

COMPANY

Howden France

LOCATION

Villeneuve d'Ascq, France

SOFTWARE

Autodesk® Inventor**Autodesk® Vault****Autodesk® Simulation Mechanical**

Howden France reduces engineering time for its industrial fans by 40 percent



Image courtesy of Howden France. Copyright © Howden Group Limited.

Project summary

Since all of its industrial fans are custom-made, Howden France sets itself a target of reducing the engineering time required during the design stage. By using Autodesk® Inventor®, Autodesk® Vault®, and Autodesk® Simulation Mechanical, Howden France has reduced the lead time through the design office by as much as 40 percent, while also improving its product designs.

Howden France, with 665 million euros turnover in 2010 and more than 4,000 employees, specializes in air and gas handling equipment. The company is part of the Charter International plc group, which includes ESAB, a global market leader in welding equipment. Howden France, which is based in Villeneuve d'Ascq in northern France, supplies centrifugal fans, axial fans, and blowers.

The challenge

Howden's product ranges cover applications in the petrochemicals, mining, steel manufacturing, and cement industries, as well as ventilation systems for mines and tunnels. Howden specialists are responsible for the design, manufacture, quality

and control, and on-site implementation of its products. "A large variety of machine design activity goes through the design office, so we had the motivation to reduce the engineering time," says Laurent Tisserand, technical director.

In the design office at Howden, three Autodesk software solutions are used on a daily basis: Inventor, Vault, and Autodesk Simulation. "Our fans contain complex shapes, and from the very start 3D CAD allowed our designers to comprehend these much better," says Tisserand. "With manufacturing being subcontracted, the objective is to communicate the most relevant information possible—here once again, 3D is the best method there is."

The solution

Throughout the process, the company quickly realized that controlling files, assemblies, and design variants is not an easy task. "Designing alongside several other people without a product data management software (PDM) system becomes difficult. We introduced an integrated version of Autodesk Vault in 2008 to work more smoothly

and to share files between different users. Vault is an excellent tool; it avoids conflict and provides you with a central database," says Tisserand. "A vast number of possible fan configurations exist, and all of these different solutions have been developed and structured in Vault. This shows the interaction and interoperability that exists between Autodesk programs. Now, we couldn't imagine working with Autodesk Inventor without Vault."

While implementing Autodesk Vault, the design office worked with the French integrator Prodware on the automated design of 3D models and 2D manufacturing plans. "We have set up a system based on Excel construction files," says Tisserand. "All we have to do is incorporate the Excel table values in the Autodesk Inventor modeler to obtain our fan models."

Another development was implemented on the commercial side: the creation of project plans used in after-sales activities to quickly develop product documentation with front, top, and 3D views. Tisserand says, "The innovation lies in the fact that the person creating the plan doesn't need to be a skillful user in Autodesk Inventor—the software remains transparent to the user." In a matter of minutes, sales representatives are able to create a project plan, which displays all the useful dimensions for the client, so they can get an idea of the machine, the layout, and how the accessories are arranged.

Howden France has been using Finite Element Analysis (FEA) calculation capabilities along with Autodesk Simulation Mechanical. "In the same way that we had built an in-house software solution that works automatically to create drawings of our fan wheels, we envisioned introducing an automated calculation model," says Tisserand.

He continues, "When you design a welded or sheet metal working model of a fan, you need beveled edges, radii, and so on. These elements are not necessary for the FEA calculation. It is important to be able to easily create simplified geometry by stripping features and unwanted details in preparation to make the CAD models calculable and usable for Autodesk Simulation Mechanical."

Autodesk Simulation features cyclical symmetry functionalities for slicing up the fan wheel into sections, which means that calculations can be made on a single section of the fan. Then, the design office on the project can make its



Image courtesy of Howden France.

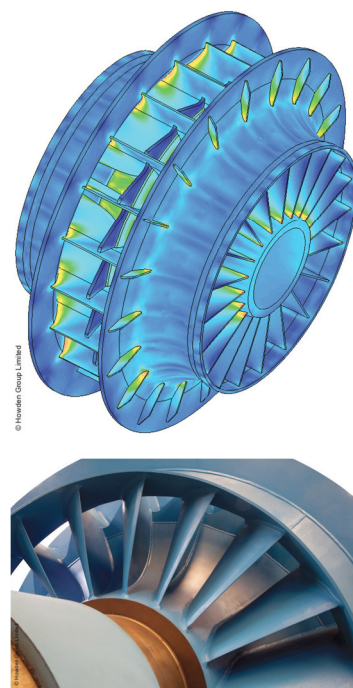
calculations much more quickly. The software simulates the wheels according to the stress level, taking fatigue and creep into account, optimizing thickness and weight of the product. This last important criterion is essential for manufacturing and has major repercussions on performance.

"By optimizing the weight, we reduce inertia for a better performance and can reduce the power of the motor required," says Tisserand. "Reducing power means lower operating costs."

Previously, Howden France worked with another company in the group for making calculations and simulations by FEA, but now has an in-house team. "We are using Autodesk Simulation Mechanical once or twice a week," says Tisserand. "We knew how to create the justification, and the software will soon have paid for itself."

The result

Tisserand says, "Our target was to reduce lead time. If we're talking about time saved, we have improved by 35 to 40 percent the lead time through the design office. Out of this total, Vault represents 10 to 12 points and the automation built around Inventor explains the rest. This figure is a 2010 figure compared with the lead time in



2004 when we were working in 2D with AutoCAD. For example, Autodesk Inventor quickly and automatically provided us with the inertia and masses of the rotors and that in itself is significant timesaving."

To further improve these figures, Tisserand expects to improve the numerical models by working with the French integrator Prodware. He also says that Howden France is planning a changeover to Autodesk® Vault Collaboration to facilitate better lifecycle management for creating and approving plans and above all, information exchange between the service teams.