



## Industry

Industrial and consumer

## Business challenges

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

## Keys to success

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



## Specialist systems for modern living

They may not be glamorous products but they provide comfort and convenience to freedom-loving motorhome, caravan and boat owners. They also represent independence and choice for people with limited mobility who cannot step into a bath or shower. Whale's range of freshwater, bilge and waste pumps; water and space heating systems and level access shower drainage products are used worldwide by consumers. They are also used within industrial, agricultural and health sectors.

The company's reputation for innovation is built on decades of expertise, from the groundbreaking design of brass pumps for the UK navy in the 1940s through to 21<sup>st</sup> century intelligent control. Whale continues to register worldwide design patents at the average rate of 5 per year.

Part of Brunswick Corporation, 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, supplied by Siemens PLM Platinum Partner Majenta PLM, since 2001.

"Solid Edge is thoroughly embedded in the company as a design tool and through Majenta PLM we receive automatic software updates as soon as they are released," comments Engineering Director, Richard Bovill. "When we asked Majenta PLM to provide training, the technical team tailored the content completely and delivered bespoke training on our site so that we could practise with real-life design projects. Because that was so effective we find that we do not need technical support very often."

## 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 take longer to develop. Solid Edge provides tools for all aspects of design.

## Solution

Provision of Solid Edge with bespoke training, automatic updates and continuing technical support from Majenta PLM

## Business impact

- Early analysis supports the optimisation of design
- Product development time 20% faster
- Design time for complex products cut from 12 months to 4 months
- In some cases design and prototyping done in 48 hours
- IP fully protected when sharing files



“The surfacing tools are very handy when modelling complex forms,” says Andrew Peoples, Product Design Engineer. Also of assistance to Whale is the specialist functionality that enables easy design of pipework.

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

## Analysing strength and performance

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

Using Solid Edge for analysis in this way enables designers to minimise time spent on setting up test rigs and undertaking physical testing. As Solid Edge integrates perfectly with Femap, advanced analysis can also be conducted as and when it is necessary.

## 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 lifelike images and 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 application.

**“We have been very impressed with Majenta PLM. They have certainly been the best CAD reseller we’ve ever had.”**

Richard Bovill,  
Engineering Director,  
Whale



“Integration with KeyShot® 3D rendering software in ST7 has dramatically increased our ability to generate life-like images for use in presentations and marketing literature,” comments Peoples.

Richard Bovill notes that manufacturers often incorporate complete Whale products into their boats and caravans and sometimes request a design to fit a specific size or shape. “Solid Edge allows us to send dummy 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 capacity.

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

Whale typically manufactures parts in plastic and it used to take 16 to 24 months for the process of designing, producing and testing a mould, then making parts. Richard 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 check out 18 or 19 digital designs quite quickly, refining and improving each one. “The design process took about 4 months instead of 12 to 14 months. 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.”

## Optimising 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.” As Jim Sargent, Technical Services Engineer, observes, “Not only have we sped up our time to market for new products by on average 20%, but we have also increased our throughput of product launches by a third.”

Richard concludes “If we come across technical challenges and need guidance we know we can efficiently access the knowledge and expertise of Majenta PLM. We can quickly log into the online support system and make a request then we receive a response either by email or by phone.” He adds that Majenta PLM assisted Whale as it did some research on product lifecycle management systems. “The team would very much like to implement Teamcenter® because 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 realise that there is the potential for us not to manage our system as effectively as we need to. Teamcenter would do the management for us.”

Contact us for further information:

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