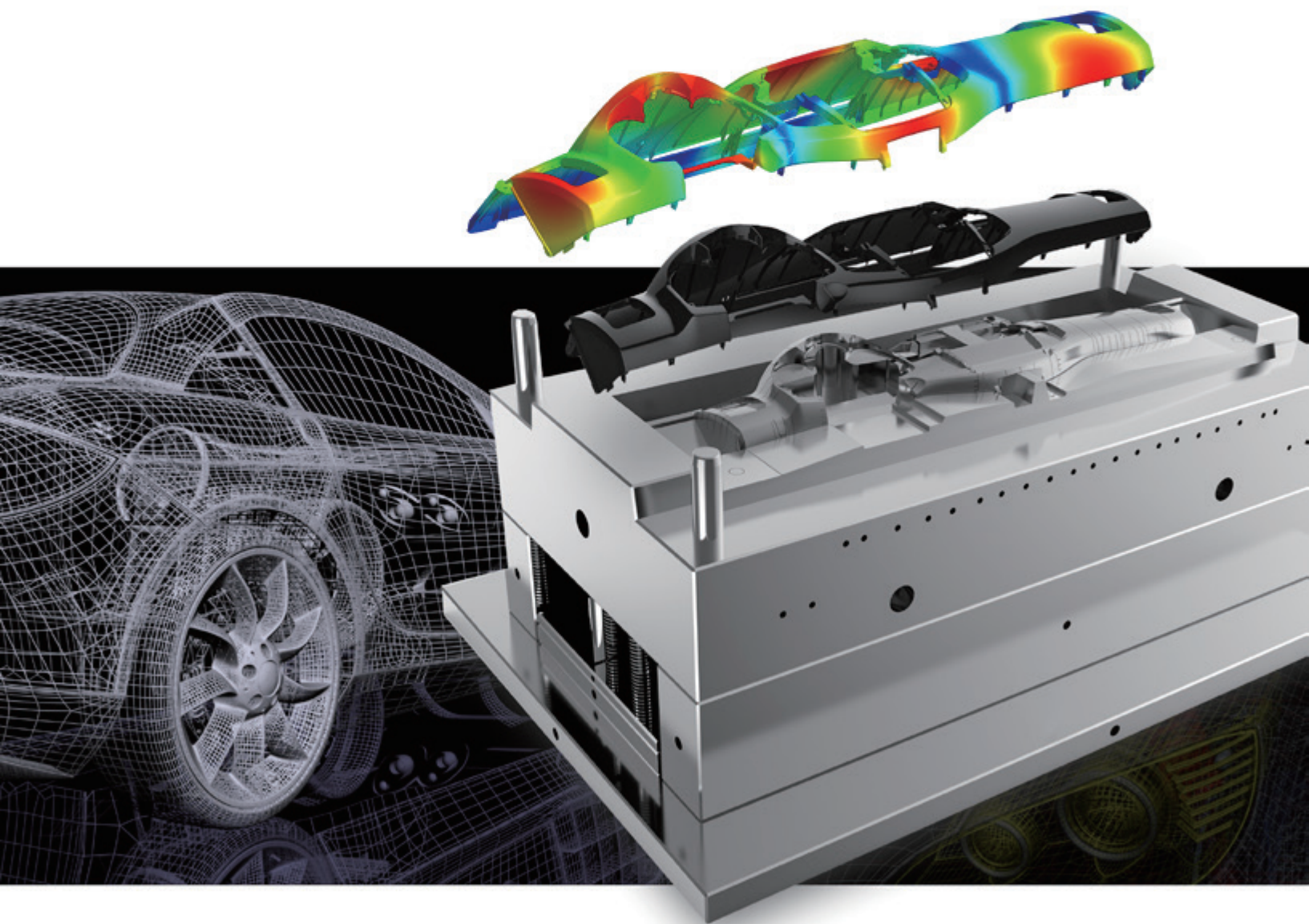


Moldex3D

# Molding Innovation

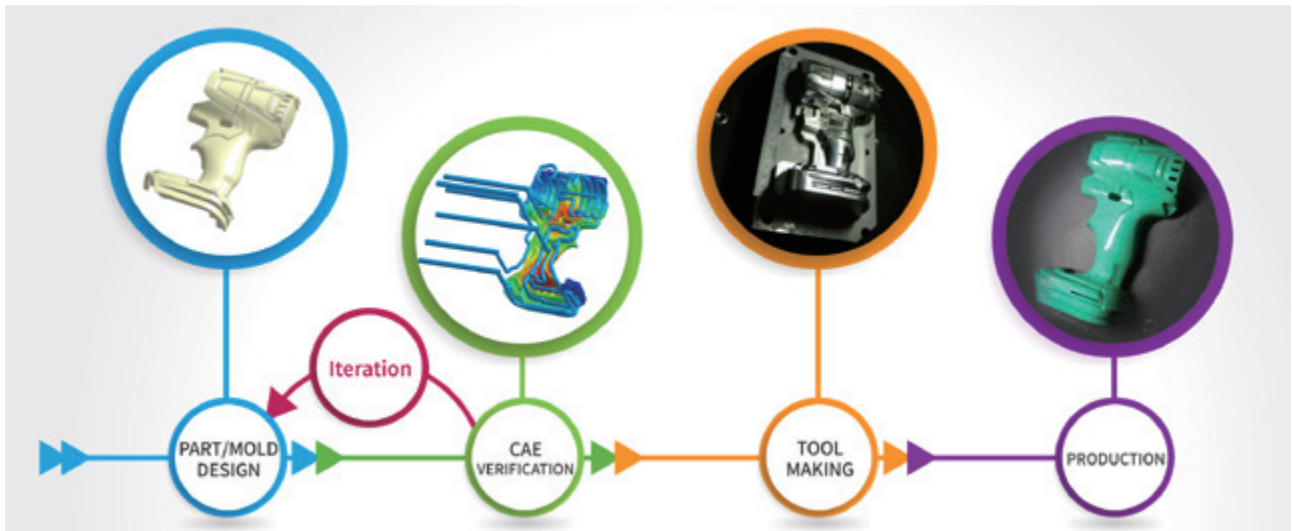
Leadership In True 3D CAE Technology



# Key to Your Core Competitiveness

Moldex3D helps you simulate and visualize versatile injection molding processes to validate and optimize your plastic designs, increase manufacturability, shorten time to market, and maximize Return on Investment (ROI).

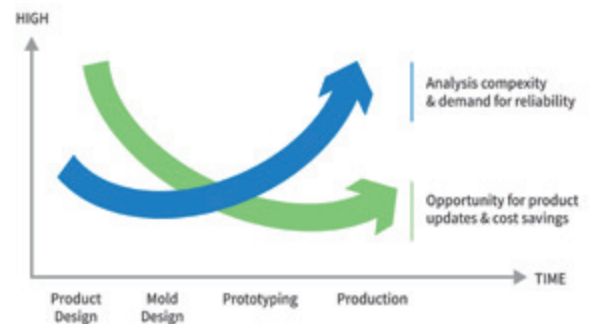
## Optimize Part/Mold Design Process



## Cost Saving for Your Business

Moldex3D CAE Software provides the true 3D simulation and visualization technology you need if you are fed up with countless trial-and-errors and want to save time, energy, and money more efficiently during the mold-making process.

- Reduce the number of tool trials.
- Shorten time to market.
- Reduce cycle time and scrap rate.
