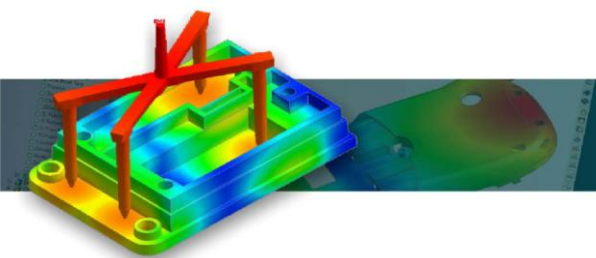




What's New in Moldex3D R10.0



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Moldex3D is a suite of professional CAE tools for plastic part design validation and mold optimization. It not only helps global manufacturers produce plastic parts with better quality and lower cost, but also enables them to implement a more efficient design-for-manufacturing workflow.

The official release of Moldex3D R10.0 brings several breakthroughs on developing solver capabilities and improving user friendliness and efficiency, such as enhanced workflow, added support for analysis, remote computing, etc, to help users solve problems more easily and more efficiently. In addition to the new modules added for customers' needs, Moldex3D has also integrated with more industrial-leading software, including CODE V and NX Nastran, to provide advanced CAE solutions for design verification and optimization.

Moldex3D R10.0 builds upon the capabilities of past releases and adds innovation for performance and functionality, offering the following new features and benefits:

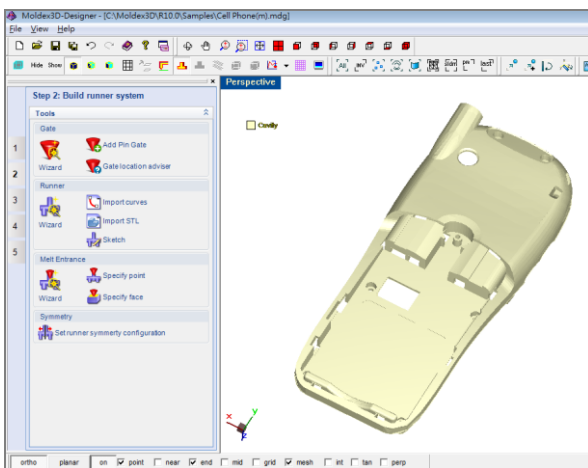
- Advanced Support for Intelligent Workflow
- Accuracy Improvements for Simulations
- Enhanced Efficiency for Simulations
- Material Database Updates
- New Simulation Capabilities
- Industrial Vertical Integration

Advanced Support for Intelligent Workflow

Moldex3D R10.0 highly improves user friendliness for the pre-processing work and develops a variety of powerful tools to help users handle the meshing work and mold design settings, such as gates, runners, cooling, etc.

Improved User Interface

- The improved user interface provides an intuitive and task-oriented workflow, improving its functionality and shortening users' learning curve.



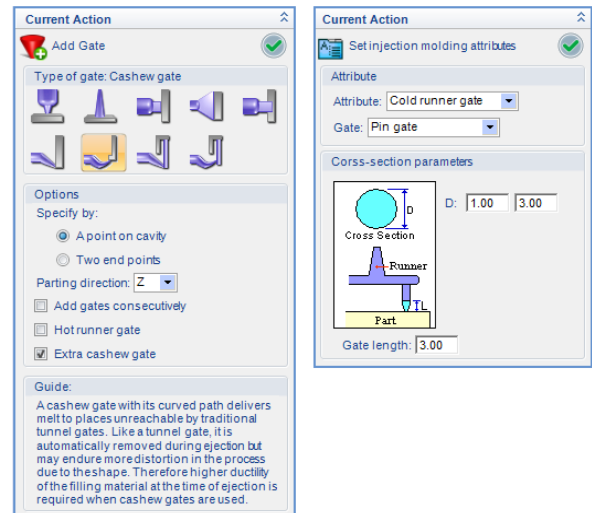
The improved user interface of Moldex3D Designer

- The compact and easy-to-navigate tool menu provides a consistent logic to guide users to access to the simulation workflow step by step easily. With only a few clicks, the improved user interface helps finish the meshing process efficiently.

