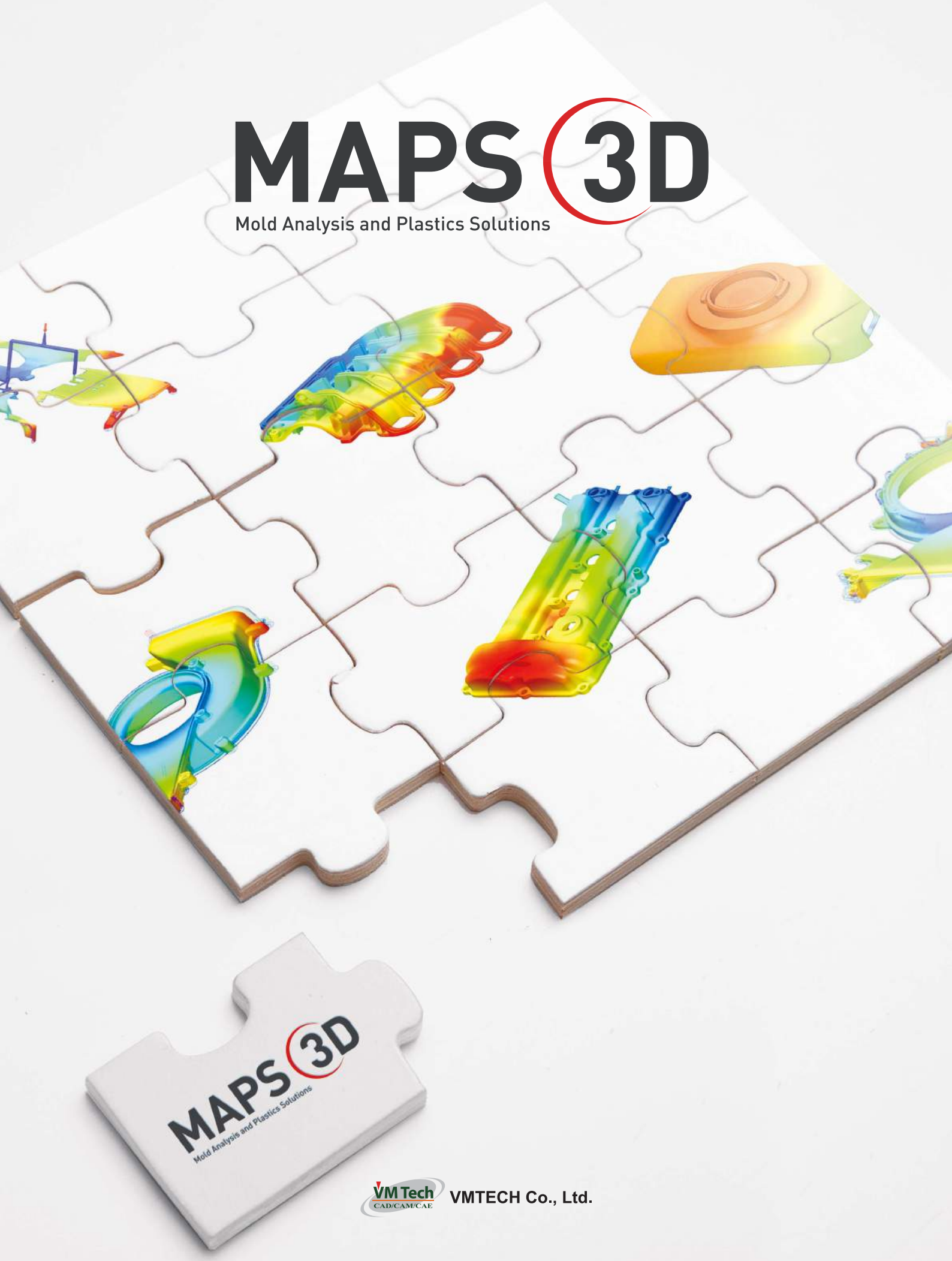
MAPS 3D

Mold Analysis and Plastics Solutions



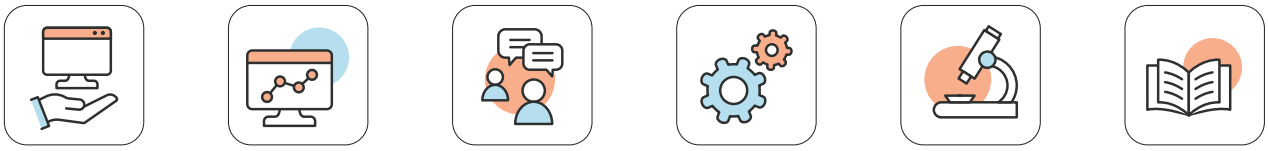
VM Tech CAD/CAM/CAE VMTECH Co., Ltd.

MAPS 3D
Mold Analysis and Plastics Solutions

- 3D Injection molding analysis S/W for product and mold designers
- Strengthen competitiveness through injection molding technology

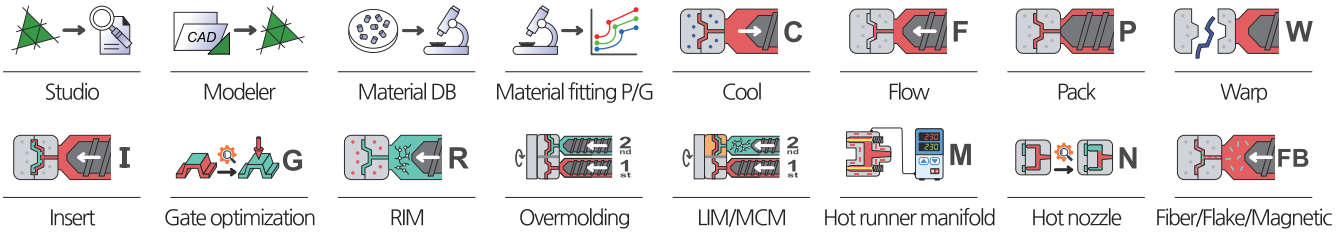
VMTech, Injection Molding Analysis S/W Developer

- Easy to use and user friendly Injection molding CAE S/W
- Analysis of the phenomena of the entire injection molding process in the mold
