

Autodesk®
Moldflow® Insight

Plastics made perfect.



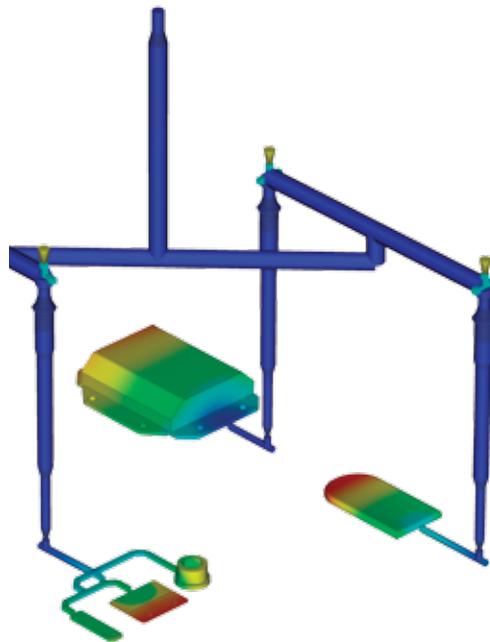
Simulation: Early and Often

With the use of plastic parts on the rise in almost every industry and the pressure to reduce costs and cut time to market, the need for simulation tools that provide deep insight into the plastics injection molding process has never been in greater demand.

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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. Currently employed by some of the top manufacturers in the automotive, medical, consumer electronics, and packaging industries, Autodesk Moldflow Insight reduces the need for physical prototypes and helps companies get innovative products to market faster.

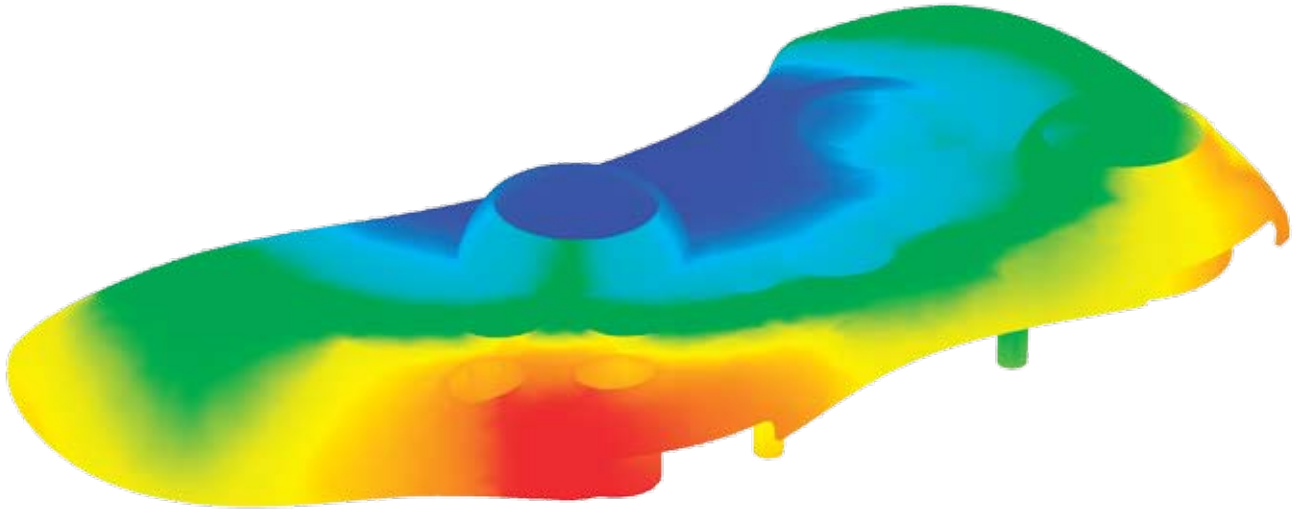


Plastics Engineering Simulation

Autodesk Moldflow Insight allows you to simulate the filling and packing phases of the injection molding process to help predict the flow behavior of plastic melts and help achieve high quality manufacturing. Engineers can optimize gate locations, balance runner systems, evaluate processing conditions and predict and correct molded part defects. Mold makers can analyze the effects of non-uniform mold temperatures, determine optimized valve-gate timing sequences, and compare flow through hot versus cold runner systems. Optional modules extend simulation capabilities beyond traditional thermoplastics injection molding to more leading edge molding processes including gas-assist, co-injection and injection compression.

Early Optimization

Moldflow Insight allows you to experiment with “what if” scenarios using different materials, part geometries, mold designs, and processing conditions before committing to a final design. This ability to evaluate different scenarios throughout the entire product development process results in higher-quality products. Autodesk Moldflow Insight helps manufacturers “get it right the first time”, so they can avoid the cost and time delays that frequently occur during the manufacturing phase.



