

Industrial machinery and heavy equipment

JIER Machine Tool Group

Metal forming and cutting machine tool maker cuts costs; improves quality and efficiency using Solid Edge

Products

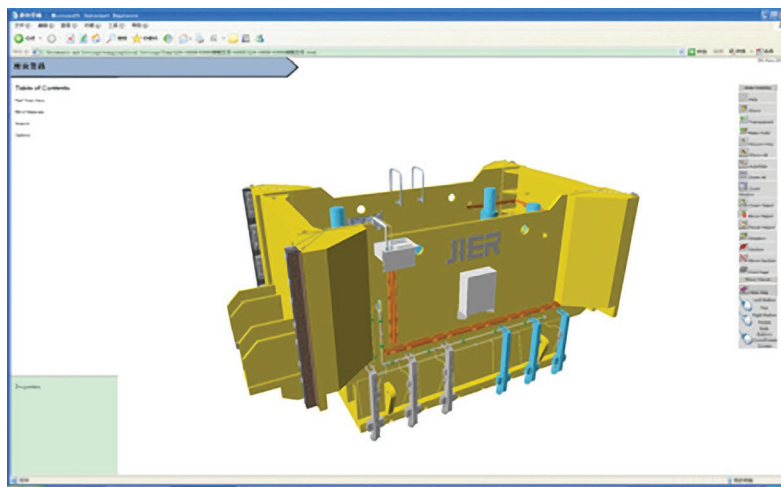
Solid Edge, Femap, NX, Teamcenter

Business challenges

- Producing higher-quality products
- Converting to 3D information-based planning
- Consolidating and standardizing basic data
- Improving ability to deal with design changes
- Improving collaboration among departments
- Reducing cost while improving R&D efficiency

Keys to success

- Improved planning process
- Automated BOM creation
- Simulation analysis
- Customized secondary software development



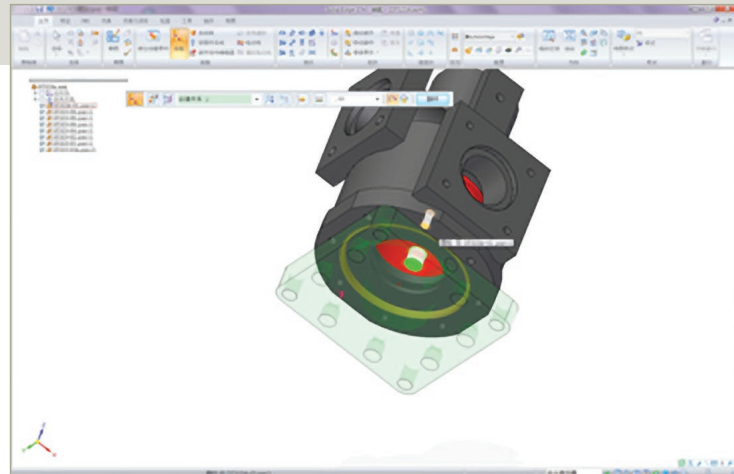
3D CAD technology helps JIER keep pace with fierce competition

Solid Edge enables conversion from 2D to 3D design

The use of Solid Edge® software for 3D computer-aided design (CAD) is helping JIER Machine Tool, Co., Ltd. (JIER) keep pace in a fiercely competitive global marketplace. Established in 1937, JIER is China's largest manufacturer of industrial machinery. JIER ranks among the Top 100 companies in the domestic machinery industry, leads the metal-forming field and is one of the world's top three, largest manufacturers of pressing equipment. JIER's products include computer numerical control (CNC)

metal-forming equipment, CNC metal-cutting machine tools, automation equipment, foundry machinery and CNC cutting equipment.

As a state-owned enterprise for more than 70 years, JIER has remained competitive because of the company's relentless pursuit of technical and management innovation. The company has maintained a competitive advantage across its core products by continuously driving innovation while using information tools to help improve enterprise management. JIER began using CAD as early as the 1980s and developed its own proprietary electrical CAD, mechanism analysis, enterprise resource planning (ERP) and product data management (PDM) software systems.



