

Medical devices and pharmaceuticals

CVC

Use of 3D modeling shrinks development cycle for customized pharmaceutical equipment by 50 percent

Product

Solid Edge

Business challenges

Accommodate frequent requests for custom equipment

Improve overall design cycle efficiency

Reduce complexity of design change process

Improve design accuracy to reduce potential material losses

Keys to success

3D design process via Solid Edge

Easy-to-use software with a short learning curve; easy-to-understand drawings

Professional technical support by Siemens partner

Results

3D models closely approximate physical equipment

Personnel from different units grasp key points and make modification suggestions clearly

CVC streamlines its R&D cycle, gains a marked competitive edge

Pharmaceutical equipment requires customization

Founded in 1979, CVC Technologies, Inc. (CVC) is a world-famous manufacturer of pharmaceutical production equipment and examination instruments. In the past 30 years, CVC has enhanced its brand recognition and paved its way into American markets through mergers and acquisitions of local equipment manufacturers. The company then established a research and development (R&D) design center and spread its presence into Italy, directly competing with its European counterparts.

Currently, more than two million sets of CVC machines have been installed in large pharmaceutical factories all over the world. CVC is now listed in biotechnology sector of Emerging Stock on the Taiwan Securities Market. The company has moved to a new factory site covering an area of 6,000 ping (19,000 square meters/ 213,000+ square feet), fully preparing the company for a potentially large increase in orders.

There are three product lines in CVC's pharmaceutical production equipment business: labeling machines, capsule counting machines and pastille packing production systems. The labeling machines were originally used to label round medicine bottles. Later they were extended to square bottles and containers as well as other shapes, and then gradually to consumer products (shampoos, beverages, etc.).

Normally CVC's production equipment must be customized to meet the needs of a customer's production site and optimized according to the specific packing materials and packed objects. To accommodate frequent custom-designed tasks, CVC uses 3D-based computer-aided design (CAD) technology, Solid Edge® software, from product lifecycle management (PLM) provider Siemens PLM Software.

Chen Ruiqin, special assistant to the general manager and former pharmaceutical equipment design director at CVC Technologies, explains that, when using 2D design software in the past, overlapped lines frequently led to failures in displaying



Results (continued) Fewer assembly errors Development cycle reduced by 50 percent

With faster turnaround, CVC's customers to go into production and generate profits sooner

3D software can clearly display the interference relationships of parts, enabling designers to eliminate the interferences during the design process.

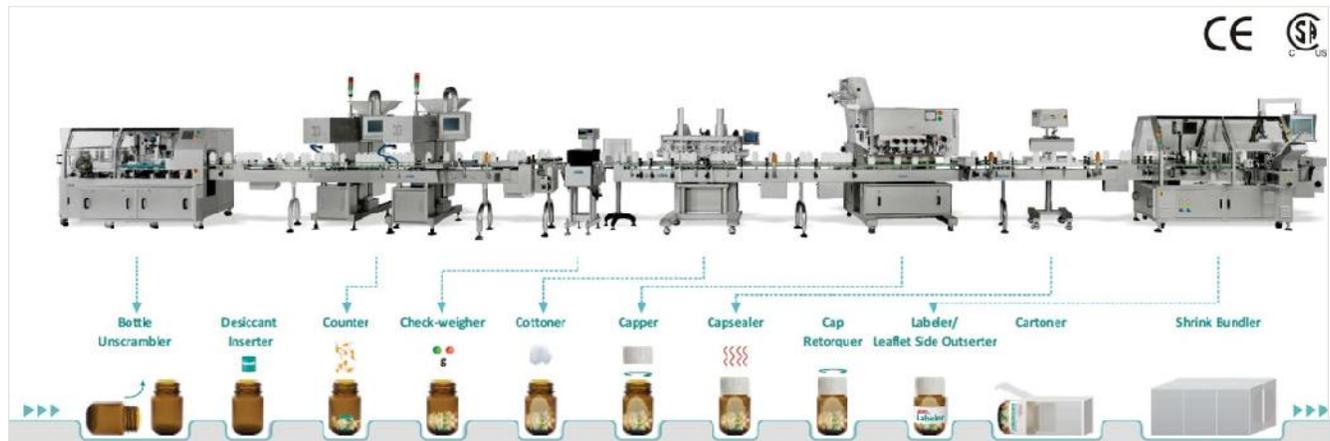
a machine's appearance accurately on a drawing, leading to problems in assembling the components after machining. After making the transition to 3D design software, all of these troubles were eliminated, while the efficiency and accuracy of design and change was greatly improved.