Specialized Simulation Tools

Autodesk Moldflow Insight addresses the broadest range of design and manufacturing issues associated with the plastics molding process. It includes specialized simulation tools for practically every molding process involved in the creation of plastics parts and molds, including niche and leading edge processes. The software enables users to simulate not only the most common, but many unique molding techniques for those times when a specialized manufacturing process is needed to meet critical design requirements. With technology advances that span material characterization, process analysis, and geometry capability, Autodesk Moldflow Insight represents the forefront of plastics simulation; helping to shorten development cycles, reduce costs, and allow teams to spend more time innovating.

Extensive Plastics Database

Autodesk Moldflow Insight includes one of the largest plastics material databases of its kind. Users have access to over 8,000 grades of commercial plastics with the most up-to-date & accurate material data, so they can confidently evaluate various material candidates or predict molded part properties that could have a critical impact on the performance of the end-use application. There's also an Energy Usage Indicator and Resin Identification Codes so designers can further decrease manufacturing energy requirements and choose materials that contribute to sustainability initiatives.

In-Depth Analysis

Autodesk Moldflow Insight gives engineers in-depth analysis capabilities to help them tackle even the toughest-to-solve manufacturing problems. With a high degree of confidence in analysis results, for even the most complex geometry, Autodesk Moldflow Insight enables engineering teams to predict potential manufacturing defects before any tooling is cut, virtually eliminating the need for time-consuming and costly mold rework.

Customized Results and Reporting

With complete control over analysis process parameters and extensive and customizable results, Autodesk Moldflow Insight enables you to correlate results to real-world processing conditions with a high degree of accuracy, helping you to predict potential problems, and take corrective action to avoid them. Once the analysis is complete, you can use the automated report generation tools to share reports in popular formats (HTML, Microsoft® Word, and PowerPoint®), allowing valuable simulation data to be shared with other members of the design-to-manufacturing team, promoting collaboration and streamlining development.



Meshing Technologies

Choose the optimal analysis mesh type, balancing analysis accuracy and solution time.

To get correct analysis results, you need an accurate representation of part geometry. Every version of Autodesk Moldflow Insight includes all three meshing technology options—so you can analyze virtually any part geometry imaginable.

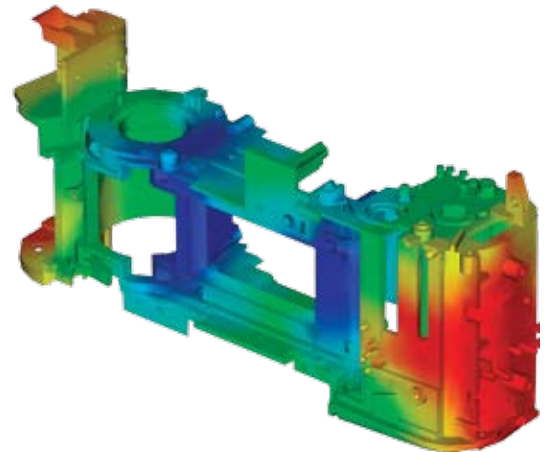
3D

Perform true 3D simulations on complex geometry using a proven technique based on a solid, tetrahedral finite-element volume mesh. 3D meshing is ideal for electrical connectors, thick structural components, and geometries with extreme thickness variations.



Dual Domain™

Analyze solid models of thin-walled parts using patented Dual Domain technology. Dual Domain allows users to work directly from 3D solid CAD models without the need to create a finite element mesh analysis model, making it easier to analyze multiple design iterations and perform more in-depth analyses.



Midplane

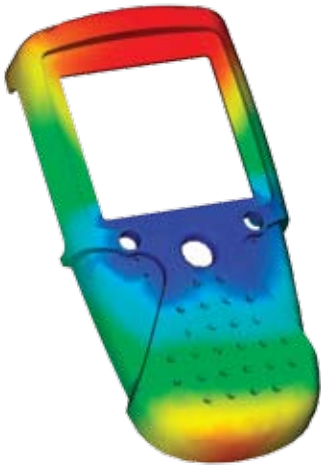
For traditional thin-walled plastic parts, generate two-dimensional planar surface meshes with assigned thicknesses.

Plastics Flow Simulation

Simulate how melted plastic will flow through your mold. You'll not only optimize part and mold design—you'll reduce potential manufacturing problems and improve the molding process.

Thermoplastics Filling

Simulate the filling phase of the thermoplastics injection molding process to predict the plastics melt flow pattern, so that mold cavities fill uniformly and you can potentially avoid short shots, and eliminate, minimize or reposition weld lines and air traps.