Results

- Reduced costs significantly
- Tripled productivity
- Improved design quality and R&D efficiency
- Automated BOM creation
- Shortened product R&D cycle
- Alleviated manual workloads

JIER engineers saw an opportunity to further improve product design quality by increasing the use of 3D CAD technology. However, JIER's legacy CAD system fell far short of the company's requirements. So, JIER engineers decided to deploy more sophisticated commercial 3D CAD software to enable them to work in 3D.

The choice of Solid Edge

JIER builds products on a manufacture-to-order basis, offering a wide range of product variants with highly technical contents and complicated structures. Because there can be nearly 10,000 parts in a single product, the company's design and manufacturing process is complex. JIER engineers wanted to better exploit the high degree of similarity in product designs and to re-use assembly design and bill of materials (BOM) information.

The company conducted a thorough comparison and analysis of various commercial software systems. In the end, JIER engineers chose Solid Edge from product lifecycle management (PLM) specialist Siemens PLM Software because the system most closely met the company's requirements.

"Solid Edge facilitates design changes to part and assembly models and it's very scalable; enabling our company to expand operations to fit our business requirements," says a CAD manager at JIER. "Solid Edge is priced reasonably and, most importantly, provides capabilities for designing parts, assemblies, welds, sheet metal and surfaces that meet JIER's essential requirements for product design."

The CAD manager notes, "Solid Edge is highly practical, easy to learn and easy to use while providing interoperability to simplify 3D CAD operations. The 2D drafting module of Solid Edge enables us to create engineering drawings and update drawings automatically from 3D models. What's more, in the process of 3D modeling, Solid Edge enables us to use 2D CAD data, thus helping the company make a smooth transition by helping us address the disconnect between 2D and 3D design."

JIER's transition from 2D to 3D

The deployment of 3D CAD software is helping enable an enterprise-wide application of 3D technology. To initiate the deployment

"Solid Edge facilitates design changes to part models and assembly models..."

CAD manager
JIER Machine-tool Group Co., Ltd.



Using Solid Edge, JIER realized automated BOM creation, doubled BOM creation efficiency, improved design quality and R&D efficiency, and shortened its product R&D cycle.

of Solid Edge, JIER management forged a three-step plan for the transition from 2D to 3D. "The first step was construction of the basic data framework for 3D, including creating a purchased parts library, a general parts library and a standard parts library, which were then gradually imported for use via the software's PDM capability," says the CAD manager.

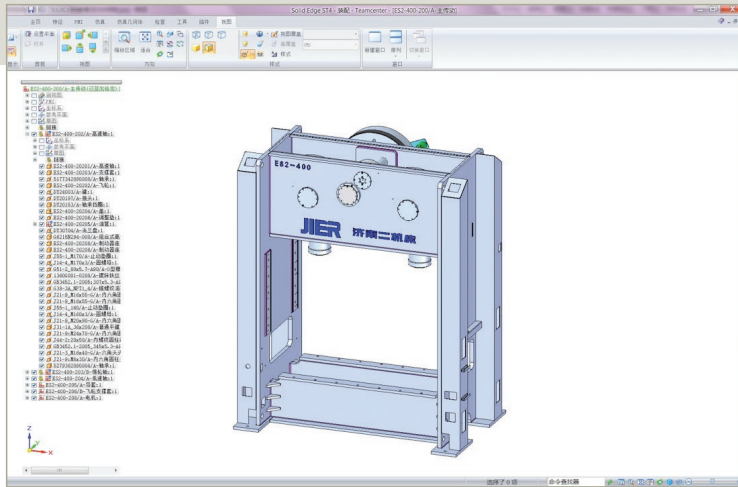
"The next step was to accumulate instances of 3D in new product design. In other words, we apply 3D design with Solid Edge for some new orders, such as product variants, to increase the use of 3D product models and digital designs.

"The third step was to comprehensively expand our application of 3D CAD. Once we reached the point when half of the company's products were designed with Solid Edge, we felt that 2D design would

gradually fall into disuse, helping us complete the transition and upgrade from 2D to 3D."

Currently, JIER has finished the construction of the basic data framework and established a PDM platform using Solid Edge. The 3D design approach is now applied for most of the company's products. On average, the company designs more than ten new products each year with Solid Edge.

