

Technical What's New

Autodesk® Moldflow® Insight



Technical What's New

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Autodesk® Moldflow® Insight software, part of the Autodesk® solution for Digital Prototyping, provides a complete set of advanced plastics engineering simulation tools for use on digital prototypes. Providing in-depth analysis and optimization of plastic parts and their associated molds, Autodesk Moldflow Insight software offers powerful functionality that can simulate the most advanced molding processes in use today. The second release of Autodesk Moldflow Insight 2010 offers the following new features and benefits:

- Enhanced Interoperability
- Sustainable Design Features
- 3D Meshing and Performance Improvements
- Coupled 3D Flow Solver Enhancements
- Midplane and Dual Domain Fill+Pack Solver Optimization
- Birefringence Simulation Enhancements
- Thermoset Analysis Enhancements
- Application Programming Interface Enhancements
- Automated Customer Feedback

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Enhanced Interoperability

Autodesk Inventor Support

Models created in Autodesk Inventor with an *.ipt file extension can now be directly imported into Autodesk Moldflow Insight. This tighter interface with Inventor better aligns Moldflow Insight with the Digital Prototyping workflow, helping to further minimize the need for costly physical prototypes and help get more innovative designs to market faster.



Autodesk Moldflow Adviser Surface Mesh Export

Autodesk Moldflow Insight surface models can now be directly exported for use in Autodesk Moldflow Adviser. This functionality allows Moldflow Adviser users that have access to Moldflow Insight to take advantage of the full range of model editing tools available in Insight.

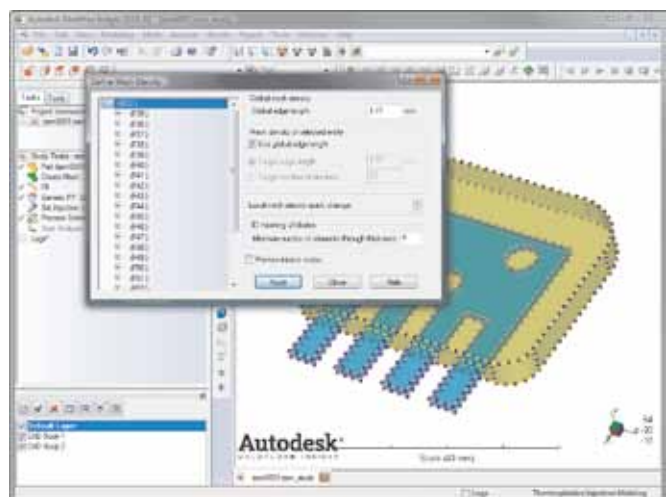
Direct Import of CAD Models

For Autodesk Moldflow Insight users that also have Moldflow Design Link 2010, Release 2, there is now a direct import feature for native CAD geometries, which allows for better and more robust meshing of CAD geometries, as well as the following improvements:

- The load time of CAD models is significantly reduced because no translation is required.
- Imported CAD models can be visualized before they are meshed.
- The cavity layout and the associated runner system can be created directly from the CAD model, without having to mesh the model first.
- 64-bit support for meshing of imported CAD models is enabled.
- Boundary conditions, such as injection locations, can be set directly on the imported CAD model.
- Meshing operations for imported CAD models are now available from the Job Manager.
- The meshing of large or complex models—for example, chip pads or connectors—is greatly improved by the use of the native CAD kernel.

Local Mesh Density Control

The existing local mesh density control has been extended to support imported CAD entities such as bodies, faces, and edges. The minimum number of elements through thickness for 3D meshing can be set independently for different CAD bodies of an assembly. This can be particularly useful when a core component, an insert, or a specific area of the model needs a finer or coarser mesh than the rest of the cavity.



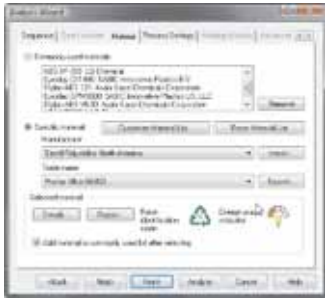
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Sustainable Design Features

Environmental Impact

The new Energy Usage Indicator in Autodesk Moldflow Insight provides an indication of the relative energy requirements to produce a part from a given material based on injection pressure, cooling time, geometry and part thickness. Armed with this knowledge, designers can further decrease manufacturing energy requirements to reduce costs and minimize environmental impact.