Expanded Gate Types

- New gate types are now available in the Gate Wizard, including pin gate, sprue gate, edge gate, fan gate, lapped edge gate, tunnel gate, cashew gate, tunnel gate with ejector pin and cashew gate with ejector pin. Using the gate-aware Runner Wizard, users can build single or multiple gates quickly and consecutively. Additionally, seeking for appropriate gate locations, users can apply Gate Location Advisor to set up one or

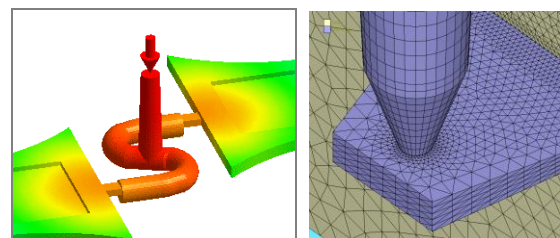
more gate locations according to the part geometry.



The tool menu of Gate Wizard

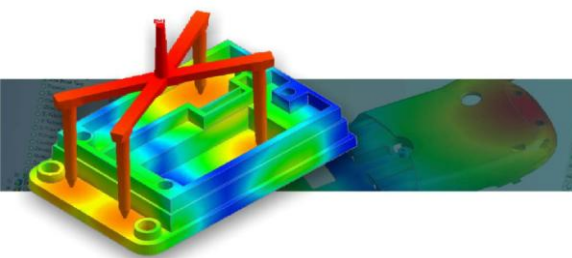
Enhanced Runner Wizard

- More runner cross section types are added, including trapezoidal, U-shape and semi-circular, to better describe the real runner geometry with true 3D solid mesh. To solve the mesh distortion problems of curvature runners, Moldex3D R10.0 allows to use curve objects as runners and to construct a complete runner system with mixed STL topology and runner lines. This feature will enhance mesh quality, modeling flexibility and calculation efficiency.

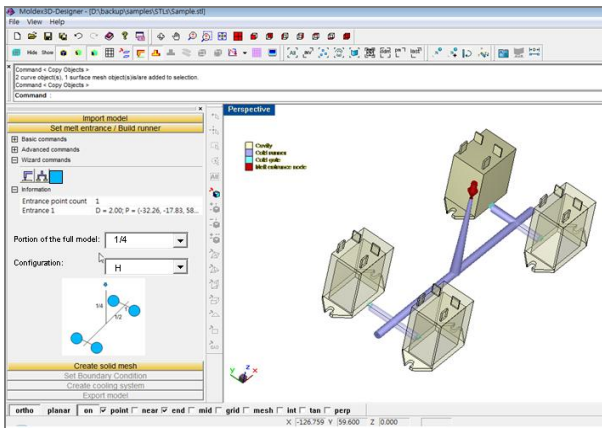


Curvature runner and runner mesh displays

- When simulating multi-cavity models, users can apply Runner Symmetrical Configuration to configure the single cavity and associated runner system, with the emulated symmetrical cavities displayed. It reduces the effort to setup symmetric boundary conditions and



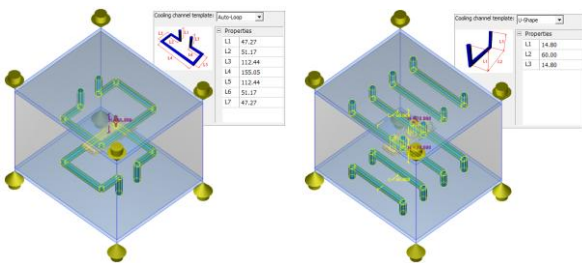
avoids ambiguity. This feature supports half and quarter symmetrical systems. Compared to a full model, it provides better mesh resolution and reduces memory requirement for multi-cavity analyses.



Multi-cavity symmetrical simulation

Customized Cooling Channel Templates

The intelligent Cooling Wizard enables users to define cooling channels by cavity side or by core side. New cooling channels templates, including straight lines, U-shape lines and auto-loop, help users quickly setup essential cooling channels and save time of restructuring the previously designed cooling system. Edited cooling channels can be saved as users' proprietary templates or as default directly for the next design.

