DASSAULT SYSTEMES

SOLIDWORKS

SUMITOMO (SHI) CRYOGENICS OF AMERICA, INC.

IMPROVING CRYOGENIC SYSTEMS DEVELOPMENT WITH SOLIDWORKS

SCAI migrated from a competing 3D design and engineering package to SOLIDWORKS design, analysis, and PDM solutions to develop its cryogenic and vacuum equipment because the majority of the company's customer base, as well as new designers and engineers, use SOLIDWORKS.

Sumitomo
(SHI) Cryogenics of America, Inc.

Challenge:
Streamline design cycles for cryogenic systems to accelerate time-to-market while improving design performance and increasing innovation.

Solution:
Implement SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, and SOLIDWORKS PDM Professional product data management software solutions.

Results:
- Shortened product development cycles and time-to-market
- Reduced design-checking time by 30 to 50 percent
- Increased design accuracy and innovation
- Improved design performance

Sumitomo (SHI) Cryogenics of America, Inc. (SCAI), a wholly owned subsidiary of Sumitomo Heavy Industries Ltd. (SHI), is a leading worldwide provider of innovative cryogenic and vacuum solutions to the medical, semiconductor, flat panel, general coating, and research industries. With offices in Asia, Europe, and the United States, the SHI Cryogenics Group has produced quality cryogenic and vacuum equipment for more than 50 years. Headquartered in Allentown, PA., SCAI is the North American division of the SHI Cryogenics Group and focuses on the development of product applications utilizing the latest cryogenic and vacuum technologies, including innovative cryopump and cryocooler designs.

Until 2013, SCAI cryogenic systems used helium gas to support applications at extremely cold temperatures between 4 K and 10 K (roughly minus 450 Fahrenheit), such as the cooling systems used for semiconductor manufacture or magnetic resonance imaging (MRI) machines. According to Drafting Supervisor Keith Jaworski, the company had been using a competing 3D design package to develop its sophisticated machines but in 2013, decided to replace the legacy platform in an effort to streamline development cycles, improve customer interaction, and facilitate the recruitment of experienced contractors.

"We realized that the number of users of our legacy platform was becoming less and less, which made it difficult to find contract help, and fewer and fewer of our customers used the legacy platform as well," Jaworski recalls. "While we make cryocoolers with standard interfaces, much of our work involves customers who want to incorporate our systems into larger designs, requiring some degree of customization. We understood that in terms of interfacing with customers—as well as attracting engineering and design talent—we would benefit from moving to a more widely used 3D design system".

After evaluating leading 3D CAD systems, SCAI decided to standardize on SOLIDWORKS® solutions, implementing SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, and SOLIDWORKS Product Data Management (PDM) Professional software solutions. SCAI chose the SOLIDWORKS platform because it's easy to use, the preferred environment of most of SCAI's customer base, and widely used. "It's easier to find help that already knows SOLIDWORKS, and the move to SOLIDWORKS improves our ability to collaborate effectively with customers," Jaworksi says.

SHORTER DESIGN CYCLES, GREATER ACCURACY

Since transitioning to the SOLIDWORKS development platform, SCAI has shortened design cycles, accelerated time-to-market, and improved design accuracy, partly through the elimination of redundant, manual tasks, like repetitive design checking. "SOLIDWORKS has enabled us to save time and speed up the process," Jaworski stresses. "For example, when we make a design change in SOLIDWORKS, it automatically ripples through the assembly and associated drawings, eliminating the need to detail the change and check the design across all associated data. This reduces the time required to check a design by 30 to 50 percent."

"SOLIDWORKS has improved our ability to design faster and more accurately," adds Senior Designer Mark Schwandt. "The SOLIDWORKS sheet metal design capabilities have helped us tremendously. For instance, we no longer need to be concerned about whether holes in 10 to 15 different pieces of sheet metal line up. With SOLIDWORKS, these holes are always where you expect them to be."

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— Mark Schwandt, Senior Designer

IMPROVING DESIGN PERFORMANCE

Using the finite element analysis (FEA) tools included in SOLIDWORKS Premium software, SCAI can simulate and optimize design performance. The first problem for which SCAI leveraged SOLIDWORKS Premium simulation capabilities was a large plate that flexed under load. "We needed to understand just how much the plate would flex in the middle," Jaworski recalls. "With SOLIDWORKS Premium, we were able to optimize the thickness of the weight-bearing plate to achieve the stiffness we wanted.

"Doing simulations in an integrated package like SOLIDWORKS Premium also saves the engineer who's responsible for analysis a significant amount of time because he only has to deal with one piece of software," Jaworksi notes. "This efficiency boost lets us optimize designs to support the higher speeds and greater loads that our customers frequently demand."

INNOVATING NEW PRODUCTS

With the ability to more accurately create designs with SOLIDWORKS—and then validate and optimize design performance with simulation tools—SCAI can more consistently develop more innovative products. "SOLIDWORKS has definitely improved our ability to innovate," Jaworski says. "We continually must come up with innovative and improved ways of doing things to support new and different types of applications."

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With SOLIDWORKS design, analysis, and PDM tools, SCAI has not only shortened design cycles and improved design accuracy, the company has also improved the performance of its innovative cryogenic and vacuum equipment designs through the use of SOLIDWORKS Premium FEA simulation capabilities.

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