Industry
Electronics and semiconductor

Business challenges
2D software draining design engineers’ time on redundant tasks
Engineers unable to concentrate on improvement and innovation
Frequent part and component modifications; 2D approach causing inconsistency in dimensions from one version to the next
Part and component assembly difficult; interferences common

Keys to success
Solid Edge – 3D software that’s easy to learn and use
Variable design to improve design efficiency
Powerful technical support from Henghua Yichuang Technology Company
Regular training in new functions

Solid Edge enables significantly improved R&D and customized development across Tianjin Samsung’s portfolio of advanced production line equipment

Focus on 3D for R&D
Founded in 1993, Tianjin Samsung Electro-Mechanics Co., Ltd. is now one of the world’s top 10 manufacturers of components for electronic equipment. Tianjin Samsung Electro-Mechanics Co. Ltd. is a joint venture between Samsung Electro-Mechanics Co. Ltd., a leading global supplier of core components for electronic products, and Tianjin Zhonghuan Electronic Information Group Co. Ltd.

The corporate values, defined in the statement – “Attitude determines everything and details make the difference” – can be seen in people and their performance at all levels in the manufacturing process. Employees maintain a very positive disposition and pay special attention to details.

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in both their study and work. The result is a high level of quality control throughout the production process.

In addition to its values declaration, company management emphasizes the requirement to produce state-of-the-art products using state-of-the-art equipment. As electronic components are small and their associated manufacturing processes are sophisticated, the production equipment and their technical level are critical in determining the quality and competitiveness of the products. Ultimately, these factors have a strong impact on the success and growth of the enterprise.

According to Li Yongfeng, the company’s assistant director of the R&D Department, “The electronic components we work with are highly specialized, and our production technologies and equipment and test technologies and equipment vary widely. Different products require different production technologies and methods. For example, one electronic component has one production line and one generation of electronic components has a one-generation production line. To illustrate, the production of multi-layer PCBs requires additional new equipment each year, which imposes higher requirements on the updated design of the production line equipment.”

In 2006, Tianjin Samsung Electro-Mechanics started focusing its efforts on 3D R&D for special equipment, concentrating on electronic manufacturing. The company placed significant importance on the development of software and hardware. With the concerted efforts of more than 60 people on the R&D team, the company established core technologies and processes, and soon delivered a variety of advanced production line equipment with comprehensive functionality.

**Results**

- Engineers productive within one week of training
- Re-use of existing designs
- Error-free design
- Top-down and bottom-up method combined to achieve effective parallel design
- Improved design development efficiency by 60 to 70 percent
- Enhanced innovation capability; improved products

This achievement was dependent on the company equipping itself with strong independent R&D capabilities as well as an independent production capacity. Solid Edge® software was instrumental in this success. Yongfeng notes, “Solid Edge 3D design technology played an essential and valuable role in this effort and continues to be instrumental in the optimal utilization of the R&D resources of our company.”

**The evolution to 3D**

In order to eliminate the manual drawing process for design, Tianjin Samsung Electro-Mechanics chose 2D CAD software as the basic platform of the R&D Department in the early 1990s, completing a full range of customized development tasks while establishing a 2D CAD-based design and manufacturing system.
However, with the 2D design system, it became obvious that the design engineers spent extensive time in repeating simple tasks and had little opportunity to think about equipment innovation and improvement. Moreover, in 2D design, the dimensions of the parts and components do not correspond to each other and this causes inconsistency between the previous and subsequent dimensions. With frequent drawing modifications required, the effective assembly of parts and components was virtually impossible without rework. Interferences were common. In order to move the design from the “experimental” level to the “scientific” level, Tianjin Samsung Electro-Mechanics determined it must evolve from a 2D process to 3D R&D.

Starting in 2006, the company began using Solid Edge 3D CAD software to achieve an error-free design process. Yongfeng explains, “The reason is simple. The headquarters in South Korea has been using this 3D software for R&D and innovation of the production line equipment for quite some time and achieved very good results. The software made it easier to communicate with the external manufacturers, so we adopted Solid Edge as the 3D platform for R&D and in the meantime acquired the basic data management platform.”

Yongfeng describes the training process: “The robust support of the team, which consists of technical consultants, training experts and other related technical personnel from Siemens PLM Software and Henghua Chuangyi Technology Co., Ltd. (a partner of Siemens in northern China), has provided us with effective assistance and guidance. At first the designers are able to effectively use the software after only one week of training. Then, technical support engineers are dispatched on a regular basis to organize specialized training to more clearly define the significance and purpose of the software in our environment, giving full play to the potential of the technology and ensuring the improvement of overall software use and value.”

**Unique capabilities, significant results**

In designing its electronic equipment and products, the unique variable design capabilities of Solid Edge are fully utilized in the parts and components module. In leveraging variable design, Tianjin Samsung Electro-Mechanics has made it easier to modify the structure of its production line equipment. This ensures that a new model can be easily assessed and validated with a simple change of structure parameters as well as readily manufactured.

The “lightweight parts” capabilities of Solid Edge are very effective in solving the design of large assembly components, enabling the design of hundreds of thousands of large assembly parts in an easy manner. By combining the top-down and bottom-up design processes, the design team can accelerate turnaround while ensuring normal assembly of the complete product.

The company has measured the results of adopting a complete 3D digital process. Design and assembly efficiency has improved dramatically, on average, by 60 to 70 percent. The result is that about 20 to 30 new R&D projects can be completed each year.

**Making a difference with synchronous technology**

Tianjin Samsung Electro-Mechanics is an ardent user of advanced global technologies and a strong believer in internal research and development. The company...
Customer’s primary business

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Customer location

Tianjin
China

“In using Solid Edge, our R&D turnaround is now 60 to 70 percent faster than with the previous CAD platform.”

Li Yongfeng
Assistant Director
R&D Department
Tianjin Samsung Electro-Mechanics Co., Ltd.

As a result of continuous independent R&D and its use of Solid Edge for innovation, Samsung has become a rising global leader in the electronic components market.” Yongfeng emphasizes, “Our product design process, both in terms of R&D and the use of software, requires a scientific, reasonable and forward-looking goal that guides Tianjin Samsung Electro-Mechanics’ future work and suits its long-term business goals. Solid Edge is key in our technology pursuits. We view Solid Edge as comprehensive 3D CAD software with a CAE/PDM-enabled mature product development platform that integrates legacy technologies with synchronous technology and 2D/3D design technologies.”

has specifically pursued technologies that “dynamically address” the needs of its market and products. Yongfeng notes, “Since 2008, many manufacturing enterprises have been impacted by the economic crisis. In particular, the high-tech, electronics and automobile industries have been distressed to a larger degree and a majority of Asian enterprises have curtailed their R&D funds. However, Tianjin Samsung Electro-Mechanics has increased its investment in research and development to build a global R&D network rather than suspend such activities.”

In 2008, Siemens PLM Software introduced the breakthrough Solid Edge with synchronous technology, which combines the speed and flexibility of direct modeling with the precise control of parametric design. After completing Henghua Chuangyi’s detailed introductory training, Tianjin Samsung Electro-Mechanics began trial use of Solid Edge with synchronous technology, and then purchased the software for ongoing use. Yongfeng describes the value of its CAD investment: “Our designers can quickly and easily create designs and just as importantly, rapidly modify their work and all in real time. With Solid Edge 3D, what you see is what you get. The virtual product and the real product are identical. Using Solid Edge, our R&D turnaround is now 60 to 70 percent faster than with the previous CAD platform.”