Howden France

Customer Success Story

Autodesk® Inventor
Autodesk® Vault
Autodesk® Simulation Mechanical

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

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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% while also improving its product designs.

Howden (€665m turnover in 2010, with more than 4,000 employees), which specializes in air and gas handling equipment, is part of the Charter International plc group; which also includes ESAB (a global market leader in welding equipment).

Its subsidiary Howden France, based in Villeneuve d'Ascq, in the north of France, supplies centrifugal fans, axial fans and blowers. The product ranges cover applications in the petrochemicals, mining, steelmaking and cement industry, as well as ventilation systems for mines and tunnels.

Howden specialists are responsible for the design, manufacture, quality and control, and on-site implementation. These custom fans are designed on the basis of an invitation to tender. "A large variety of machine design activity goes through the design office, so we had the motivation to reduce the engineering time," noted Laurent Tisserand, Technical Director.

In the design office, three Autodesk software solutions are used on a daily basis: Inventor, Vault and Autodesk Simulation. In 2006, the Howden Group selected Autodesk Inventor as the standard 3D CAD package for all the Group's subsidiaries.

"Our fans contain complex shapes, and from the very start 3D CAD allowed our designers to comprehend these much better. With manufacturing being subcontracted, the objective is to communicate the most relevant information possible – here once again, 3D is the best method there is."

Throughout the process, the company quickly realized that it is not an easy task to control files, assemblies, and design variants. "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" explains Laurent Tisserand.

A vast number of possible fan configurations exist, and all of these different solutions have been developed and structured in Vault. "And this shows the interaction and interoperability that exists between the various Autodesk programs. Nowadays we couldn't imagine working with Autodesk Inventor without Vault."

While implementing Autodesk Vault, the design office has worked with the French integrator Prodware on the automated design of 3D models and 2D

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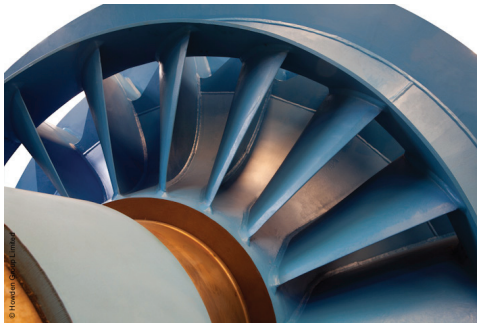

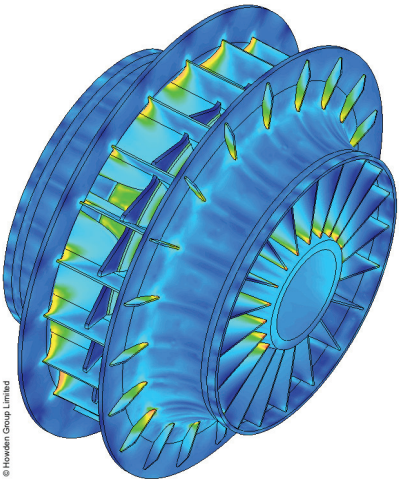

manufacturing plans. “We have set up a system based on Excel construction files. All we have to do is incorporate the Excel table values in the Autodesk Inventor modeler to obtain our fan models.”
Another development was implemented on the commercial side : the creation of project plans used in after-sales actitivities to quickly develop product documentation with front, top and 3D views. “The innovation lies in the fact that the person who is 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.

Autodesk Simulation, the latest member of the Autodesk family to be introduced

The latest software launched at the start of 2010: calculation by Finite Element Analysis (FEA) with Autodesk Simulation Mechanical, which is perfectly compatible with Inventor. “In the same way that we had built an in-house software which works automatically to create drawings of our fan wheels, we envisaged introducing an automated calculation model. When you design a welded or sheet metal working model of a fan, you need beveled edges, radii etc.
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 can make its 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 consequently can reduce the power of the motor required.
Reducing power means lower operating costs. When you’re talking about a motor of several MW and you’re saving tens or hundreds of KW, your client is very happy.
Previously, we worked with another company in our Group for making calculations and simulations by Finite Element Analysis (FEA) – nowadays we have an in-house team and we are using Autodesk Simulation Mechanical once or twice a week.
We knew how to create the justification, and the software will soon have paid for itself.”

Autodesk Vault enables standardization of components

Laurent Tisserand resumes his first report: “Our target was to reduce lead time. If we’re talking about time saved, we have improved by 35-40% 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 time saving.”
To further improve these figures, Laurent Tisserand expects to improve the numerical models by working with the French integrator Prodware, and is also planning for the changeover to Autodesk Vault Collaboration facilitating better lifecycle management (for creating and approving plans) and above all, information exchange between the service teams.

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