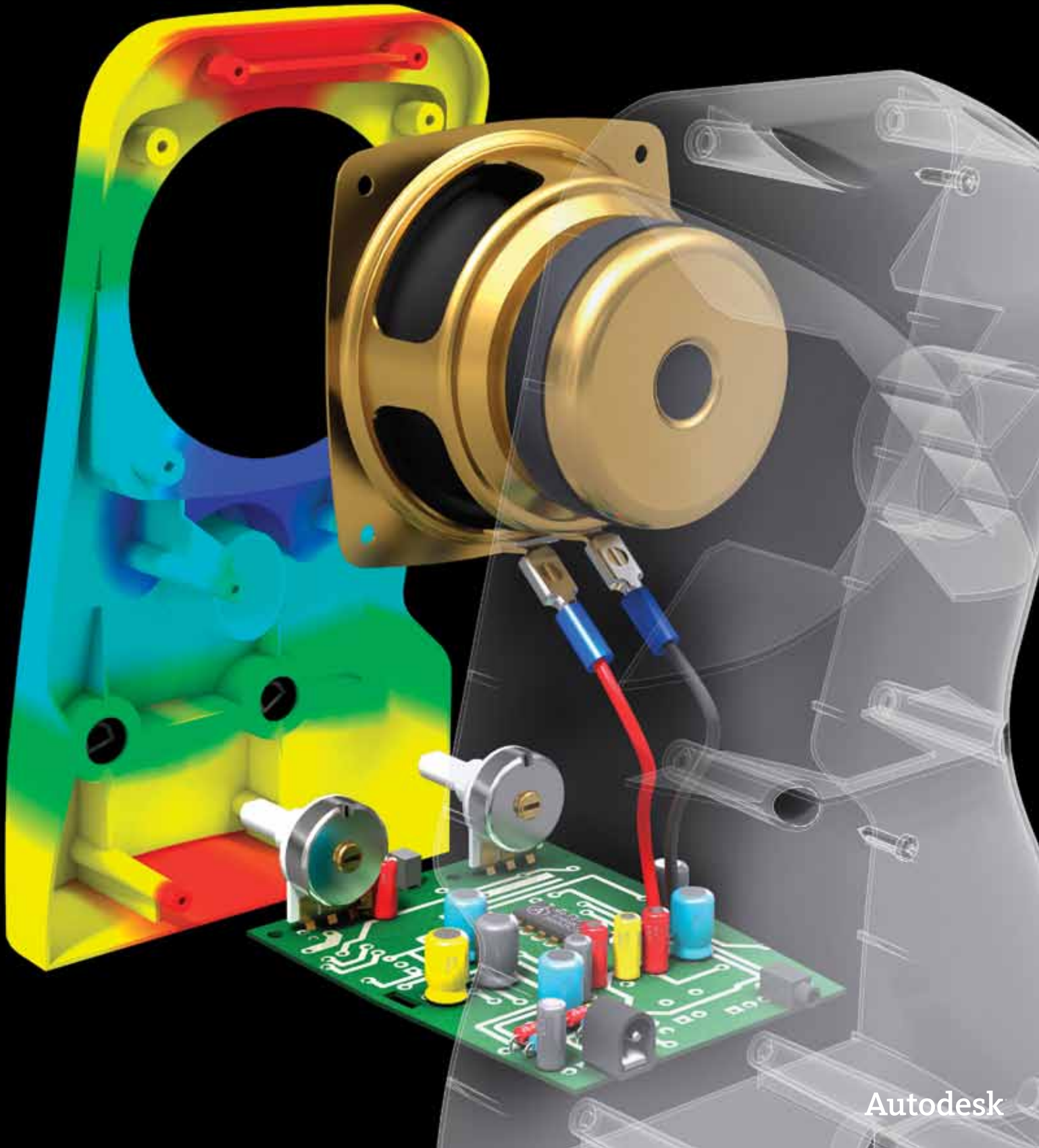


Technical What's New

Autodesk®
Moldflow® Insight



Technical What's New

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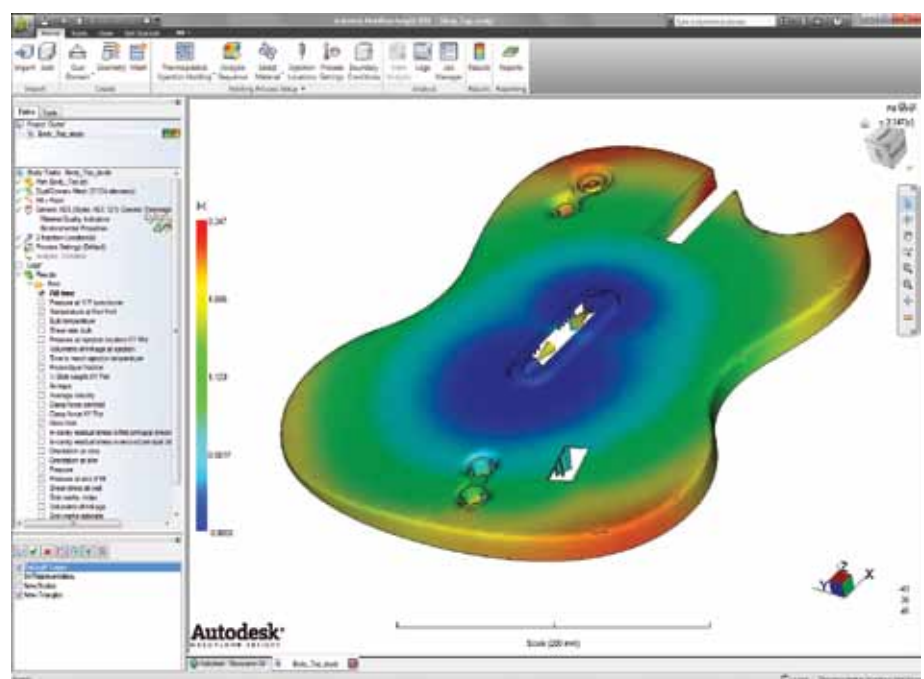
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What's New in Autodesk Moldflow Insight 2011

Autodesk® Moldflow® Insight software, part of the Autodesk® solution for Digital Prototyping, provides injection molding simulation tools for use on digital prototypes. Providing in-depth validation and optimization of plastic parts and associated injection molds, Autodesk Moldflow Insight software helps study the injection molding processes in use today. Used by some of the top manufacturers in the automotive, consumer electronics, medical, and packaging industries, Autodesk Moldflow Insight software helps reduce the need for costly mold rework and physical prototypes, minimize delays associated with removing molds from production, and get innovative products to market faster.

