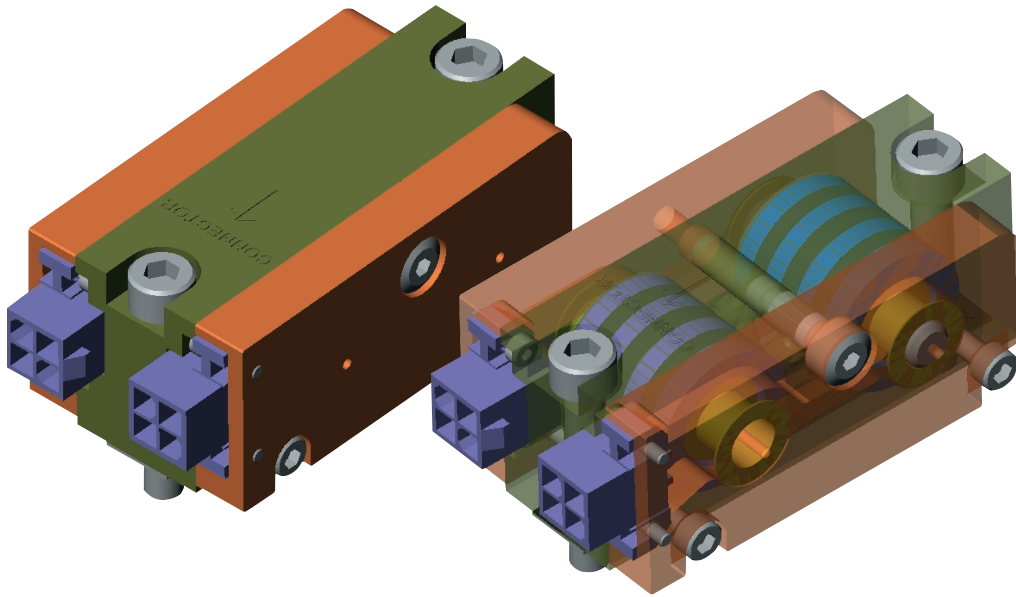




Customer Showcase



Floworks Helps Sturman Industries Bring Space Technology Down to Earth

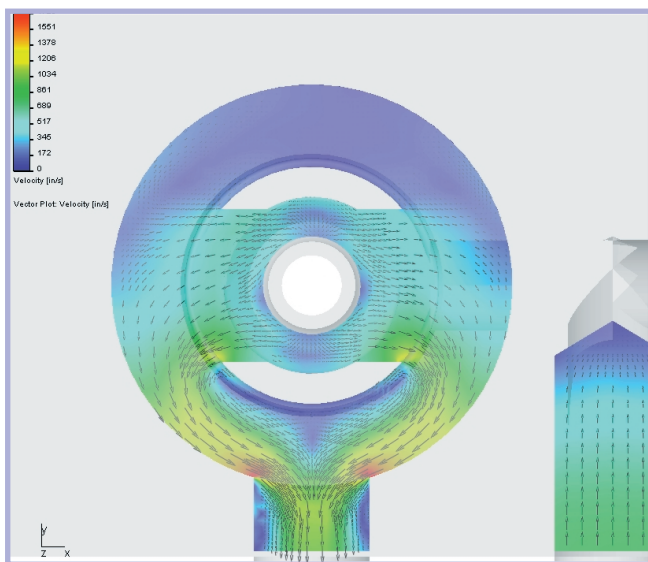


Engineering Fluid Dynamics (EFD) is helping commercialize technology that once helped land men safely on the moon. Feet firmly planted on the ground, Woodland, Colorado-based Sturman Industries is using the latest EFD technology, FloWorks from NIKA, to simulate fluid flow and refine its high-speed, energy efficient, valve designs.

Sturman's co-founder and namesake Eddie Sturman invented these digitally controlled, magnetically-latching valves 30 years ago for the Apollo Space Program. By creating a magnetic latch on either side of a specially designed spool, and controlling the latch with sophisticated electronic controls, the spool is passed back-and-forth at tremendous speeds and remarkable precision to ensure accurate fluid control. The 2-inch long valves save energy, provide far greater economy and generate much less pollution than comparative valves used for the same application. Industrial applications for the technology are numerous, ranging from the automotive and trucking, to irrigation and carpet making.

Steve Massey is a mechanical engineer who started with five other employees in a garage a decade ago and has since seen Sturman's head count rise to more than 150. A staff of 20 engineers and designers use SolidWorks and both Computational Fluid Dynamics (CFD) and EFD programs to create and analyze design iterations.

"The reasons for our growth are our technology, which is very unique, as well as a great relationship with International Trucks, which is using our products for both diesel fuel injection and a camless application that handles the hydraulic actuation of intake and exhaust valves. You can't vary how much mechanical valves open but by manipulating our digital valves a truck driver could theoretically turn cylinders completely off to slow the truck or increase fuel economy."



Massey conducts a wide variety of analysis and engineering support for Sturman's design team and had been searching for a product like FloWorks for months. "There is another engineer on staff who is an analysis expert and who spends virtually all of his time conducting CFD simulations with Star CD. My primary responsibility is design and I was immediately drawn to FloWorks when I saw it because all I want to do is design verification rather than spend all day setting up a simple flow problem."

According to Massey, CFD doesn't provide the user-friendliness that designers need, lagging far behind EFD in terms of ease-of-use. A designer will find FloWorks as easy to use as SolidWorks, a claim no other fluid analysis program can make. There is a very short learning curve and Massey found it so intuitive that he didn't even complete the training tutorial.

"With Star, you have to be a dedicated fluid analysis expert to use it whereas Engineering Fluid Dynamics programs like FloWorks are all about ease of use. They are tailored for designers, not CFD specialists. This is very important because most of the stuff that we do is design verification of non-transient, incompressible flow problems and we really don't need six different choices for turbulence models."

"Even when I obtained the FloWorks beta version more than a year ago, it looked like the first analysis program with an easy setup. In the past using a more traditional CFD program, I would spend several hours on the setup with the actual number crunching taking a half hour. The latest version of FloWorks takes the user's time and redirects it to CPU time."

Design optimization is, indeed, the key application of FloWorks on Sturman's HVA (Hydraulic Valve Actuation) product line. Massey's HVC II valve design underwent several hundreds of hours of FloWorks analysis and was the first design in which the EFD program was absolutely crucial.

"FloWorks probably drove 80 percent of the HVC II design because we had to maximize flow by minimizing radial and axial forces. It has paid off big time but we're too busy to even develop any exact metrics. With some software programs, though, you just know that you are benefiting and I would say that FloWorks has definitely paid for itself ten times over."

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