For example, the labeling generatrix common on the production lines of pharmaceutical factories is mostly in a beeline. To address customers' requests, CVC used Solid Edge to improve turnaround and productivity.

3D software yields faster prototypes As new labeling methodologies require new production lines, CVC's design service team uses Solid Edge to develop prototypes within shorter timeframes. Ruiqin says, "Unlike using with 2D software,

where it is impossible to know whether parts interfere with each other until they are assembled, 3D software can clearly display the interference relationships of parts, enabling designers to eliminate the interferences during the design process. This capability of 3D software greatly improves the design accuracy and reduces possible loss of molding materials."

Having the ability to design in 3D furthers CVC's product differentiation and adds a new competitive dimension to the company. The company has established a rigorous preparation process for its design services. First, business, design, manufacturing and other departments jointly hold a startup meeting to discuss the customer's requirements. Next, Ruiqin explains, "We usually set up several check points in the design process according to the project



scope. After the design team brings out the first versions of the 3D models, we convene different units together for a joint examination.”

Equipment and sales personnel examine the machine for operability and ease of installing replacement parts, while manufacturing personnel examine the feasibility of the assembly process. After internal project teams finish their examinations and adjustments, the models are used to produce a prototype. Only after all relevant work has been done to perfection, based on prototype testing and design changes, is the physical equipment launched for marketing teams to promote.

“3D models enable professionals from different units to grasp their own key points,” says Ruiqin. “Because the object can be displayed concretely, when they propose modifications, designers can understand them clearly, which is one of the most beneficial features of 3D design.”

Development cycle cut in half

Using Solid Edge, CVC’s design time for a new production line has dropped from three months in the past to 1.5 to 2 months currently. When a customer purchases a standard production system and

requests only partial customization, the design time is even shorter. This result is very significant for precision industrial design, not only shortening CVC’s lead-time, but also helping customers go into production and generate profits as quickly as possible.

In the highly competitive pharmaceutical equipment sector, CVC’s other product advantage lies in its ability to switch molds quickly. Because the production lines of pharmaceutical factories typically make use of the same set of pharmaceutical equipment with partial replacement sub-assemblies only, the ease and rapidity of replacements affects productivity. Now with 3D modeling technology, CVC is able to take the space requirements of its customers’ production sites into account earlier in the design process, and can also precisely simulate the entry and exit of parts, the machine wiring direction and so on.

Take CVC’s newly deployed pastille packing production line for example. This complex production system consists of many concatenated machines, turntables and conveyer belts, and 3D modeling played a significant role in its development.

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Solutions/Services

Solid Edge
www.siemens.com/solidedge

Customer's primary business

CVC Technologies manufactures pharmaceutical production equipment and examination instruments.
www.cvc-tech.com

Customer location

Taichung
Taiwan

Partner

CADEX Technology
www.cadex.com.tw

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"This integrated system requires working within the space constraints of customers' production sites," Ruiqin says. "We used Solid Edge to conduct connection simulations of the entire process and of different conveyer belts. That enabled us to finalize the design with only minor adjustments after the actual assembly on the site. Without Solid Edge, it could have cost us much more in terms of time and money to complete such a complex equipment system."

Synchronous technology for further efficiency

To improve design efficiency even further, CVC has started using Solid Edge with synchronous technology. New project design teams were the first users. CVC expects that by using synchronous technology, whenever there is a future need to add new parts, the user will only need to search for the appropriate mold drawing and add the newly required functions (such as digging a hole) to automatically display the correlations between new parts and the old mold. With synchronous technology, phased operations are not



necessary, and all work can be processed in a single scenario, which saves time and significantly reduces errors.

During the deployment of Solid Edge, CVC received comprehensive technical services from CADEX, a Siemens PLM Software partner. "CADEX provides highly responsive and practical services for positive problem-solving, helping our designers get quickly acquainted with 3D design tools, and put them into valuable use in important projects for improved benefits," Ruiqin concludes.

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