Autodesk Moldflow Insight 2011 software offers the following new features and benefits:

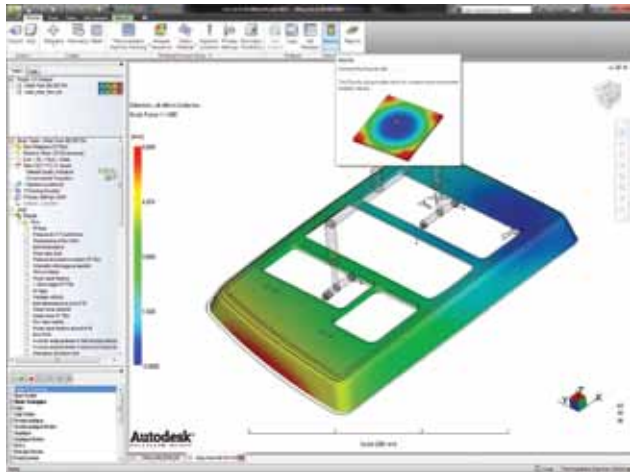
- New User Interface
- Material Quality Indicators
- Enhanced Support for GPU Technology
- Enhanced Structural Simulation of Plastic Parts
- Prediction of Sink Marks Expanded
- Prediction of Weld Lines Expanded
- Photorealistic Defect Visualization
- Accuracy and Speed Enhancements for Simulations
- Material Database Updates
- Redesign of Online Help
- Improved Support for Large Models



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New User Interface

The new user interface for Autodesk Moldflow Insight 2011 software provides an intuitive and task-oriented workflow, aimed at improving overall productivity.



A central and easy-to-navigate Home tab organizes common tasks in a manner that follows the typical simulation workflow. Functionality is presented based on the task at hand, which improves accessibility of commands and reduces time taken digging through menu systems.