Thermoplastics Packing

Optimize the overall packing profile and visualize the magnitude and distribution of volumetric shrinkage. You'll minimize part warpage and reduce defects such as sink marks.

Molding Window

Quickly evaluate multiple gating schemes, part thicknesses, and materials. Determine recommended processing conditions and use them to conduct in-depth filling and packing analyses.

Design of Experiments

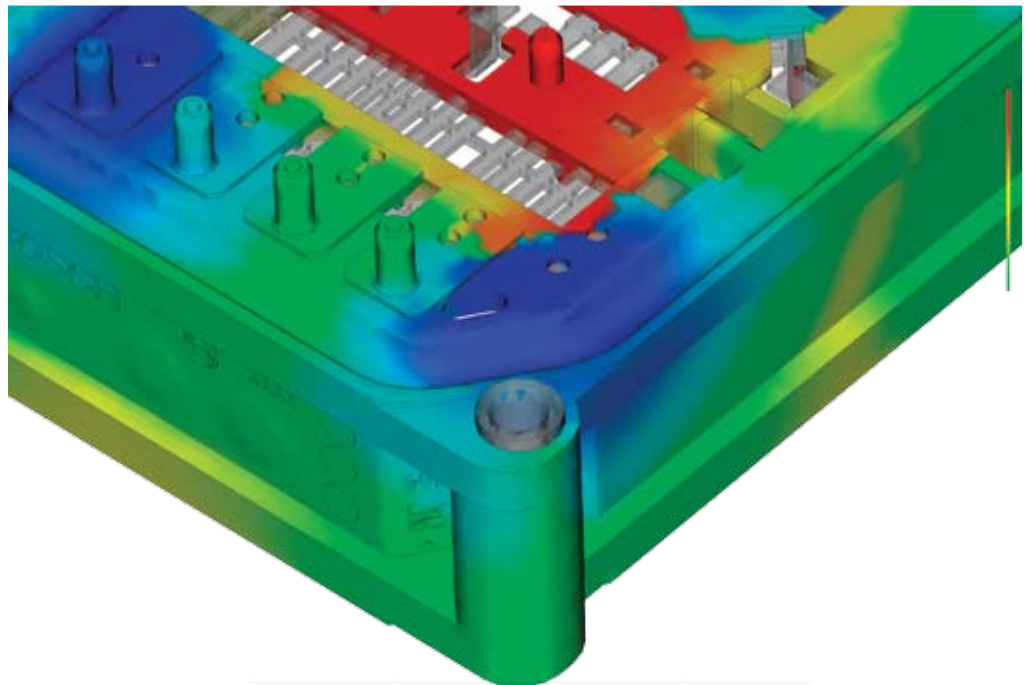
Run a sequence of automatic analyses that vary processing parameters—including mold and melt temperatures, injection time, packing pressure and time, and part thickness—to optimize processing conditions and thus the quality of the molded part.

Insert Overmolding

Run insert overmolding analyses to determine the impact of mold inserts on melt flow, cooling rate, and part warpage.

Two-Shot Sequential Overmolding

Simulate the two-shot sequential overmolding process, in which one part is filled; the tool is opened and indexed to a new position; and a second part is molded over the first.



Feed System Design and Mold Cooling Simulation

With tools for modeling and optimizing all types of runner systems and gating configurations, Autodesk Moldflow Insight gives tooling engineers the capabilities they need to improve surface appearance, minimize part warpage, and reduce overall cycle times.

Gate Location

Automatically identify up to 10 gate locations at once. You can minimize injection pressure and choose to exclude specific regions of the geometry when determining gate location.

Automatic Runner Balancing

Balance the runner systems of single-cavity, multi-cavity, and family mold layouts—ensuring that all parts fill at the same time, minimizing stress levels and reducing the volume of material required by runners.

