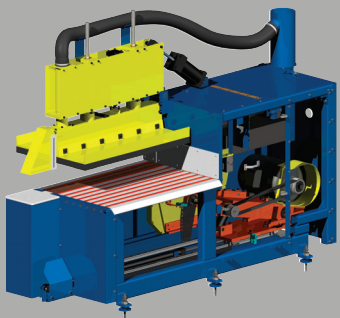


Granco Clark Worldwide

ACCELERATING ALUMINUM EXTRUSION SYSTEM DESIGN WITH SOLIDWORKS OFFICE



With SolidWorks software, Granco Clark engineers can look inside their assembly designs and detect interferences between parts, which reduces errors while increasing throughput.

As a leading supplier of aluminum extrusion systems, Granco Clark Worldwide designs and manufactures large, sophisticated pieces of equipment that are used for automating the process of transforming aluminum billets into finished products and components. Each aluminum extrusion system, which is unique and tailored to meet the requirements of a specific customer, generally comprises a series of as many as 25 interrelated pieces of equipment. Because these subsystems involve the development of numerous large assemblies – ranging from 2,500 to 12,000 components each – managing drawings for these multitiered assemblies in the AutoCAD® 2D design environment had become laborious and time-consuming, according to Scott Buiten, mechanical engineering manager.

“We decided to move to 3D because of the whole parametric design issue,” Buiten explains. “In 2D, making a change throughout these assemblies required the manual alteration of each drawing iteration. When you change a detail in 3D, the change ripples throughout the assemblies. We believed moving to 3D would help us to reduce errors and increase throughput at the same time.”

In 1999, Granco Clark engineers conducted an extensive evaluation and benchmark of leading 3D design systems, asking vendors for SolidWorks®, Pro/ENGINEER®, Solid Edge®, and Mechanical Desktop® to model a 50-part conveyor assembly on-site. They asked the vendors to make changes to the assembly in order to replicate the company’s real-world design process, and then observed how each type of system handled the task. Following the benchmark, Granco Clark selected the SolidWorks Office suite of mechanical design software. The company chose SolidWorks software because of its ease of use and its large assembly, sheet-metal, interference-checking, automatic drawing generation, and advanced visualization and communications capabilities.

“The SolidWorks interface was the easiest to use, and SolidWorks was the most powerful software and provided the best value,” Buiten notes.

Modifying designs quickly and easily

In the SolidWorks Office design environment, Granco Clark engineers are able to design new systems and modify existing designs more efficiently, according to Nicholas Benner, mechanical engineer/systems administrator. “Using SolidWorks, we have cut down our design time by about 25 percent,” Benner says. “In 2D, making a minor design change required modifying as many as 30 different sets of geometry, which could take as long as two weeks. With SolidWorks, we can make a minor change in about five minutes, and major changes can be made in just a couple of days.”

He adds that the company also has accelerated prototype development with SolidWorks software. “We are able to do more with SolidWorks,” Benner says. “We have fewer iterations on prototypes, and our prototypes are a lot more mature.”

→ Granco Clark Worldwide is the leading North American manufacturer of automated aluminum extrusion systems. Founded in 1947, the company designs custom heating and handling equipment that automates the process of manufacturing extrusions from heated aluminum billets, which customers in many different industries use for a variety of product applications. Each Granco Clark aluminum extrusion system is custom-designed for a specific customer’s unique needs, so no two systems are identical. Headquartered in Belding, Michigan, Granco Clark has built a reputation for producing technological innovations – starting with the introduction of the first direct flame-impingement furnace in 1954 – and for manufacturing aluminum extrusion systems of exceptional quality.



- Shortened design cycle by 25 percent
- Cut reengineering and rework by 50 percent
- Reduced drawing errors by 50 percent
- Improved design visualization and presentation capabilities

→ **CHALLENGE:** Granco Clark Worldwide designs and manufactures automated aluminum extrusion systems. Each extrusion system requires the development of numerous large assemblies, and managing drawings for these multitiered assemblies in 2D had become problematic. Granco Clark decided to move to a 3D design environment to reduce errors while increasing throughput, and then conducted an extensive evaluation of leading 3D CAD systems.

→ **SOLUTION:** The company selected the SolidWorks Office suite of mechanical design software because of its ease of use and its large assembly, sheet-metal, interference-checking, automatic drawing generation, and advanced visualization and communications capabilities. By deploying SolidWorks Office, Granco Clark shortened its design cycle by 25 percent, cut reengineering and rework by 50 percent, reduced drawing errors by 50 percent, and improved its design visualization and presentation capabilities.

Reducing errors and rework

Since implementing SolidWorks Office software, Granco Clark has reduced the amount of reengineering and rework it conducts by 50 percent, and has cut its drawing errors in half. "With SolidWorks, drawings are not only easier to make, but also more detailed," Benner says. "We are able to add a lot more detail to our drawings, including isometric and exploded views, which makes them easier to understand in our manufacturing facility. The interference detection tools allow us to catch potential errors early in the design process and changes are much easier to make, both of which help us to improve our quality. SolidWorks helps us to minimize errors, whether they are design- or drawing-related."

SolidWorks sheet-metal capabilities are an added bonus for Granco Clark. "We are doing things in sheet metal that we just could not do before implementing SolidWorks," Benner says. "We develop duct work for cooling systems and guards for moving pieces in sheet metal. With SolidWorks, these designs are much more complex and complete, which gives our manufacturing specialists all the information that they need to make elaborate sheet-metal structures."

Improving communications

The company benefits from the advanced visualization and communications tools included with SolidWorks Office software. Using SolidWorks Animator and PhotoWorks™, engineers can create animated and static images of extrusion systems for use at trade shows and during customer presentations.

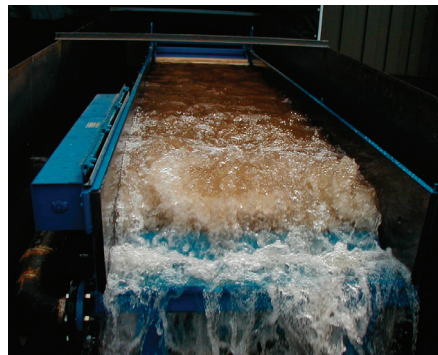
"We have been able to create animations of what's going on inside our systems, something that could not even be filmed," Benner says. "We can simulate and take apart our equipment on screen, which gives our customers a better idea of the concept they are buying. These capabilities help us to close sales and generate new business."

Granco Clark also uses eDrawings™ to communicate design concepts to customers, especially when they are located far away.



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Granco Clark products designed with SolidWorks are more complex and complete, such as this standing wave water quench system, the largest one Granco Clark has ever built.



SolidWorks software facilitates the handling of large assemblies, including those used to develop the extrusion cut-off saw shown here.

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