

# : visi flow

## molding design

All areas of molded component creation can benefit from the optimization of mold tool design and molding process parameters. Part designers, mold makers and molders will all benefit from using Vero's patented technology for injection simulation to achieve cost effective and reliable mold designs and the optimum molding conditions. VISI Flow is a unique prediction tool, ideal for pre and post production analysis and concurrent engineering of injection molded plastic components.

### Pre-production analysis.

Before any tool design is started, preventive analysis can detect potential manufacturing issues – such as welding lines, air traps and best gate location etc, providing the maximum possible time frame for a corrective solution.

### Post-production analysis.

When a component is already in production and not performing as expected, molding simulations can help the operator better understand the conditions inside the mold cavity during the molding cycle. This procedure can help judge the effectiveness of different corrective actions and produce the most effective improvements to the molding results.

### Concurrent engineering.

Pre-production and post-production analyses can certainly be very helpful but, if not related to the entire process, they do not guarantee the complete optimization of the part/mold/molding process. This is only made possible through an integrated CAD/CAM/CAE analysis. An uninterrupted data exchange between the design and the analysis environment provides the ability to identify possible critical situations, set the most effective

molding parameters, optimize the runners and cooling layout and predict problems concerning any part of the plastic component creation process.

### A cost effective solution.

VISI Flow provides a user friendly interface with short model preparation and calculation times. Initially introduced to the injection simulation market over 25 years ago, VISI Flow combines the powerful versatility of VISI Modeling with the undisputed result accuracy of Finite Element Analysis. VISI Flow provides the complete solution for part/mold designers and plastic injection molding technicians; from filling analysis, to warpage calculations and thermal optimization analysis.

### Multiple CAD interfaces.

VISI Flow can work directly with Parasolid, IGES, CATIA v4 & v5, Pro-E, UG, STEP, Solid Works, Solid Edge, ACIS, DXF, DWG, STL and VDA files. The extensive range of translators ensures that users can work with data from almost any supplier. Very large files can be handled with ease and companies working with complex designs will benefit from the ease with which their customer's CAD data can be manipulated.

