

CCTY BEARING CO.

ADVANCING HIGH-PERFORMANCE BEARING
DEVELOPMENT WITH SOLIDWORKS SOLUTIONS



Using SOLIDWORKS 3D design and simulation solutions, CCTY Bearing not only realized substantial reductions in development and delivery lead times, the company also created its patent-pending Square Ball Universal Joint. The innovative design which allows for the transfer of high torque smoothly while making assembly easier, by reducing the number of u-joint components from approximately 115 to 6.

Challenge:

Shorten lead times for customer bearing assembly development while simultaneously improving product discussion, reducing prototyping requirements, and increasing design innovation.

Solution:

Implement SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, and SOLIDWORKS Simulation Premium analysis software solutions.

Benefits:

- Cut lead times for custom bearings substantially
- Decreased prototyping requirements
- Improved prototype quality
- Reduced Square Ball Universal Joint design cycle by two to three times

CCTY Bearing designs and manufactures high-performance bearings and assemblies. The company's extensive product line ranges from traditional bearing products—such as spherical plain bearings, radial ball bearings, tie rods, ball joints, and self-lubricating bushings—to innovative bearing designs like its patent-pending Square Ball Universal Joint™ (u-joint) assembly.

In addition to manufacturing commodity-based bearing products, CCTY Bearing makes custom bearing solutions for original equipment manufacturers (OEMs), and specializes in the development of steering linkages, suspension/wheel systems, and custom bearing assemblies for golf cart, fork lift, snowmobile, ATV, UTV, and specialized vehicle manufacturers.

CCTY Bearing has sales, engineering, design, and warehouses in the United States, Germany, Japan and China, and a manufacturing plant in Zhenjiang, China. In 2015, CCTY Bearing implemented a 3D design and simulation solution in the United States to support interactions with customers, improve communications with manufacturing colleagues in China, and shorten development lead times, according to Strategic Sales Manager John Sweetwood.

"We tried to work without a 3D CAD solution, but there were too many corrections and delays because things were lost in translation," Sweetwood recounts. "Time kills all deals, so we decided to implement a design and simulation platform to work with customers directly to develop design concepts and make sure that they will work with the customer's application. We also wanted to improve communication with our manufacturing plant in China and maintain more control over prototypes, so we could speed up the process."

CCTY Bearing evaluated the Pro/ENGINEER® and SOLIDWORKS® 3D design platforms before standardizing on SOLIDWORKS. The company implemented SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, and SOLIDWORKS Simulation Premium analysis software solutions because they are easy to use, offer 3D visualization and communication tools, and provide integrated design analysis capabilities. "Having access to robust, integrated simulation capabilities was the deciding factor, because we utilize simulation on a regular basis," Sweetwood says.

IMPROVED INTERACTIONS WITH CUSTOMERS, MANUFACTURING PARTNERS

Since implementing SOLIDWORKS solutions in 2015, CCTY Bearing has realized substantial reductions in development and delivery lead times—partly, because of improved visualization and communications with customers and manufacturing colleagues, and partly because of the ability to validate and optimize performance using simulation tools. "SOLIDWORKS has helped us become more nimble and quick in helping our customers solve their problems," Sweetwood notes.

"With SOLIDWORKS, we can quickly develop a conceptual design and determine if it will work with the customer's specific mating parts, then share the design with customers and our manufacturing partners," Sweetwood continues. "SOLIDWORKS has allowed us to improve our conversations because they have the design in front of them. If the customer doesn't have SOLIDWORKS, we've had success using SOLIDWORKS eDrawings® to allow them to better visualize and understand the design. Improving communications alone has helped to reduce the number of design iterations required."



"Using SOLIDWORKS Simulation tools, we can help our customers reduce weight by removing material where it isn't needed, then send the customer the simulation report. This helps us get a design right on the first prototype, in most cases."

— John Sweetwood, Strategic Sales Manager

SIMULATION REDUCES PROTOTYPING

CCTY Bearing leverages SOLIDWORKS Simulation Premium software to analyze various performance aspects of its designs, including yield and tensile strength, buckling, and deformation, as well as the performance characteristics of nonlinear materials. By using SOLIDWORKS Simulation tools, the bearing manufacturer can pinpoint and address potential design performance issues, resulting in reduced prototyping requirements.

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The bearing manufacturer relies on SOLIDWORKS Simulation results because it has verified the accuracy of the software. "We've seen close correlation between our simulation results and what we learn during physical testing," adds Engineering Manager Richard Perlberg.

INNOVATING A SQUARE BALL UNIVERSAL JOINT

CCTY Bearing also used SOLIDWORKS design and simulation tools to come up with a better way to design and manufacture a u-joint. The company's innovative, patent-pending Square Ball Universal Joint handles friction in the same way as a sliding bearing—spreading the load out over a large area—and which allows for the transfer of high torque smoothly. They also made it easier to assemble by reducing the number of u-joint components from approximately 115 to 6.

"SOLIDWORKS allowed us to quickly iterate on the Square Ball Universal Joint design, which decreased our development cycle by two to three times," Sweetwood stresses. "This product has great automotive potential, and the SOLIDWORKS platform has proven to be a real advantage for us."



With SOLIDWORKS design and simulation tools, CCTY bearing has improved visualization and communications with customers and manufacturing colleagues—leading to more efficient manufacturing and assembly—while simultaneously reducing prototyping requirements.

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