

VISI

Formaplex

FORMAPLEX

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VISI is acknowledged as one of the world's leading CAD/CAM software solutions. It offers a unique combination of fully integrated surface and solid modelling, 3D tool design, and comprehensive 2D, 3D and 5-axis machining strategies with dedicated high speed milling routines.



Formaplex Limited

VISI Flow Is Vital For Formaplex Mould Tool Integrity

Specialist plastic flow analysis software performs a significant role for a leading UK tool and mouldings manufacturer which successfully produces over 400 pre-proven tools each year.... and its costs were recovered within the first month.

Formaplex design and manufacture aluminium and steel injection mould tools to the automotive, motorsport and aerospace industries, and produce low volume finished moulded components such as brackets and fixings, through to bumper assemblies and instrument panels. They also supply composite tooling and components, carry out specialist machining and finishing projects, component painting, flocking and assembly.

The company has over 40 CNC machines – both 3 and 5-axis – with a range of machining envelopes up to 8m x 6.2m x 2m to suit a wide variety of design projects, along with 11 injection mould presses, from 55 tonnes to 3,500 tonnes.

They specialise in providing full design support and advice for tools, including plastic flow analysis, logistics project management through production, measurement, tool testing, design, and manufacture. Technical Director Adrian Chapman says VISI Flow from Vero Software is vital in ensuring the long-lasting integrity of their mould tools – its injection simulation achieves cost effective and reliable designs, and optimum moulding conditions such as well-balanced runners with symmetrical filling patterns.

“Aluminium moulds, in particular, can be damaged if filled from the wrong position, in the wrong sequence, or by excessive pressure with inadequate clamp tonnage. It’s all too easy to blow the mould and damage the parting faces. But VISI Flow shows us all potential manufacturing issues such as welding lines, air traps and the best gate location, before the mould is trialled.

“We can quickly analyse where the pressure is going to be too high, whether the material will freeze too quickly, if we need to have more than one gate and whether they’re in the right place. Once we’ve analysed and understood exactly what we need to do we can advise the customer on any necessary changes such as part thickness modification, changing the material or re-engineering.”

Initial studies of moulded features and draft check analysis tell him all he needs to know to complete his initial Design for Manufacturability (DFM) work. He then carries out initial fill studies where VISI provides the same level of control over injecting molten polymer into the mould cavity as is available on the moulding machine. The simulation provides the ability to forecast and visualise how a component will be filled by the plastic melt front, making it possible to identify any potential aesthetic issues. VISI Flow provides a number of analytical tools that allow the investigation of moulding variables such as pressure, temperature, shear stress, frozen skin, fibre orientation, clamping force and many others.



About The Company:

Name: Formaplex

Business: Manufacturer of tooling and lightweight components.

Web: www.formaplex.com

Benefits Achieved:

- Single software solution for DFM analysis, 3D tool design, plastic flow simulation and CNC manufacturing.
- Cost effective and reliable designs with optimum moulding conditions such as well-balanced runners with symmetrical filling patterns.
- Dedicated high speed milling techniques and built-in smoothing algorithms create intelligent 3 and 5-axis CNC toolpaths for their Doosan and Kondia milling machines.

Comments:

“VISI provides us with key information at the design stage and it supports the complete mould process, which ultimately ensures total end product satisfaction.

Within the first month of using VISI Flow to analyse the correct filling pattern and maximise our process parameters, we saved the cost of the software.”

Adrian Chapman



“With VISI I can quickly analyse the customer CAD data to verify moulding feasibility by checking for draft conditions and undercut features; then VISI Flow shows the capability of successfully moulding the required plastic part.

“We use the part splitting tools to create parting faces, enabling us to quickly design the main core and cavity block. Once we have those finalised, we model the sliders, lifters and any other small components – whether they’re automatic or manual – and incorporate them into the mould tool.

“With VISI we can simulate the mould kinematics and correct any issues before we start cutting expensive metal. It gives a very clear indication of all areas where problems could arise. We can give our customers full and accurate information regarding the development of their mould tools. Without it, our dynamic approach and customer service would definitely be hindered.”

He says once the mould tool is complete it undergoes a maturation procedure – a series of process trials that monitor and review the continuous improvement of the product until the component is ultimately accepted.

The company operates out of 150,000 square feet across three ‘state of the art’ sites in Hampshire, and is expanding with a further 120,000 square feet purpose built facility in 2016. Specialist Engineering is a crucial division of the business which supports the Metrology department, where moulded components are accurately inspected and measured with the latest CMM technology. Formaplex design and manufacture bespoke fixtures for the inspection process, under the guidance of Specialist Engineering Manager Grant Keates.

