New plastic flow analysis service complements established design business

Taupo-based ACS Design has minimized potential problems in product and tool design, by virtually moulding plastic parts using VisiFlow plastic flow analysis, before any steel is cut for tooling.

By Romy Udanga

ACS Design proprietor Andrew Simpson says the VisiFlow software from UK-based Vero Software highlights potential problems in product and tool design before investment is made in actual tooling.

Specialising in 3D tool and product design, ACS Design has been serving the toolmaking, metal pressing and plastic injection moulding sectors since 2002.

"We have successfully used the SolidWorks software to develop complex tool designs in 3D. We can supply 3D files as well as fully detailed 2D drawings and documentation for product and tool design projects," Simpson says.

A design engineer with over 25 years experience in the manufacturing industry, Simpson is a certified toolmaker and mechanical engineer – a strong combination of hands-on experience and design skills.

Simpson's decision to establish a design business was brought about by toolmaking contacts asking for 3D tool design services in the late 1990's as contract toolmaking shops with CNC machining centres were being asked by their customers to supply "design and build" projects.

"The business has steadily grown over the succeeding years with a constant supply of work from toolmakers, moulders and the occasional inventor wanting to bring their ideas to fruition," Simpson says.

Simpson's years of experience as a toolmaker always prompts him to ask when designing a mould: "How would I make this?".

"Quality, practical design solutions are what we aim to provide. It helps to know what is achievable on the shop floor so that the toolmaker's job is made easier with a design that can be actually made," Simpson says.

This led to ACS Design investing recently in VisiFlow plastic flow analysis software to complement its existing design services.

"VisiFlow is part of a complete toolmaking software suite that encompasses all aspects of the toolmaking process. It allows ACS Design to run any injection moulded product through a virtual moulding machine.

"This is of major benefit to any product and tooling project as it allows potential moulding or design problems to be highlighted long before they become an issue in the production environment.

"We can analyse any new or existing product to identify where potential or existing problems occur," Simpson says.

A recent example of a customer benefiting from this leading edge flow analysis technology is a project ACS Design undertook for Fisher and Paykel Healthcare.

"Engineers at this well-known market leader in Healthcare products wanted to improve the moulding performance of an existing part. The part was modelled in its existing form and an analysis carried out using the polymer and settings as used on the actual production moulding machine.

"The analysis highlighted the challenges in producing this technical part that the F&P engineers were finding in the production environment," Simpson says.

Based on information from the first analysis, changes were made to the part model and a new analysis carried out.

"The new analysis showed that a marked improvement in the quality of the moulding could be expected. The changes made to the part are very subtle and would not be noticeable to a casual observer, but the improvement in part quality is clear."

Simpson says VisiFlow enabled the whole process to be carried out and verified before any tooling was commissioned for the changes to the part.

"In the past, an educated guess would have been taken as to possible changes, tooling designed and made, trial mouldings produced and only then after much expense would the resulting part be able to be verified.

"With VisiFlow a virtual moulding can be produced at a fraction of the cost giving product and tool design engineers greater confidence in how and where to make improvements to existing moulded parts."

Flow analysis takes much of the guesswork out of the injection moulding process, and the trend in Europe and Asia is to run any new product design through it.

Details such as correct polymer selection, gate position and sizing, injection speed, injection pressure, hold and pack pressure profiles, cooling times and internal stresses can all be obtained.

Shape analysis can also be carried out to determine how a part will potentially distort and shrink.

"Visiflow is a powerful tool that maximises the moulding experience of our customers and our design experience with the ability of the software so that we can arrive at a better solution all round," Simpson says.

"When you are investing large sums of money in new tooling it pays to take the time to verify that your product is mouldable and that the tooling will produce quality parts."

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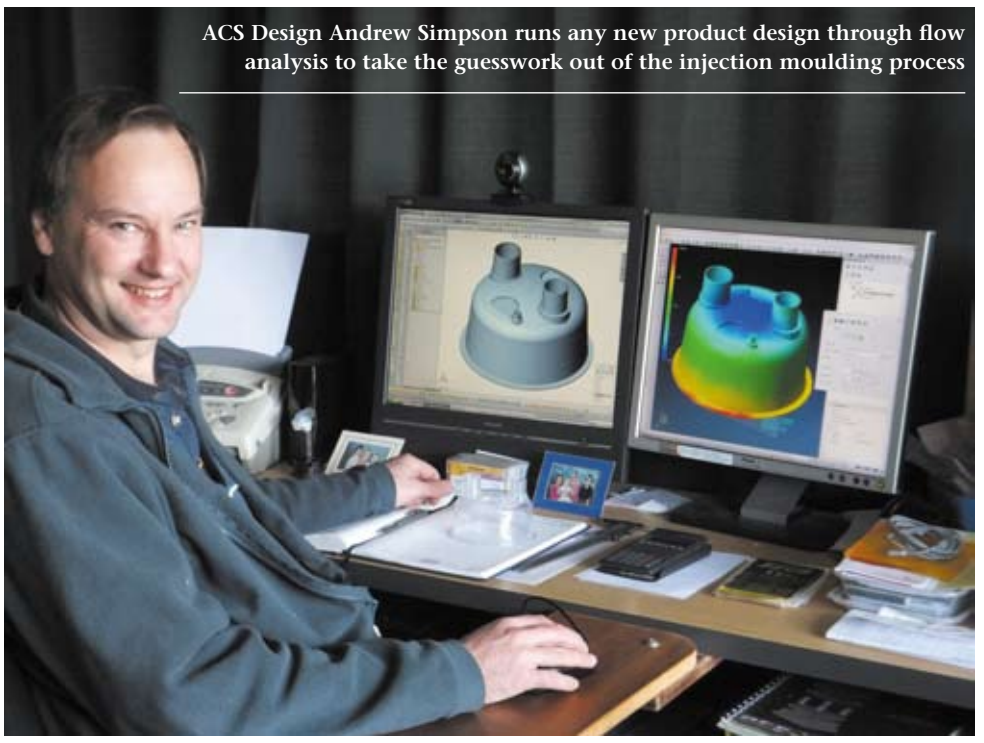