This new user interface also includes the Application menu, Quick Access Toolbar, and the InfoCenter—providing a more consistent experience as you work with multiple Autodesk products.

Tooltips help new users get up to speed quickly on what each command does and how they should be used.

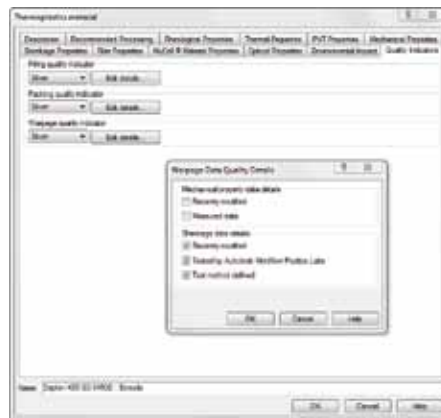
Standard Autodesk navigation and orientation tools like the ViewCube® and Navigation Bar are also now available in Autodesk Moldflow Insight 2011 software—leading to an improved experience when interacting with models.

The new Navigation Bar provides access to pan and zoom tools and the ViewCube—an on-screen widget, shaped like a cube, that rotates as you orbit your 3D scene and provides a clickable interface to orient and re-orient the model.

The new user interface helps to increase your productivity when creating simulation models or evaluating simulation results.

Material Quality Indicators

The accuracy of simulation results depends in part on the quality of material data used as input. Therefore, the Autodesk Moldflow material database has been enhanced to include Material Quality Indicators which reflect the confidence you can have in the material data selected for the type of analysis you want to perform.



There are three different indicators, each of which reflects the quality of the material data for three different analysis requirements.

Fill Quality Indicator—incorporates the quality of Viscosity, Specific Heat Capacity, and Thermal Conductivity data.

Packing Quality Indicator—incorporates the quality of the Fill Quality Indicator results and the pVT data.

Warpage Quality Indicator—incorporates the quality of the Packing Quality Indicator as well as the Mechanical and Shrinkage data.

Each quality indicator can be assigned a Gold, Silver, or Bronze rating based on the following criteria:

- Testing method used to generate the value of each material property.
- Completeness of the range of material properties needed for the analysis type.
- How recently the testing was completed.

A Gold rating indicates a high confidence in the quality of the material data for the analysis type. When accurate simulation results are critical, it is recommended to use a material with a Gold rating.

A Silver rating can result from a combination of well-tested, grade-specific data and estimated material data. For example, a material might have recently tested, grade-specific Viscosity and Specific Heat Capacity data, but also includes supplemental Thermal Conductivity data (indicated in red in the material data details). This could result in a Silver Fill Quality Indicator rating.

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A Bronze rating can reflect issues such as incomplete datasets, the extensive use of supplemental data, or unverified test results. The use of materials with a Bronze rating can still generate good simulation results, but these results should not be relied upon to determine critical requirements such as precise warpage or shrinkage allowances used for the creation of molds.

Enhanced Support for GPU Technology

Autodesk Moldflow Insight 2011 software includes enhanced support for graphics processing unit (GPU) technology. GPU technology allows numerical intensive calculations in a 3D Fill+Pack analysis to be performed on a GPU card, resulting in a faster solution time.

Enabling automatic GPU card detection

To further facilitate the use of this technology, the software automatically detects and uses a compatible GPU card if one is found. This enables users who have a GPU card to automatically benefit from speed improvements when running a 3D Fill+Pack analysis.

Improved GPU memory support for large models

Autodesk Moldflow Insight 2011 software also includes improved support for running a 3D Fill+Pack analysis on larger models. Previously, the required memory was assessed prior to the start of an analysis; and, if the memory requirement exceeded the memory capacity of the GPU card, the card was not used. Now, the memory assessment is performed prior to iterations. Therefore, an analysis on a very large model may use the GPU card early in the filling stage—when the memory requirement is still low enough to fit into the GPU card's memory. Once the maximum memory threshold is reached, the GPU card disengages and the analysis continues on the computer's regular CPU.

