DASSAULT SYSTEMES

SOLIDWORKS

SIDDHARTH ENGINEERS

ADVANCING BALL VALVE DEVELOPMENT WITH SOLIDWORKS SOLUTIONS

Siddharth Engineers leveraged SOLIDWORKS design, analysis, flow simulation, and technical communication software solutions to accelerate the development of ball valves and turnkey projects—involving valves, pumps, piping, instrumentation, programmable logic controllers, and other automation hardware—while simultaneously improving quality.

Challenge:
Accelerate the development of ball valves and turnkey projects—involving valves, pumps, piping, instrumentation, programmable logic controllers, and other automation hardware—while simultaneously improving quality.

Solution:
Implement SOLIDWORKS Standard design, SOLIDWORKS Simulation Professional structural analysis, SOLIDWORKS Flow Simulation computational fluid dynamics (CFD) analysis, and SOLIDWORKS Composer technical communication software solutions.

Benefits:
- Cut design cycles by 20 percent
- Shortened time-to-market by 12 percent
- Reduced prototyping costs by 30 percent
- Improved product quality and performance

Siddharth Engineers has specialized in the design, engineering, and manufacture of ball valves and related components and systems since its establishment in 1998. The company's business has grown to encompass many different types of valves, including custom designs, as well as the management of turnkey projects involving design, fabrication, and installation of valves, pumps, piping, instrumentation, programmable logic controllers, and other automation hardware. Over the years, Siddharth Engineers has built a reputation for reliability by following strict quality norms at the various stages of production and by leveraging testing and simulation technologies.

In addition to emphasizing sound design and engineering practices, the firm leverages advanced manufacturing technologies, including CNC machining, vertical machining centers, hydraulic test rigs, and degreasing systems. Siddharth Engineers inspects all incoming parts to make sure that they meet specifications and checks all pressure-bearing parts for strength and tightness before assembly.

Until 2012, the company used AutoCAD® 2D design tools to develop its ball valves and systems. That's when Siddharth Engineers management decided to move to a 3D development platform to increase productivity and achieve additional quality improvements, according to Partner Pradeep Parab. "We wanted to move from 2D to 3D to reduce iterations, improve visualization, and eliminate a lot of wasted effort," Parab recalls. "Making greater use of simulation and analysis tools—to complement our testing effort—was another objective that required the use of 3D geometry."

After investigating possible 3D design systems, Siddharth Engineers decided to transition to the SOLIDWORKS® 3D development environment, implementing SOLIDWORKS Standard design, SOLIDWORKS Simulation Professional structural analysis, SOLIDWORKS Flow Simulation computational fluid dynamics (CFD) analysis, and SOLIDWORKS Composer technical communication software solutions. Siddharth Engineers chose SOLIDWORKS because it is user-friendly; particularly well suited for moving from 2D to 3D; and integrates design, analysis, and communications tools within a single, common platform.

FASTER DESIGN, IMPROVED QUALITY

Since implementing SOLIDWORKS solutions, Siddharth Engineers has realized substantial productivity improvements, resulting in shorter design cycles, faster times-to-market, and improved quality. Using SOLIDWORKS software, the valve manufacturer has cut design time by 20 percent and time-to-market by 12 percent. "Our first design with SOLIDWORKS was a manual override for a valve that was part of a defense rocket," Parab recalls.

"That project demonstrated the benefits of working in 3D with SOLIDWORKS software," Parab continues. "The ability to model our assembly designs in 3D using SOLIDWORKS, and then evaluate the assembly to identify critical areas that need improvement prior to testing and manufacturing the finished product has dramatically improved both the speed and quality of our development processes. SOLIDWORKS enables us to bring higher quality products to market faster, which has improved our competitiveness."

Moving from 2D to SOLIDWORKS 3D has also allowed Siddharth Engineers to increase design reuse and the development of derivative designs, both of which contribute to design cycle reductions.

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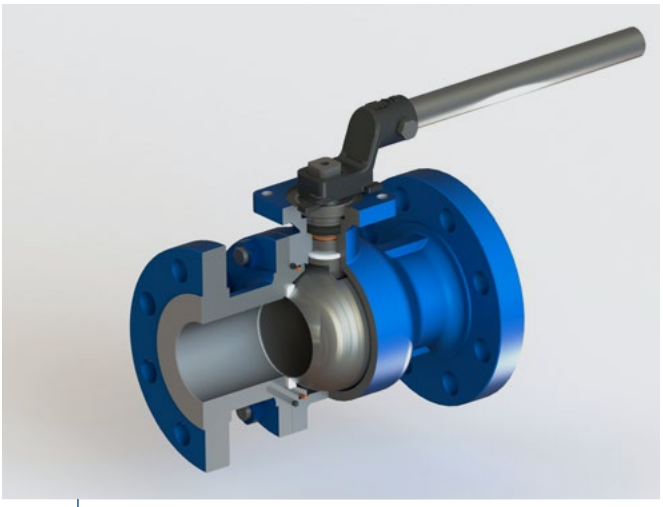
— Pradeep Parab, Partner

SIMULATION REDUCES PROTOTYPING

In addition to standardizing on the SOLIDWORKS 3D modeling environment, Siddharth Engineers acquired SOLIDWORKS Simulation Professional and SOLIDWORKS Flow Simulation software to support its efforts to minimize prototyping, improve performance, and make testing more efficient. "After modeling our valve designs, we need to test designs for feasibility and performance before releasing them for manufacturing and the creation of tooling," Parab stresses.



Using SOLIDWORKS structural and flow simulation tools, Siddharth Engineers has reduced prototyping requirements and improved performance; and with SOLIDWORKS Composer technical communication software, the ball valve manufacturer has streamlined the development of user manuals and product documentation.

Focus on Siddharth Engineers
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"In the past, testing/design modification iterations added time and cost to the process," Parab adds. "With SOLIDWORKS simulation tools, we now have a very effective digital prototyping environment that helps us address potential failures before building a physical prototype. This capability has enabled us to reduce prototyping costs by 30 percent while simultaneously allowing us to eliminate potential leaks, decrease minimum valve opening torque, reduce weight, shorten manufacturing time, and minimize field failures."

IMPROVED COMMUNICATIONS, INCLUDING MOBILE

The transition from 2D to the SOLIDWORKS 3D design environment has also improved Siddharth Engineers' communications with its customers. For example, by supplying customers with SOLIDWORKS Simulation Engineering Reports of virtual prototyping studies, the valve manufacturer not only validates valve performance but also instills greater customer confidence in the quality of their designs. The addition of SOLIDWORKS Composer software has automated the development of user manuals, and SOLIDWORKS eDrawings® communication tools lets Siddharth Engineers share designs via tablets and smartphones.

"By moving to the SOLIDWORKS 3D development platform, we have improved design visualization and communication, both of which help to shorten the process and optimize valve designs," Parab points out. "The integration of modeling and simulation tools in SOLIDWORKS helps keep us focused on the design, and the ability to communicate with customers via mobile smartphones prepares us for conducting business in new ways for years to come."

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