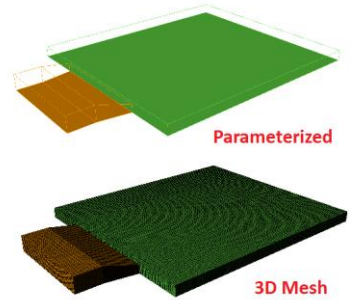
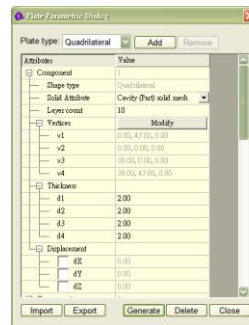


Settings of different cooling systems

Parameterized Mesh Generator

In response to users' expectation to create high quality structure mesh for some generic geometry, the

parameterized mesh generator has been developed to help users define the model parameters in 2D and then generate 3D structure mesh. Furthermore, users can specify nodal parameters on each edge of model to optimize mesh density and result accuracy.



Parameterized mesh generator

Mesh Engines Support Multi-Core

The meshing kernels, both in Designer and Mesh, will automatically detect and fully utilize the modern multi-core CPU to speed up meshing without any additional settings. Users will save significant amount of time on mesh preparation.

Accuracy Improvements for Simulations

Moldex3D R10.0 has improved and expanded its solver capabilities to satisfy users' demands to acquire more accurate and more advanced CAE solutions for manufacturing problems and industrial challenges.

Modeling for Crystalline Material

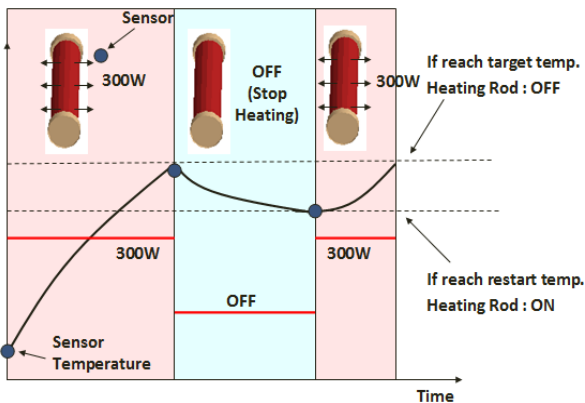
An increasing cooling rate generally shifts the transition temperature of semi-crystalline polymer towards lower temperature and increases the final specific volume of the material. In consideration of the impact of cooling rate, Moldex3D solvers now support the analysis of injection molding with high cooling rate characteristics.

Added Support for HTC Effect

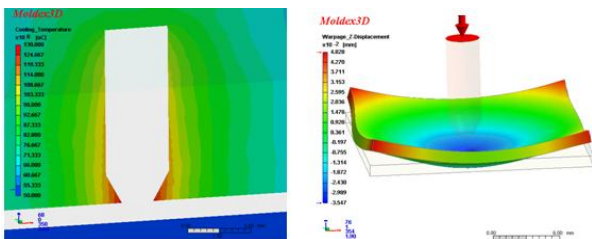
The thermal contact between polymer and mold varies throughout the different phases of a typical injection molding cycle. Heat Transfer Coefficient (HTC) variations are now considered and well simulated when the mold detachment happens in the packing phase. This feature improves packing and warpage prediction.

Added Support for Heater-Sensor Coupling

An added support of Transient Cool analysis capabilities is to provide the heater controller settings to help users control the heaters by the sensor node temperature. This enables more accurate simulations for the realistic heater control system. Moldex3D R10.0 also supports the cooling analysis of hot runner effects to provide more accurate part warpage prediction with more precise moldbase temperature distribution.



