

Moldex3D IC Packaging Encapsulation Innovation

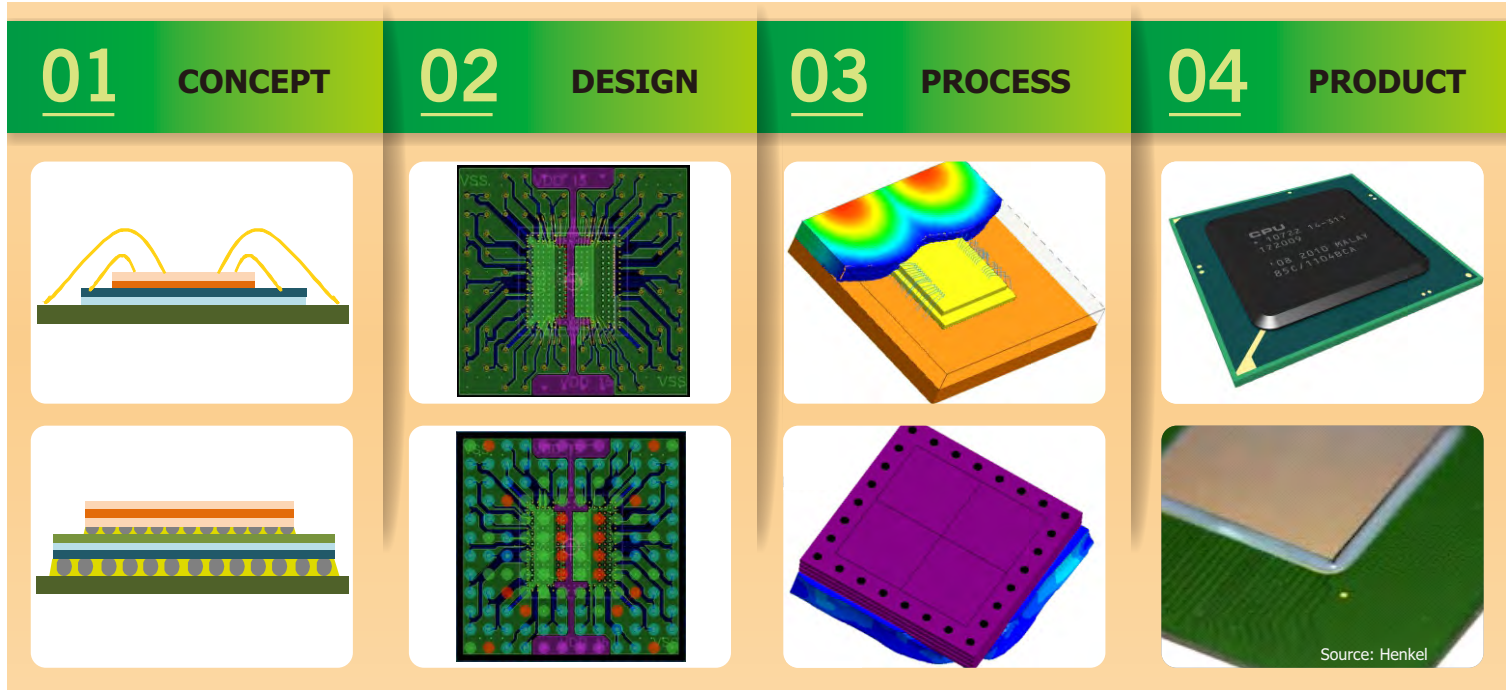
Simulate mold encapsulation process and validate mold design
Optimize process conditions and reduce cycle time
Enhance molding quality and prevent potential defects

