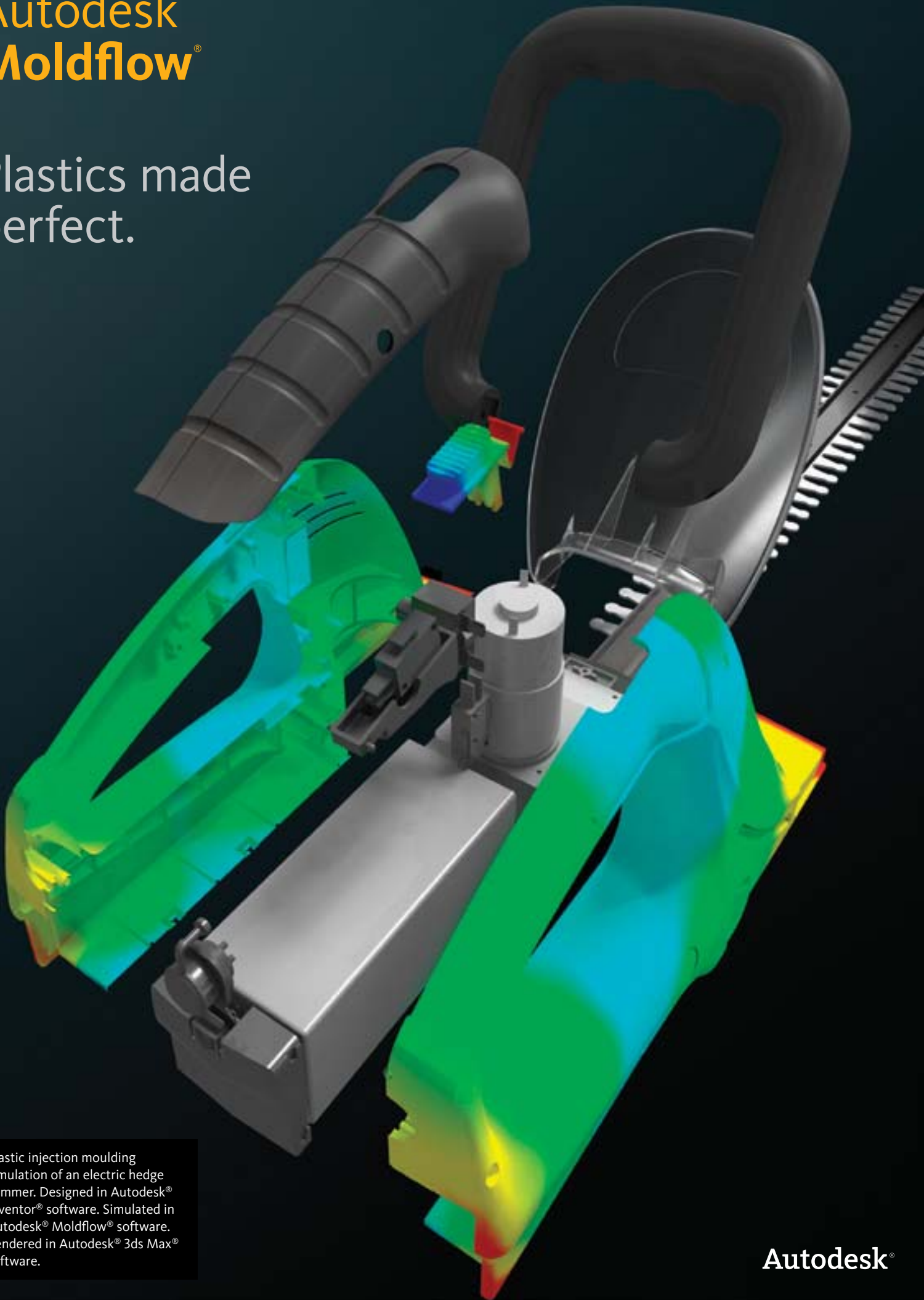


Autodesk®
Moldflow®

Plastics made
perfect.



Plastic injection moulding simulation of an electric hedge trimmer. Designed in Autodesk® Inventor® software. Simulated in Autodesk® Moldflow® software. Rendered in Autodesk® 3ds Max® software.

