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— Thomas Schnell
CAD Administrator
Feige GmbH

Digital prototyping ensures correct filling

Whether we're filling buckets, barrels or canisters – with solutions from Autodesk, Feige Filling can create the right filling systems.



Real filling system - Image courtesy of Feige GmbH

Project Summary

Feige GmbH, Abfülltechnik was founded in 1972 by Dipl. Ing. Gerhard Feige and has been part of the Haver & Boecker Group since 2003. The company has developed into one of the leading manufacturers of liquid and paste product filling machinery. Customers come from the chemical and pharmaceutical sectors, petrochemicals, construction materials, paint and lacquer manufacturing and food processing, packaging and logistics. They include all the well-known global companies in these sectors as well as a number of smaller enterprises.

At their site in Bad Oldesloe, northern Germany, designers develop high quality filling systems which are tailored precisely to customer requirements. In doing so, Feige combines tradition and innovation to enable the company to be an attractive partner for large and medium sized customers and to meet demands at the highest levels. At the end of the day, all of the machines produced by Feige are one-off special solutions requiring a number of design areas be harmonised to ensure that everything works. To save on costs and development time, Feige designs the systems digitally using solutions from Autodesk.

Complete Digital Prototyping

Feige is one of many long-standing Autodesk customers. The company decided to use AutoCAD as far back as 1991. At that time, the program was the standard in the field of 2D design. It was

well-known and the costs were affordable for a medium-sized company. Feige gradually migrated to 3D beginning in 2002. Test environments were set up to run parallel to the established design process. This was undertaken first with Mechanical Desktop and later with Autodesk Inventor. Finally, the extensive system designs were completely migrated to Inventor. "Above all, we needed a solution that would enable us to work with large components in a structured and problem-free manner. That's why we finally opted for Autodesk Inventor. Another plus point is the direct transition into AutoCAD. This ensured a very smooth adoption," says Thomas Schnell, CAD Administrator at Feige.

The company most recently migrated to the 2011 version of Autodesk Inventor, which has additional functionality in the areas of mechatronics, mechanics, control, documentation and animation, to enable the effective design of systems. In comparison with competitors, Inventor won the designers over with features such as close integration with various other Autodesk solutions like AutoCAD and Autodesk Showcase. What's more, many of Feige's partner companies also work with Autodesk solutions, meaning that it is uncomplicated to exchange data between them. "Inventor has proven itself well in the field of design and is extensively used throughout the global design community."

Faster decisions with precise visualization of the 3D model in Inventor.

3D development leads to significantly fewer failures. There are few, if any, collisions because everything has already been visualized in advance. This visualization is a clear advantage, because the system can be seen in action before it is even built. Furthermore, the majority of products from suppliers are available in 3D. The components are then incorporated just as if the designer had them in his hand, together with all their properties, such as size and fixing points.

"This goes a long way towards promoting an understanding of the system," says Schnell. On average, up to 5,000 machinery components are built into each segment of a system. The 64-bit support in Autodesk Inventor 2011 means that processing large components is no longer a problem. The CAD Administrator also anticipates a time advantage of around 30 percent through 3D design, while the quality of the systems is simultaneously improved.

With the migration to the latest Inventor release, Schnell anticipates further productivity benefits because the contour refining and detail precision functions will offer Feige's designers better support for the design process. Schnell thinks that the shrink-wrap function is unique. This makes it possible for large groups of components or a module to quickly be converted into a simplified volume or area model that can be used as a compact alternative illustration. This ensures that intellectual property is protected when working with third parties. "It is as though we covered our system with a sheet, but left important interface points visible to our partners. This enables us to protect our know-how and could secure an important competitive advantage for us."

The simulation and analysis functions in Inventor also help designers when making calculations for systems. The comprehensive simulation environment allows movement simulations as well as static and modal finite element measurements at component and module level. Loads and forces can thus be precisely analysed. "3D design and the calculation functions enable us to push closer and closer to the limits. In the past, we simply made a

sheet or support thicker based on our experience, to ensure it was strong enough. Today, we can design more complex components and thus save materials and of course costs."