- Design review of injection molding part and prediction of moldability and dimensional stability
- Training and technical support through more than 30 years of experience



Development and sales of S/W | Application program development | CAE consulting | User demand program development | Material test service | Educational support

Injection Molding Analysis S/W MAPS–3D



Studio | Modeler | Material DB | Material fitting P/G | Cool | Flow | Pack | Warp

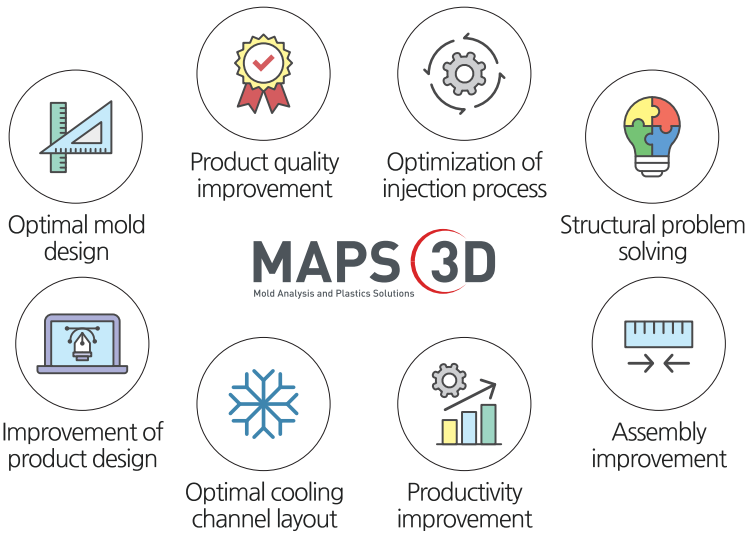
Insert | Gate optimization | RIM | Overmolding | LIM/MCM | Hot runner manifold | Hot nozzle | Fiber/Flake/Magnetic

