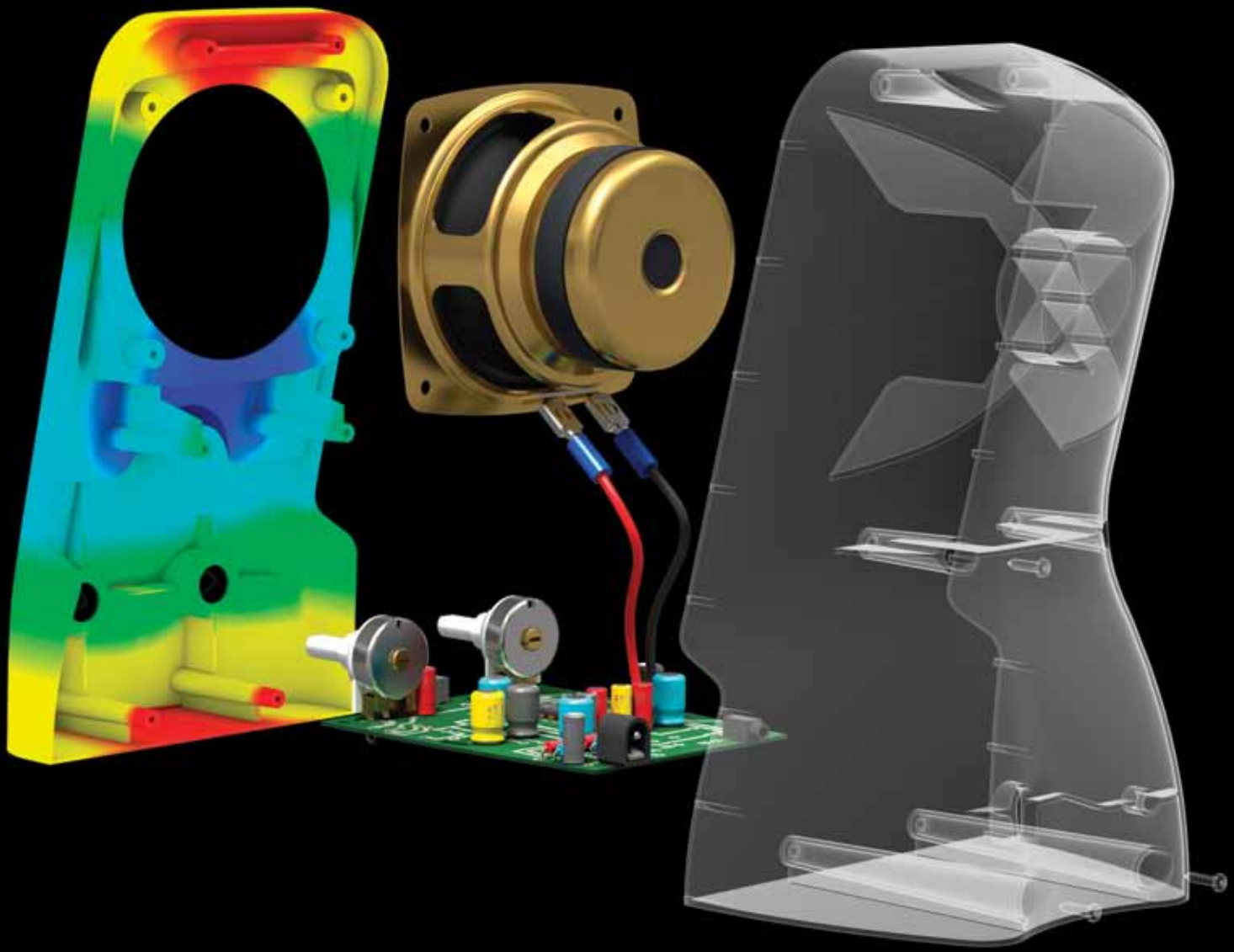
Technical What's New

Autodesk®
Moldflow® Adviser



Autodesk

Technical What's New

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What's New in Autodesk Moldflow Adviser 2011

Autodesk® Moldflow® Adviser injection molding simulation software, part of the Autodesk® solution for Digital Prototyping, provides wizard-based tools to help validate and optimize plastic part, injection mold, and tool designs before manufacturing begins. Using a digital prototype to simulate the plastic injection molding process helps reduce the number of costly physical prototypes required to design plastic parts and gets innovative products to market faster and with greater confidence.