Hot Runner Systems

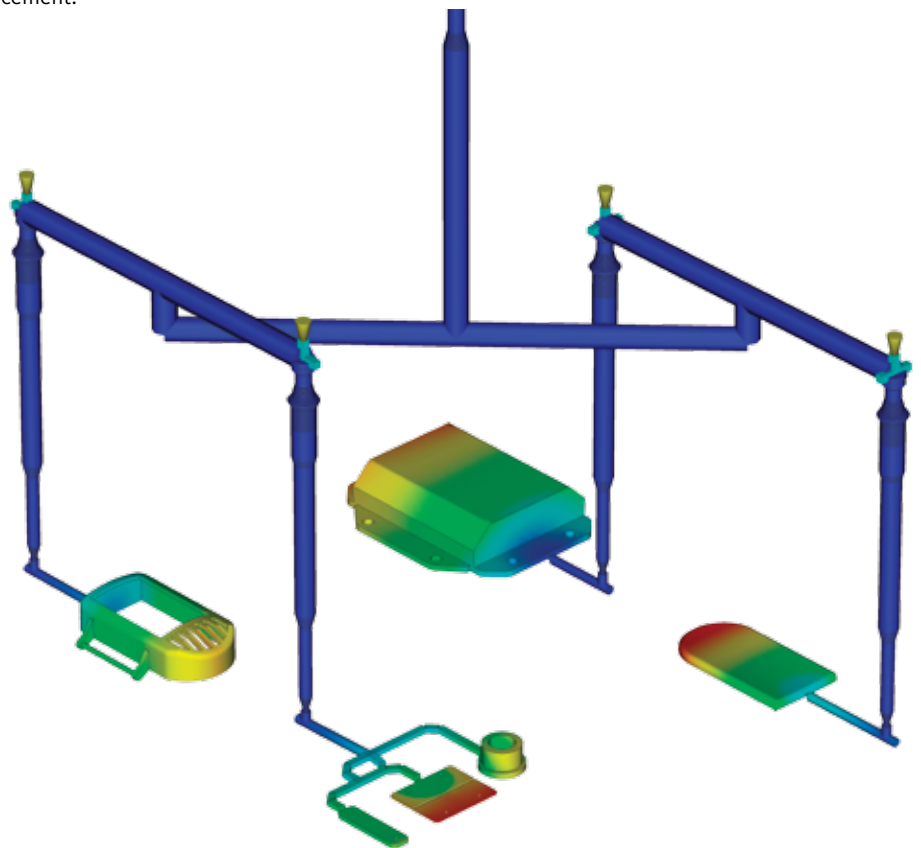
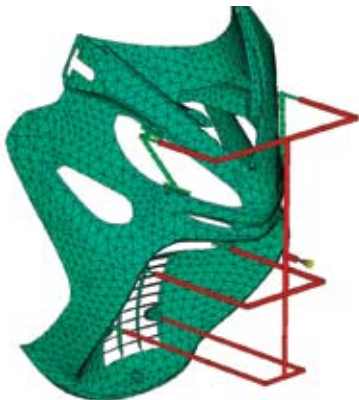
Model the components of a hot runner system, and setup sequential valve gates to eliminate weld lines and gain more control over the packing phase.

Dynamic Feed® Systems

Simulate the Synventive Molding Solutions Dynamic Feed® hot runner system, which provides independent melt pressure-based process control for up to 32 nozzles in a single mold.

Centerline Import/Export

Import and export feed system centerlines between your CAD software and Autodesk Moldflow Insight, decreasing modeling time and avoiding errors in runner placement.



Cooling Component Modeling

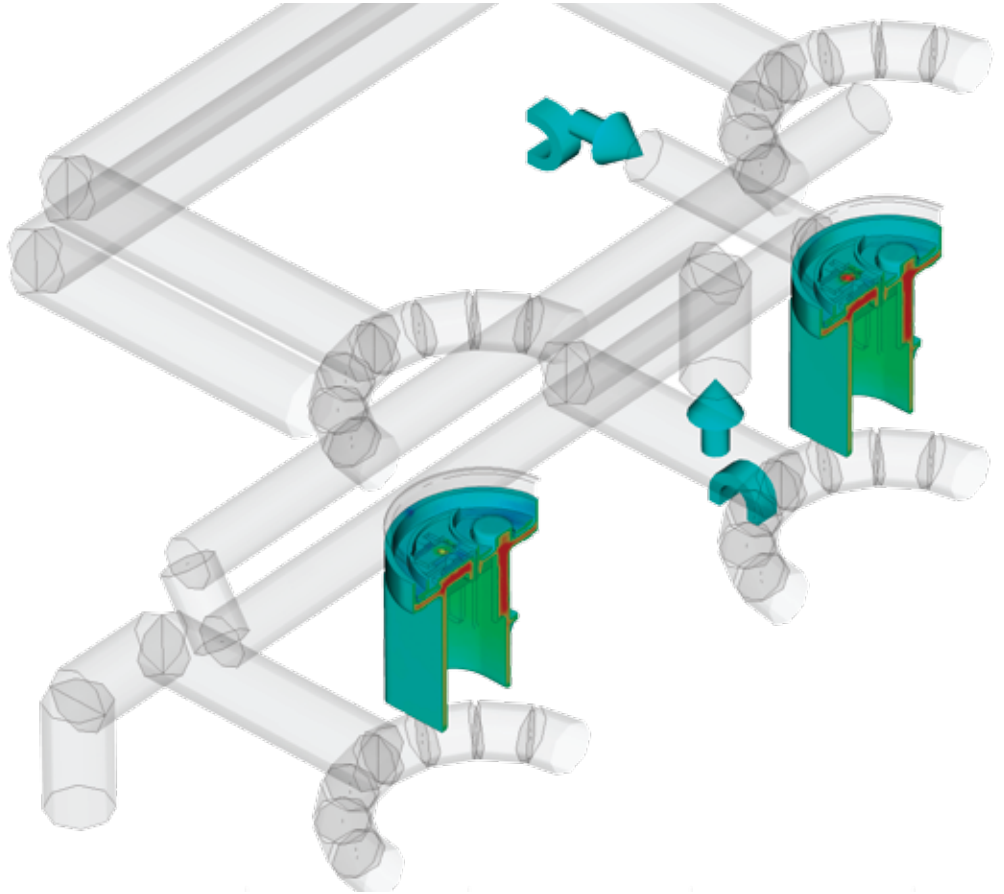
Analyze the efficiency of your mold's cooling system. Model cooling circuits, baffles, bubblers, mold inserts, and mold bases around the part.