Strengthen Competitiveness Through Injection Molding Technology

Cost reduction
- Thickness optimization
- Gate optimization
- Optimization of plastic resin

Quality improvement
- Securing appearance quality
- Minimization of deformation
- Assembly improvement

Increased productivity
- Reduction of cycle time
- Extension of mold life
- Quality improvement
- Reduction of delivery time

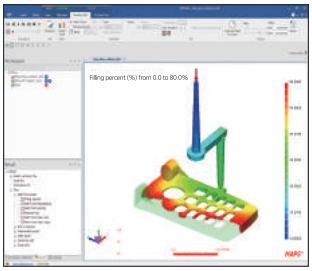


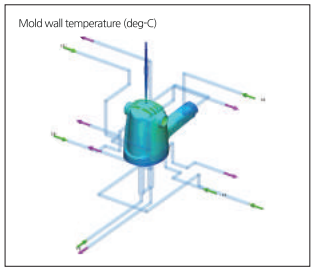


Studio

MAPS-3D Studio performs analysis by setting the material and processing conditions necessary for injection molding analysis, and provides various GUI environments to easily analyze results

- MAPS-3D Viewer
- Project Wizard
- Analysis Manager
- Edit Project Contents
- Detail Chart
- Report Wizard
- Warp Reverse Engineering
- Project With Pivot Table
- Bookmark

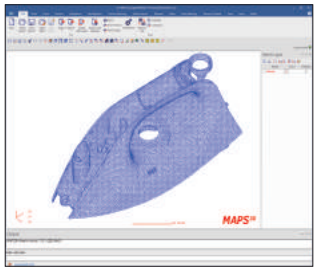


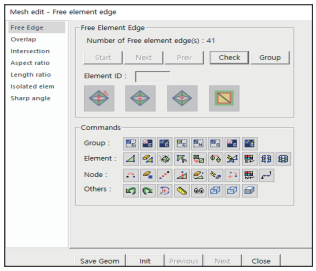


Modeler

MAPS-3D Modeler provides a perfect interface with 3D CAD/CAE system, and provides an easy GUI environment so that even beginners can use it without difficulty

- Easy and fast geometry/Mesh editing
- Automatic surface/Solid meshing
- CAD interface/FEA interface
- Extract curves from coolant surfaces
- Runner, Cooling channel system
- Key nodes, Local mesh
- Edit Mesh Wizard
- Mesh quality check

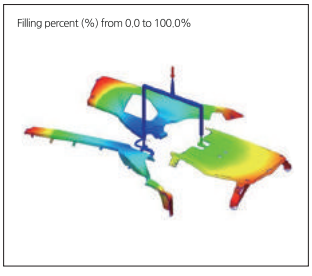


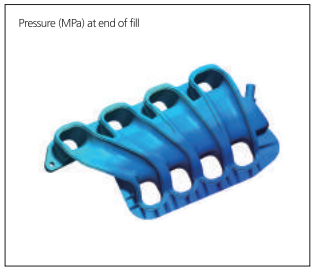


Flow

MAPS-3D is the basic module for analyzing the process of filling molten resin into the mold to optimize the product and mold design/injection molding process

- Visualization of flow pattern
- Prevent flow mart using Ram-speed control
- Prevent over and under packing pressure
- Predict injection pressure and clamping force
- Predict short shots, weld lines and air traps
- Optimize filling conditions
- Hot runner temperature control
- Mold temperature profile
- Validation of hot runner systems