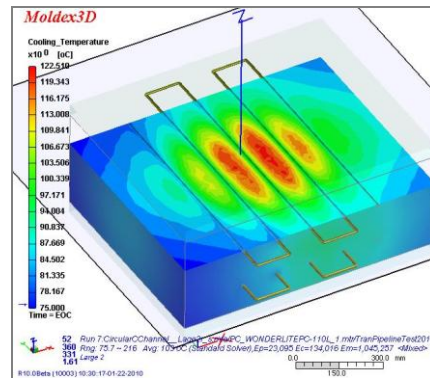
Heater control system by sensor node temperature



Moldbase temperature distribution and part warpage prediction

Moldex3D R10.0 supports the pipe network analysis to analyze the mold cooling efficiency with its coolant flow rate and cooling channel design. Additionally, users are able to define the convergence criteria for different analysis purposes. The convergence condition and cycle time will be logged in the log file for users to observe the steady state of the cycle temperature easily. Three tolerance criteria are available:

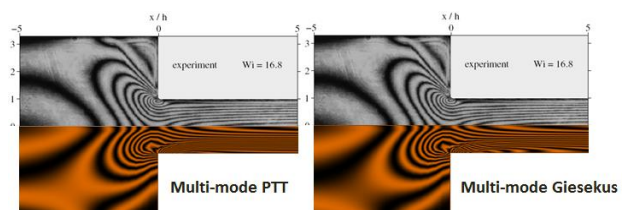
- Average part surface temperature
- Maximum variation of part surface temperature
- Maximum variation of mold temperature



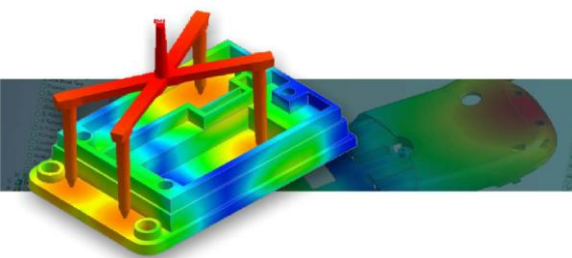
Cooling temperature distribution of the pipe network analysis

Added Support for Viscoelasticity

Moldex3D R10.0 supports multi-mode PTT and Giesekus models. While the single mode is sometimes inadequate to describe the viscoelasticity behaviors, this feature can reflect the effects of multiple relaxation times and bring more accurate polymer viscoelasticity prediction.



The simulations of multi-mode PTT and Giesekus compared with real viscoelasticity distributions

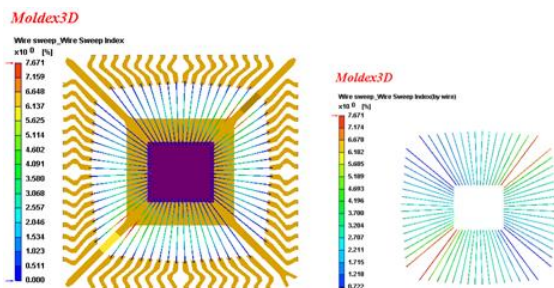


Improved Analysis for Reactive Injection Molding (RIM)

- Moldex3D R10.0 provides the mold thermal analysis of the RIM process. Its simulation results, cycle average and transient approach, are well visualized for users to revise their mold design. Moreover, the scorch-index calculation enables users to simulate rubber injection molding with long induction time by Deng-Isavev model. It helps users optimize runner design and process parameters to avoid premature vulcanization.

Improved Analysis for IC Packaging

- With the newly-developed Moldex3D stress solver, users now can run full simulations for IC Packaging, including wire sweep and paddle shift, without accessing to external structural solvers. Additionally, Moldex3D R10.0 expands supports to more drag force models for wire sweep calculation.



Wire sweep prediction with Moldex3D-Stress

Enhanced Efficiency for Simulations

Moldex3D R10.0 improves user friendliness for the pre-processing work and enhances user efficiency for the post-processing work.

Rendering Enhancement for Shell Project

- The rendering efficiency for graphic performance of Shell Project has been enhanced by 2-3 times with entry-level graphic cards. Its performance increases much more with high-end graphic cards.

Enhanced Support for XY-Plot

- The redeveloped user interface of XY-Plot function helps users save different plot settings and review the simulation analysis results more easily, especially for sensor data. It also adds a toolbar for XY-Plot viewer.

