SAWSTOP, LLC

Innovating an injury-reducing table saw with SolidWorks Premium

Using SolidWorks software, SawStop has accelerated development of its revolutionary, safety system-equipped table saws.

SawStop inventes and manufactures unique, safety system-equipped table saws that dramatically reduce the risk of operator injury. Company founder and President Steve Gass, a lifelong woodworking hobbyist, was working as a patent attorney when he developed an electronic detection system that induces an electrical signal onto the blade and monitors that signal for changes. Compared to wood, the human body has a relatively large, inherent electrical capacitance and conductivity that cause the signal to drop—and the saw to stop—when a person makes contact with the blade.

In 2000, Gass and two of his colleagues joined together to establish SawStop. David Fulmer, vice president in charge of engineering, has responsibility for product design. Fulmer initially used Autodesk Inventor® 3D CAD software primarily because the software's offices are located nearby, but he soon began to reconsider the company's CAD platform due to data compatibility issues.

"When we sent models to vendors, we had to do a lot of extra work to create STEP or IGES files," Fulmer recalls. "After we discovered that most of our vendors use SolidWorks® software, we decided to take a look at it to determine if it represented a more mature, stable, and compatible platform."

SawStop transitioned to SolidWorks 3D CAD software, implementing one seat of SolidWorks Premium and two seats of SolidWorks Professional, because it is easier to use; is fully compatible with the company's vendors; and provides robust surfacing, mold development, and animation capabilities. The company also values the integrated SolidWorks Workgroup PDM product data management and SolidWorks SimulationXpress and SolidWorks Simulation analysis applications.

"Everything was easier to use and worked better in SolidWorks software," says Fulmer. "We learned to use it with no formal training. After the first two weeks, I could do more with SolidWorks software than I was ever able to do with Inventor."

Results:

- Shortened design time by 20 percent
- Reduced prototype costs through integrated analysis
- Improved marketing with rendering and animation capabilities
- Doubled sales year over year

DS SolidWorks

Shorter design time, lower prototype costs

Since transitioning to SolidWorks software in 2003, SawStop has realized a 20 percent reduction in design time. "Converting models in and out of STEP and IGES files never seemed to work right and required additional time," Fulmer explains. "With SolidWorks software, we just send native files, including constraints and colors. After working with SolidWorks software native files, I would never work any other way."

Using integrated SolidWorks SimulationXpress and SolidWorks Simulation analysis software, the company can simulate part performance, thereby reducing the number of prototypes, material usage, and associated costs in the process. "With integrated FEA (finite element analysis) capabilities, we know our parts will not fail. This enables us to avoid the material costs associated with making parts bigger or heavier to minimize the risk of failure," Fulmer notes. "We use SolidWorks SimulationXpress for simple part studies—such as checking the rigidity of our saw fence—and SolidWorks Simulation for more critical analyses, including any situation involving assemblies."

Complex surfacing of parts

Using the surfacing and mold development tools found in SolidWorks software, SawStop is able to work with complex geometries and develop more intricate parts. "In addition to saving time and money through producing design data that is more compatible for working with our partners, the surfacing and modeling capabilities allow us to produce innovative part designs faster," Fulmer says.

"One example is the blade guard on our table saw, which is a clear plastic shell consisting of two separate parts," he adds. "This is a complex shape with curves that I could not figure out how to do in Inventor. With SolidWorks software, I built the part using lofted surfaces and then thickened it. Because this is an injection-molded part, maintaining uniform wall thicknesses is important. The shell-and-thicken feature in SolidWorks software was critical for designing this part."
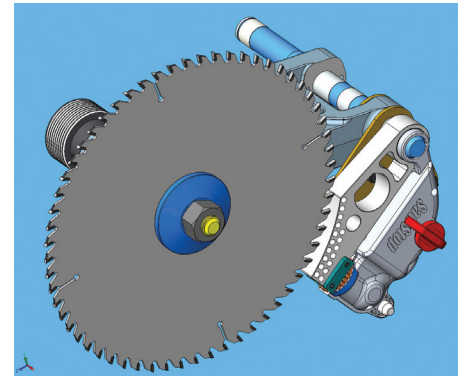
Rendering, animation capabilities drive communication

By transitioning to SolidWorks 3D CAD software, SawStop not only has improved product quality, but also has enhanced its ability to market products through the use of SolidWorks software rendering and animation tools. The company's commercial table saw sales have doubled year over year, and SawStop has already begun developing a consumer model.

"We use the photorealistic rendering and animation tools in SolidWorks software to produce user how-to videos on the web," Fulmer says. "With these tools, we have produced over 100,000 DVDs that show how the saw works. We also use renderings to produce our user manuals since it is easier to create an animation than to videotape a saw. With SolidWorks software, we can also use cutaways and transparencies to show what is happening inside. All these tools help us to design, manufacture, and market our table saws better."

With integrated SolidWorks SimulationXpress and SolidWorks Simulation analysis software, SawStop product developers can simulate part and assembly performance, saving time and reducing prototyping costs.

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