Resin Identification Codes are now also included with all thermoplastics in the Autodesk Moldflow material database. Having access to these codes allows designers to select materials that are more easily recycled and that contribute to sustainability initiatives.

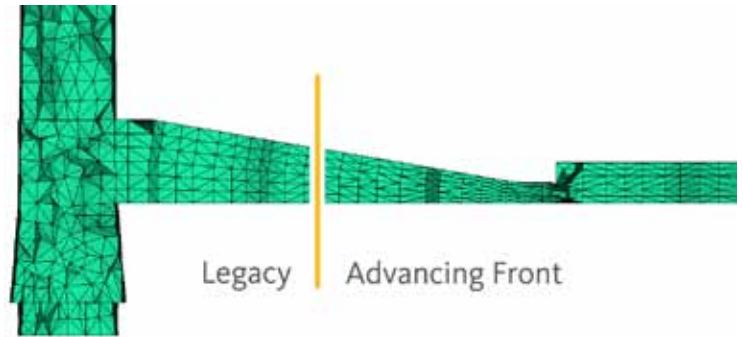


3D Meshing and Performance Improvements

New 3D Mesh Generator

A new 3D mesh generator based on the Advancing Front method has been developed to improve the 3D mesh quality, and features the following:

- Interface mismatch and dense node patches on the model boundaries can be avoided.
- Elements are generated layer-by-layer based on an anisotropic edge length control, and the edge length can be specified in the thickness direction.
- Multiple quality measures are used to optimize the mesh, and the percentage of flat elements is significantly reduced.
- More elements are generated in corner and transition regions in order to increase the analysis resolution.



Improved 3D Temperature Solution

The accuracy of the temperature calculation in tetrahedral elements has been improved, in both filling and packing, through a variety of enhancements in the algorithm. Benefits include:

- Improvements in pressure, shrinkage and warpage predictions.
- Smoother temperature distributions.
- More uniformity in plots of shrinkage, density and freeze time.

New 3D Fiber Solver

A new 3D Fiber solver offers an improved fiber orientation solution for fiber-filled thermoplastic materials when the Coupled 3D Flow solver is used. Benefits include the following:

- The fiber orientation solution now is more efficient.
- Velocity gradient calculations are improved.
- Dependency of results on mesh orientation is reduced.
- Result visualization is improved, especially when viewing the fiber orientation profile through the part thickness.

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Coupled 3D Flow Solver Enhancements

Users can now get accurate results faster when running a 3D Flow (Coupled 3D solver only) analysis. The speed improvement is achieved through a combination of enhancements, including:

New AMG Matrix Solver

The new Autodesk-developed AMG (Algebraic Multi Grid) matrix solver replaces the previous AMG matrix solver developed by Allied Engineering Corporation. It is generally faster and uses less RAM than the previous solver. The new matrix solver can take advantage of multi-core processors and can use some graphics cards to further decrease the total time-to-solution.

Parallel Solution Technology

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. This solution is new for the Coupled 3D Flow solver and is available on all supported Windows operating systems.

GPU Card Support

A new option to use the graphics processing unit (GPU) of some graphics cards for the Coupled 3D Flow analysis solver can result in substantially shorter analysis times. It is available on computers that have a double precision-capable, CUDA-enabled graphics card installed.

Midplane and Dual Domain Fill+Pack Solver Optimization

Fill and Pack analyses benefit from code optimization that has been implemented in the latest release of Moldflow Insight 2010 as follows:

Reduced Memory Requirements

Internal tests show that a typical analysis using an unfilled material and default process settings now requires significantly less memory, thereby using system resources more efficiently.

Faster Solution Times

Internal tests also show that a typical analysis using an unfilled material and default process settings runs about 5% faster than the same analysis as compared to the previous solver.

Birefringence Simulation Enhancements

Spectrum Correction Factor

With the Spectrum Correction Factor, you can modify the influence of viscoelastic deformations on your birefringence simulation results and improve the analysis accuracy. The sensitivity can be adjusted to target your own validation data, which can be applied to individual materials and then stored in the material database.

Temperature Shift Model

Users can now choose the form of the Temperature Shift Model, a key part of the viscoelastic calculations inherent in birefringence simulations. Under certain circumstances, this further improves accuracy through a better interpolation of relaxation time with simulated plastic temperature.