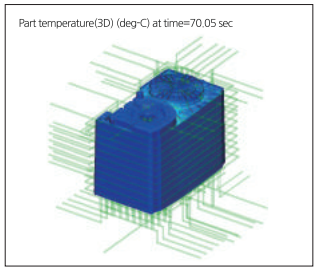


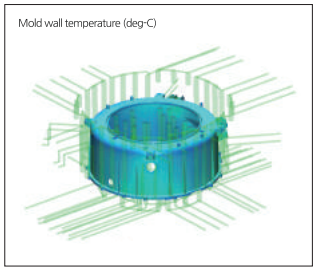


Cool

MAPS-3D Cool is the modules that interpret the impact of cooling channels on molds and products, and are used to reduce cycle time and improve product quality through uniform mold cooling

- Reduce cycle time and improve product quality
- Minimize computational time with parallel operations
- Reduce deformation due to uneven cooling
- Channel efficiency, manifold overview
- Achieve uniform cooling with optimal cooling design
- World's first/industry-only FMM





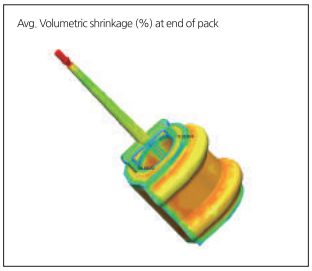
MAPS 3D
Mold Analysis and Plastics Solutions

· MAPS-3D (Mold Analysis and Plastics Solution - 3D)
· World leading CAE S/W for injection molding industry

Pack P

MAPS-3D Pack is the module that predicts physical changes according to the packing process to prevent product shrinkage

- Set optimal packing conditions through frozen time prediction
- Surface quality control through shrinkage and sink mark prediction
- Quality control by predicting weight change of runners and parts
- Optimize deformation through stress prediction

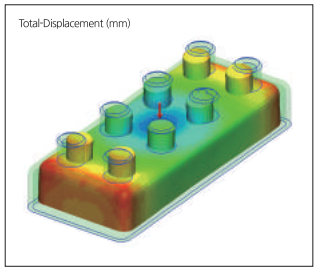


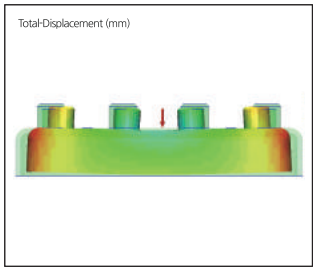


Warp W

MAPS-3D Warp is the module that predicts distortion and shrinkage of extracted products from mold due to physical changes in the injection molding process

- Predict dimensional stability according to product and resin
- Flatness review according to user plane
- Product shrinkage review for mold design
- Assembly review according to rib/boss reinforcement
- Model export(STL) for reverse engineering
- Predict individual deformations with temperature/pressure
- Predict roundness and flatness

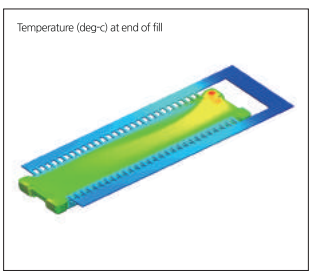


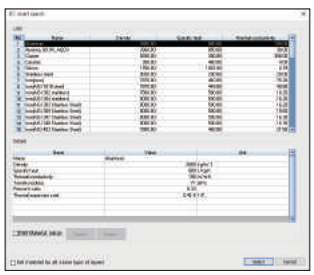


Insert I

MAPS-3D Insert is the module that predicts the quality of insert injection molding products that are molded by pre-mounting inserts such as metal and glass in the mold

- Type of inserts : metal, glass, thermoplastics and etc.
- Deformation analysis with constraint nodes by user
- Deformation analysis by defining insert as rigid body
- Predict physical change according to initial temperature of inserts