- Reduce tool trials cost of electricity, time and manpower.
- Reduce manufacturing cost, increase margin rate, increase revenue and ROI.
- Extend mold life.



## Issue Diagnosis for Your Product

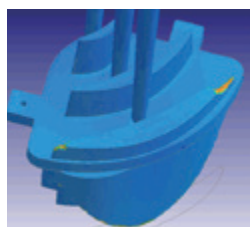
Predict upfront more than 85% of common manufacturing problems, such as short shot, flow imbalance, air trap, or hesitation. It greatly improves part quality, structure, and appearance.



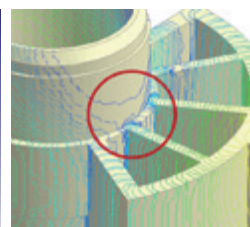
Weld Line



Flow Imbalance



Air Trap



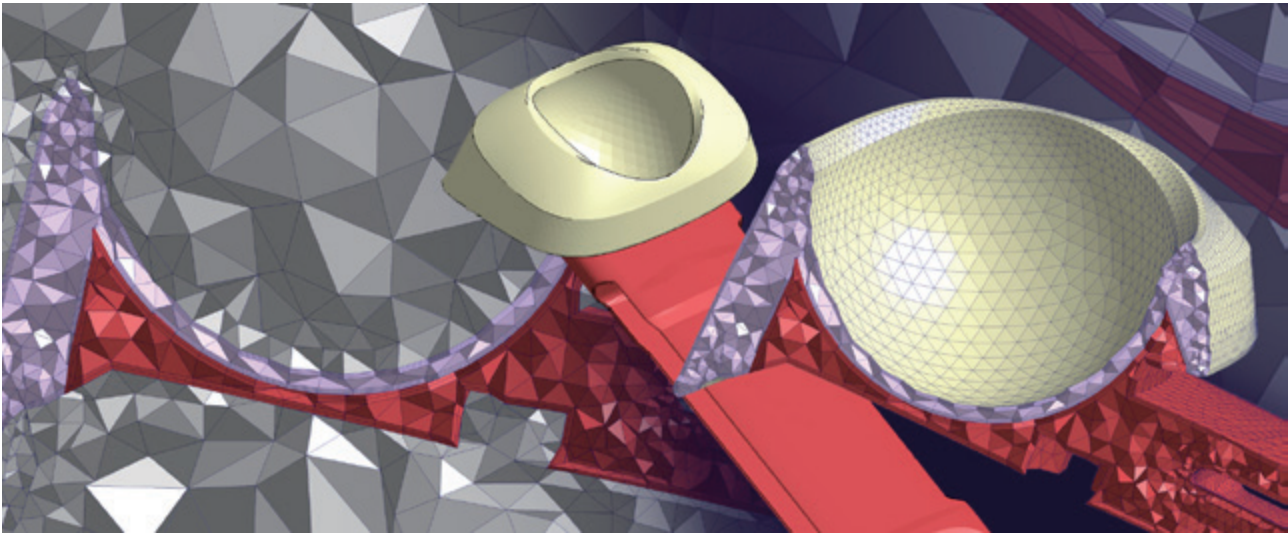
Hesitation



Short Shot



# Boost Work Efficiency in Pre-processing



## Meshing

Automatic 3D Meshing Engine (eDesign)

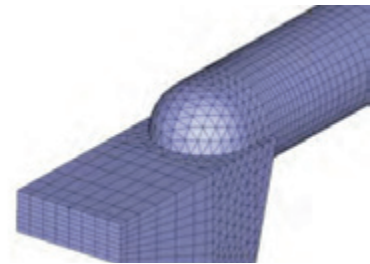
- Support auto mesh generation for saving time and variant level of mesh generation with intelligent wizards.