Improved Project Model Manager

- The improved model manager enables users to control the object display status faster and more easily. Users are able to turn on/off each object and define their colors; moreover, the settings can be directly saved as default for the next project.

User Defined Copy Run Contents

- With this feature, users can choose to copy partial or full run data for CAE analysis. The flexibility of copy run contents will save disk space and copy time to build additional runs for simulations.

Binary Format of Result Files

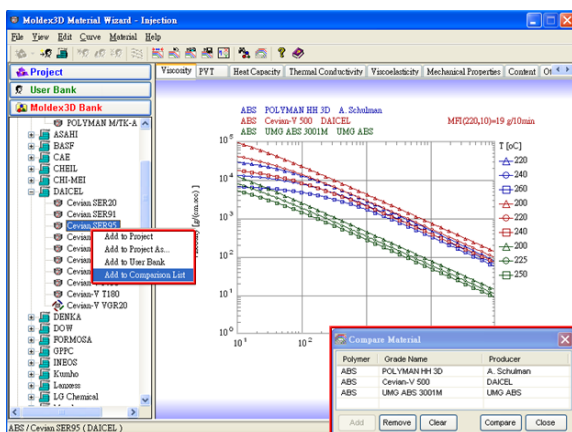
- The analysis result files have been changed from ASCII to binary format in Moldex3D R10.0. Compared to R9.1 Project, it is estimated to reduce 40-50% project file size, highly improving the efficiency of result loading and storage.

Remote Computing

- Moldex3D R10.0 expands supports of remote computing to enable users to submit or download analysis jobs from the client computer to the remote computing server across intranet. With the parallel computing cluster, the server can automatically assign analysis jobs to different computing nodes, and the completed jobs will be downloaded to the client computers automatically. It not only saves users' time for running simulation analyses but also enhances the calculation efficiency by the computing cluster.

Material Database Updates

Moldex3D material database in R10.0 has been updated with 437 thermoplastic materials modified and 98 materials added. Users can add a material from Moldex3D material bank, user bank or Project settings into Material Comparison List to easily compare its properties with different materials. Additionally, Moldex3D R10.0 supports Matereality 4.0. Users can directly download material properties, including anisotropic mechanical properties, from <http://www.matereality.com>.



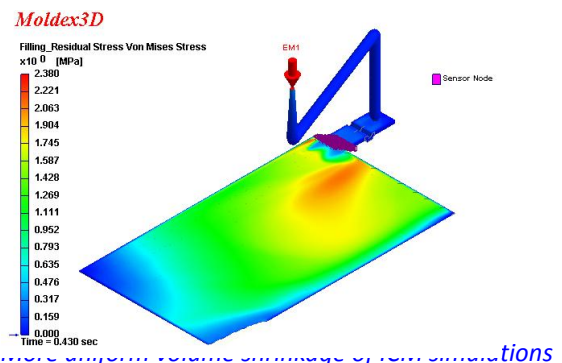
Materials compared by Material Comparison List.

New Simulation Capabilities

Considering industrial customers' demands for specific simulation capabilities, Moldex3D R10.0 has developed new modules to in-depth help users simulate the plastic injection molding processes.

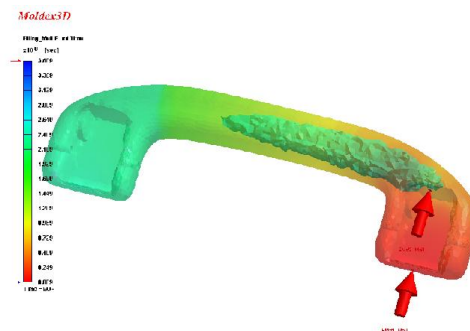
Injection Compression Molding (ICM)

Moldex3D-ICM helps users accurately simulate the injection compression molding process, which is generally applied to thin and flat products such as light guide plates or CD disks. The effects of key process conditions, including delay time and compression gap, on cavity pressure and volume shrinkage distribution can be simulated and visualized.