Cooling Simulation

Optimize mold and cooling circuit designs to achieve uniform part cooling, minimize cycle times, eliminate part warpage due to cooling factors, and decrease manufacturing costs.

Rapid Heat Cycle Molding

Setup variable mold surface temperature profiles for processes that maintain a warmer mold temperature during filling to achieve a smooth surface appearance. Switch to a colder mold temperature in the packing and cooling phases to help freeze the part and decrease cycle time.

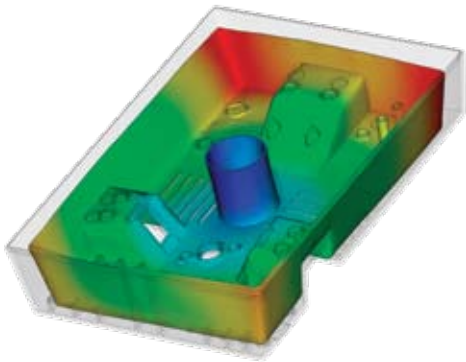


Structural Integrity Simulation

Evaluate part and tool design to control shrinkage and warpage—and test the molded product’s structural integrity.

Warpage Prediction

Uncover and isolate the primary causes of warpage resulting from process-induced stresses. Identify where warpage is likely to occur, and then optimize part design, material choice, and processing parameters to control part deformation before building the mold.



Shrinkage Prediction

Meet critical part tolerances by accurately accounting for molded part shrinkage based on processing parameters and grade-specific material data.

Fiber Orientation

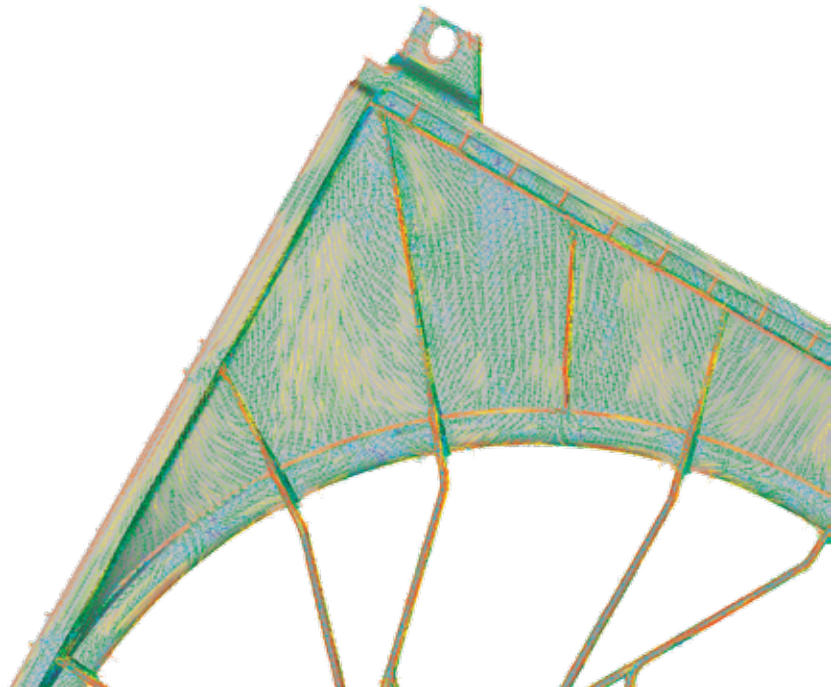
Understand and control the orientation of fibers within fiber-filled plastics to reduce shrinkage variations across the molded part and minimize or eliminate part warpage.

Autodesk Moldflow Structural Alliance

Exchange mechanical property data between Autodesk Moldflow Insight and ANSYS® or ABAQUS® structural analysis software to account for the effects of processing on the performance of fiber-filled injection-molded plastic parts when subjected to service loading.