High Resolution 3D Mesh Technology (BLM)

- Support auto mesh generation, especially for complicated 3D geometry, with less complex and faster workflow.
- Support mixed type to construct runner system with combination of curve and geometry runner/gate.
- Support non-matching technology for part insert and moldbase.
- Support tetra elements and Boundary Layer Mesh (BLM).

Hybrid Mesh Technology

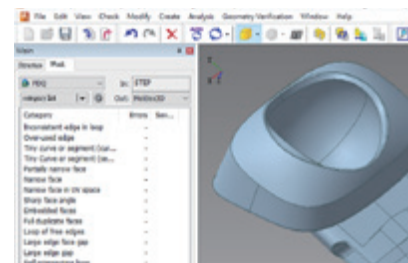
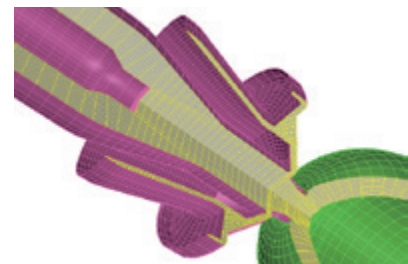
- Create mesh manually for the most customized purpose.
- Increase mesh resolution significantly with acceptable element count.
- Control uniform or biasing mesh pattern and element layer count in thickness direction by users.
- Support tetra, hexahedral, prism, and pyramid elements.



## Integrated Geometry Healing Tool

Moldex3D CADdoctor

- Enable multi-CAD data exchange between Moldex3D preprocessing and multi-CAD platform.
- Fix the defects of part and simplify the complicated geometry structure with high-quality surfaces and entities for better BLM generation.

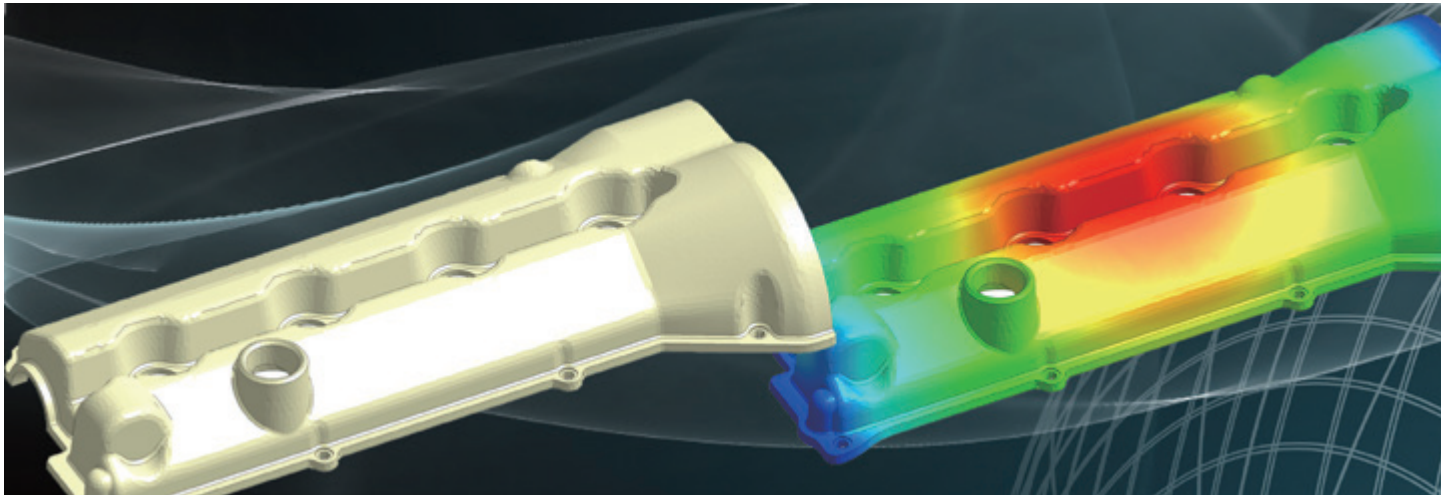


## CAD Interoperability

SYNC

- Integrated with PTC® Creo®, NX, and SOLIDWORKS®.
- Provide the automatic mesh engine and intelligent wizards for CAE analysis and help to build a complete injection molding system in CAD environment.
- Synchronize design changes with simulations to effectively optimize the product designs.
- Enable CAD users to quickly validate part designs directly in familiar CAD/CAM environments.