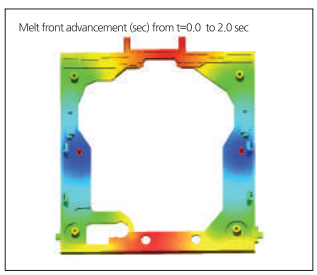


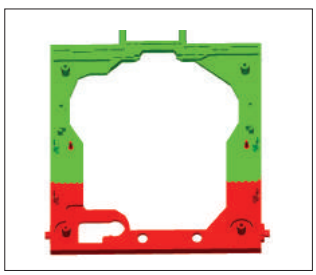


Gate optimization G

MAPS-3D Gate optimization is the module that automatically calculates the position of the gate where the flow balance is optimized using only the shape and predicts the flow pattern without performing flow analysis

- Solving time within 1~2% of filling analysis time
- Max. number of gates : 30
- Set initial gate locations
- Define active/inactive gate areas
- Automatic calculation and display flow pattern

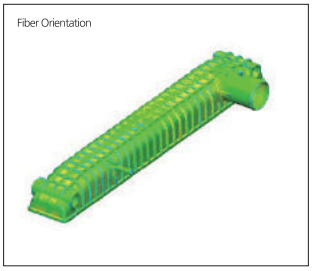


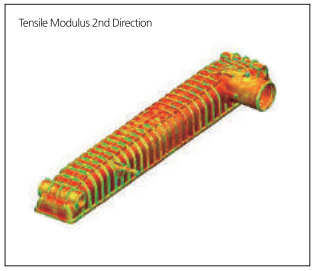


Fiber FB

MAPS-3D Fiber is the module that analyzes the degree of fiber orientation, anisotropy, and mechanical/thermal properties of GF/CF added to reinforce the strength of molded products during the molding process

- Predict mechanical properties according to orientation
- Predict linear expansion coefficients according to orientation
- Predict physical properties of 1st/2nd direction
- Experiment of strength according to structural analysis interface

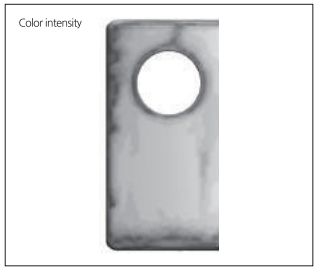


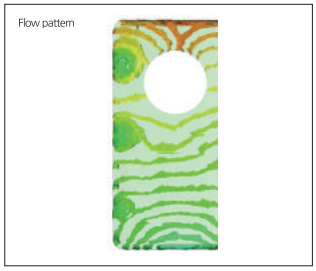


Flake FK

MAPS-3D Flake is the module that predicts the orientation of flakes and appearance quality of a product in the molding process of the resin to which flakes are added

- Predict appearance quality of flake-added products
- Predict flake orientation according to processing conditions
- Predict orientation according to flake shape
- Predict meld lines according to flake's orientation
- Predict flow marks by checking color intensity near gates

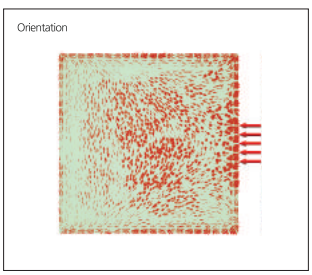


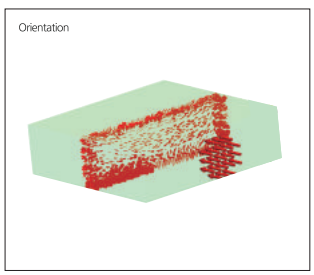


Magnetic MG

MAPS-3D Magnetic is the module that predicts the orientation of magnetic body according to external magnetic field during the molding process of a resin containing a magnetic body

- The world's first and industry's only injection molding process
- Set the shape of magnetic powder by user
- Set external magnetic field by user
- Predict magnetic field molding process of complex shapes

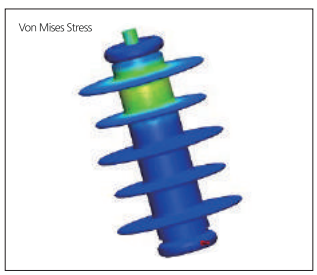


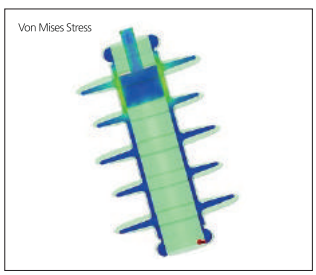


RIM R

MAPS-3D RIM is the module that predicts the physical change of a product by considering the injection molding process and curing reaction of thermosetting resins such as epoxy and LSR

