

# Swagelok Company

FLUID SYSTEM COMPONENT MANUFACTURER SHORTENS TIME-TO-MARKET WITH SOLIDWORKS



Radial diaphragm valve, designed in record time with SolidWorks software.

For more than 50 years, Swagelok Company has maintained high standards and has built an unequalled reputation for quality in designing and producing precision fluid system components. In 1997, Swagelok began to reassess its product design process. The company decided to upgrade to a newer 3D solid modeling technology that allows it to generate new designs more efficiently, thereby reducing product development time and lowering costs.

## Enhancing 3D productivity

Swagelok chose the SolidWorks® system, a Windows®-based, computer-aided design (CAD) package selected for its modeling power as well as for its ease of use and short learning curve. "You can tell that the SolidWorks developers work with users in mind. The interface is highly intuitive," says William Gurley, engineering project manager at Swagelok. "Once people start using SolidWorks, they learn it in no time."

Gurley also notes that parametric features enable users to quickly modify designs, in contrast to laboriously re-creating 2D engineering drawings to reflect changes. Moreover, solid models can be used to produce color-shaded images that are easily interpreted by everyone involved with the product development process. At Swagelok, these renderings are useful to both engineers and managers, as well as manufacturing, sales, and marketing personnel. "From day one" says Gurley, "you get accurate photo-realistic renderings, so everyone in the process can see the concepts that designers have in mind."

Gurley notes that by using assembly modeling capabilities, Swagelok maintains accuracy and proper fit among the many individual components that compose a particular design. The ability to handle complex, curved shapes enhances product aesthetics. He adds, "SolidWorks can generate contoured surfaces in just a few clicks, instead of 10 or 15 with other systems we saw."

## Penetrating new markets

One of the first major projects undertaken with SolidWorks software was the development of an entire line of products aimed at the biotech and pharmaceutical markets. "With SolidWorks, we engineered the product line from top to bottom in less than a year," says Gurley. "This was done in record time. Getting just a single product out the door can take two years or more when working in older 3D systems or in 2D."

→ Founded in 1947, Swagelok Company is a leading supplier of quality fluid system components. The company maintains one of the world's largest industrial manufacturing and distribution networks composed of more than 5,000 employees at 270 manufacturing, research, technical support, distribution, and sales facilities in over 40 countries. Product lines include valves, fittings, and related components for the leak-free handling of liquids and gases. Swagelok products are used by customers in research, process, analytical instrumentation, biotech, pharmaceutical, power, petrochemical, semiconductor, and general industries.



- Reduced time-to-market by 100 percent and engineered a new product line in under a year
- Lowered costs and shortened lead times, while improving service
- Enhanced enterprise-wide engineering controls through product data management
- Eliminated development cycles with integrated add-on analysis and simulation solutions

→ The Swagelok Company is a leading supplier of quality fluid system components and maintains one of the world's largest industrial manufacturing and distribution networks. The company switched to 3D CAD technology to generate designs more efficiently and reduce product development time. The company chose SolidWorks software for its ease-of-use, short learning curve, parametric design capabilities, assembly modeling, plus integration with downstream applications, such as analysis, manufacturing, and product data management.

→ Using SolidWorks, Swagelok designers engineered an entire new product line for the biotech and pharmaceutical markets in less than a year – approximately half the time required using more conventional systems. By implementing innovative solutions such as SolidWorks, Swagelok is reducing cost and lead times, while improving service and maintaining the industry's highest quality standards.

### Standardizing product data enterprise-wide

Because of the company's early success using SolidWorks in critical projects, Swagelok is now implementing the software as a design standard enterprise-wide. As a result, the company will have a common engineering database.

The SMARTEAM® database tracks revision levels, part numbers, and engineering change information. It also serves as a bridge, allowing design centers, production facilities, and other groups to conveniently share product information across the enterprise. SMARTEAM also helps to protect files by limiting certain lifecycle operations to authorized users. This is an important feature to consider when sharing design data across the enterprise.

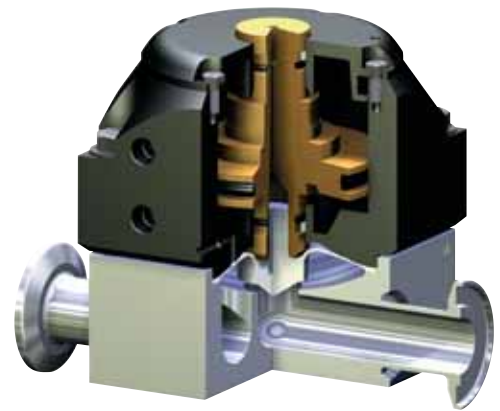
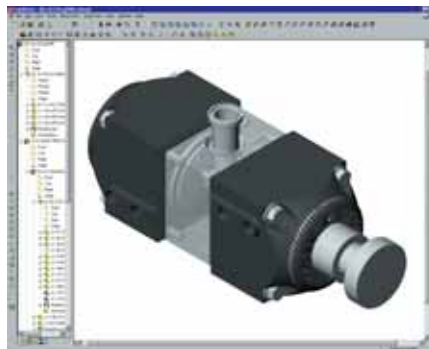
Progressive Computing Corporation, a local VAR, provided applications assistance, training, and support in planning the SolidWorks/SMARTEAM system. The company also implemented the technology across the enterprise.

### Adding downstream value with solid models

"Possibly the greatest strategic benefit of solid modeling is the leverage it provides in performing downstream functions," explains Andrew Dougherty, Manager of Product and Technology Development at Swagelok.

The company is using other advanced engineering design tools to reduce product development costs and lead time. Computational fluid dynamics (CFD) is being employed to analyze flow through virtual fluid system designs and to determine the load induced on individual components. Finite element analysis (FEA) is then used to determine stresses, deflections, and other mechanical design behaviors. This virtual design toolkit has greatly reduced the need for concept prototypes.

"Solid model data feeds directly into these analysis and simulation tools," says Dougherty. "So we can evaluate the design early in the process and easily correct problems before getting to hardware testing or the shop floor. Eliminating these build-and-test cycles shaves months off the typical product development cycle."



Assembly modeling capabilities ensure accuracy and proper fit among the parts of fluid system components, such as Swagelok's DR Series sanitary valve.

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