# Validate and Optimize with Plastics Injection Molding Simulation

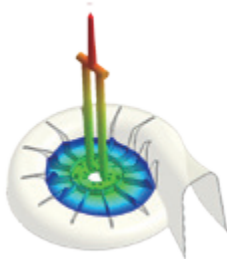


## Standard Injection Molding Solutions

Integrated Process Simulation: Simultaneous simulation by synchronous data exchange

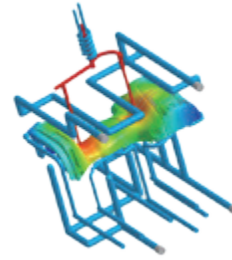
### Flow

- Visualize melt front.
- Predict locations of weld line or air trap.
- Optimize gate size and locations.



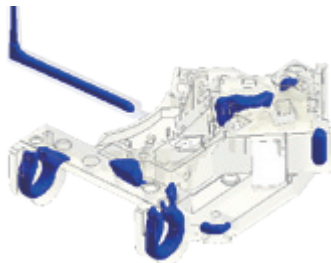
### Cool

- Improve cooling efficiency.
- Reduce cycle time.
- Predict hot spots.



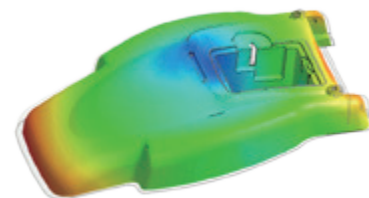
### Pack

- Evaluate gate-freeze time.
- Avoid sink mark, or flash.
- Optimize packing profile.



### Warp

- Predict final part shape.
- Identify warpage causes.
- Calculate residual stress.



## Multi-Component Molding (MCM)

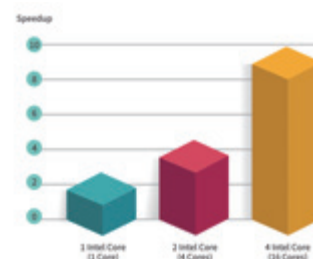
- Predict warpage with different materials.
- Detect potential re-melt issue.

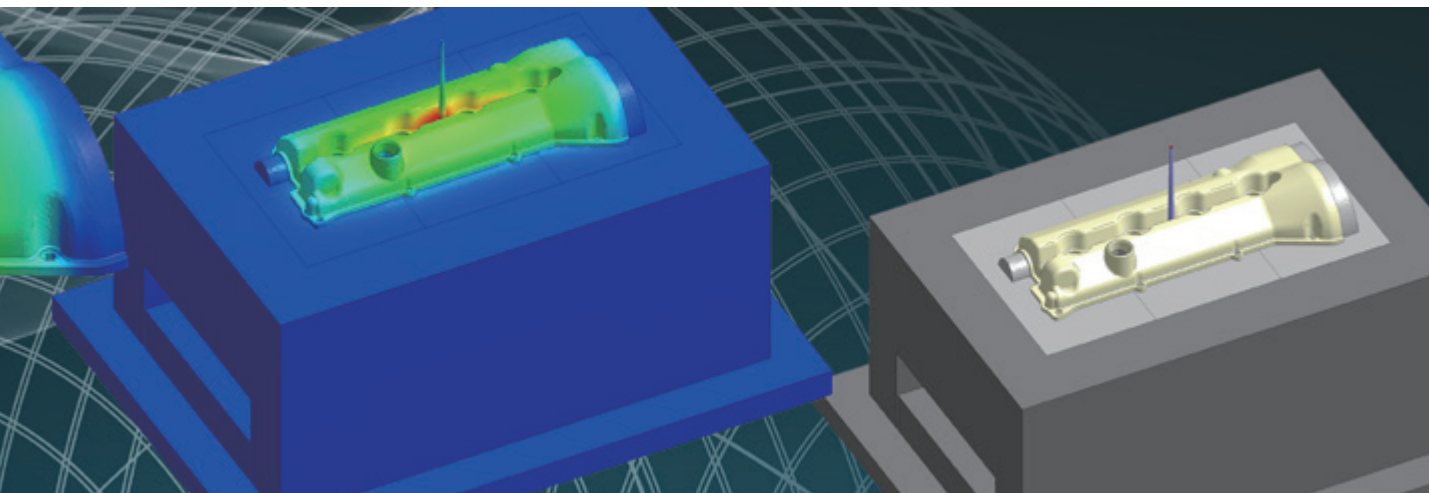
## Reaction Injection Molding (RIM)

- Simulate thermoset injection molding.
- Simulate cavity filling, curing, part warpage, fiber orientation, multi-component molding, etc.

## High-Performance Parallel Processing (PP)

- Speed up analysis with options of utilizing the strength of multi-core, multi-CPU, and multi-PC cluster.

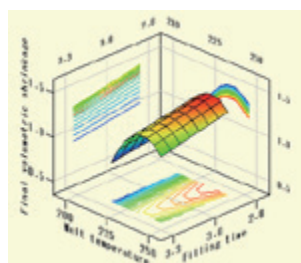




## DOE & Optimization

### Expert

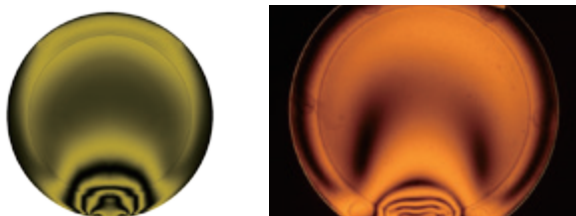
- Manage analysis variation and provide graphical summaries automatically.
- Evaluate the optimal process conditions, such as injection velocity, packing time, cooling time, or mold temperature.