Autodesk®

Validation and Optimisation of Plastic Parts

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

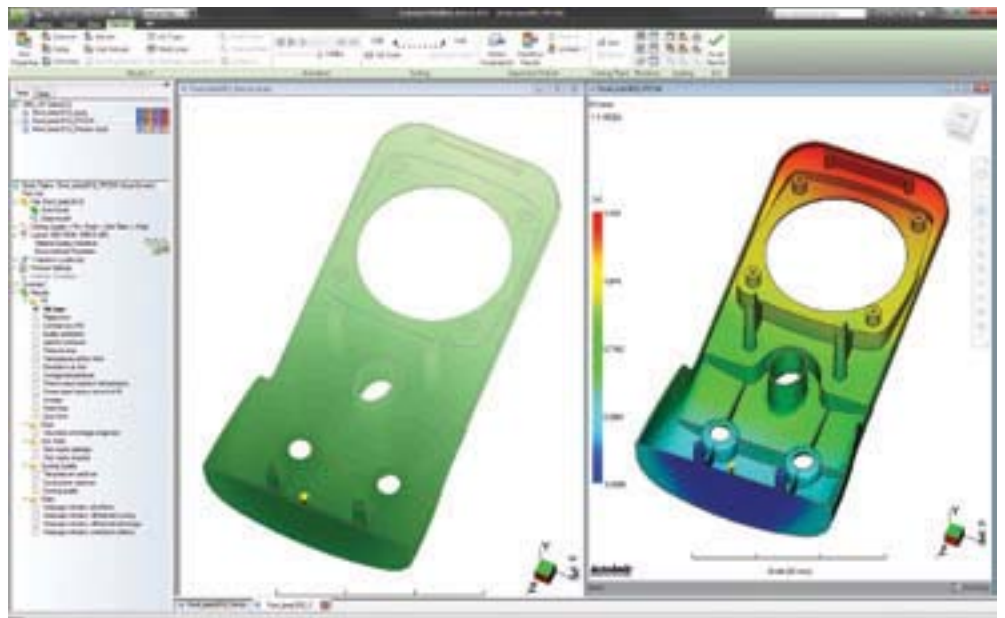
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Autodesk® Moldflow® plastic injection moulding simulation software, part of the Autodesk solution for Digital Prototyping, provides tools that help manufacturers validate and optimise the design of plastic parts and injection moulds and study the plastic injection moulding process. Companies worldwide use Autodesk® Moldflow® Adviser and Autodesk® Moldflow® Insight simulation software to help reduce the need for costly physical prototypes, reduce potential manufacturing defects and get innovative products to market faster.

Autodesk Moldflow Product Line

Autodesk is dedicated to providing a wide range of injection moulding simulation tools to help CAE analysts, designers, engineers, mould makers and moulding professionals to create more accurate digital prototypes and bring better products to market at less cost.



Simulation

Validate and optimise plastic parts, injection moulds and the injection moulding process.

Plastic Flow Simulation

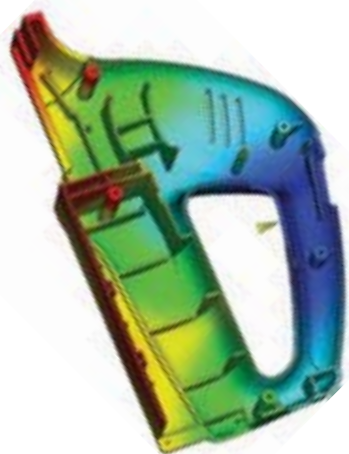
Simulate the flow of melted plastic to help optimise plastic part and injection mould designs, reduce potential part defects and improve the moulding process.

Part Defects

Determine potential part defects such as weld lines, air traps and sink marks, then rework designs to help avoid these problems.

