead of 12 to 14 months," says Bovill. "We then proceeded with rapid prototyping and were able to confirm all aspects of the heater's design through physical testing. We managed to cut overall development time to less than half what it would normally have been."

## Solutions/Services

Solid Edge

[www.siemens.com/solidedge](http://www.siemens.com/solidedge)

Femap

[www.siemens.com/plm/femap](http://www.siemens.com/plm/femap)

## Customer's primary business

Whale designs and manufactures special water, waste, bilge and heating systems for modern living.

[www.whalepumps.com](http://www.whalepumps.com)

## Customer location

Bangor

Northern Ireland

## Partner

[Majenta PLM Limited](#)

## The future

Bovill describes Solid Edge in terms of two levels of benefit to Whale: "With regard to timescale, quality and regulatory compliance, we have definitely improved in the output of our own products. In addition, Solid Edge enables us to provide astounding technical services to other companies. We can, for example, design and prototype a customer's product within 48 hours."

Jim Sargent, technical services engineer, observes, "Not only have we sped up our time-to-market for new products by on average 20 percent, but we have also increased our throughput of product launches by a third."

Sargent adds that the team would very much like to implement Teamcenter® software, also from Siemens PLM Software. He notes, "We began looking at Teamcenter because of the fact that we have three different locations, two in Northern Ireland and one in California. With the design team using a manual system to collaborate across three sites, we realize that there is the potential for us not to manage our system as effectively as we might. The use of Teamcenter would enable us to optimize data and process management."

**“Not only have we sped up our time-to-market for new products by on average 20 percent, but we have also increased our throughput of product launches by a third.”**

Jim Sargent  
Technical Services Engineer  
Whale

## Siemens PLM Software

Americas +1 314 264 8287

Europe +44 (0) 1276 41 3200

Asia-Pacific +852 2230 3308

[www.siemens.com/plm](http://www.siemens.com/plm)

© Siemens Product Lifecycle Management Software Inc. Siemens and the Siemens logo are registered trademarks of Siemens AG. D-Cubed, Femap, Fibersim, Geolus, GO PLM, I-deas, J T, NX, Parasolid, Solid Edge, Syncrofit, Teamcenter and Tecnomatix are trademarks or registered trademarks of Siemens Product Lifecycle Management Software Inc. or its subsidiaries in the United States and in other countries. KeyShot is a registered trademark of Luxion ApS. WHALE is a trademark of Munster Simms Engineering Limited also trading as Whale. All other logos, trademarks, registered trademarks or service marks belong to their respective holders.

43901-Z3 1/15 H