## Injection Molded Plastic Optics

### Optics

- Predict flow- or thermally-induced birefringence, retardation, fringed orders, and fringed patterns.
- Integrate with CODE V by providing non-uniform refractive index prediction and deformed shape.



## Viscoelasticity (VE)

- Analyze the viscous and elastic properties of polymeric materials.
- Calculate flow-induced residual stress, warpage, and optical properties (with Optics module).

## Stress

- Predict stress and displacement distributions of parts and part inserts.
- Evaluate displacements of plastics under certain external loadings.
- Support FSI (Fluid-structure interaction) calculation.
- Predict annealing with Viscoelasticity.

## Cloud Extension

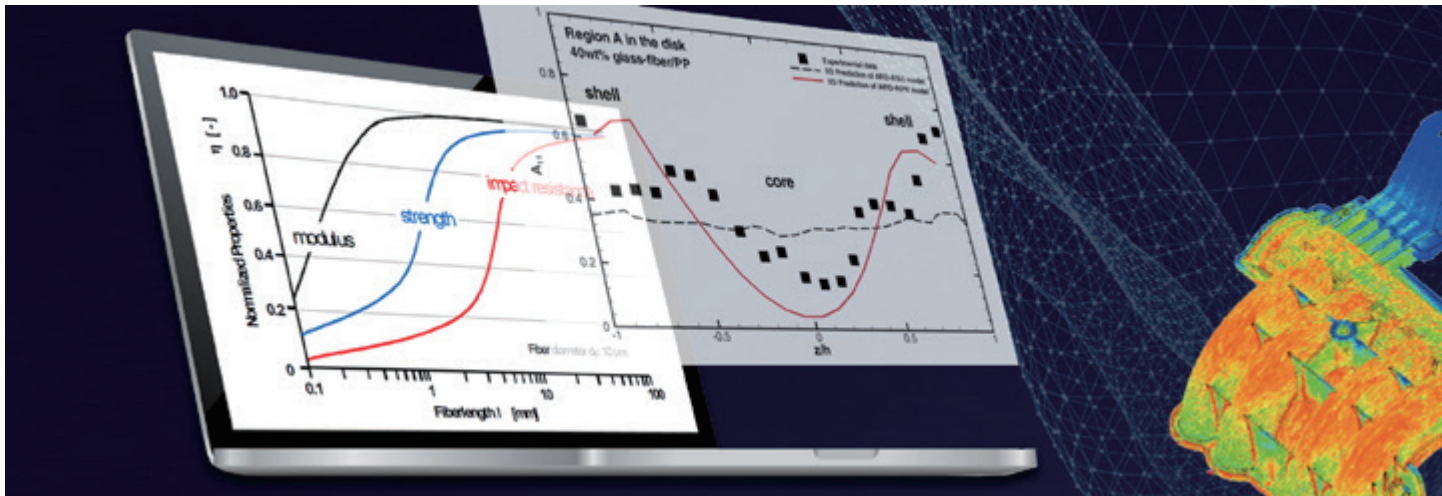
- Provide scalable license seats for fluctuating demands.
- Support full Moldex3D simulation capabilities.
- Offer a 16-core computing node for one job.

## API

- Enable users automate the workflow via the pre- and post- processor API.
- Integrate with CAD and structural analysis software.

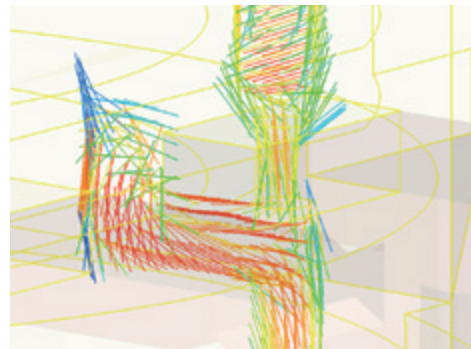


# Meet Growing Demands of Lightweight Composite Products



## Fiber

- Visualize fiber orientation, length, and concentration for short and long fiber-reinforced plastics.
- Calculate thermo-mechanical properties and optimize process conditions to enhance the strength of plastics.
- Evaluate the strength of parts and weld line regions.
- Support flake orientation simulation.



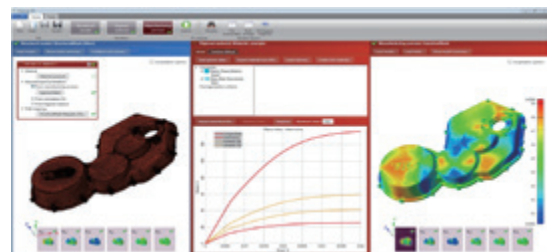
## FEA/Micromechanics Interface

- Export fiber orientation, material anisotropy, residual stresses, and molding pressure to structural software.
- Validate the structural performance of products and mold sustainability.



