

## Industrial machinery and equipment

# Taiyuan Mining Machinery Group

### Virtual product development sustains market leadership strategy

#### Product

NX

#### Business initiatives

New product development

#### Business challenges

Increasing competition

Shorter delivery cycles

Harsh operating conditions for the equipment

#### Keys to success

3D design process that starts early

Digital simulation to improve reliability

Part libraries that promote data re-use

Concurrent engineering practices

Workflow management tools

#### Results

Development time reduced by 32 percent

Delivery cycle time down by 35 percent

Market share increased by 9 percent

### NX helps improve design efficiency and shortens delivery times for coal mining machinery

#### Increasing competition

Taiyuan Mining Machinery Group (TMMG) Co., Ltd. designs and manufactures equipment for coal mining, metallurgy, lubrication, hydraulics and electrical control. With strengths in both product development and manufacturing, TMMG holds one-third of the domestic Chinese market for coal mining machinery. Its goal is to become one of the top three manufacturers of coal mining machinery worldwide.

TMMG faces increasing competition from large international companies as well as from domestic firms. To reach its goal, TMMG must develop custom solutions, supply high-quality products, reduce delivery cycle times and provide the best service in the industry. In addition, because of the harsh conditions in which these machines operate, TMMG must ensure that its products are extremely durable. Mining is now being done in harder and deeper coal beds. TMMG must provide highly efficient solutions for a variety of different mining conditions while reducing the maintenance costs for the equipment. This requires the company's R&D center to speed the pace of new product development.



#### Virtual designs, right the first time

Over the years as delivery cycles compressed (and quality requirements increased), TMMG management realized the limits of its 2D development process. The company performed a detailed study of 3D solutions and a comparison of two providers – Siemens PLM Software and Parametric Technology Corp. Siemens' reputation and the scalability of its solutions convinced TMMG to implement the NX™ digital product development system.

Engineers at the TMMG Design Institute use NX to define new products virtually. At the early stage of product development, engineers create virtual digital models with which they control the overall layout, place parts and components, check assemblies and so on. During this process, they also use the NX Nastran® finite element analysis solution to simulate actual working conditions and analyze performance,



including structural stability, modal response and kinematics. Analysis results are used to improve reliability and optimize designs. The manufacturing department also gets involved in the project at this point, using design data to reduce process planning times. The use of NX enables concurrent engineering and has transformed the process of research and development.

NX part libraries, version management tools and templates significantly increase part re-use and help establish 3D design standards. NX is also used to continuously evaluate engineers' designs, ensuring compliance with customer and regulatory agency requirements, engineering rules and company best practices. Automatic

verification enables the R&D center to create designs that are right the first time, eliminating costly errors and redesigns.

For TMMG, NX provides a unified product definition as well as built-in collaboration and workflow management capabilities. This integrated functionality ensures rapid development at every stage of the design process. Ultimately, the use of NX, along with assistance from Siemens PLM Software and partners, has significantly improved the efficiency of the company's product development process.

#### **Impressive metrics**

NX has been used on a number of major projects at TMMG. After analyzing these projects, the company found that research and development cycle time was reduced by 32 percent and the delivery time was reduced by 35 percent. Ultimately, with NX, market share has already increased by nine percent.

As the NX implementation expands within the enterprise, more and more design engineers are joining the team. TMMG management has noted the important role of Siemens PLM Software products in improving the company's product development capability and has decided to fully

**“NX enables us to improve our product design efficiency, increase design quality and reduce delivery times.”**

Xie Guijun  
Head of Design Institute  
TMMG

### Solutions/Services

NX  
NX Nastran  
[www.siemens.com/nx](http://www.siemens.com/nx)

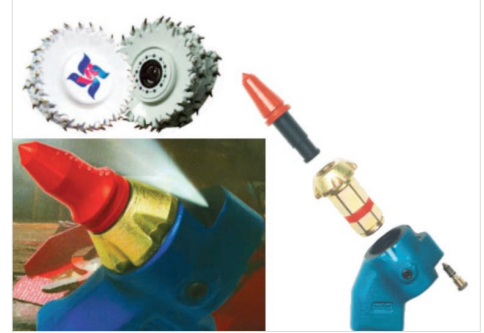
### Customer's primary business

TMMG develops and manufactures coal mining machinery and other heavy-duty equipment.  
[www.sxkuangji.com](http://www.sxkuangji.com)

### Customer location

Taiyuan City, Shanxi Province  
China

extend the application of Siemens PLM Software products in the future. More specifically, management considers the use of Siemens PLM Software products key to the company's strategic transformation and critical to its improving product quality, shortening development and delivery cycle times, and increasing the technical content and added value of its products.



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### Siemens PLM Software

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[www.siemens.com/plm](http://www.siemens.com/plm)

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