Core Shift

Minimize the movement of injection mold cores by determining ideal processing conditions for injection pressure, packing profile, and gate locations.



Specialized Molding Processes

With Autodesk Moldflow Insight, you can simulate virtually all plastics molding processes and state-of-the-art process applications.

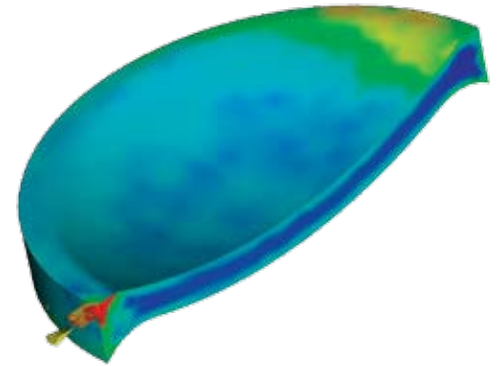
Gas-Assisted Injection Molding

Determine where to position polymer and gas entrances, how much plastic to inject prior to gas injection, and how to optimize the size and placement of gas channels.



Birefringence

Predict the optical performance of an injection-molded part by evaluating changes in the refractive index resulting from process-induced stresses. Evaluate multiple materials, processing conditions, and gate and runner designs to control birefringence in the part.



Process Optimization

Perform an injection-molding machine-specific analysis, taking into account machine response time, maximum injection velocity, and the number of steps that can be programmed for velocity and pressure profiles on the machine controller. Achieve uniform flow front velocity and temperature profiles through the injection molding machine nozzle, mold feed system, and part cavities.

Co-Injection Molding

Visualize the advancement of skin and core materials in the cavity and view the dynamic relationship between the two materials as filling progresses. Use co-injection results to optimize material combinations while maximizing your product's overall cost/performance ratio.

Injection-Compression Molding

Simulate simultaneous or sequential polymer injection and mold compression. Comprehensively evaluate material candidates, part design, mold design, and processing conditions.

Microcellular Injection Molding

Evaluate the feasibility and benefits of MuCell® injection molding, in which a supercritical fluid such as carbon dioxide or nitrogen is mixed with molten polymer and injected into the mold to produce microcellular foam.

Thermoset Flow Simulation

Simulate processes such as thermoset injection molding, RIM/SRIM, resin transfer molding for fiber-reinforced plastics, and rubber compound injection molding.

Reactive Injection Molding

Predict how the mold will fill, with or without the presence of fiber-reinforced pre-forms. Avoid short shots due to pre-gelation of resin, highlight potential air traps, and identify problematic weld lines. Balance runner systems, select the proper molding machine size, and evaluate thermoset materials for various applications.

Microchip Encapsulation

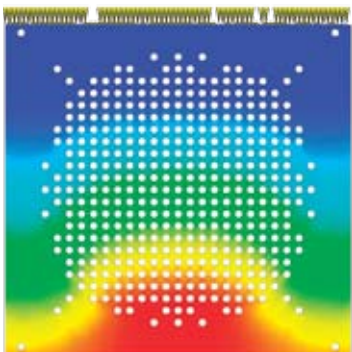
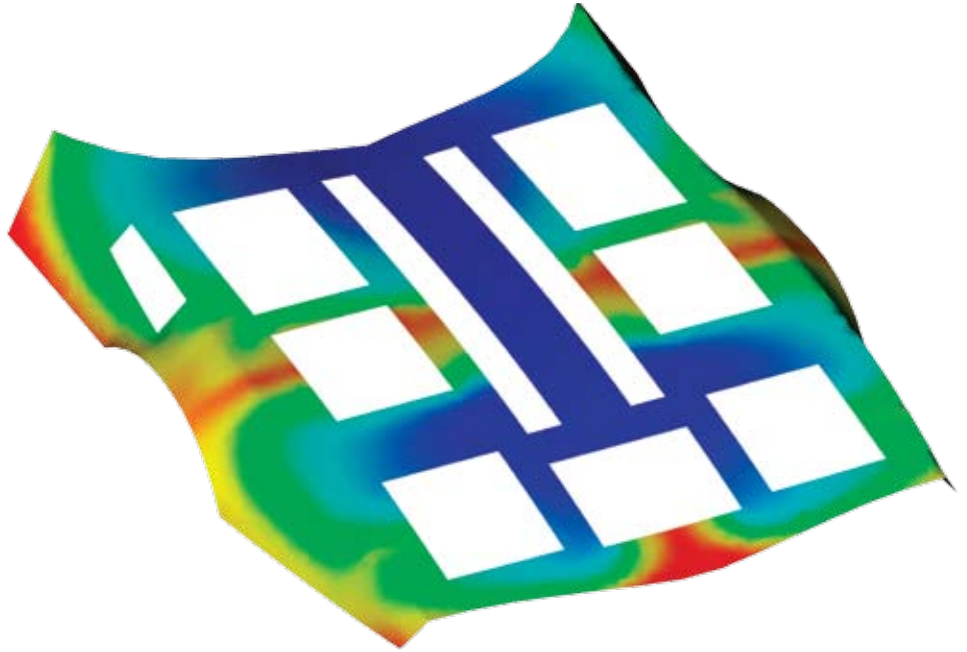
Simulate the encapsulation of semiconductor chips with reactive resins that ensure protection from hostile environments, heat dissipation, and the interconnectivity of electrical chips.