first integrated CAD/CAE application

unique patented solid meshing technology

short model preparation and calculation times

accurate filling simulation

identification of aesthetic issues

multiple molding variables

fiber orientation

material database customization

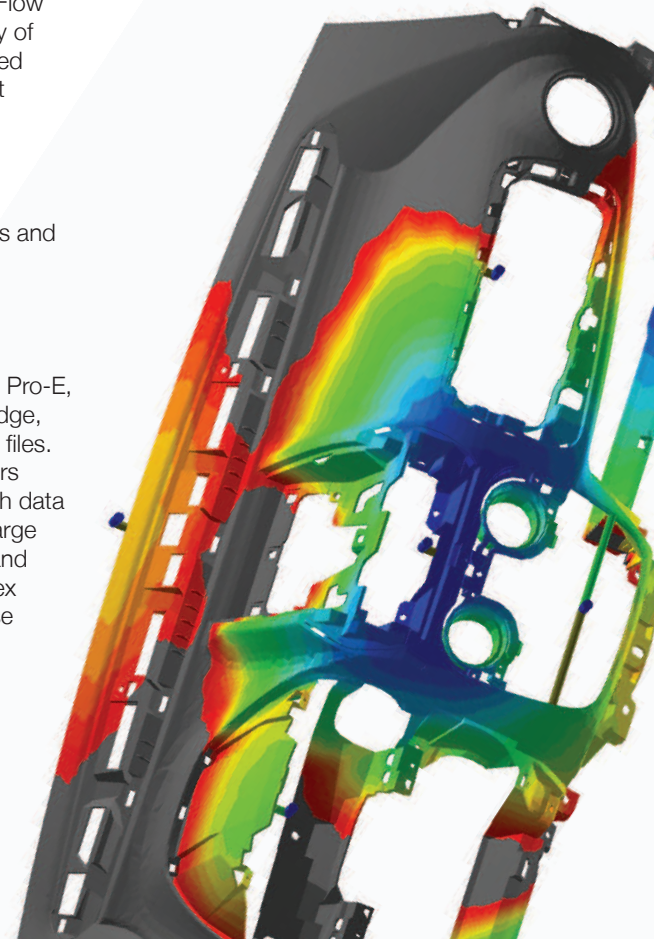
warpage prediction

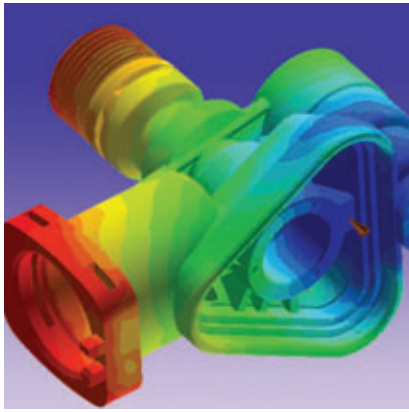
thermal analysis

cooling layout optimization

import of cooling and feeding system

gas-assisted molding, co-injection, overmolding and crosslinking analyses





#### Runner and cooling systems.

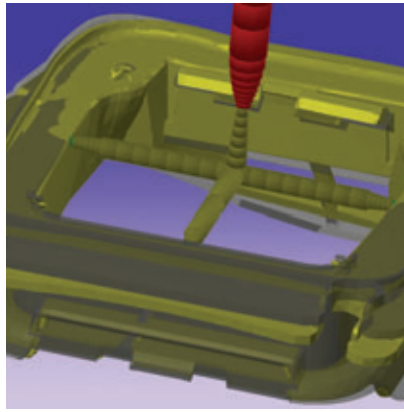
A range of methods are available for importing or creating one of the most important mold tool features. Any feeding and conditioning system, with no limit of complexity, can be included within the analysis, and easily edited to allow for a comparative analysis to be calculated.

#### Patented meshing technology.

Using a proprietary hybrid meshing technology, VISI Flow performs a real 3-dimensional flow simulation with very short calculation times. The solid mesh creation is an automated function applied to any CAD geometry providing VISI Flow with short model preparation times and rapid analysis calculations. The patented meshing approach gives consistent results unaffected by component size, complexity or wall thickness.

#### Materials database.

The accuracy of the analysis result is directly related to the material characterization. VISI Flow includes an extensive material database covering a wide selection of material grades and suppliers. New materials are constantly being developed and introduced into the market place, so to guarantee an accurate representation of molding materials, VISI Flow provides the operator with the ability to easily add new polymer grades or modify the existing data to match the exact molding material being used.

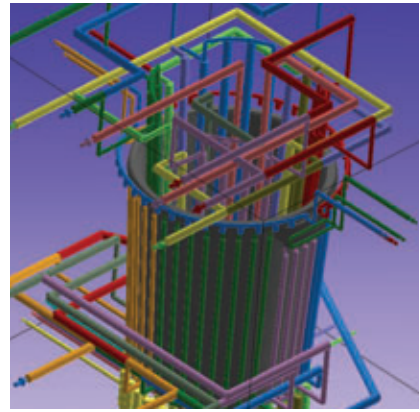


#### Filling phase.

The filling phase provides the same level of control over the injection of molten polymer into the mold cavity as you have on any injection molding machine. The filling simulation provides the ability to forecast and visualize how a component will be filled by the plastic melt front; making it possible to identify any potential aesthetic issues. The filling module provides many tools to allow the operator to investigate the molding variables; such as pressure, temperature, shear stress, frozen skin, fiber orientation, clamping force and many others.

#### Shape phase.

The result presented by VISI Flow Shape allows the operator to visualize and measure the final molded shape predicted after processing the values for the filling, holding and freezing molding phases. Many tools are provided to the operator for evaluating the result; including viewing displacement along an axis, querying point locations to calculate the warpage, linear shrinkage and ensuring feature ovalization stays within any set tolerance. The results will also help identify any possible defects, such as sinking or voids caused by packing conditions during the holding time. If necessary, it is possible to export the warped model geometry for comparison with the original CAD data for potential reverse engineering or improvements to the mold tool design.



#### Thermal phase module.

The thermal module is a powerful tool for the detailed analysis of the effect of the thermal conditioning system of an injection mold tool. The thermal module provides the ability to run an analysis by considering all possible thermal effects due to the heat exchange among plastic and blocks, hot and cold runners and mold inserts with highly conductive materials. The ability to analyze the cooling system allows the operator to visualize the warpage related to the cooling system and makes it possible to define the best layout to achieve the shortest possible cycle times. Other useful features include controlling both core and cavity temperatures, analyzing the temperature distribution through the insert blocks and defining the ejection time in relation to the solid fraction of the part.

#### Analysis of the molding process.

Other optional modules make it possible to simulate the latest molding techniques such as sequential molding, gas-assisted, co-injection, overmolding technologies and crosslinking grades. As with all modules within VISI Flow, the system automatically enters key values for creating an analysis relevant to the geometry and material grade selected.

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