Faster Decisions with Visualization

Visualizations are very important for sales at Feige. As soon as new orders are received, a comparison is made to see which existing components could be reused. The company's database currently contains more than 160,000 design drawings. A requirement is then sent to the corresponding designer, who will need to modify a component or design a new one. "The pre-visualization of the 3D model in Inventor is so precise and realistic that we can use it as the basis for our decisions," explains Schnell.

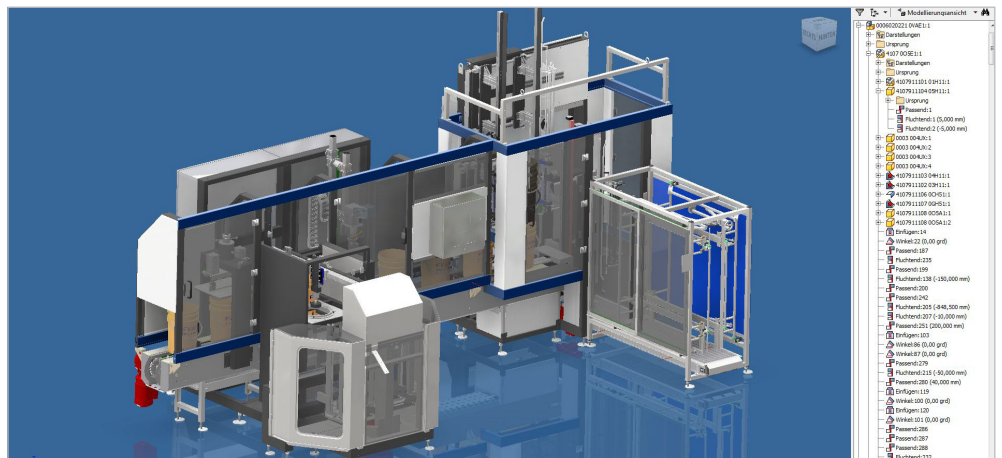
If the component is approved, it is integrated into the system. Feige also uses Autodesk Showcase to produce photorealistic visualizations of the entire system. The designers also develop short animations that simulate how the system will work. On the basis of these images and films, decisions are made on whether the system is correctly designed and whether it can be presented to the customer. The next stage is to transform these images into the user elements of the filling system, which will generally have touch panels. The design data is also used to program the robots which are part of the system. The precise illustration makes

it possible for control technicians to write their programs which then have to be run on the robots.

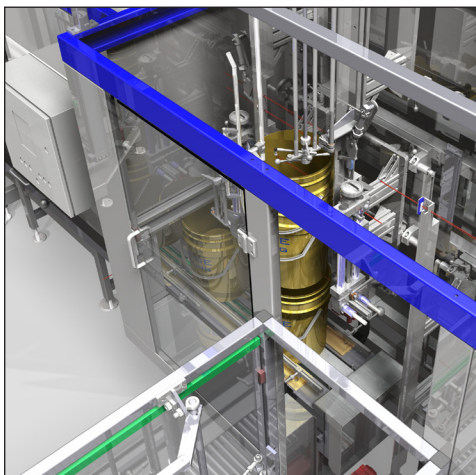
Technical Documentation with Inventor Publisher

Autodesk also offers a high performance solution for the creation of technical documentation in 2D and 3D in the shape of Inventor Publisher. To make the assembly instructions easier for its service technicians, Feige has opted for the new solution and is now testing the first processes. "The ability to quickly and easily generate detailed instructions with exploded drawings and sub-illustrations from Inventor data clearly adds value for us. The creation of animated films to give an example of how components have to be replaced will also make it easier for our technicians to complete their work and to do so safely. In the longer term, we are planning to extend the use of this tool to generate all our documentation," says Schnell.

"For us, there is no alternative to Autodesk. We've been using Autodesk for a long time and we are great fans of the development of their solutions and their interaction and integration. Performance and functions are well thought-through and make our work easier. We have been able to digitally produce our products from end to end. Design, marketing and sales can all be done in 3D and relying on the same data. This is a deciding factor in our success," says Schnell.



Visualisation of a system in Autodesk Inventor 2011 - Image courtesy of Feige GmbH



Rendering a system - Image courtesy of Feige GmbH

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