

Poseidon Diving Systems

DESIGNING THE FIRST HANDS-FREE, SELF-ADJUSTING, DEEP-DIVE REGULATOR WITH SOLIDWORKS



SolidWorks software provided the tools Poseidon engineers needed to take a breakthrough product from concept through production, while saving time and money.

- Cut design cycles by 20 to 35 percent
- Saved \$100,000 on development of Xstream regulator
- Introduced first self-adjusting, deep-dive regulator
- Improved marketing and design visualization capabilities

Poseidon Diving Systems is a leading global manufacturer of diving equipment for recreational and technical diving markets. For years, the company worked with external design firms and engineering consultants, who used a range of different CAD systems, to develop its products. In 2000, Poseidon management decided to bring product design and engineering functions in-house. By acquiring its own 3D solid modeling system, the company hoped to accelerate product development, cut costs, and extend its technological edge, according to Yaniv Bertele, product development manager.

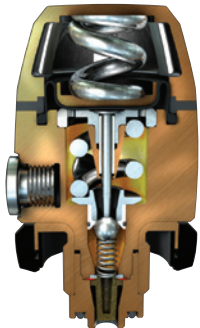
“We believed that implementing our own 3D CAD system and conducting most of our product development internally not only would be more economical, but also would create a more professional environment for sparking innovation and technological advances,” Bertele recalls. “By moving most of the design work in-house, we have greater control over product design throughout all stages of product development.”

Poseidon engineers evaluated the CAD packages previously used by its design consultants, including the Pro/ENGINEER®, AutoCAD®, Autodesk Inventor®, Solid Edge®, and SolidWorks® CAD systems. The company chose SolidWorks Professional software because of its ease of use, wide range of mechanical design capabilities, and compatibility with other product development applications.

“The only system that satisfied our needs was SolidWorks,” Bertele recounts. “With SolidWorks Professional, we use the same suite of software to create new designs, engineer and test the products, render photorealistic images and animations for marketing, and send part and assembly models to suppliers, using SolidWorks eDrawings® files if the vendors do not have SolidWorks themselves. SolidWorks Professional was the only package that provided those capabilities with the level of user-friendliness we needed.”

“SolidWorks enables us to use the same suite of software from the conceptual sketching phase all the way through validation, prototyping, production, and marketing.”

Yaniv Bertele,
Product Development Manager



With SolidWorks software, Poseidon engineers created the innovative, dual-valve design for the Xstream regulator, which optimizes air flow according to breathing resistance regardless of depth.

Trimming time and costs on a breakthrough product

Poseidon's Xstream line of diving regulators are the first hands-off, self-adjusting, deep-dive regulators on the market, helping South African diver Nuno Gomes set the deep-dive world record of 1,044 feet. By deploying SolidWorks software on their development, Poseidon Diving Systems introduced a breakthrough product while condensing design cycles and trimming development costs at the same time.

“The only way to give a diver ‘The Ultimate Dive’ is to make the diving equipment function without manual adjustments, so the diver's concentration is completely on the dive,” Bertele explains. “Most conventional mouthpieces have adjustment wheels and knobs that a diver uses to adjust breathing resistance according to specific depths. With SolidWorks software, we were able to push the technology forward by creating the Xstream dual-valve design, which optimizes air flow according to breathing resistance regardless of depth. So the diver's focus is on the dive, not the regulator.

“Without SolidWorks software, Xstream development would have cost an additional \$100,000 and would have taken much longer,” Bertele adds. “The SolidWorks program itself saves about 20 to 35 percent of product development time.”

Design simulation, mold development, and surfacing tools

Because of the versatility and flexibility of SolidWorks Professional software, Poseidon Diving Systems has realized both time and cost savings. “SolidWorks enables us to use the same suite of software from the conceptual sketching phase all the way through validation, prototyping, production, and marketing,” explains Bertele. “We use SolidWorks SimulationXpress to check the structural strength of components, and we work with a consultant, who uses SolidWorks Flow Simulation, to optimize air flow.”

He notes that dedicated SolidWorks mold design and analysis tools save time and improve the quality of injection-molded components. “Our engineers use draft analysis, parting lines, and mold-filling analysis tools on a daily basis,” Bertele says.

SolidWorks software also enabled Poseidon to solve a surfacing challenge on a “new age” dive fin design. “Our innovative fin design presented surfacing challenges because of its complicated geometry, which involves double curvature with many small details,” Bertele explains. “The fin was originally modeled by a consultant in Pro/ENGINEER, but we could not solve the surfacing problems until the design was brought into SolidWorks. Our hydrodynamic tests showed no errors, and SolidWorks surfacing tools were able to handle even highly complicated geometries.”

Improved design visualization accelerates marketing

In addition to condensing design cycles and reducing development costs, SolidWorks and PhotoWorks™ software have enhanced Poseidon's design visualization and photorealistic rendering capabilities, enabling the company to accelerate its marketing activities.

“Using SolidWorks and PhotoWorks software to render design images allows us to begin production of marketing materials before we create a physical prototype,” Bertele stresses. “Because we can develop marketing materials ahead of building a prototype, we can start taking orders before manufacturing begins, moving our business forward and creating greater demand prior to product introductions.”



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