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

- New User Interface
- New Design Adviser
- Material Quality Indicators
- Support for GPU Technology
- Enhanced Structural Simulation of Plastic Parts
- 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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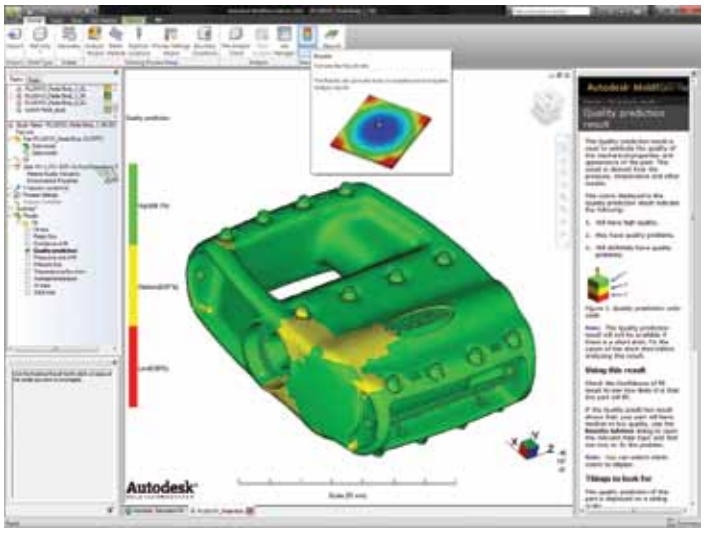
New User Interface

The new user interface for Autodesk Moldflow Adviser 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.

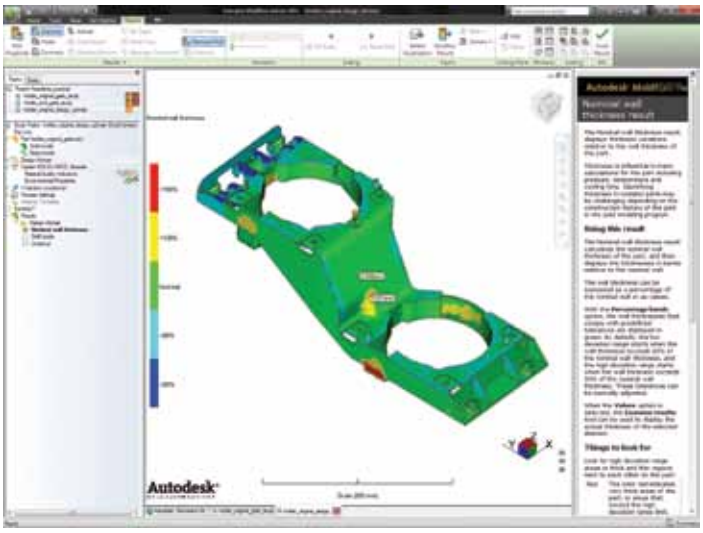
Standard Autodesk navigation and orientation tools like the ViewCube® and Navigation Bar are also now available in Autodesk Moldflow Adviser 2011 software—leading to an improved experience when interacting with models.

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.

New Design Adviser

The new Design Adviser in Autodesk Moldflow Adviser 2011 software helps you quickly identify areas of plastic parts that violate design guidelines related to the injection molding manufacturing process.



Design Adviser replaces the previous Geometry Adviser with a broader range of tools for part design validation. The Design Adviser tool is available for both Dual Domain™ and 3D models consisting of single parts and can be quickly launched from the Analysis Wizard. This powerful tool provides the following results to help you easily identify aspects of your part design that are outside design guidelines:

Thickness—Excessive variations in wall thickness can cause part warpage and surface blemishes as well as problems with the flow of melted plastic such as race-tracking or hesitation. By examining nominal wall thickness results, you can identify any region of the part that varies beyond acceptable limits and help avoid potential defects.

Draft angle—Display variations in draft angle so you can easily identify features or regions that will be difficult to eject from the mold. Such difficulty can cause excessive stresses in the part as well as the ejection system and can lead to potential premature failure of parts and molds. A fully customizable scale allows you to also account for other factors that affect ejection such as mold surface roughness or texture, part complexity, depth of the part to be ejected, and the material properties.

Undercut—Features that cast shadows on other features of the part are undesirable because they often require complex and expensive mold components. By examining undercut results, you can identify the location of these features and determine whether they are necessary; and, if so, help ensure more complex tooling is designed in order to properly form such features in a way that the part can be successfully ejected.

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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.

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.

Support for GPU Technology

Autodesk Moldflow Adviser 2011 software introduces 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.

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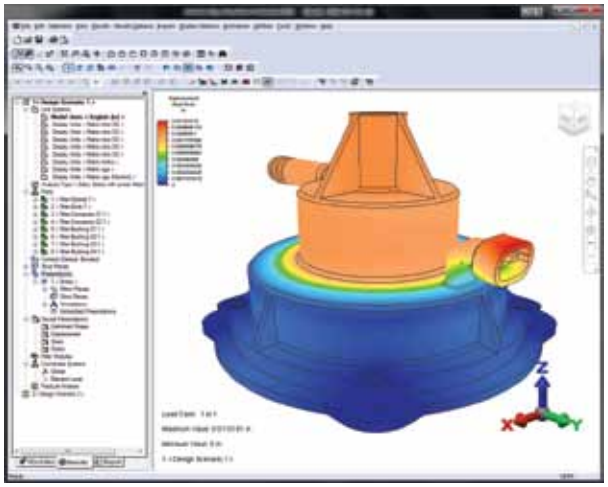
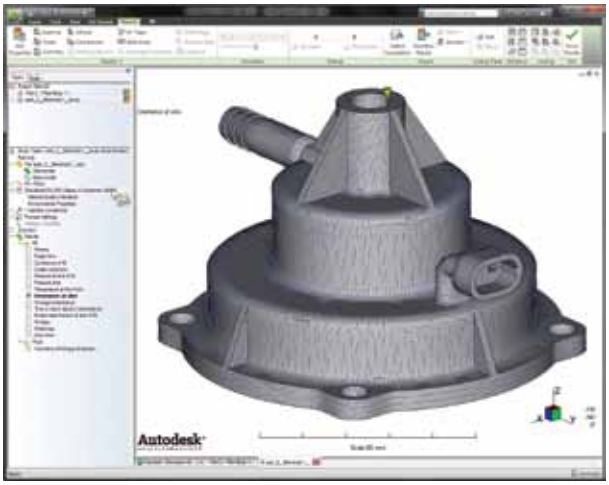
Enhanced Structural Simulation of Plastic Parts

