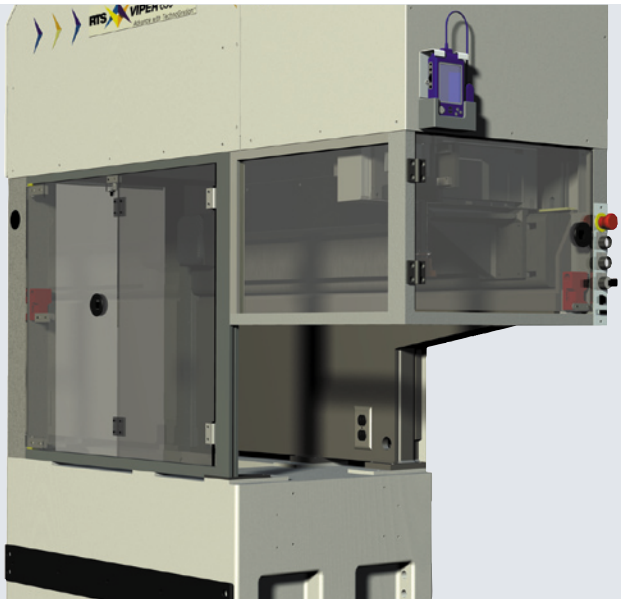
RTS Wright Industries LLC

BRINGING A FLEXIBLE ROBOTIC ASSEMBLY PLATFORM TO LIFE WITH SOLIDWORKS SOFTWARE



RTS Viper 650 Assembly Platform

- Realized a 20 percent reduction in the design
- Cut design costs by 20 percent
- Reduced design errors by 50 percent
- Introduced its first standardized assembly system

RTS FSI designs and manufactures automated robotic systems for product assembly in a variety of industries, including the semiconductor, automotive, electronics, and personal healthcare markets. For many years, RTS systems were one of a kind. RTS FSI engineers designed systems based on customer-specific assembly requirements using the MicroStation® 2D design package. Each machine involved a distinct design project because 2D design tools limited the company's ability to reuse and leverage existing design data.

As the company's custom-order business grew, its sales force foresaw the need for standard automation assembly equipment and the opportunity to design an RTS system that could be configured to support different applications. The company was evaluating a move to 3D when a customer specifically requested SolidWorks® design output. "We started using SolidWorks software when we won a job that required SolidWorks data as the delivered CAD format," explains Steve Lauer, senior mechanical design engineer and SolidWorks facilitator. "Our headquarters in Nashville, Tennessee, was already implementing the software, so we made the decision to transition to 100 percent SolidWorks designs at our Phoenix facility."

Lauer notes that RTS selected SolidWorks 3D CAD software for its ease of use, Windows® compatibility, short learning curve, large-assembly capabilities, and full associativity across assemblies, models, and drawings. After using SolidWorks successfully on that first design project, RTS FSI was ready to leverage fully associative 3D design to produce its first standardized product: the Viper 650.

SolidWorks

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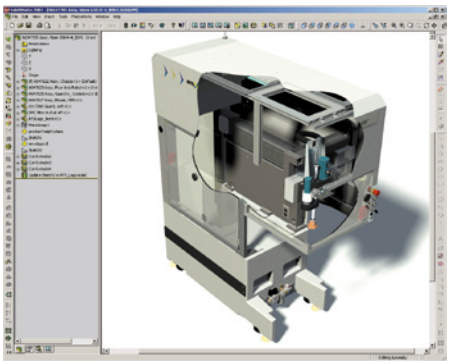
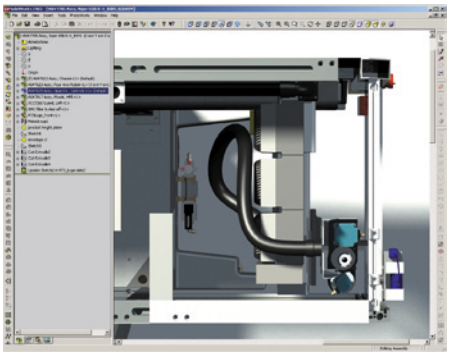
Steve Lauer, Senior Mechanical Design Engineer





RTS heavily leveraged the dynamic assembly capabilities in SolidWorks software to identify and resolve component interference and collision problems on the Viper 650.

Designing a large assembly in a tight envelope

The design requirements for the Viper 650 were complex, recalls Bill Parmentier, senior mechanical design engineer and lead designer on the Viper 650. "The system had to be designed to operate with different feeders, conveyors, and manual assembly systems. The project also involved creating an assembly of approximately 600 components in a relatively small space," Parmentier says. "We envisioned the Viper as a robotic cell on an assembly line or as a standalone assembly station. Either way, we needed to fit the system into a tight space. We were given a 650 mm envelope and had to shoehorn the system into that envelope."

RTS employed a collaborative design approach on the Viper 650, designing many subassemblies in parallel that were later merged as one large assembly. Using SolidWorks, RTS cut the design cycle on the Viper 650 from five months to four, cut design costs by 20 percent, and reduced design errors by 50 percent.

"SolidWorks was the key factor for getting the system into a tight envelope," Parmentier adds. "We needed to get a 340 mm stroke in a 650 mm-wide base. We also had to be really concerned about the weight. The Viper is relatively narrow, and we didn't want toppling the machine to be easy. We used the mass properties in SolidWorks to keep a close watch on the center of mass. It would have been nearly impossible to do that in 2D."

Resolving collision issues with dynamic assembly

RTS heavily leveraged the dynamic assembly capabilities in SolidWorks software to identify and resolve component interference and collision problems on the Viper 650. "You know a lot more in 3D," Parmentier points out. "Working in a tight space, we had to make sure there were no collisions. In SolidWorks, we used the dynamic assembly mode to pinpoint areas of interference while we designed the system. Then, we easily addressed those issues by making the necessary design changes.

"In 2D, we wouldn't have known what we had until we built it," he adds. "We would have spent a lot of time, considering the amount of cable routing involved, fixing those things on the shop floor."

Achieving flexibility with configurations

The Configuration Management capabilities of SolidWorks software helped RTS to demonstrate the versatility of the Viper 650 during customer presentations. "Another big advantage of SolidWorks is we can use configurations to show how our system interfaces with different feeder systems, conveyors, and assembly systems," Lauer says. "With SolidWorks, we use the best information we have regarding our customers' products and show them the different configurations that support their assembly processes."

The move to 3D has also enabled RTS to reuse standard designs instead of recreating them. "We developed a subassembly for a dial index machine that has become the standard indexer design in many of our machines. We not only reuse SolidWorks design data, but also discover opportunities to improve our designs," Lauer says.

SolidWorks

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