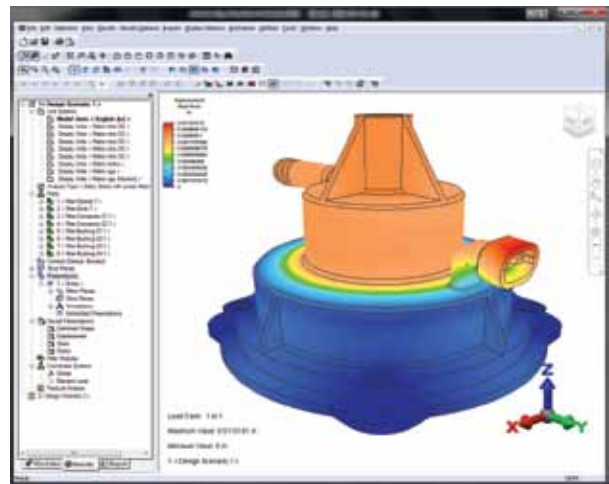
Improved support for multiple GPUs

If more than one GPU card is available, the analysis will select the fastest GPU among the available GPUs with adequate memory in order to perform the analysis with the minimal solution time. This automatic detection of multiple GPUs includes handling of separate GPU cards in one computer as well as multiple GPU chips in a single card.

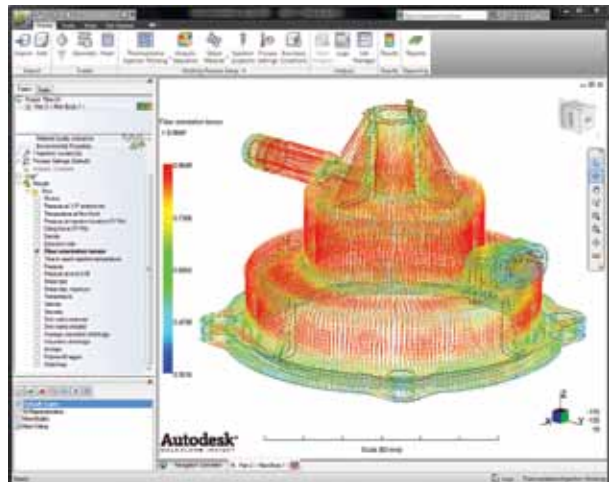
Enhanced Structural Simulation of Plastic Parts

The Autodesk® Algor® Simulation products provide a broad range of structural analysis tools that help designers optimize products for performance.

For products that use a fiber-filled material, you can now export your Autodesk Algor Simulation model to Autodesk Moldflow 2011 software in order to simulate the plastic injection molding process and help predict the orientation of fibers in the manufactured part.



Within the Autodesk Moldflow 2011 software, the material selected in the Autodesk Algor Simulation software can be imported. You then set the mesh type and generate a mesh, set an appropriate injection location, and start a Fill+Pack analysis. Then, view the orientation of fibers in the anisotropic resin and determine the proper processing conditions to help optimize the structural properties in critical areas of the part.



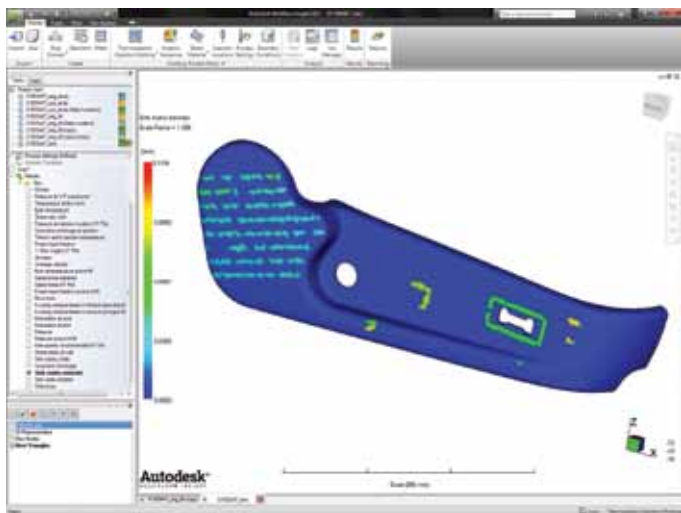
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Finally, use the as-manufactured material properties to improve the accuracy of structural simulations performed in Autodesk Algor Simulation software.