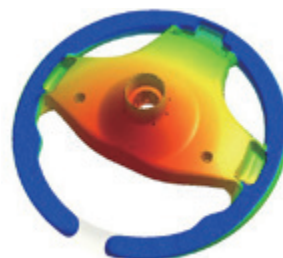
## Moldex3D Digimat-RP

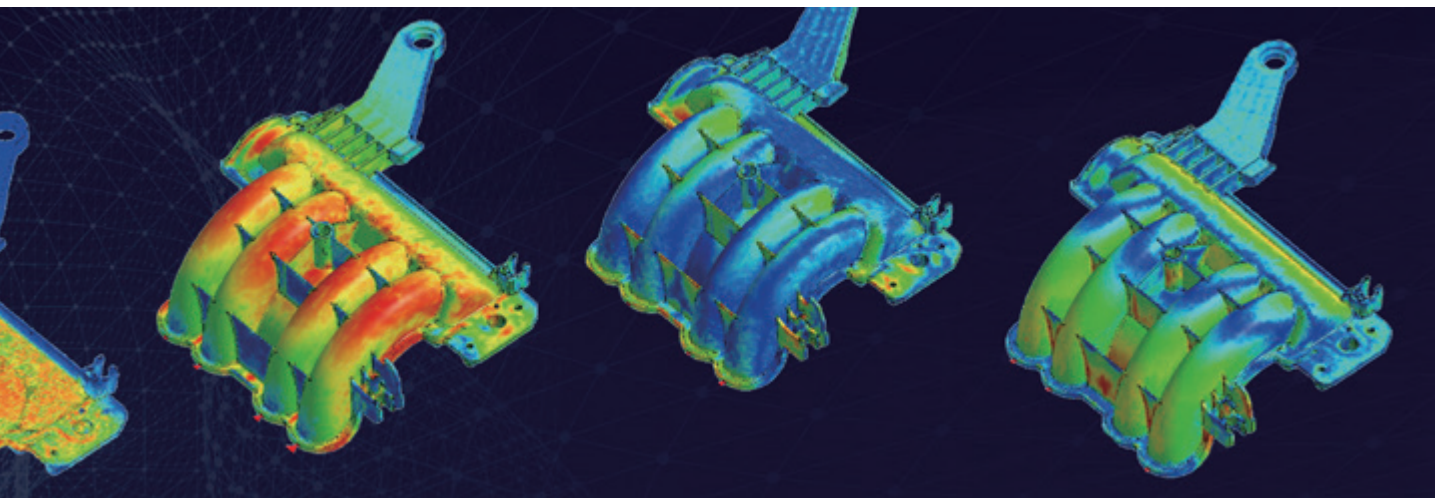
- Bridge manufacturing process and FEA analysis.
- Predict the mechanical behaviors with nonlinear material modeling technology for reinforced plastic.
- Define material properties and criteria of failure properties for reinforced plastic.
- Support automatic reverse engineering for material model generation based on experiment data.



## Polyurethane (PU) Chemical Foaming

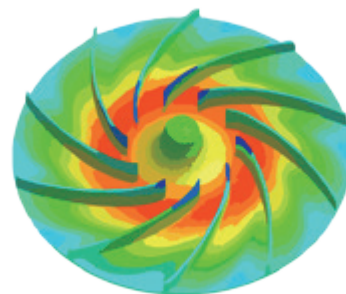
- Provide foaming kinetics for different by-products in chemical foaming process.
- Optimize for a desired volume-to-weight ratio of the product.





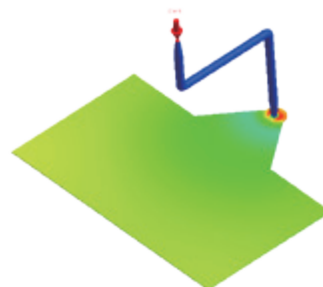
### Compression Molding (CM)

- Visualize pressure distribution, volume shrinkage, residual stress distribution, fiber orientation, etc.
- Predict potential molding defects, such as flashing.



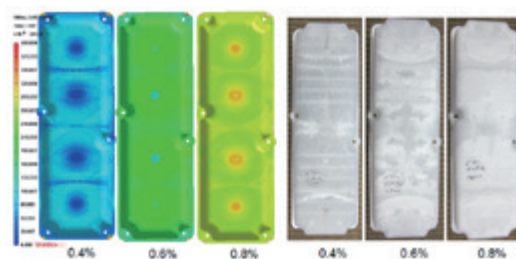
### Injection Compression Molding (ICM)

- Visualize property changes in the compression molding process over time.
- Calculate residual stress and evaluate process designs.



### Foam Injection Molding

- Visualize the filling behavior of the polymer-gas solution into the cavity.
- Visualize bubble density and size considering the bubble nucleation and growth.
- Evaluate the surface quality, bubble effects, weight reduction, tonnage reduction, shrinkage reduction, etc.
- Support CBA material simulation as an initial gas concentration option for thermoplastic analysis.