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 mechanical properties of the manufactured part due to the orientation of fibers.



Within the Autodesk Moldflow 2011 software, the material selected in the Autodesk Algor Simulation software is imported, an appropriate meshing technology is selected, a gate location based on the geometry of the part is suggested, and the analysis type is set to Fill+Pack. A single mouse click then accepts these defaults, sets an injection location at the suggested gate location, and starts the analysis. Then, you can view the simulation results and determine the proper processing conditions to help optimize the structural properties in critical areas of the part.

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.

Photorealistic Defect Visualization

Simulation results in Autodesk Moldflow Adviser 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.

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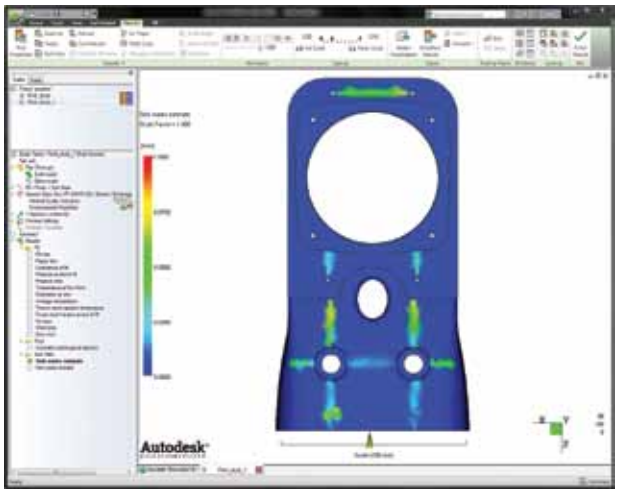
With Autodesk Moldflow Adviser 2011 software, you can now export your model and the related sink mark and warpage results—as an ASCII FBX file (*.fbx)—to Autodesk® Showcase® software for photorealistic visualization of defects.



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 Adviser 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 Adviser 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 fiber orientation in runner segments, if they exist in the model. 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 the runner segments is expected to more accurately represent the initial fiber orientation at the cavity entrance.

Enhanced calculation of weld lines
Improvements have been implemented in 3D Fill+Pack analysis to improve the calculation of weld lines and enhance the display of the Weld lines result for 3D models.

Flow front temperature solution improved for 3D models
3D Fill+Pack analysis 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.

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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.

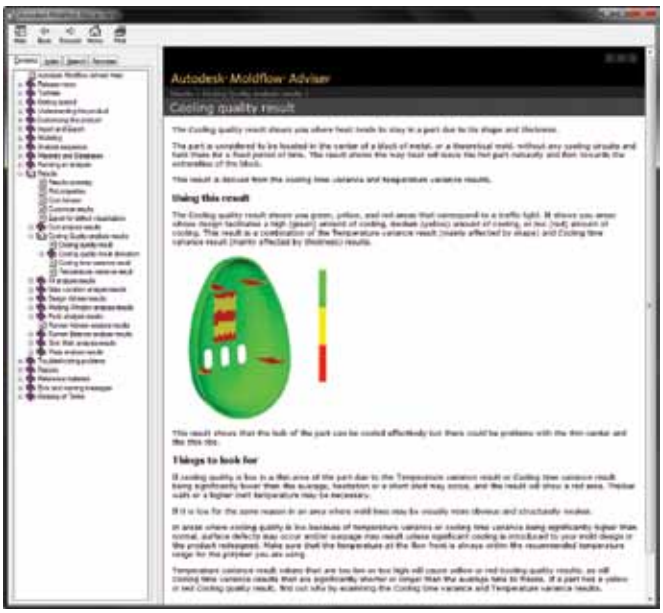
Improved consistency for analyses of Dual Domain models
Warp analysis of Dual Domain models now incorporates the same methodology to determine part thickness that is used for Fill+Pack and Cool analyses, providing a consistent approach and improved results across analysis types.

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 and 99 mold materials from 12 suppliers.

Redesign of Online Help

The online help included with Autodesk Moldflow Adviser 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.

Improved Support for Large Models

Autodesk Moldflow Adviser 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 Adviser 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.

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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 Adviser software more effectively but also make sure Autodesk Moldflow Adviser software is working effectively for you.

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Feedback

Autodesk Moldflow Adviser 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-moldflowadviser**
- 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 Adviser 2011 software to help make you more productive, make your company more competitive, and return true value to your bottom line.

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