

SOUTHMEDIC, INC.

Designing a revolutionary oxygen delivery system with SolidWorks software



Using SolidWorks software, Southmedic developed the OxyArm Predictable Oxygen Delivery System, the first "open" oxygen delivery system on the market.

Southmedic, Inc., designs and manufactures surgical and specialty operating room products for OEM and end-user markets. For many years, Southmedic used 2D CAD technology to support product development. But when management recognized the limitations of using the CADKEY® 2D system it had utilized in the past, the company began evaluating 3D approaches to product design.

"We wanted a CAD system that would help us take a product from concept to manufacturing and tooling design more efficiently," explains Engineering Manager Maurice Lavimodiere. "We needed a design system that would be more reliable and robust."

Lavimodiere adds that Southmedic wanted to improve the efficiency of its product development and expand its existing markets. The company believed it could develop new products and tap new, emerging markets with the productivity gains made possible by a proven 3D modeler.

After evaluating several 3D packages, including Pro/ENGINEER® and Solid Edge®, Southmedic selected SolidWorks® 3D CAD software because of Dassault Systèmes SolidWorks Corp.'s complete focus on product design, proven parametric features, bidirectional associativity, advanced visualization capabilities, and integration with leading engineering applications. "We needed a tool that would be flexible, easy to use, and would allow us to design intuitively. We chose SolidWorks software because we believed it would help us design products faster, and we perceived DS SolidWorks as a company focused on developing CAD tools that are powerful but easy to use," Lavimodiere says.

"While reviewing the product," Lavimodiere continues, "it became obvious to us that DS SolidWorks listens to their users' enhancement requests. The interaction between DS SolidWorks developers and users explains why SolidWorks software is such a tremendous tool."

Results:

- Shortened design cycle by 30 to 40 percent
- Accelerated handling of design and tooling changes
- Improved capacity to design complex parts
- Developed revolutionary product

A breakthrough in oxygen delivery

Southmedic leveraged SolidWorks software to investigate new market opportunities. "Existing oxygen delivery systems produced a level of patient dissatisfaction and discomfort," Lavimodiere notes. "Oxygen masks can feel claustrophobic and create unpleasant odors. Nasal cannulas can produce nasal burns, chafing, and sinus sensitivity. We set out to develop a product that would allow oxygen to be delivered through a headset and address these areas of patient dissatisfaction."

Using SolidWorks software, Southmedic developed the OxyArm™ oxygen delivery system, the first "open" oxygen delivery system on the market. The OxyArm system uses an innovative diffuser mushroom assembly that is positioned over the mouth and nose to deliver oxygen to patients at adjustable levels.

"With SolidWorks software, the design cycle for the OxyArm was about three months," Lavimodiere points out. "I estimate that product development was 30 to 40 percent faster with SolidWorks software."

Streamlining plastics design

The development of the OxyArm required a great deal of testing, rapid prototyping, and design changes and refinements. The challenge was to eliminate the need to clamp the apparatus to the patient's ears while still providing uninterrupted oxygen flow. The apparatus was designed so that movement of the patient's head would not disturb it. This way, the boom that delivers oxygen to the diffuser remains stable.

"Plastics design is a highly iterative process, requiring numerous design changes," explains Lavimodiere. "For example, you may need to add draft to a part, which affects the assembly, the mold, and all associated drawings. With CADKEY, you would need to begin again for every change. SolidWorks software makes handling these design changes much easier. All you need to do is open the FeatureManager and make a change, and all of the associated parts, assemblies, molds, and drawings update themselves automatically."

Enhancing design communication

Communicating product concepts is another requirement, because, in addition to developing its own line of products, Southmedic, Inc., develops and communicates design concepts to OEM customers on a regular basis.

"Because SolidWorks software is so easy to use and has such realistic rendering features, I can develop a product concept on site during the first meeting and either animate it on screen or print it," states Lavimodiere. "This truly impresses our prospects."

Using SolidWorks software, Southmedic is able to communicate with partners, such as Western University in Ontario, which conducted wind-tunnel flow analysis on the OxyArm. "Since SolidWorks software has become so standard we can export files as either SLAs or CAD models for use by our vendors and partners," Lavimodiere says.

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Maurice Lavimodiere
Engineering Manager



The OxyArm Predictable Oxygen Delivery System uses directional diffuser technology to provide superior oxygen therapy to patients.



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