With this deep integration between Autodesk Algor Simulation and Autodesk Moldflow software, you can better predict the real-life behavior of your plastic parts because the material properties account for fiber orientations produced during the injection molding process.

Prediction of Sink Marks Expanded

Autodesk Moldflow 2011 software expands the capability to predict the location and depth of sink marks to include Dual Domain™ and 3D models as well as Midplane models.



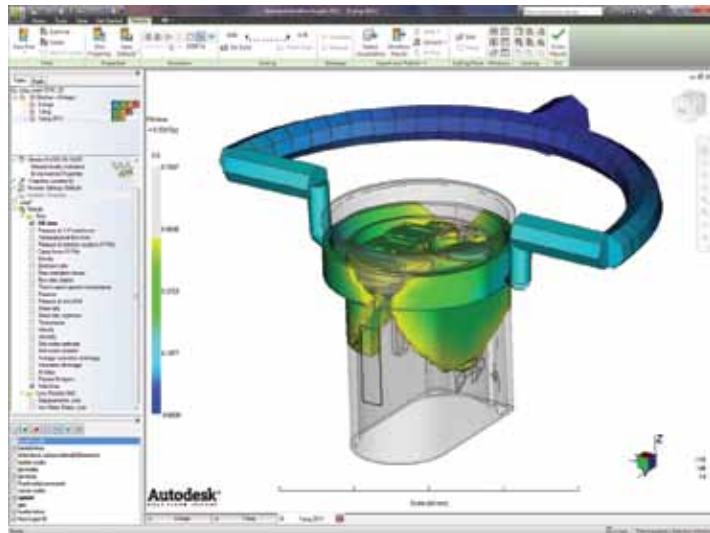
Sink marks result from localized shrinkage of the material at thick sections and appear as depressions or indentations on the surface of a molded part. These surface defects are typically very small, but they can be quite visible. Although sink marks do not affect part strength or function, they are often perceived to be severe quality defects.

The new Sink marks estimate result shows the location and depth of sink marks which may be caused by features on the opposite face of the part surface. The depth of sink marks are available numerically and can also be visualized as a shaded plot.

To assist with the interpretation of results for 3D models, a new Average volumetric shrinkage result is also available—where the average value of volumetric shrinkage over the half-gap thickness is plotted on the surface of the model.

Prediction of Weld Lines Expanded

Autodesk Moldflow Insight 2011 software expands the capability to predict weld lines to include 3D models as well as Midplane and Dual Domain models.



A weld (or meld) line is created when two or more flow paths meet during the filling process. Weld lines on plastic parts can cause structural problems and concerns related to visual appearance.

The Weld lines result is now available for analyses of 3D models using the Coupled 3D Flow solver with the following molding processes: Thermoplastics Injection Molding, Thermoplastics Overmolding, Gas-Assisted Injection Molding, Reactive Molding, Microchip Encapsulation, and Underfill Encapsulation.

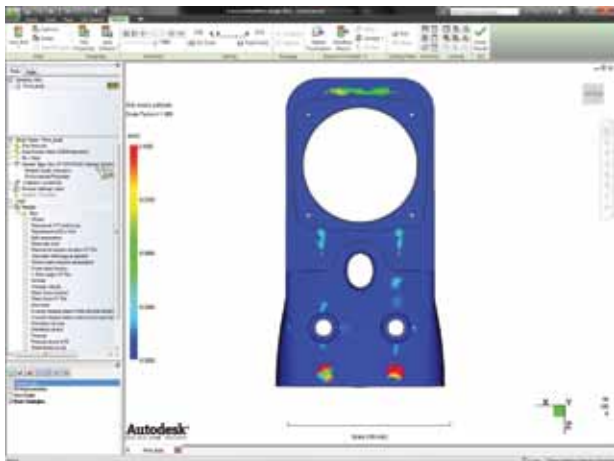
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Photorealistic Defect Visualization

Simulation results in Autodesk Moldflow Insight software help you determine how well your part design will fill with plastic and also identify where defects such as sink marks and part warpage might occur. However, it may be difficult to determine whether these defects would be noticeable on the physical product by simply reviewing simulation result contours or values.



With Autodesk Moldflow Insight 2011 software, you can now export your model and the related sink mark and warpage results—as an ASCII FBX file (*.fbx)—to Autodesk® Showcase® software for photorealistic visualization of defects.