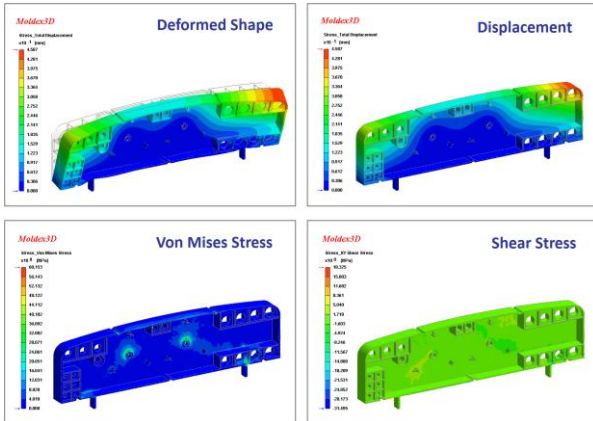
Fluid-Assisted Injection Molding (FAIM)

Moldex3D-FAIM is a true 3D CAE simulation tool to visualize flow behaviors when fluid (gas or water) is injected directly into the cavity through melt entrances or specific fluid entrances in the injection molding process. Typical molding issues for FAIM, such as fingering effect, blow-through, or corner effect, can be predicted to help users investigate the real production process and increase manufacturability.



Stress Analysis on Injection-Molded Parts

Moldex3D-Stress provides users with the complete stress simulation analyses for parts and part inserts. This feature is especially useful when the fiber-filled material is employed. As a result, mapping between Moldex3D and other general purpose structural CAE is no longer necessary.



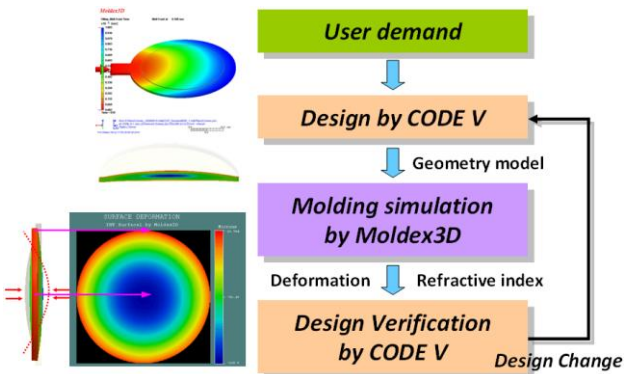
Simulation results of stress analysis

Industrial Vertical Integration

Moldex3D R10.0 has integrated with a wide variety of industrial leading software to benefit users with advanced CAE solutions for injection molded product design.

Optical Integration with CODE V

Integrated with CODE V, Moldex3D has developed advanced optical solutions to help designers analyze the manufacturing feasibility of part design by injection molding simulation analyses and export the deformed shape and refractive distribution into CODE V for verification and optimization. This feature gives designers the power to overcome the difficulties between ideal product design and real production and enables them to satisfy the market demands.



The process of the optical solution with CODE V

NX Nastran Added into I2 Modules

The integration with NX Nastran provides users with a CAE solution for structural analyses. Critical analysis results, such as pressure, temperature, or material reduction, can be precisely simulated and predicted for different mesh types of parts and part inserts. More features for I2-NXNastran are as the following:

Items		I2-NXNASTRAN		
		Original Mesh	Deformed Mesh	Mapped Mesh
Part	Material reduction	○	○	○
	Initial strain output	○		○
	Packing phase temperature output	○		○
Part insert	Flow pressure output	○		○
Moldbase	Moldbase output	○		○
	Pressure output	○		○
	Temperature output	○		○
Other	Runner output	○	○	○
	Output as high order element	○	○	○

Your Feedback Is Important to Us

Thank you for your continuous support of Moldex3D. We added new and enhanced functionalities to Moldex3D R10.0 to help you become more productive and more competitive and return true value to your investment. We sincerely invite you to provide feedback to Moldex3D research and development team. Please don't hesitate to discuss with your Moldex3D authorized resellers and support staffs near you. Alternatively, you can always provide your feedback to mail@moldex3d.com.

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