Wire Sweep & Paddle Shift

Predict bonding wire deformation within the cavity and shifting of the leadframe resulting from pressure imbalances during the microchip encapsulation process.

Underfill Encapsulation

Simulate the pressurized underfill encapsulation process (flip-chip encapsulation) to predict the flow of the material encapsulated in the cavity between the chip and the substrate.



Results Documentation, Customization and Learning Resources

Use automatic documentation tools to prepare analysis results and share them with team members.

HTML Reporting

Use the report generation wizard to create web-based reports. Quickly and easily share analysis results with customers, vendors, and team members.

Microsoft Office Word & PowerPoint

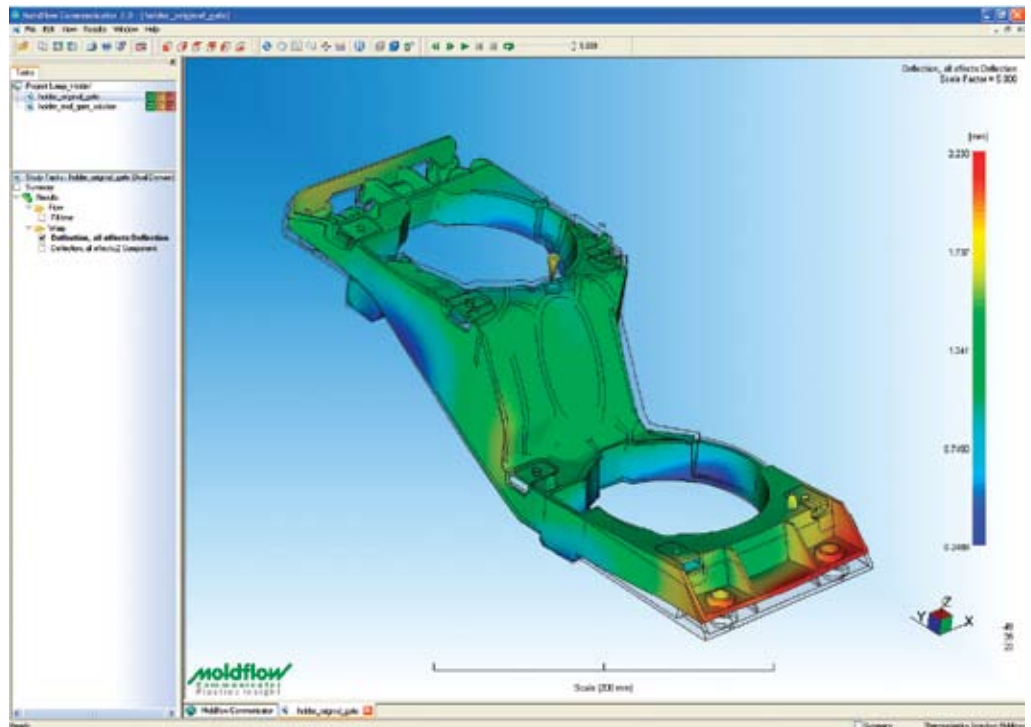
Easily export results and images to Microsoft Office 2007 (Word and PowerPoint) for use in formal reports and presentations.

Autodesk® Moldflow® Communicator

Collaborate with other designers and suppliers by exporting results from Autodesk Moldflow Insight into Autodesk Moldflow Communicator, a free product that lets stakeholders easily visualize, quantify, and compare analysis results.

API Tools

Application programming interface (API) tools expand the scope of the software by enabling you to automate common tasks, customize the user interface, interface with third-party applications, and implement standardized corporate protocols and best practices.



Workspaces

Customize the user interface and application features to meet the needs of any user. Setup profiles for novice users to guide them through the analysis process and identify common problems or setup profiles to give additional functionality and flexibility to more experienced analysts.

Help System

The Moldflow Insight Help System provides a wealth of information on using the software, from solver theory to how to interpret analysis results, as well as providing advice on how to design better plastics parts and injection molds.

