

# S&S Worldwide, Inc.

SCALING NEW HEIGHTS IN THRILL RIDE DEVELOPMENT WITH SOLIDWORKS



Using SolidWorks 3D CAD software, S&S Worldwide engineers can visualize ride designs more accurately and efficiently.

- Shortened design cycles by 25 percent
- Cut development costs by 20 percent
- Improved product quality by 25 percent
- Increased market share by 33 percent

S&S Worldwide, Inc., is the largest American manufacturer of roller coasters and amusement park rides, as well as the first company to introduce a pneumatically launched roller coaster. With a global market encompassing 27 countries, the company continually evaluates new methods for efficiently designing thrill rides, while still achieving high levels of performance and personal safety. To achieve its goals, S&S Worldwide decided to transition from the Mechanical Desktop® design software it once used to a 3D CAD system, according to Quin Checketts, director of Technical Services and lead designer at S&S Worldwide.

“Moving to a 3D CAD package offered the best solution for simplifying our design process,” Checketts recalls. “Many of our product designs comprise thousands of parts, and a single roller coaster train can contain upwards of 8,000 individual components. So we needed a system that could handle large, complex assemblies. Our goals were to shorten design cycles, improve product quality, and enhance design visualization, while reducing prototype development costs.”

S&S Worldwide evaluated several CAD packages before selecting SolidWorks® 3D CAD software, installing 10 seats for its design engineers. The company chose SolidWorks because of its ease of use, broad data compatibility, large-assembly capabilities, and advanced visualization tools.

## Visualizing track/wheel interaction saves time

With SolidWorks software, S&S Worldwide engineers can visualize ride designs more accurately and efficiently, resulting in improved modeling productivity and design cycle reductions. For example, the firm’s El Loco coaster includes a variety of tight turns, sharp bends, and steep hills, in combination with accelerator boosters and decelerator brakes. Now S&S Worldwide can visualize how the ride vehicle interacts with the track, without having to build an actual physical model.

**“We may spend more time modeling a design in SolidWorks up front, but overall we realize a cycle reduction due to the time saved in the field.”**

Quin Checketts,  
Director of Technical Services



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## Minimizing problems in the field

Since moving to SolidWorks software, S&S Worldwide has been able to identify potential design and performance issues in SolidWorks during the conceptual design phase, instead of discovering problems later in the field. “Because we are dealing with elaborate assemblies, we want to avoid issues that come up during the installation of a ride,” Checketts stresses. “The more design errors we can catch during the conceptual design, the faster and more cost-effective we will ultimately be.”

He notes that the costs associated with addressing design issues generally go up by a factor of 10 at each stage in the process. If an error resolved on the computer model cost \$1, for example, then fixing the error on the shop floor would cost \$10, while resolving the issue in the field would cost \$100.

“Anything we can catch at the modeling stage saves time and money,” Checketts points out. “In addition to helping us save time, SolidWorks has enabled us to reduce development costs associated with needless prototyping, scrap, and rework by 20 percent. We may spend more time modeling a design in SolidWorks up front, but overall we realize a cycle reduction due to the time saved in the field.”

## Configuring different operation modes

S&S Worldwide engineers also use SolidWorks software to improve product quality and innovation, resulting in a 33 percent increase in market share. The company uses SolidWorks configuration capabilities in conjunction with collision and interference detection tools to gain insights into the design and the operation of the entire ride system.

“With SolidWorks configuration capabilities, we can visualize assemblies during different modes of operation—a coaster vehicle with the lap-bar up or down, for instance,” notes Checketts. “By running collision detection on our various configurations, we can ensure that our designs function properly before building a single prototype. SolidWorks has enabled us to improve our overall product quality by at least 25 percent.”



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