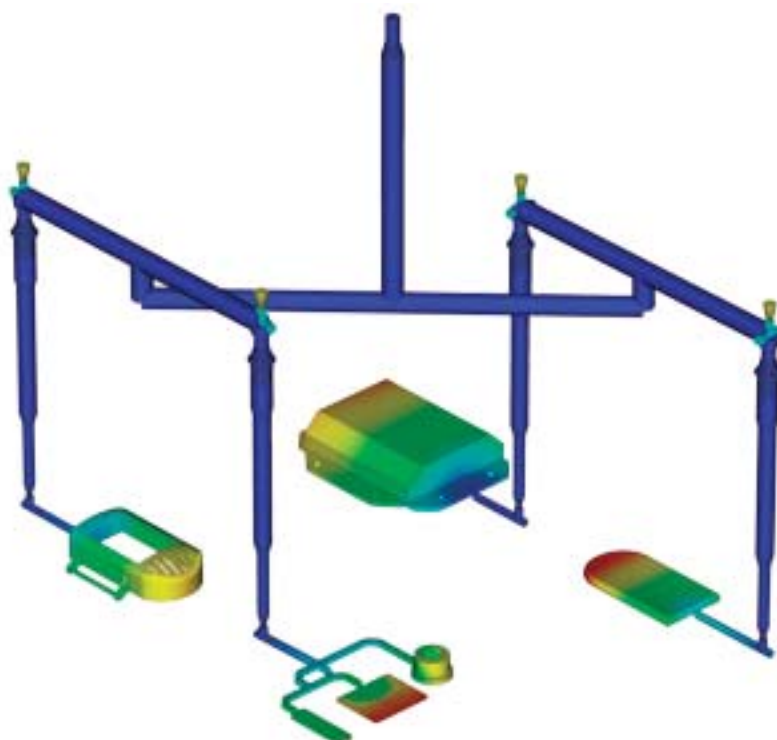
Thermoplastic Filling

Simulate the filling phase of the thermoplastic injection moulding process to help predict the flow of melted plastic and fill mould cavities uniformly; avoid short shots; and eliminate, minimise or reposition weld lines and air traps.



Thermoplastic Packing

Optimise packing profiles and visualise magnitude and distribution of volumetric shrinkage to help minimise plastic part warpage and reduce defects such as sink marks.



Feed System Simulation

Model and optimise hot and cold runner systems and gating configurations. Improve part surfaces, minimise part warpage and reduce cycle times.

Gate Location

Identify up to 10 gate locations simultaneously. Minimise injection pressure and exclude specific areas when determining gate location.

Runner Design Wizard

Create feed systems based on inputs for layout, size and type of components, such as sprues, runners and gates.

Balancing Runners

Balance runner systems of single-cavity, multicavity and family mould layouts so parts fill simultaneously, reducing stress levels and volume of material.

Hot Runner Systems

Model hot runner system components and set up sequential valve gates to help eliminate weld lines and control the packing phase.



Simulation

Mould Cooling Simulation

Improve cooling system efficiency, minimise part warpage, achieve smooth surfaces and reduce cycle times.

Cooling Component Modeling

Analyse a mould's cooling system efficiency. Model cooling circuits, baffles, bubblers and mould inserts and bases.

Cooling System Analysis

Optimise mould and cooling circuit designs to help achieve uniform part cooling, minimise cycle times, reduce part warpage and decrease manufacturing costs.

Rapid Heat Cycle Moulding

Set up variable mould surface temperature profiles to maintain warmer temperatures during filling to achieve smooth surfaces; reduce temperatures in the packing and cooling phases to help freeze parts and decrease cycle times.

Shrinkage and Warpage Simulation

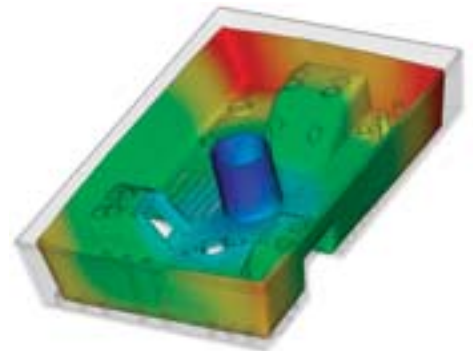
Evaluate plastic part and injection mould designs to help control shrinkage and warpage.

Shrinkage

Meet part tolerances by predicting part shrinkage based on processing parameters and grade-specific material data.