- Predict flow pattern, molding pressure, weld line in filling analysis
- Predict curing reaction using mold temperature profile
- Predict curing reaction and incubation time
- Predict flow pattern according to gravity
- Predict stress/strain according to curing reaction
- Predict stress/strain considering inserts





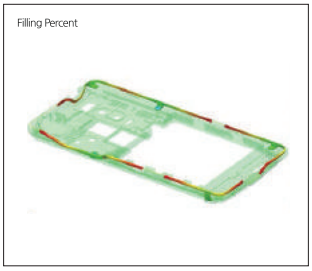
MAPS 3D
Mold Analysis and Plastics Solutions

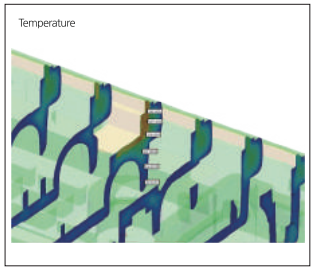
- Best innovation solution that analyzes design & quality in advance
- Best solution for the 4th industrial era (AI/XR/DNA/DX)

Overmolding

MAPS-3D Overmolding is the module that predicts various physical phenomena that occur in the process of sequentially molding two types of plastics in a mold

- Predict similar problems like general injection molding process
- Predict deformation considering the 1st injection molding product
- Predict remelting, deformation, weight change and etc. of the 1st injection molding product under the 2nd injection process
- Predict fiber orientation and properties for product with GF/CF

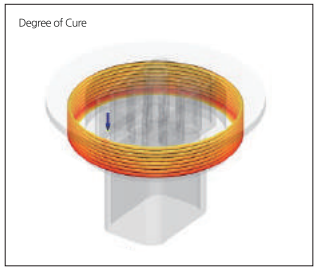


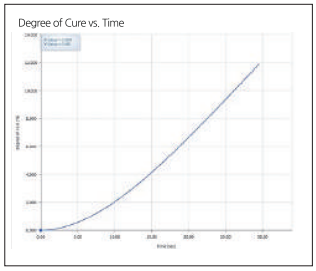


LIM/MCM

MAPS-3D LIM/MCM (Liquid Silicon Molding & Multi-Components Molding) is the module that predicts the process of overmolding or in-mold assembly molding for thermoplastic/thermoset resins

- Predict similar problems like general injection molding process
- Predict curing reaction for thermoset resin
- Predict post-deflection/re-melting of thermoplastic resin according to molding of thermoset resin
- Predict curing reaction of thermoset resin according to physical changes of thermoplastic resin

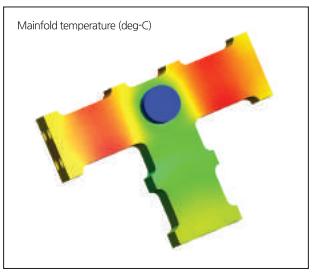


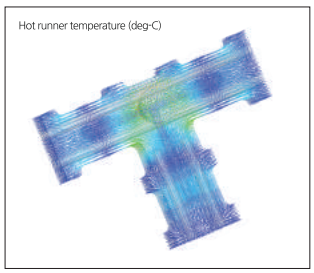


Hot runner heat balancing

MAPS-3D Hot runner heat balancing is the module that predicts the temperature distribution according to the heater layout and control method through thermal analysis within the hot runner manifold

- Optimize manifold according to capacity and layout of heaters
- Predict temperature distribution in manifold
- Predict temperature distribution by sensor control
- Manifold heat balancing
- Predict heat distribution of manifold/heater