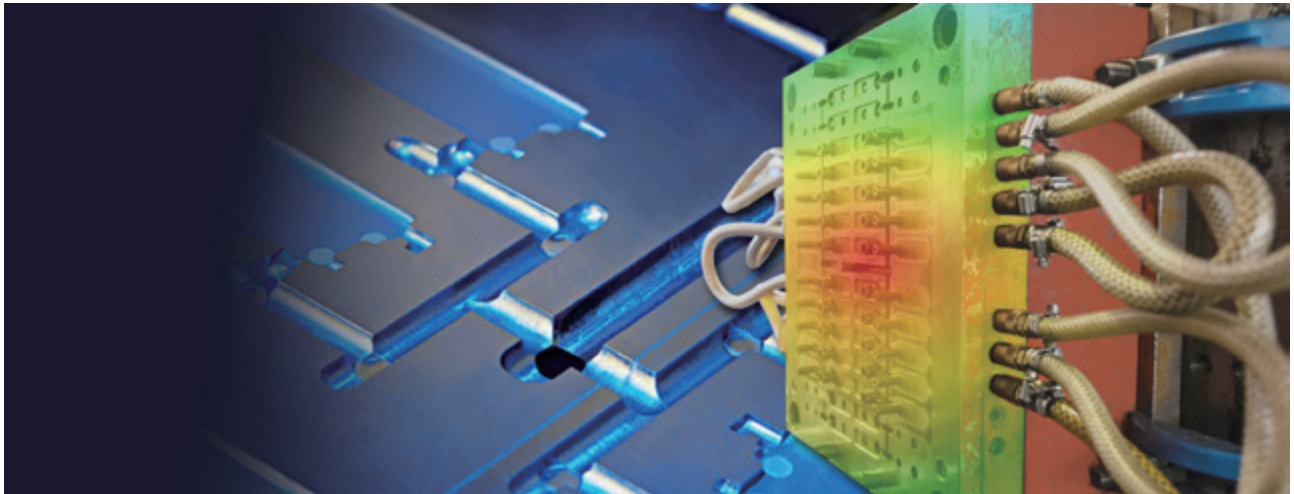
### Resin Transfer Molding (RTM)

- Control resin infusion by pressure or flow rate.
- Capture cure reaction trend during molding through viscosity and kinetics models.



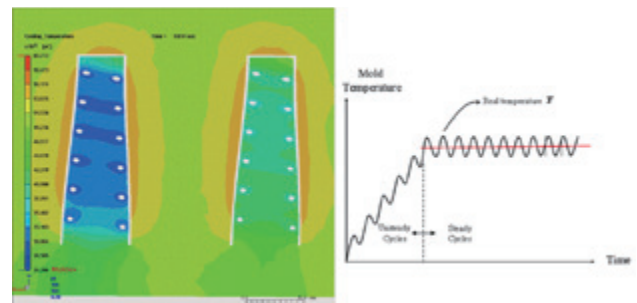


# Handle Injection Temperature: Heat and Cool Management



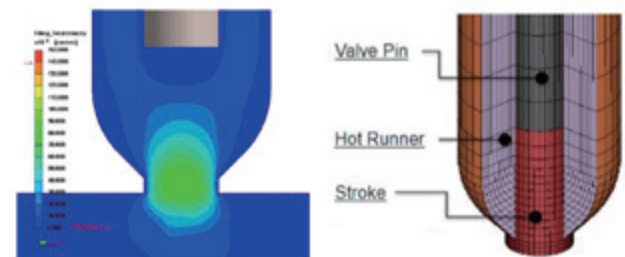
## Transient Cool

- Support various dynamic variotherm technologies, including Heat & Cool™, Induction Heating Molding (IHM), Electricity Heating Mold (E-Mold), etc.
- Utilize rapid temperature-changing molding process to increase melt fluidity in the filling stage and further improve part quality within a reasonable cycle time.



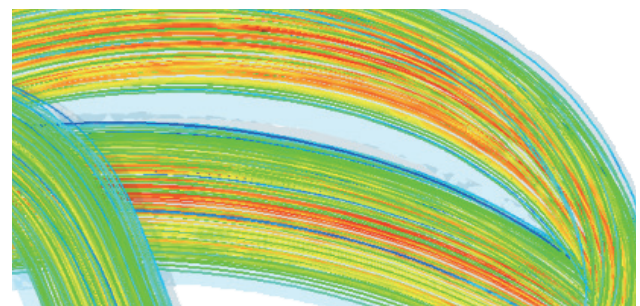
## Advanced Hot Runner

- Visualize temperature distributions over time in hot runners and moldbase.
- Predict problems, such as non-uniform melt temperature, unbalanced filling, etc.
- Support quick, steady analysis for complex hot runner layout design.
- Support pin movement control by flow front location.



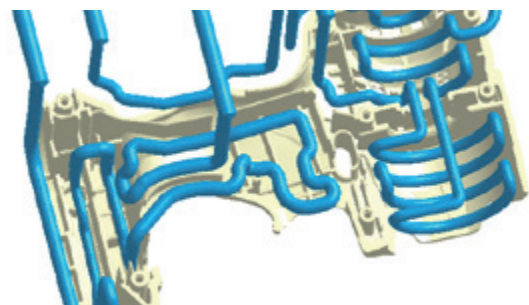
## 3D Coolant CFD

- Simulate coolant flow in 3D cooling channels to guarantee cooling efficiency.
- Visualize the streamline direction and predict dead spot.
- Optimize cooling system design and achieve cycle time reduction.



## Moldex3D Cooling Channel Designer (CCD)

- Automatically create conformal cooling channels model with product contour.
- Provide a fast and intuitive workflow to build complex cooling system.





# Simulate Multi-Material Injection Molding Processes



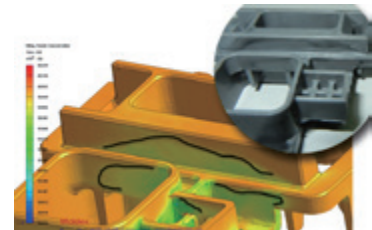
## Gas/Water-Assisted Injection Molding (GAIM/WAIM)

- Specify the gas/fluid injected from single or multiple gas entrances or from the melt entrance.
- Optimize gas/fluid channel designs and locations of gas/fluid entrances.
- Visualize the skin thickness and core-out ratio distributions and predict corner effect and blow through.