Warpage

Predict warpage resulting from process-induced stresses. Identify where warpage might occur and optimise part and mould design, material choice and processing parameters to help control part deformation.



Core Shift Control

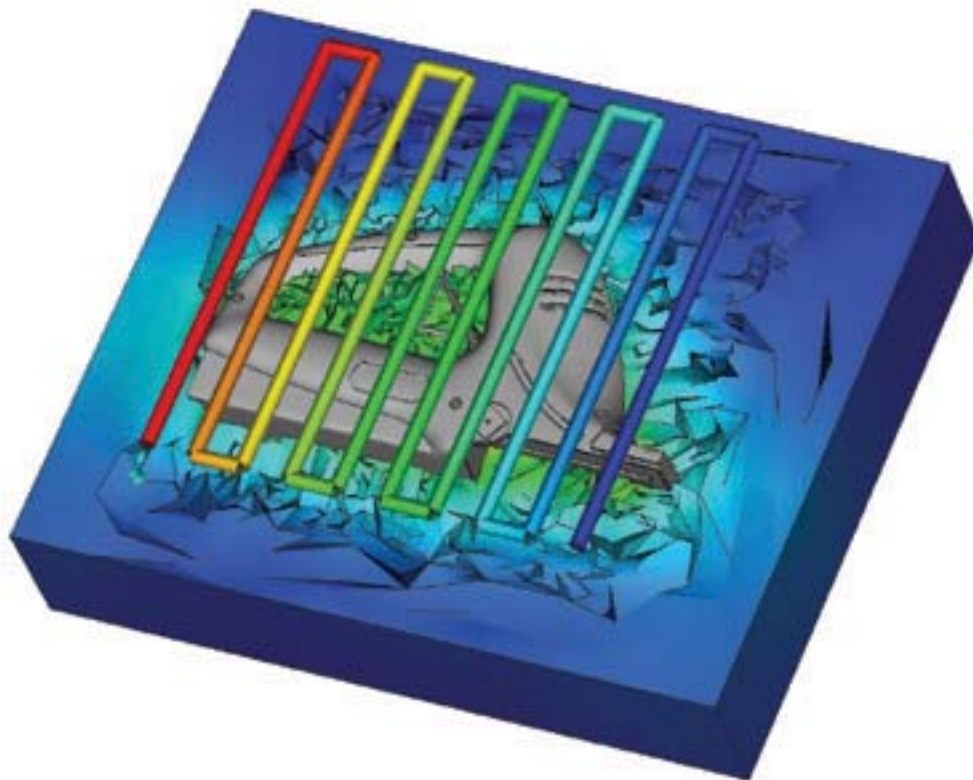
Minimise the movement of mould cores by determining ideal processing conditions for injection pressure, packing profile and gate locations.

Fibre Orientation

Control fibre orientation within plastics to help reduce part shrinkage and warpage across the moulded part.

CAE Data Exchange

Validate and optimise plastic part designs using tools to exchange data with mechanical simulation software. CAE data exchange is available with Autodesk® Simulation, ANSYS® and Abaqus® software to predict the real-life behaviour of plastic parts by using as-manufactured material properties.



Simulation

Thermoset Flow Simulation

Simulate thermoset injection moulding, RIM/ SRIM, resin transfer moulding and rubber compound injection moulding.

Reactive Injection Moulding

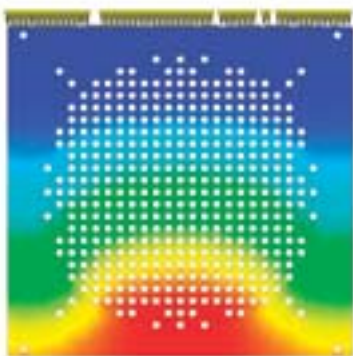
Predict how moulds will fill with or without fibre-reinforced preforms. Help avoid short shots due to pregelation of resin and identify air traps and problematic weld lines. Balance runner systems, select moulding machine size and evaluate thermoset materials.

Microchip Encapsulation

Simulate encapsulation of semiconductor chips with reactive resins and the interconnectivity of electrical chips. Predict bonding wire deformation within the cavity and shifting of the lead frame due to pressure imbalances.

