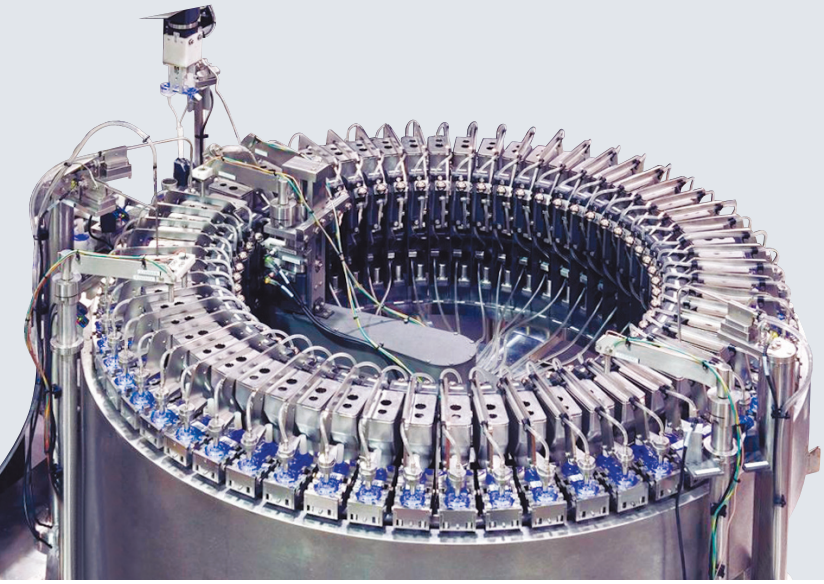
Remmele Engineering, Inc.

CREATING AN INNOVATIVE DRUG DELIVERY MANUFACTURING SYSTEM WITH SOLIDWORKS



Remmele used the SolidWorks 3D CAD solution to develop an advanced manufacturing system for producing the dosage form for Aradigm Corporation's revolutionary AERx pulmonary drug delivery system.

- Reduced design cycle by 25 to 30 percent
- Minimized errors, pinpointed source
- Improved concept visualization, communication
- Accelerated documentation development

Remmele Engineering is a leading provider of advanced manufacturing systems for manufacturers in industries ranging from military equipment and aerospace to consumer and medical products. Until 1999, the company utilized AutoCAD® 2D design tools to develop factory automation, manufacturing, and assembly systems. As the complexity and diversity of automated systems increased over the past decade, the communications, quality, and time limitations of 2D CAD became more apparent, according to Brian Miles, manager of design and control engineering.

"For many years, we worked in familiar industries with clients who could read a 2D drawing," Miles explains. "More and more, we began working with customers in various industries involving new product-to-market ventures, innovative production processes, and pioneering manufacturing techniques, which demanded a 3D model. We came to realize that we needed to upgrade our design platform and add capabilities that addressed the limitations of 2D and enabled us to interact more effectively with customers. We understood that getting through the concept proposal, development, and production process quickly would become the key to our success."

Remmele's engineers conducted a thorough evaluation of fifteen 3D CAD systems, considering criteria such as ease of use, technical functionality, communication/presentation capabilities, legacy data handling, the viability of the parent company, and the quality of local support. "After several months of analysis, SolidWorks® software came out head-and-shoulders above the rest," Miles recalls.

Remmele selected the SolidWorks 3D CAD system because of its ease of use, large assembly and configuration capabilities, robust design communication/animation tools, ability to import/export AutoCAD data, industry leadership position, and strong local support.

SolidWorks

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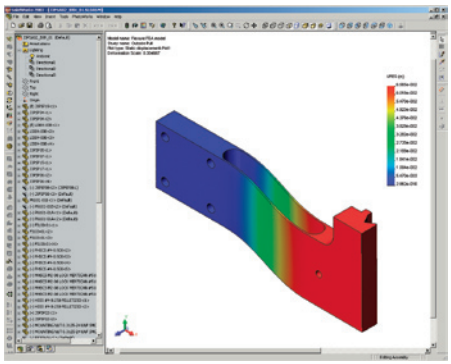

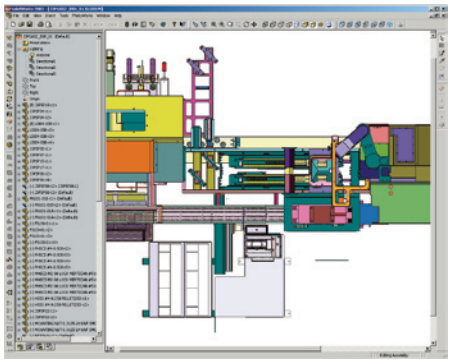

Remmele Engineering uses SolidWorks large-assembly, documentation, and communications capabilities with integrated tools, such as SolidWorks Simulation finite element analysis software, to create automated manufacturing systems equipment of increasingly greater complexity in less time and with fewer errors.

Changing requirements demand 3D

One early project that confirmed the soundness of Remmele's decision to standardize on SolidWorks software was the development of an advanced manufacturing system for Aradigm Corporation (Hayward, California) to produce the dosage form for its revolutionary AERx® pulmonary drug delivery system, which is in late stage development for the delivery of insulin through the lungs instead of hypodermic needles. The patient breathes into a mouthpiece, and the system meters the patient's breathing rate, calculates the appropriate dose, and delivers the medication.

"The requirements on the Aradigm project really justified our selection of SolidWorks and our decision to move to 3D," notes John Nelson, CAD systems specialist. "The system that produced the drug dosage forms was a very long, large assembly of more than 4,000 parts that had to produce precise doses at high volume in a controlled environment.

"The size and complexity of this system demanded a 3D approach," he adds. "We needed the ability to communicate the design to the customer without the ambiguity of 2D; we needed configurations to show the different approaches, options, and sequences for the process; and we needed tight quality control to provide the degree of precision required. SolidWorks was a key to the success of the project."

Increased productivity and quality

Since implementing SolidWorks software, Remmele has realized improvements in productivity and quality. "We are at least 25 to 30 percent faster than we were before," Miles says. "For example, we can import SolidWorks models into GibbsCAM®, our automated machining package. It used to take a long time for our machinists to do the data translation to program toolpaths. Now, we just take the model straight in, which saves programming time."

Remmele also uses SolidWorks Simulation finite element analysis software – fully integrated with SolidWorks – to save time and improve quality by verifying design performance. "We have fewer mistakes, and it's easier to correct mistakes and understand how mistakes were made," Miles says.

Design Engineer Steve Klopp says he uses 3D ContentCentral®, an online repository of frequently used SolidWorks components, to save time and effort. "Sometimes, up to 70 percent of our systems use purchased parts. The ability to get models of those components quickly and accurately is a huge benefit," Klopp says.

Improved communication and documentation

The design communication and documentation capabilities in SolidWorks software help Remmele win and retain customers. Miles says Remmele uses live SolidWorks sessions over the web, SolidWorks eDrawings®, configurations, and SolidWorks animation features to communicate, discuss, and refine system concepts with customers, and SolidWorks automated drawing creation capabilities to create documentation and manuals.

"SolidWorks provides a real comfort level for customers," Miles says. "They know they will have close communication and access to project details without having to hop on a plane or travel. They can see the whole system functioning, which builds credibility and trust and helps us win additional work."

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