

Vent-axia

Business



Company: Autodesk Customer: Vent-Axia Submitted by: The WhiteOaks

Consultancy Vent-Axia has been making high quality ventilation equipment for the commercial, domestic and industrial markets for more than 60 years.

Its portfolio of products includes more than 1, 200 fans and accessories, which represent the leading edge in ventilation technology, and it supplies over one million items each year. By introducing Autodesk design solutions, Vent-Axia has been able to achieve greater flexibility in design, shorten its product development cycle and capitalise on the portability and reliability of its design data. The design of a ventilation fan begins with its impeller, the multi-bladed rotor that draws air through the fan. The impeller has a complex shape that used to be fashioned by hand and eye. Product Engineer Will Lewis explains, “ Fan design is as much an art as a science, so more often than not the quickest and cheapest way to determine a fan’s performance is to prototype it and test it. The prototypes used to be made by hand.

Each impeller can have up to seven blades, or occasionally more, and each blade has a complex aerofoil shape with variable radial geometry. Making all of the prototype blades identical so that the impeller would be properly balanced was very difficult indeed, even for a skilled craftsman. And if an impeller wasn’t balanced perfectly, it was impossible to get reliable results from performance testing.” The adoption of Autodesk design tools and rapid prototyping using stereo lithography has transformed the whole process.

Vent-Axia has four seats of Mechanical Desktop, ten seats of AutoCAD

Release 14 and one seat of 3D Studio MAX running on 200 megahertz RM dual Pentium Pros and 266 megahertz RM Pentium IIs.

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Robot Excel provided the software and professional training and support. By using Mechanical Desktop, the prototyper can now be confident that every impeller blade will be identical and every impeller will be balanced.

Therefore performance tests will yield reliable results. The design data is then exported to a stereo lithography system, which uses the data to control a UV laser. The laser traces out a thin section of the impeller in a bath of UV sensitive resin, causing it to solidify. The process is then repeated for the next thin section, and so on, until the solid model is formed.

It is then UV oven backed for several hours to form a usable prototype. Once a resin prototype has proved itself in tests, it can be used as the basis for a whole family of products. Will Lewis explains, “ At Vent-Axia, we mainly use Mechanical Desktop for parametric solid modelling. Working from one impeller design, Mechanical Desktop can scale it up or down by entering different parameters to produce a family of impellers and casings for different sizes of fans.” The time savings that result are significant. Will Lewis explains, “ Depending on the complexity of the model, it can take from a couple of hours to a day to model it and, depending on the stereo lithography bureau’s workload, we can have the solid model back within as little as three days.

And of course this method is far more accurate than before and far more representative of the production model that will actually be moulded.” The design data is then electronically transferred to a tool-maker, who can be anywhere in the world. For example, Vent-Axia has used toolmakers in Korea, and the data could be transferred to them within a few hours.

Streamlining the design process like this enables Vent-Axia to go from the <https://assignbuster.com/vent-axia/>

initial design to completed tooling within as little as 10 weeks. It also gives the company much greater freedom to investigate radical new fan designs that couldn't be easily attempted before. The difficulties associated with making and testing hand-crafted impellers meant that each new generation of impellers used to represent a small evolutionary advance over the previous generation.

Rapid prototyping using data generated by Mechanical Desktop enables Vent-Axia to try out different designs quickly and without risk, because of the short cycle times involved, the reliability of the performance tests and the assurance that production models will perform precisely as the prototype. The company also uses Kinetix 3D Studio MAX to create visualisations, conceptual designs and presentations. Using 3D Studio MAX, 3D models of products generated by Mechanical Desktop can be taken into the environments where they will be installed to check if their positioning, appearance, colour scheme and so on are acceptable. Clients can be given walk-throughs of the environment or animated exploded views where the successive layers of an installation fly off to show how it all fits together. 3D Studio MAX was also used to create animations for a CD-based product selection program that clients use to find the right fan for a particular situation.

You just put in the parameters and the program determines what kind of fan is required. Autodesk design tools and solutions have eliminated many obstacles that have restricted Vent-Axia's design and production processes, giving its designers the freedom and flexibility to offer a substantially

improved service in their product development activities and ultimately to their customers.