Underfill Encapsulation

Simulate flip-chip encapsulation to predict material flow in the cavity between the chip and the substrate.

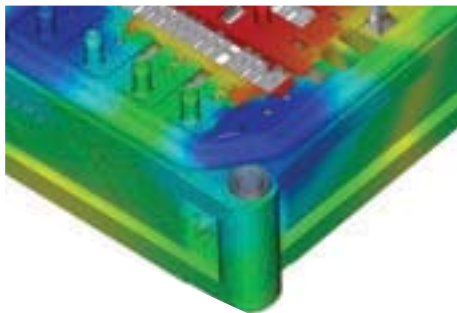


Specialised Simulation Tools

Solve design challenges with simulation.

Insert Overmoulding

Run an insert overmoulding simulation to help determine the impact of mould inserts on melt flow, cooling rate and part warpage.



Two-Shot Sequential Overmoulding

Simulate the two-shot sequential overmoulding process: one part is filled; the tool opens and indexes to a new position; and a second part is moulded over the first.

Birefringence

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

Specialised Moulding Processes

Simulate a wide range of plastic injection moulding processes and specialised process applications.

Gas-Assisted Injection Moulding

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

Co-Injection Moulding

Visualise the advancement of skin and core materials in the cavity and view the dynamic relationship between the two materials as filling progresses. Optimise material combinations while maximising the product's cost-performance ratio.



Injection-Compression Moulding

Simulate simultaneous or sequential polymer injection and mould compression. Evaluate material candidates, part and mould design, and processing conditions.

CAD Interoperability and Meshing

Use tools for native CAD model translation and optimisation. Autodesk Moldflow provides geometry support for thin-walled parts and thick and solid applications. Select mesh type based on desired simulation accuracy and solution time.

CAD Solid Models

Import and mesh solid geometry from Parasolid®-based CAD systems, Autodesk® Inventor® software, CATIA® V5, Pro/ENGINEER® and SolidWorks®, as well as ACIS®, IGES and STEP universal files.

Error Checking and Repair

Scan imported geometry and automatically fix defects that can occur when translating a model from CAD software.

Centreline Import/Export

Import and export feed system and cooling channel centrelines from and to CAD software, to help decrease modelling time and avoid runner and cooling channel modelling errors.

Autodesk Moldflow CAD Doctor

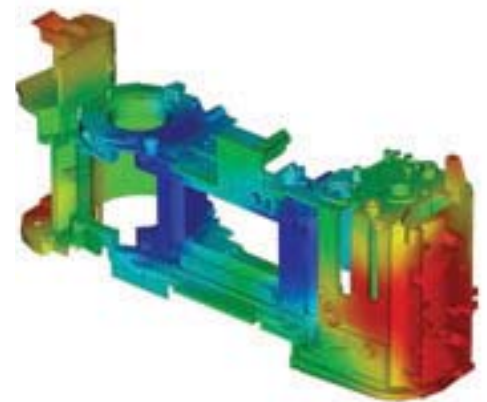
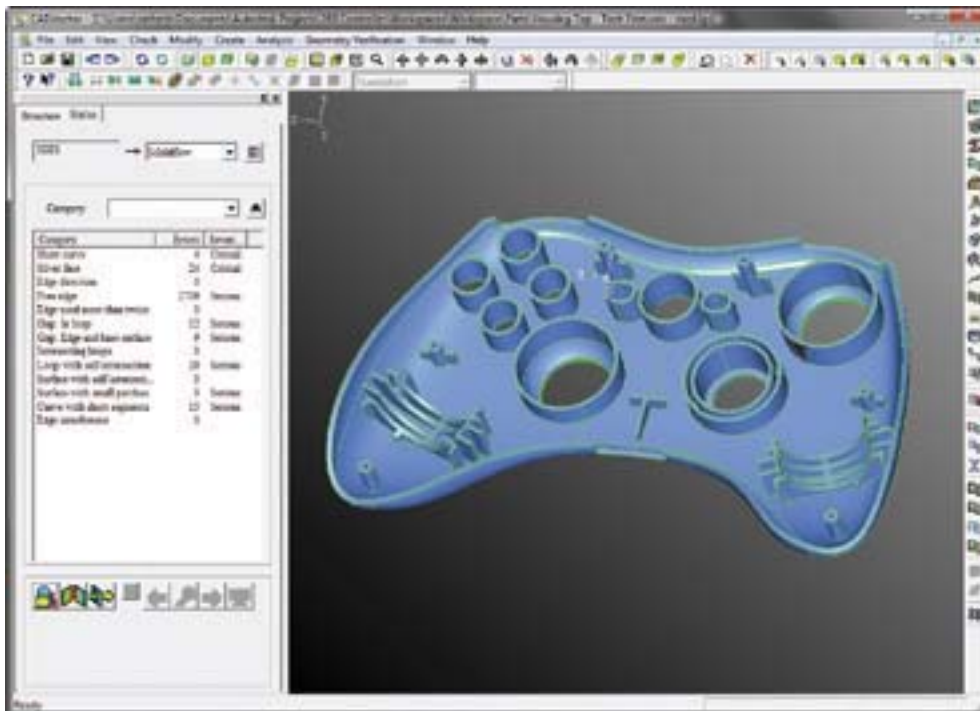
Check, correct, heal and simplify solid models imported from 3D CAD systems to prepare for simulation.