The expansion of 3D at JIER was not without challenges. An internal rollout fell short of expectations. To find the root causes of these issues, JIER engineers partnered with Siemens PLM Software consultants to build an implementation team. Siemens PLM Software arranged periodic training courses and provided technical support for designers to enable them to apply Solid Edge more skillfully. Siemens PLM Software also carried



out version upgrades, secondary software development and other activities to better meet company requirements.

JIER has adopted all of the basic functions of Solid Edge, in particular, part design and assembly design. The assembly design functionality enables engineers to assemble available parts or components according to the assembly relationship through a top-down or bottom-up approach. This enables multiple engineers to work on the same project, thus enabling collaborative design.

The sheet metal design function helps engineers quickly complete the design of sheet metal parts. Femap™ software, also from Siemens PLM Software, is used in the assembly environment for simple strain or modal analysis of parts and sheet metal. The 2D drafting function is used to create and update drawings automatically according to 3D models, and enables engineers to create standard and auxiliary views quickly. The company utilizes the tools of Solid Edge for a number of other important processes, including BOM creation and web-based collaboration.

JIER has also implemented Siemens PLM Software's Teamcenter® software and NX™ Nastran® software. These closely integrated software solutions constitute JIER's digital product development platform. Solid Edge

is used primarily for 3D product design. NX Nastran is employed for professional finite element analysis (FEA), structural curve analysis and simulation. Teamcenter is engaged for complete PLM.

Automatic extraction of BOM information, eliminating silos

JIER has very complicated product BOMs because there can be as many as 10,000 parts involved in any one product. In addition, a highly competitive market is forcing accelerated design and innovation. Because the product design is normally subjected to repeated changes and improvements, the product BOM changes accordingly. Therefore, JIER engineers wanted to make the most out of the BOM information generated in the design stage while eliminating the storage of data in "information silos" such as PDM and ERP.

JIER engineers have performed some secondary development work, customizing their implementation of Solid Edge. Because of the tight integration between Solid Edge and Teamcenter, the automatic extraction of assembly BOM information now enables the easy analysis of the assembly and parts contained in the assembly. After finishing the assembly design using Solid Edge, the assembly drawing can be directly added to Teamcenter. The assembly BOM information can be extracted automatically from the assembly drawing. Furthermore, an intermediate data table produced using the assembly BOM as basic data can be submitted to ERP.

Before this functionality, the creation of assembly BOMs at JIER was done manually, leading to an error-prone process. By changing from manual to automatic BOM creation, BOM generation efficiency has been more than doubled, the product R&D cycle dramatically shortened and manual work eliminated.

Solutions/Services

Solid Edge

www.siemens.com/solidedge

NX Nastran

www.siemens.com/nx

Femap

www.siemens.com/plm/femap

Teamcenter

www.siemens.com/teamcenter

Customer's primary business

JIER Machine Tool Group Co., Ltd. produces CNC metal-forming equipment, CNC metal-cutting machine tools, automation equipment, foundry machinery and CNC cutting equipment.
www.jiermt.com

Customer location

Jinan

Shandong Province

China

Implementation benefits

"With the implementation of Solid Edge, JIER has significantly improved design quality and R&D efficiency," says the CAD manager. "For example, when a design problem is uncovered during the assembly process, changes can be made quickly. Design problems can also be avoided during the design process. Solid Edge allows designers to directly use all resources available to make linked designs and synchronous changes, which improves design efficiency. Meanwhile, as pre-phase preparation for 3D advancement, we have fully consolidated, sorted through and standardized basic data, thereby laying a solid foundation for further use of the information in future projects."

The use of Solid Edge is only the first step in the transition from 2D to 3D. As 3D CAD application deepens, JIER will further apply 3D to technical, manufacturing and other processes, progressing towards the ultimate goal of 3D application throughout the product lifecycle.

JIER is very productive in its use of 3D data and information management tools according to its business requirements and strategies, but the CAD manager notes that the company continuously seeks to exploit PLM to further advantage: "We believe that the journey to informatization will deliver even more dynamic benefits to JIER's development."

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www.siemens.com/plm

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