This interoperability lets you see how the part might actually look in real life and determine whether the defects are visible to the eye, enabling you to assess part quality and decide whether the design needs to be changed to avoid downstream manufacturing defects.

Or, you can experiment with the application of different surface treatments such as texture in order to hide small blemishes caused by the manufacturing process.

With this deep integration between Autodesk Moldflow and Autodesk Showcase software, you can significantly enhance design reviews and quality assessments of plastic parts by examining a photorealistic rendering of the manufactured digital prototype.

Accuracy and Speed Enhancements for Simulations

Multiple enhancements have been implemented to improve the performance of Autodesk Moldflow Insight 2011 simulations.

Automatic parallelization for 3D Fill+Pack analyses

Parallel solution (multi-threaded) technology allows major computational tasks to be computed simultaneously by multiple threads on a processor or many processors when running an analysis.

Now, 3D Fill+Pack analyses will benefit from automatic parallelization—where Autodesk Moldflow Insight 2011 software will automatically determine the appropriate number of threads to use, eliminating the need for users to specify related solution parameters.

The primary advantage of automatic parallelization is efficiency. Because the solver determines the most efficient number of threads to use throughout the analysis, it prevents machine overload and takes advantage of speed improvements when available.

3D Fill+Pack fiber orientation calculation extended to runners

3D Fill+Pack analyses using fiber-filled materials now calculate fiber orientation beginning at the specified injection location—accounting for the fiber orientation in a runner system modeled by beam elements, if one exists in the model. Additionally, the fiber orientation state at the injection location is now always assumed to be aligned at skin/transverse at core. Extending the fiber orientation calculation to include the runner system better represents the actual molding process in the simulation and improves the predicted fiber orientation distribution in the part.

Calculating the fiber orientation in beam elements is expected to more accurately represent the initial fiber orientation at the cavity entrance.

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Improved consistency between model types

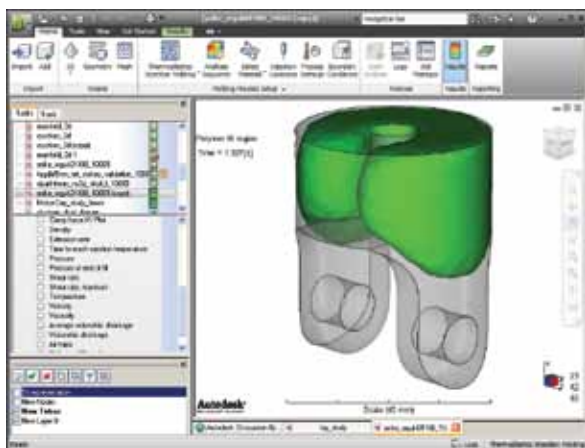
The name and definition of the former Freeze time plot has been changed to the Time to reach ejection temperature result for 3D Fill+Pack analyses—matching the plot name used for Midplane and Dual Domain models. In addition, an option to turn off dynamic update of results has also been added.

Flow front temperature solution improved for 3D models

The flow front temperature solution for tetrahedral elements in the Coupled 3D Flow solver has been improved to more accurately calculate temperature changes at the flow front, resulting in smoother display of the Temperature at the flow front result.

Predicted flow front advancement improved for 3D models

A new flow front advancement technique has been implemented for 3D Fill+Pack analyses. This modification results in better symmetry and smoothness of the predicted filling pattern, along with improved display of the Polymer fill region result plot and jetting prediction.



Improved Cool analysis

Cool analysis has been optimized for 64-bit computers and available memory is better utilized in order to improve solution times. In addition, Cool analysis has been improved to more accurately calculate the coolant temperature in cooling circuits—helping users to better optimize a cooling circuit design.