ACS Design Andrew Simpson runs any new product design through flow analysis to take the guesswork out of the injection moulding process

VERO VISI CADCAM reduced lead times by 20 percent

Leading German tool maker Formenbau Kellermann GmbH reduced lead times by more than 20 percent after investing in VISI.

Formenbau Kellermann is a sought-after partner to the automotive industry providing complex single and multiple-component tools for high-quality plastic parts such as intake manifolds, oil modules, air filter housings and cylinder head covers.

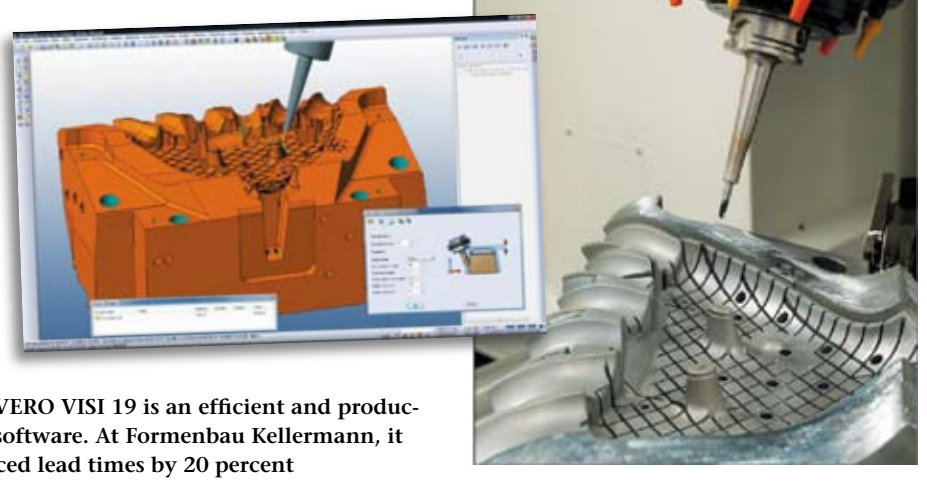
Based close to Nürnberg after relocating and expanding twice, it was founded in 1970 by Mr. Heinz Kellermann. Today Formenbau Kellermann with its 27-strong personnel is being run by graduate engineer Ms. Sabine Kellermann.

"Pricing pressure, competition from emerging countries and the trend towards ever shorter project terms are challenges that force tool manufacturers to rethink the classical form of single item production," Sabine says.

"In tool-making, flexibility and the use of the latest technology is a must. This basic principle is also applicable to Formenbau Kellermann where we have invested heavily in machinery and software so we are ready to adapt to changing market conditions."

The CAD/CAM software of choice at Formenbau Kellerman is VISI from British manufacturer VERO Software.

"As a progressive company, we had already invested much earlier in 3D. Prior to our switch to VISI in 2003, we worked with ICEM DDN, a product that had been on the market for many years but could no longer compete with modern systems."



The VERO VISI 19 is an efficient and productive software. At Formenbau Kellermann, it reduced lead times by 20 percent

Feature recognition drives CAM consolidation

The introduction of 'Compass Technology' for feature recognition means that Formenbau Kellermann automatically generates 2 and 2-1/2-axis CNC programmes for regular geometries such as holes or milling grooves which are common features in tool making—dramatically reducing programming time and eliminating potential positioning errors.

In principle, only three steps are necessary for CNC plate programming: Start the feature recognition, run the company-specific Compass based rules and finally, verification of the completed CAM programs.

3-5 axis simultaneous milling

One function that is used intensively at Formenbau Kellermann is the ability to automatically convert 3-axis to 5-axis continuous toolpaths.

"This enables us to reduce expenditure on programming time and still benefit from the advantages of 5-axis machining," Sabine explains.

"For example, the Mikron HOM 1350U allows for an approach angle from +16° to -120°, whereby the distance between spindle and table is only 30mm. This approach is applicable for most geometries and we benefit from better surface finish through the use of shorter, more rigid tooling and reduced vibration."

For more information on VERO engineering software contact:
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