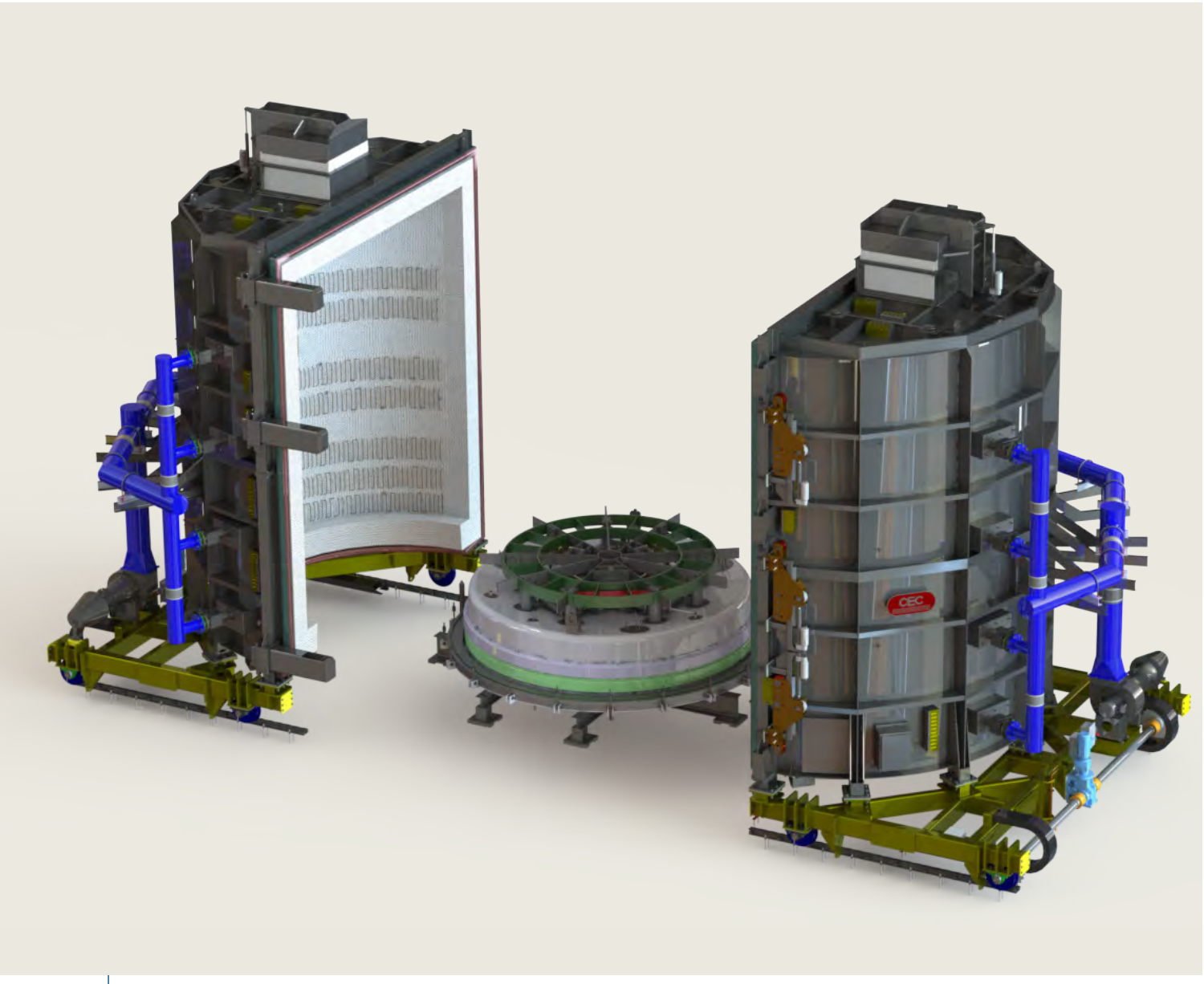
DASSAULT SYSTEMES

SOLIDWORKS

CONSOLIDATED ENGINEERING COMPANY

ADVANCING INDUSTRIAL HEAT TREATMENT SYSTEMS DEVELOPMENT WITH SOLIDWORKS



Using SOLIDWORKS design, fluid flow simulation, and product data management solutions, CEC has automated development workflows for its heat treatment systems, shortening design cycles and improving product performance in the process.

CEC

Challenge:
Improve development of custom industrial furnaces and quenching the systems by eliminating clearance issues, optimizing fluid flows, and minimizing scrap and rework on the shop floor.

Solution:
Implement SOLIDWORKS Professional 3D design, SOLIDWORKS Premium 3D design and analysis, SOLIDWORKS Flow Simulation computational fluid analysis (CFD), SOLIDWORKS PDM Professional product data management, and DraftSight 2D design software solutions.

Benefits:
- Automated development workflows via PDM
- Optimized fluid flows to improve product performance
- Reduced scrap and rework dramatically
- Improved quality of engineering drawings

Consolidated Engineering Company (CEC) has been designing and building for 58 years. The company designs, manufactures, and assembles heat treatment products that meet the strict metallurgical properties requirements of industrial manufacturing companies around the globe. In short, CEC helps its customers make metal stronger through heat treatment and produce better products, such as more efficient engines, lighter airplanes, and safer automotive bodies. The engineered-to-order furnaces enable customers to make everything from NASA spaceship parts to the wrench in a toolbox.

CEC innovations—developed by a talented staff that specializes in electrical, thermal, mechanical, and materials applications for industrial furnaces and heat-treating equipment—have resulted in more than 140 U.S. patents. The company now offers custom-designed roller hearth furnaces, chain furnaces, drop bottom furnaces, car bottom furnaces, tip up furnaces, batch furnaces, and retort furnaces, as well as water- and air-based quenching systems.