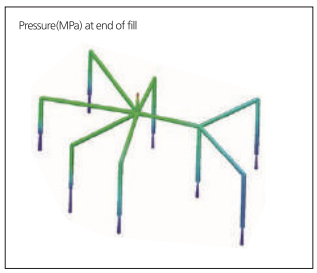


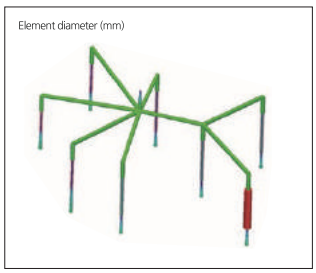


Nozzle pressure

MAPS-3D Nozzle pressure is the module that optimizes the diameter of each nozzle according to the shape of the product of the hot nozzle connected to the manifold

- Optimize nozzle diameter for each nozzle flow rate/layout
- Analysis time within 1 minute by using only 1D elements
- Predict pressure drop at each nozzle
- Predict mass and flow rate at each nozzle





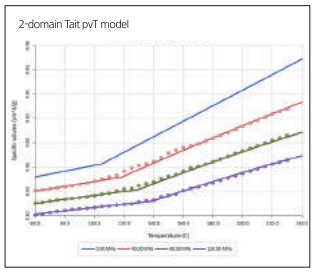


Material test service

VMTech measures various physical properties for injection molding analysis of thousands of resins produced worldwide and provides DB for analysis

- Viscosity according to temperature/shear rate (Bagley/rabinowitsch correction)
- pvT according to temperature pressure (Isobaric condition)
- Specific heat/thermal conductivity according to temperature
- Evaluation of processing window and thermal stability
- Transition/solidification/ejection temperature
- Crystallization of crystalline resin

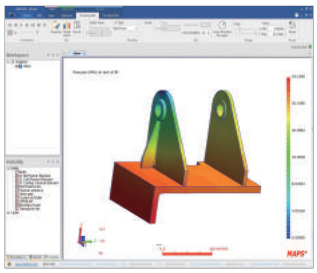


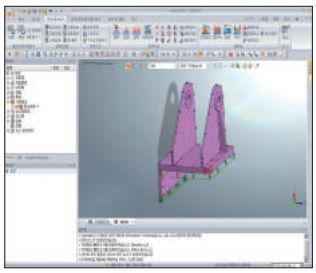


Structural FEA interface

Structural FEA interface is the module that predicts structural stability of a product by linking analysis results according to the injection molding process predicted by MAPS-3D with structural analysis

- MAPS-3D Export : temperature, pressure, residual stress, orientation, coefficient of thermal expansion, tensile modulus
- Structural analysis S/W : MSC/Nastran, MSC/Marc, Abaqus, NFX

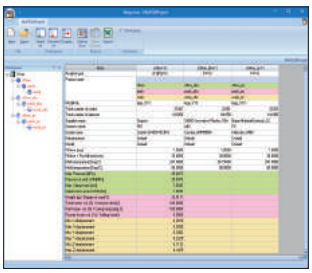


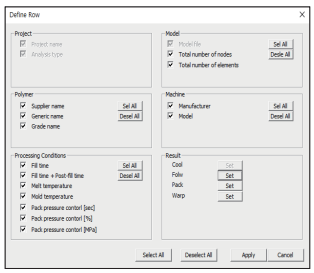


Project

MAPS-3D Project provides convenient functions to check information and results of analyzed projects without driving MAPS-3D Studio

- Check results in a short time
- Quick and convenient comparative analysis
- Check multiple project information and results
- Save results as Excel file





Technical support

VMTech provides various technical services for customer needs

- Large model analysis support (HPC)
- Simultaneous analysis support for multiple projects
- Project support for MAPS-3D customers
- Free support for customer property measurement (UDB)
- Resolve the issue of lack of licenses
- Free training for MAPS-3D users
- Free fitting for physical properties of resin
- Remote technical support





MAPS 3D

Mold Analysis and Plastics Solutions

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