3D Simulations

Perform 3D simulations on complex geometry using a solid, tetrahedral, finite element mesh technique. This approach is ideal for electrical connectors, thick structural components and geometries with thickness variations.

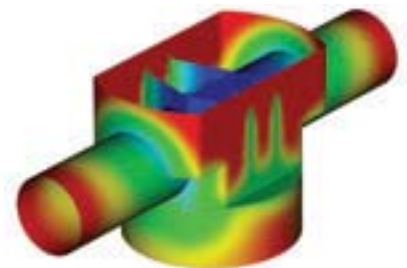
Dual Domain Technology

Simulate solid models of thin-walled parts using Dual Domain™ technology. Work directly from 3D solid CAD models, leading to easier simulation of design iterations.



Midplane Meshes

Generate 2D planar surface meshes with assigned thicknesses for thin-walled parts.



Results Evaluation and Productivity Tools

Visualise and evaluate simulation results and use automatic reporting tools to share the results with stakeholders. Take advantage of features such as a material database and advisers to further boost productivity.

Results Interpretation and Presentation

Use a wide range of tools for model visualisation, results evaluation and presentation.

Results Adviser

Query regions of a model to identify primary causes of short shots and poor part or cooling quality. Get suggestions on how to correct the part, mould or process.

Photorealistic Defect Visualisation

Integration with Autodesk® Showcase® software enhances quality assessments of plastic parts by examining near photorealistic renderings of digital prototypes.

Automatic Reporting Tools

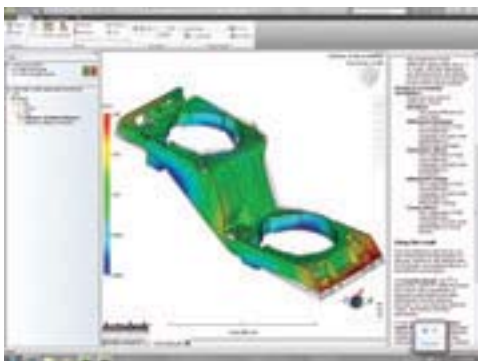
Use the Report Generation wizard to create web-based reports. Prepare and share simulation results more quickly and easily with customers, vendors and team members.

Microsoft Office Export Capability

Export results and images for use in Microsoft® Word reports and PowerPoint® presentations.

Autodesk Moldflow Communicator

Collaborate with manufacturing personnel, procurement engineers, suppliers and external customers using Autodesk® Moldflow® Communicator software. Use the Autodesk Moldflow Communicator results viewer to export results from Autodesk Moldflow software so that stakeholders can visualise, quantify and compare simulation results more easily.



Material Data

Improve simulation accuracy with precise material data.

Material Database

Use the built-in material database of grade-specific information on more than 8,500 plastic materials characterised for use in plastic injection moulding simulation.



Autodesk Moldflow Plastics Labs

Get plastic material testing services, expert data-fitting services and extensive material databases with the Autodesk® Moldflow® Plastics Labs.

