

KAVLICO

ADVANCING SENSOR AND TRANSDUCER DEVELOPMENT WITH SOLIDWORKS SOLUTIONS



Kavlico leverages SOLIDWORKS design and simulation solutions to effectively respond to customer demand for smaller, lighter, and more durable sensors and transducers.



Challenge:

Respond to market demands for smaller, lighter, and more durable products.

Solution:

Implement SOLIDWORKS Professional design, SOLIDWORKS Composer, and SOLIDWORKS Simulation Premium advanced analysis software.

Results:

- Saved eight to 10 weeks on mold development
- Cut product weight in half
- Reduced product size by 40 percent
- Doubled its number of products

Manufacturers worldwide rely on sensors and transducers from Kavlico to perform critical sensing operations involving pressure, position, and force. Customers ranging from automotive and aerospace manufacturers to industrial and medical device companies depend on Kavlico's innovative sensing technology for the operation of their products. Kavlico is a recognized leader in its field with a reputation for building products designed to withstand exceptionally rugged environments.

As part of the company's continuous improvement initiative, the goal of which is to redefine and optimize sensors for increasingly challenging applications, management decided in 1998 to upgrade from AutoCAD® 2D design tools to a 3D development platform. According to Senior Designer Cesar Gomez, Kavlico needed to respond to market demands for smaller, lighter, and more durable sensors and transducers.

"To compete successfully in the sensor industry, we need to reduce sensor weight and make our products more compact," Gomez explains. "In addition to size and weight requirements, we must design our products to operate in harsher environments. To overcome these challenges efficiently and cost-effectively—to account for the clearances, operating conditions, and tight tolerances involved—we simply had to move to 3D."

After evaluating 3D systems, Kavlico chose SOLIDWORKS® Professional design software because it's easy to learn and use, includes design configuration and mold development tools, and operates well with other CAD data. The company has since added SOLIDWORKS Simulation Premium analysis software for conducting thermal, structural, and vibration analyses, and SOLIDWORKS Composer software for facilitating technical communication development.

"There's a night-and-day difference in product development with SOLIDWORKS versus working in 2D," Gomez says.

"With SOLIDWORKS, we are actually able to see where the sensor fits within our customers' applications, understand how it correlates with what surrounds it, and simulate how it will perform in distinct operating environments. In short, SOLIDWORKS gives us the ability to cost-effectively design and produce more sophisticated sensors with improved accuracy and performance."

STREAMLINING MOLD DEVELOPMENT

Kavlico sources many sensor and transducer components that rely on plastic injection molding. Using SOLIDWORKS mold design and analysis tools, the company has streamlined part and mold development, cutting an average of eight to 10 weeks from the process. "Before we implemented SOLIDWORKS, mold development could require two or three iterations, which ate up three-quarters of our mold development time," Gomez recalls. "Every time that we had to make a design change, we lost four weeks in mold development."

"With SOLIDWORKS, we use draft analysis and mold development tools to make sure that the part we hand off to the moldmaker is easily producible," he adds. "If necessary, we can add uniform draft to the part or increase wall thicknesses, universally. This not only makes us more accurate and cost-effective, but also helps us to successfully launch products on time."

"With SOLIDWORKS, we can deliver our products faster and more cost-effectively because the process is more streamlined and accurate."

— Cesar Gomez, Senior Designer

SIMULATION CUTS SIZE AND WEIGHT

SOLIDWORKS Simulation Premium software plays a significant role in helping Kavlico produce lighter, more compact products. For example, Gomez conducted thermal, structural, and vibration analyses to optimize a new pressure transducer.

"To guarantee that our assemblies will not have a resonance weakness that will lead to vibrational failure, we employ the Simulation software," Gomez explains. "With SOLIDWORKS Simulation, I conducted design studies with easy iterations to understand how the overall shape and support material affects the mechanical response of an assembly, which would have been impossible with a 2D approach."

"It literally took minutes to evaluate different geometric changes to increase the fundamental response of the assembly," Gomez continues. "By using SOLIDWORKS Simulation, I was able to cut the weight of the transducer, which is 40 percent smaller, in half. Running analysis studies helps us in many other ways, such as matching the resonant frequency of a particular engine, absorbing vibration when the engine is running at different modal frequencies, conducting stress and fatigue analyses, and optimizing. Integrated analysis is a big help."

MORE PRODUCTS OF GREATER COMPLEXITY

By implementing integrated SOLIDWORKS design and analysis solutions, Kavlico has energized product development, doubling the number of products that it develops while simultaneously reducing part count and assembly complexity. "Kavlico is known for customization, developing products that match our customers' specific needs," Gomez stresses. "With SOLIDWORKS, we can deliver our products faster and more cost-effectively because the process is more streamlined and accurate."

"We are able to optimize our designs across many variables—from small size, light weight, and tight tolerancing to minimal prototyping, improved quality, and greater innovation," Gomez continues. "Our designs are more sophisticated because they have the same strength, withstand the same pressure, and absorb the same vibration in a smaller, lighter package."

Focus on Kavlico

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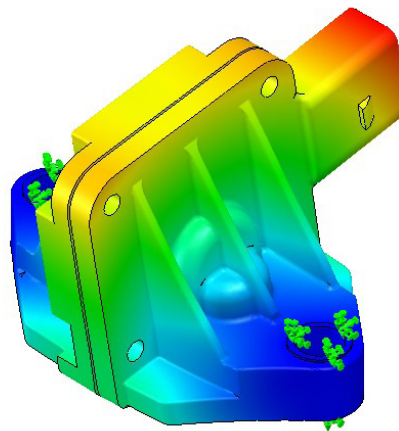
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Using SolidWorks design and simulation tools, Kavlico has doubled its product offering while simultaneously reducing product size and weight.

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