Leatherman Tool Group, Inc.

EXPANDING MULTIPURPOSE, COMPLEX TOOL AND KNIFE DESIGN WITH SOLIDWORKS

With SolidWorks 3D CAD software, Leatherman Tool Group is meeting its goals of expanding tool and knife lines and developing products for new markets.

- Increased number of annual new products by 100 percent
- Shortened development cycles by 33 percent
- Supported implementation of lean manufacturing methodologies
- Achieved ambitious accelerated product development goals

Leatherman Tool Group, Inc. is the leading manufacturer of multipurpose tools and knives, selling more than 37 million units since 1983. As the company continues to grow, so do its product development goals and design requirements. Expanded tool and knife lines and the development of products for new markets, such as multipurpose gardening tools, prompted the company to replace its 2D CAD design tools with a 3D CAD system in 2001.

The company's engineers believed that 3D would provide the efficiencies and modeling capabilities they would need to support an accelerated product development (APD) schedule and market expansion. However, according to CAD Manager C.J. Goodrich, Leatherman discovered that the original software the company attempted to use did not provide its engineers with the full range of capabilities needed to sustain an expanded APD program. "Our product designs require greater use of organic shapes with more curves instead of just square, sheetmetal parts," Goodrich explains. "With our previous CAD package, we had neither the capabilities to model intricate shapes requiring 3D splines and curves, nor the complex surfaces required to develop innovative designs."

In 2005, Leatherman evaluated 3D CAD packages with more advanced modeling and surfacing capabilities, including SolidWorks® 3D CAD software. After comparing the capabilities of the leading systems, the company decided to switch to SolidWorks software – implementing 22 seats of SolidWorks Professional and a floating license for SolidWorks Simulation – because of the system's ease of use, advanced modeling and surfacing tools, and sheet-metal design capabilities. Leatherman also valued the integration of SolidWorks Simulation design analysis, SolidWorks Workgroup PDM, and PhotoWorks™ photorealistic rendering software.

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Advanced modeling and surfacing increase throughput

The implementation of SolidWorks software has helped Leatherman to achieve its ambitious new product development goals. Rather than releasing one new product line each year, the company is now releasing two or three new product lines annually. Leatherman has also experienced a reduction in its development cycles, which once ranged from 18 to 24 months, but now take just 13 to 15 months – an average reduction of 33 percent.

"We have doubled our modeling productivity since moving to SolidWorks," Goodrich stresses. "While we enjoy efficiency gains across the board, the main reason for our increased throughput is the advanced modeling and surfacing capabilities in SolidWorks. Our C304 Series knife, for example, is a very complex shape with a few surfaces and 3D contours. It is a very difficult shape to make because there are no flat surfaces. To create complicated shapes like this, it is simpler to use sweeps, lofts, and surfacing tools with SolidWorks. We also use design configurations to create product families from our initial designs."

Integrated applications add value

Leatherman has realized additional productivity gains through access to integrated capabilities, including sheet-metal design, mold development and analysis, finite element analysis (FEA), PDM, and photorealistic rendering solutions. "Having FEA at the part level and sheet metal as an integrated module are big pluses for us," notes Goodrich. "We use SolidWorks Simulation to evaluate stresses on our springs and latches, to ensure they will not break, and to check deflections. We also use the TolAnalyst for our tolerance stackups.

"SolidWorks Workgroup PDM has helped us to improve our manufacturing processes. We also use draft analysis to work more effectively with mold-making vendors on our knife handles," Goodrich adds. "We also benefit from being able to show photorealistic renderings and 3D concepts earlier in the process, which we now give to our suppliers for marketing purposes and to solicit feedback."

Managing expanded product design data

The inclusion of SolidWorks Workgroup PDM software with SolidWorks has enabled Leatherman not only to manage product designs, revisions, and lifecycles more effectively, but also to implement lean manufacturing methodologies and more efficient approaches to production. After installing SolidWorks in its Design Engineering Group, the company added another nine seats for Manufacturing.

"SolidWorks Workgroup PDM has really opened our eyes to improvements in our manufacturing processes," Goodrich points out. "It allows us to add manufacturing into the process earlier. Plus, we are having great success in using SolidWorks as the foundation for instituting lean manufacturing methodologies that cut out waste and redundancy during interactions between Design Engineering and Manufacturing."

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