Productivity Tools

Use advisers and extensive help to boost productivity.

Cost Adviser

Learn what drives part costs to help minimise those costs. Estimate product costs based on material choice, cycle time, post-moulding operations and fixed costs.

Design Adviser

Identify quickly areas of plastic parts that violate design guidelines related to the injection moulding process.

Help

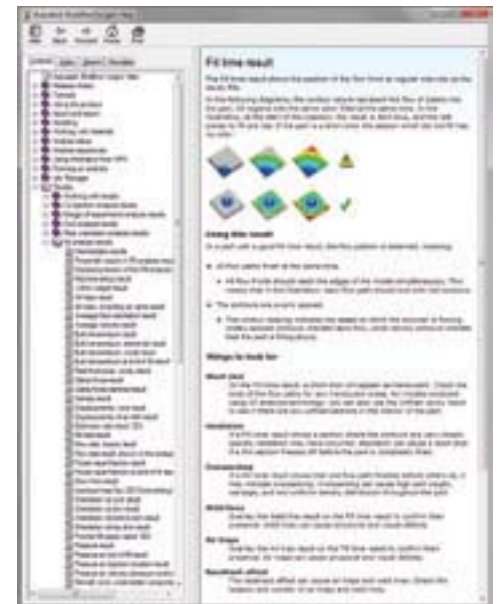
Get help on a results plot, including information on what to look for and how to correct typical problems. Learn more about solver theory, interpreting simulation results and designing better plastic parts and injection moulds.

Automation and Customisation

Automate common tasks and customise Autodesk Moldflow software for your organisation.

API Tools

Application programming interface (API) tools enable you to automate common tasks, customise the user interface, work with third-party applications and help to implement corporate standards and best practices.

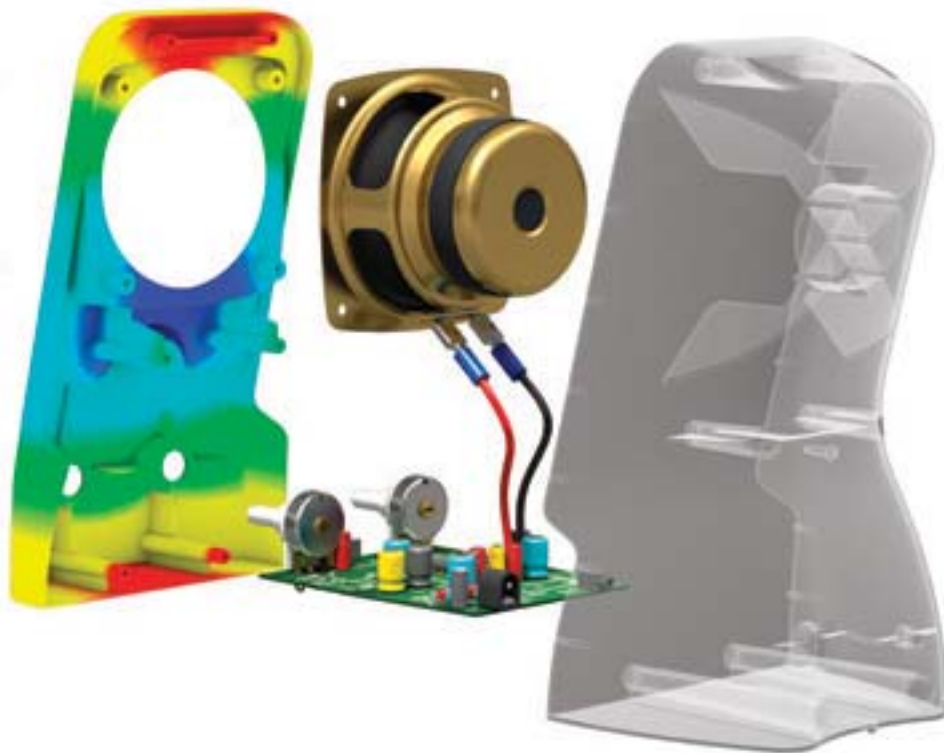


Feature Comparison

Compare the features of Autodesk Moldflow products to learn how Autodesk Moldflow Adviser and Autodesk Moldflow Insight software can help to meet the needs of your organisation.