CAD Connectivity Products

Complementary products for Autodesk Moldflow Insight offer native CAD model translation and analysis model optimization.

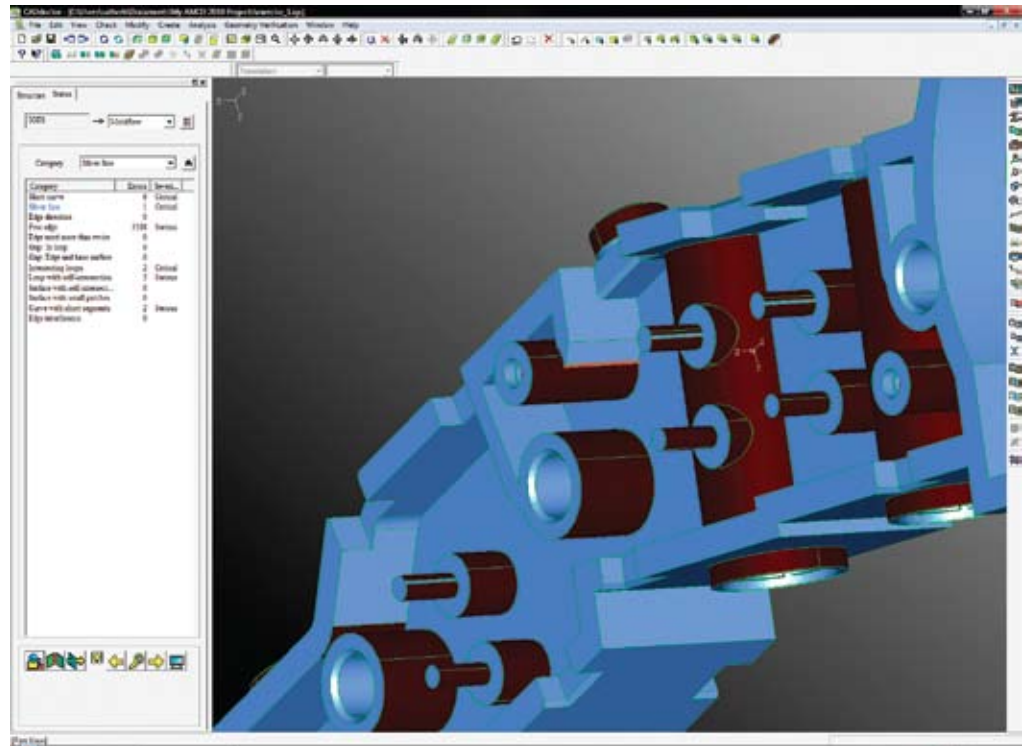
Autodesk® Moldflow® Design Link

Directly import and mesh solid geometry data from Parasolid®-based CAD systems, Pro/ENGINEER®, and CATIA® V5.



Autodesk® Moldflow® CAD Doctor

Check, correct, heal, and simplify solid models imported from 3D CAD systems in preparation for analysis using Autodesk Moldflow Insight.



Autodesk Moldflow Insight Product Comparison Chart

Autodesk Moldflow Insight Product Line

With different product configurations that offer specific levels of functionality, Autodesk is dedicated to helping CAE analysts, plastics design engineers, mold makers and molding professionals create accurate digital prototypes and bring better products to market at less cost.

	Autodesk Moldflow Insight Basic	Autodesk Moldflow Insight Performance	Autodesk Moldflow Insight Advanced
Thermoplastic Molding Processes			
3D, Dual Domain® & Midplane Mesh	•	•	•
Synergy Pre- and Post-Processing	•	•	•
Thermoplastic Filling & Packing Analysis	•	•	•
Gate Location Analysis	•	•	•
Molding Window Analysis	•	•	•
Runner Balancing Analysis	•	•	•
Design of Experiments	•	•	•
Overmolding Analysis	•	•	•
Cooling Analysis		•	•
Fiber Flow Analysis		•	•
Shrinkage Analysis		•	•
Process Optimization		•	•
Stress Analysis		•	•
Warpage Analysis		•	•
Autodesk® Moldflow® Structural Alliance		•	•
Injection-Compression Molding			•
Co-Injection Molding			•
Gas-Assisted Injection Molding			•
MuCell Injection Molding			•
Birefringence Prediction			•
Thermoset Molding Processes			
Reactive Molding Analysis	•	•	•
Microchip Encapsulation		•	•
Underfill Encapsulation		•	•
Autodesk® Moldflow® Adviser			
Autodesk Moldflow Adviser Design	•	•	•
Autodesk Moldflow Adviser Manufacturing	•	•	•
Autodesk Moldflow Adviser Advanced		•	•