Until 2008, CEC utilized AutoCAD® and Mechanical Desktop® 2D design tools. However, the prevalence of interference issues on the shop floor, quality and performance improvement objectives, and a commitment to remain a leader in its industry prompted management to upgrade to a 3D development platform, according to CAD Manager/Design Engineer Michael Sutherland.

"The reason that we decided to upgrade to 3D was to keep up with product development trends; address interference problems during asssembly, which were hard to catch in 2D; and remain a leader in our industry," Sutherland explains. "Designing assemblies that range up to 300,000 parts and working with leading automotive manufacturers and suppliers, we had to move to 3D to continue to compete successfully."

After evaluating 3D design systems, CEC chose SOLIDWORKS® solutions, implementing SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, SOLIDWORKS Flow Simulation computational fluid analysis (CFD), SOLIDWORKS PDM Professional product data management (PDM), and DraftSight™ 2D design software. The furnace manufacturer chose SOLIDWORKS solutions because they are easy to use, include the broadest range of integrated capabilities, have better support, and provide the greatest value for the price.

IMPROVED PRODUCT PERFORMANCE, LESS SCRAP AND REWORK

Since implementing the SOLIDWORKS platform, CEC has ulitized SOLIDWORKS design-checking and interference-detection tools to minimize the amount of rework required during system assembly, dramatically reducing the amount of scrap produced in the process. The company also utilizes integrated SOLIDWORKS Flow Simulation CFD analysis software to study fluid flows and the impact of design changes within its systems.

"With SOLIDWORKS Flow Simulation software, we have the ability to quickly optimize designs within the CAD environment," notes Engineering Manager Andrew Turner. "Simulation results also work as an effective selling tool and boost customer confidence in CEC.

"CFD allows us to select fans, design baffles, and place nozzles to optimize furnace air flow and provide more uniform temperatures and quicker heating times. We use CFD in a similar application for quenching systems to analyze components such as pumps, agitators, and ducting," Turner continues. "CFD also works as a selling tool by allowing us to incorporate customers specific product models into simulations. Showing a customer simulation results of their actual process increases their confidence in CEC and assures them that the equipment is designed for their specific process."

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— Andrew Turner, Engineering Manager

AUTOMATING WORKFLOWS, PDM/ERP INTEGRATION

Implementation of the SOLIDWORKS PDM Professional product data management system has not only enabled CEC to automate and formalize its development processes, it has also allowed CEC to integrate PDM data with its enterprise resource planning (ERP) system, resulting in additional automation opportunities and associated productivity gains. "We've optimized PDM to directly place finished parts into our ERP system," Sutherland stresses.

"Our engineering workflow is now completely automated, with the folder structure, kickoff forms, and related documents automatically generated for each project," Sutherland continues. "When drawings are released, PDFs are auto-generated and XML BOMs are created and sent to the ERP system. With SOLIDWORKS PDM, we've been able to achieve as much automation as possible."

MANAGING LEGACY DATA, SUPPORTING ASSEMBLY

The move to SOLIDWORKS 3D has not created any 2D legacy data or engineering drawing management issues for CEC because the furnace manufacturer utilizes the free DraftSight 2D design package to open, modify, and save older 2D drawings. In fact, the quality of CEC's drawings has improved since the move to SOLIDWORKS 3D and DraftSight 2D solutions.

"We use DraftSight to create schematics and 2D layouts for our proposals," Sutherland says. "We also use SOLIDWORKS eDrawings® files to support our field personnel during installs at a customer site. They are able to better visualize how to assemble a system and can even measure dimensions and distances with eDrawings."

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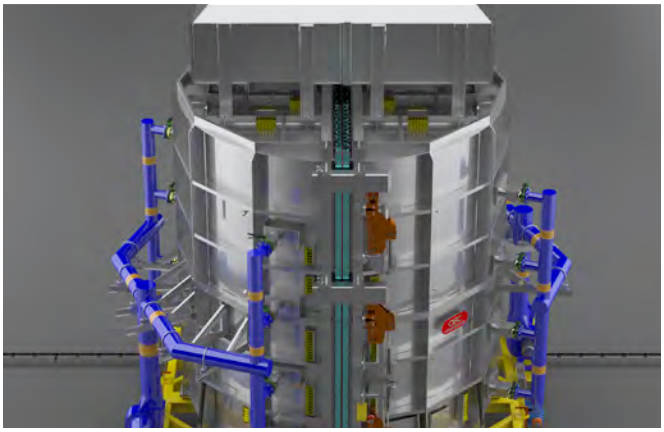

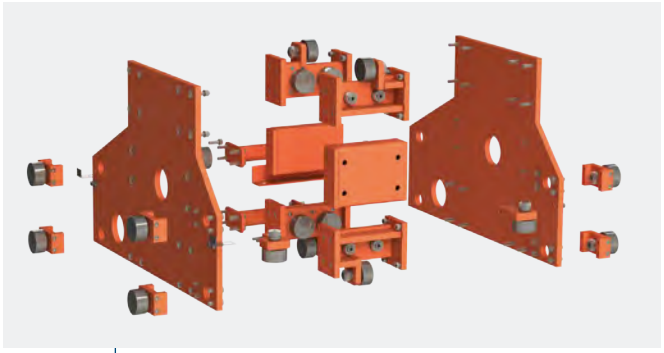

By integrating SOLIDWORKS PDM Professional software with its enterprise resource planning (ERP) system, CEC has automated additional processes. PDFs and XML BOMs (bills of materials) are now generated automatically and imported directly into the ERP system.

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