	Autodesk Moldflow Adviser Design	Autodesk Moldflow Adviser Manufacturing	Autodesk Moldflow Adviser Advanced	Autodesk Moldflow Insight Basic	Autodesk Moldflow Insight Performance	Autodesk Moldflow Insight Advanced
MESHING TECHNOLOGY						
Dual Domain	✓	✓	✓	✓	✓	✓
3D		✓	✓	✓	✓	✓
Midplane				✓	✓	✓
CAD INTEROPERABILITY						
CAD Solid Models	✓	✓	✓	✓	✓	✓
Parts	✓	✓	✓	✓	✓	✓
Assemblies				✓	✓	✓
SIMULATION CAPABILITIES						
Thermoplastic Filling	✓	✓	✓	✓	✓	✓
Part Defects	✓	✓	✓	✓	✓	✓
Gate Location	✓	✓	✓	✓	✓	✓
Moulding Window	✓	✓	✓	✓	✓	✓
Thermoplastic Packing			✓	✓	✓	✓
Runner Balancing		✓	✓	✓	✓	✓
Cooling			✓		✓	✓
Warpage			✓		✓	✓
Fibre Orientation			✓		✓	✓
Insert Overmoulding				✓	✓	✓
Two-Shot Sequential Overmoulding						
Core Shift Control					✓	✓
MOULDING PROCESSES						
Thermoplastic Injection Moulding	✓	✓	✓	✓	✓	✓
Reactive Injection Moulding				✓	✓	✓
Microchip Encapsulation					✓	✓
Underfill Encapsulation						✓
Gas-Assisted Injection Moulding						✓
Injection-Compression Moulding						✓
Co-Injection Moulding						✓
MuCell®						✓
Birefringence						✓
DATABASES						
Thermoplastics Materials	✓	✓	✓	✓	✓	✓
Thermoset Materials				✓	✓	✓
Moulding Machines				✓	✓	✓
Coolant Materials					✓	✓
Mould Materials					✓	✓

	Autodesk Moldflow Adviser Design	Autodesk Moldflow Adviser Manufacturing	Autodesk Moldflow Adviser Advanced	Autodesk Moldflow Insight Basic	Autodesk Moldflow Insight Performance	Autodesk Moldflow Insight Advanced
CAE DATA EXCHANGE						
Autodesk Simulation			✓		✓	✓
Abaqus			✓		✓	✓
ANSYS			✓		✓	✓
LS-DYNA®					✓	✓
NEi Nastran					✓	✓
SUPPORTED LANGUAGES						
English	✓	✓	✓	✓	✓	✓
Chinese (Simplified)	✓	✓	✓	✓	✓	✓
Chinese (Traditional)	✓	✓	✓	✓	✓	✓
French	✓	✓	✓	✓	✓	✓
German	✓	✓	✓	✓	✓	✓
Italian	✓	✓	✓	✓	✓	✓
Korean	✓	✓	✓			
Portuguese	✓	✓	✓	✓	✓	✓
Spanish	✓	✓	✓	✓	✓	✓



Digital Prototyping for the Manufacturing Market

Autodesk is a world-leading supplier of engineering software, providing companies with tools to design, visualise and simulate their ideas. By putting powerful Digital Prototyping technology within the reach of mainstream manufacturers, Autodesk is changing the way manufacturers think about their design processes and is helping them to create more productive workflows. The Autodesk approach to Digital Prototyping is unique in that it is scalable, attainable and cost-effective, which allows a broader group of manufacturers to realise the benefits with minimal disruption to existing workflows and provides the most straightforward path to creating and maintaining a single digital model in a multi-disciplinary engineering environment.

Learn More or Purchase

Access specialists worldwide who can provide product expertise, a deep understanding of your industry and value that extends beyond your software. To license Autodesk Moldflow software, contact an Autodesk Value Added Reseller. To locate the reseller nearest you, visit www.autodesk.co.uk/reseller.

To learn more about Autodesk Moldflow software, visit www.autodesk.co.uk/moldflow.

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