And VISI plays a key role in this process, too, ensuring absolute accuracy and repeatable tolerances. He says they design the fixture by importing the native CAD model into VISI and creating the fixture around the critical points of the component. “The CAD data can come from our customers in a range of formats, but VISI handles it all seamlessly, which is a great advantage for our speed and efficiency of design.”

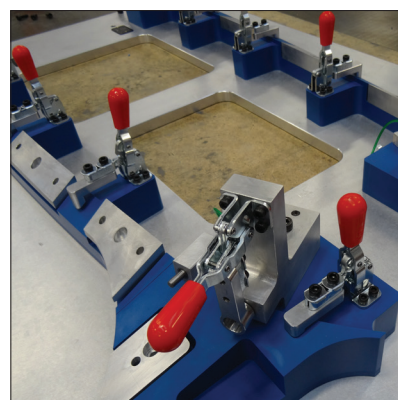
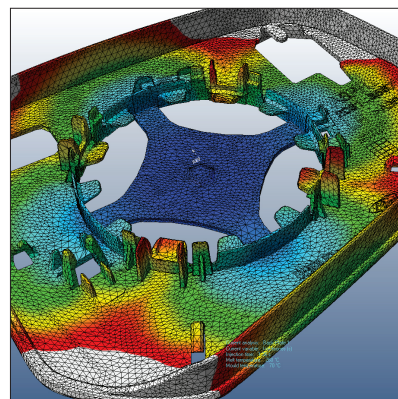
His next step is to send the finished CAD data of the fixture to the shop floor where VISI Machining’s dedicated high speed milling techniques and built-in smoothing algorithms create intelligent 3 and 5-axis toolpaths for their Doosan and Kondia CNC machines.

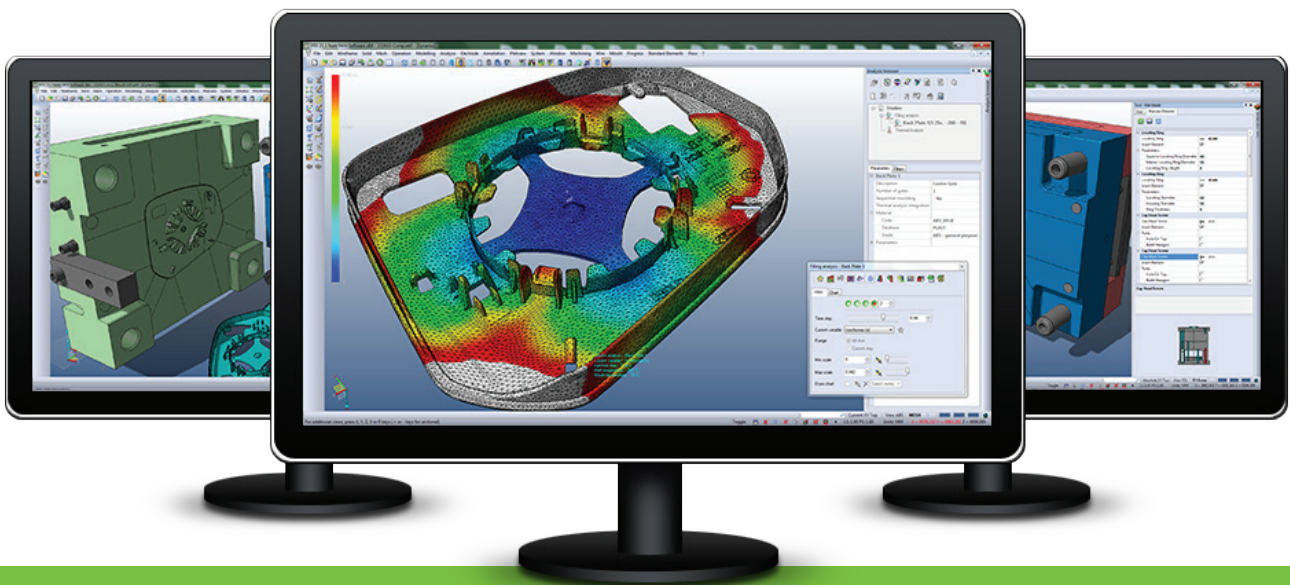
“We don’t have any real challenges or issues with designing and manufacturing our jigs and fixtures, because VISI helps us achieve everything we need to.

He says the Specialist Engineering Division embraces new technology with a high level of investment year on year, and is now incorporating sheet metal fabrication, encompassing welding of a range of steels through to exotic metals such as titanium.

Summing up the company’s overall use of VISI, Adrian Chapman says: “It provides us with key information at the design stage and it supports the complete mould process, which ultimately ensures total end product satisfaction.

“A conservative estimate is that within the first month of using VISI Flow to analyse the correct filling pattern and maximise our process parameters, we saved the cost of the software by avoiding downtime, repairs, wasted toolmaking and setting time, and reduced material costs.”





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