Thermoset Analysis Enhancements

Mold Surface Temperature Profiles

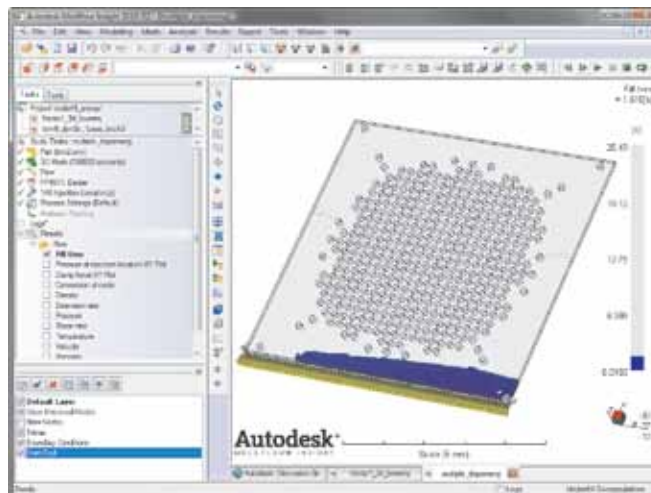
The capability to setup variable mold surface temperature profiles has been extended to 3D analyses of thermoset molding processes, including Reactive Molding and Microchip Encapsulation. This allows users of thermoset materials to examine the effect of mold temperature variation on material curing.

Preconditioning Analysis Options

The option to perform preconditioning analysis has been extended to 3D thermoset simulations, including Reactive Molding and Microchip Encapsulation. The preconditioning analysis calculates the melt temperature of the reactive material as it starts to flow into the mold cavity.

Multiple Dispensing Passes

Underfill Encapsulation analyses can now be programmed for multiple dispensing passes, in which a specific volume of encapsulant is dispensed on each pass. This more realistically simulates the movement of the dispensing nozzle.



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Application Programming Interface Enhancements

The Application Programming Interface (API) offers new and improved capabilities to automate user interface functions, including:

- Access to additional data in the thermoplastics material database, including the new Resin Identification Code and Energy Usage Indicator fields.
- Access to data in additional materials databases, including:
 - Coolant
 - Filler properties
 - Leadframe material
 - Mold material
 - Mucell material properties
 - Preform properties
 - Wire material
- Access to data in the injection molding machine database.
- New capabilities to loop through curve data and to get the coordinates of a point anywhere along a curve.
- Expanded Job Manager interaction.
- Control of animation speed for report generation.
- Access to 3D mesh diagnostic operations.

Automated Customer Feedback

Customer Involvement Program

Autodesk now invites Moldflow Insight 2010 customers to join the Customer Involvement Program. With your participation in this program, information about your system and the ways in which you navigate the program will be collected and sent to Autodesk. This information helps us identify trends and usage patterns that we can use to improve your experience with our products. You can choose to participate at any time, and, your participation can be anonymous. If you choose to provide us with your contact information, with your permission we may occasionally contact you to discuss the discovered trends.



Customer Error Reporting

Autodesk is committed to making quality products and this commitment does not stop when the product is shipped. The new customer error reporting feature in Moldflow Insight 2010 provides customers with a mechanism to report to our developers if the program closes unexpectedly. Details about the type of failure and the state of the software when the failure occurred are sent to Autodesk automatically. Your step-by-step description, and the command history preceding the failure provides us with the missing link between the conditions that caused the failure and the point of failure itself. This information is then used to identify and resolve program problems.

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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 Moldflow Insight more effectively—we want to make sure that Moldflow Insight is working effectively for you.

Subscription

Log into the Subscription Center to receive product updates, log and view support requests, or take eLearning courses. A valuable component of Autodesk® Subscription, eLearning provides a continually expanding curriculum of short training exercises.

Feedback

Autodesk Moldflow Insight customers can provide feedback to the Moldflow Insight development team through several avenues:

- Submit feedback, share best practices and collaborate with other users through discussion groups at www.autodesk.com/discussiongroup-moldflow-all.
- 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 Autodesk Manufacturing Community Portal, at mfgcommunity.autodesk.com.
- Talk with your Autodesk Moldflow Direct Sales Manager or 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 Autodesk Moldflow Insight and hope you feel we are listening to your needs. We developed the new and enhanced functionality in Moldflow Insight 2010 to help make you more productive, make your company more competitive, and return true value to your bottom line.