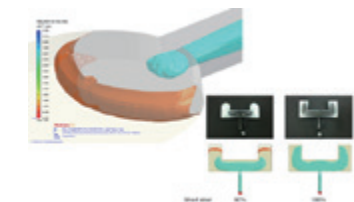
## Powder Injection Molding (PIM)

- Visualize flow behaviors of the feedstock.
- Predict black line due to phase separation of powder and binder (non-uniform powder concentration).



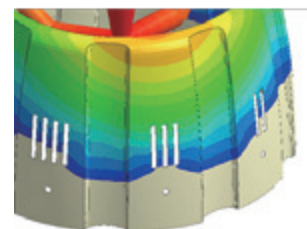
## Co-Injection Molding

- Visualize the flow behaviors of skin and core materials.
- Optimize geometry thickness and process conditions based on core breakthrough prediction.
- Consider temperature imbalance and pressure resistance variations of skin layer and center core.



## Bi-Injection Molding

- Define independent melt entrances and filling/packing parameters for different materials.
- Visualize the melt front time for each melt entrance in the filling stage.
- Predict weld line through melt front advancement.



## In-Mold Decoration (IMD)

- Support IMD film boundary condition (BC) setting with minimum human effort for model preparation.
- Provide wash-out index to better predict the wash-off ink decoration of the film.



# Product Portfolio and Features

● Essential features contained | ○ Optional features

Product Package & Mesh Technology				
	Professional Basic	eDesign	Professional	Advanced
<b>True 3D Mesh</b>				
eDesign	●	●	●	●
Boundary Layer Mesh (BLM), Tetra	●		●	●
Solid (Hexa, Prism, Pyramid, Hybrid)				●
<b>2.5D Mesh</b>				
Shell				●

● Essential features contained | ○ Optional features

Standard Injection Molding				
	Professional Basic	eDesign	Professional	Advanced
<b>Solver Capabilities</b>				
Simultaneous Filling Analysis (max.)	1	1	1	3
Parallel Processing (PP)	4	4	8	12
Thermoplastic Injection Molding	●	●	●	●
Reaction Injection Molding (RIM)	●	●	●	●
Cloud Extension	●	●	●	●
<b>Simulation Capabilities</b>				
Filling	●	●	●	●
Surface Defect Prediction	●	●	●	●
Venting Analysis	●	●	●	●
Gate Location	●	●	●	●
Cold & Hot Runners	●	●	●	●
Runner Balancing	●	●	●	●
Packing		●	●	●
Cooling		●	●	●
Transient Mold Cooling or Heating		●	●	●
Conformal Cooling		●	●	●
3D Coolant CFD		○	●	●
Rapid Temperature Cycling		●	●	●
Induction Heating		●	●	●
Heating Elements		●	●	●
Warping		●	●	●
Insert Molding	●	●	●	●
Multi-shot Sequential Molding		●	●	●

● Essential features contained | ○ Optional features

Solution Add-on				
	Professional Basic	eDesign	Professional	Advanced
<b>CAD Interoperability</b>				
SYNC	○	○	○	○
Moldex3D CADdoctor	○	○	○	○
Moldex3D Cooling Channel Designer (CCD)		○	○	○
<b>Fiber Reinforced Plastics</b>				
Fiber	○	○	○	○
Stress		○	○	○
FEA Interface	○	○	○	○
Micromechanics Interface	○	○	○	○
Moldex3D Digimat-RP	○	○	○	○
<b>DOE</b>				
Expert		○	○	○
<b>Thermal Management</b>				
Advanced Hot Runner		○	○	○
In-Mold Decoration(IMD)			○	○
<b>Optical</b>				
Optics				○
Viscoelasticity (VE)		○	○	○
<b>Special Molding Processes</b>				
Powder Injection Molding (PIM)	○	○	○	○
Foam Injection Molding		○	○	○
Gas-Assisted Injection Molding (GAIM)			○	○
Water-Assisted Injection Molding (WAIM)			○	○
Co-Injection			○	○
Bi-Injection			○	○
PU Chemical Foaming			○	○
Compression Molding (CM)				○
Injection Compression Molding (ICM)				○
Resin Transfer Molding (RTM)				○

1.Moldex3D SYNC supports PTC® Creo®, NX, and SOLIDWORKS®.

2.Moldex3D FEA Interface supports Abaqus, ANSYS, MSC.Nastran, Nastran, NX Nastran, LS-DYNA, MSC.Marc, and Radioss.

3.Moldex3D Micromechanics Interface supports Digimat and CONVERSE.

4.Database: Thermoplastics materials, thermoset materials, molding materials, coolant materials, and mold materials.

System Requirements	
<b>Platform</b>	
Windows	Windows 10, 8, 7, Server 2012, 2008 R2, HPC Server 2008 R2
<b>Hardware</b>	
Minimum	Intel® Core i7 processor, 16 GB RAM, and at least 1 TB free space
Recommended	Intel® Xeon® E5 processor, 32 GB RAM, and at least 2 TB free space



**Moldex3D**



**Visible Edge**

1-888-VIS-EDGE (847-3343)  
sales@visible-edge.com  
www.visible-edge.com