Improved consistency for analyses of Dual Domain models

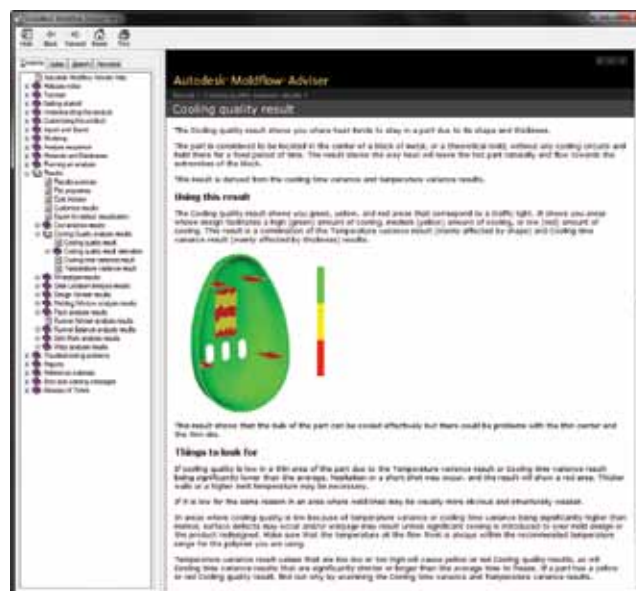
Warp analysis of Dual Domain models now incorporates the same methodology to determine part thickness that is used for Fill+Pack and Cool analyses, providing a consistent approach and improved results across analysis types.

Material Database Updates

The Autodesk Moldflow material database has been reviewed and modified—resulting in an updated database that now contains 8,479 thermoplastic materials from 414 suppliers, 180 thermoset materials from 42 suppliers, and 99 mold materials from 12 suppliers.

Redesign of Online Help

The online help included with Autodesk Moldflow Insight 2011 software incorporates a new navigation structure and updated look and feel, making it easier to find the help you need and providing an experience that is consistent with other Autodesk products.



The heart of the redesign is the implementation of navigation tabs, helping to organize information into topic types. Each topic type can consist of tabs labeled as Concept, Procedure, and Quick Reference:

- Concept tabs provide conceptual information about tools, processes, and tasks.
- Procedure tabs provide step-by-step procedures for accomplishing specific tasks.
- Quick Reference tabs provide descriptions of dialogs or elements in a dialog box.

Get started with a variety of learning tools such as the Interface Introduction, Getting Started Guide, Tutorials, and videos that help you along the way.

The addition of breadcrumbs provides a clearer navigation path, allowing you to easily identify your current location within the online help.

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Improved Support for Large Models

Autodesk Moldflow Insight 2011 software greatly improves the stability of the user interface when working with large models in preparation for simulation and then evaluating the related simulation results.

Stability and speed improvements

When handling models where memory usage exceeds 4 GB on 64-bit Windows operating systems, the user interface is now more stable during both pre-processing and post-processing operations. Additionally, performance of the user interface has been significantly improved for large selections during model editing.

Improved handling for out-of-memory conditions

Autodesk Moldflow Insight 2011 software provides improved handling for out-of-memory conditions when memory limits are reached during results evaluation on 32-bit Windows operating systems. When the available memory is exceeded, you will now be prompted to save your work prior to exiting the user interface.

Stay Up to Date

Autodesk gives you more. Gain access to technical expertise, utilize training and support programs direct from Autodesk, stay up to date with the latest product releases, and give us your feedback. Not only does Autodesk want to help you use Autodesk Moldflow Insight software more effectively but also make sure Autodesk Moldflow Insight software is working effectively for you.

Subscription

Autodesk® Subscription gives you immediate access to software upgrades and exclusive access to service and support benefits designed to help you get the most out of your Autodesk software. Learn more at www.autodesk.com/subscription

Autodesk Learning and Education

Get expert training with instructor-led classes and validate your experience with Autodesk certifications.

Feedback

Autodesk Moldflow Insight customers can provide feedback to the Autodesk Moldflow development team through several different avenues. For example:

- Provide tips or join newsgroups at www.autodesk.com/discussiongroup-moldflowinsight
- Keep up-to-date on what's happening in your industry, stay in touch with other industry professionals, and take advantage of a host of online resources at the Manufacturing Community Portal at mfgcommunity.autodesk.com
- Talk with your Autodesk Authorized Reseller and support staff

Your input is crucial to our success and we look forward to receiving your suggestions.

Conclusion

We thank you for your continued support of the Autodesk Moldflow family of products and hope you feel we are listening to your needs. We added the new and enhanced functionality to Autodesk Moldflow Insight 2011 software to help make you more productive, make your company more competitive, and return true value to your bottom line.