Source: Chipworks



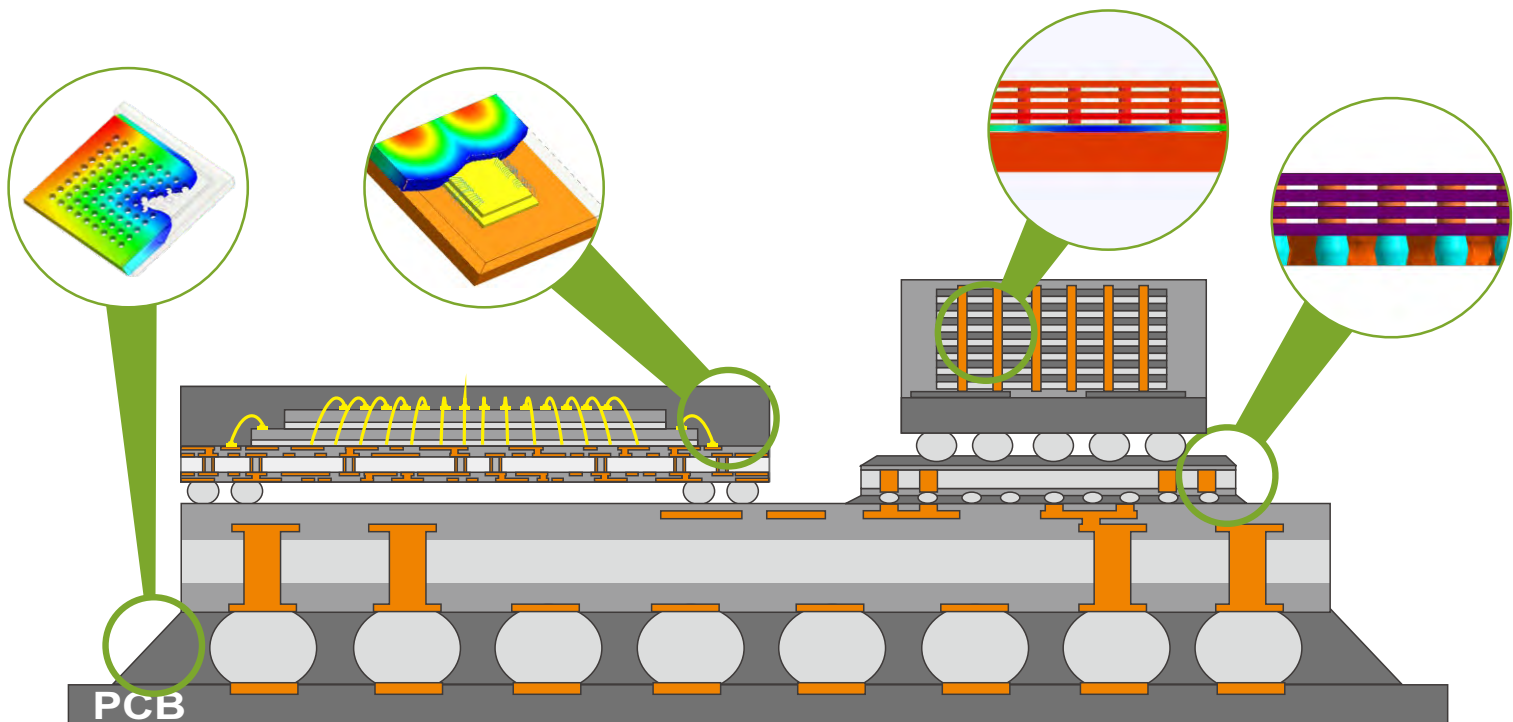
Mold Encapsulation Innovation

Moldex3D offers a complete suite of IC Packaging simulation solutions for various steps in production process to assist industry professionals in validation and optimization. Considering chip design, material properties and process conditions, Moldex3D's promising solutions surely bring quality, reliability and process efficiency.



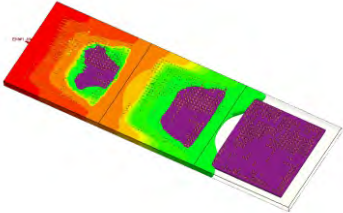
Advanced IC Packaging Solutions

Besides transfer molding and compression molding simulations, Moldex3D provides a variety of solutions for the underfill process from 2.5D to 3D IC stacking, such as Capillary Underfill (CUF), No-flow Underfill (NUF), Molded Underfill (MUF), Non-conductive Paste (NCP), Non-conductive Film (NCF), etc., for the growing application of 3D IC stacking.



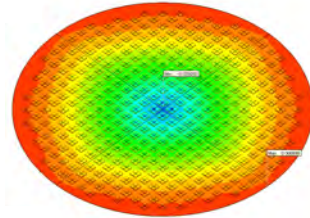
Co-simulation Platform

Moldex3D takes full consideration of customer needs and combines front-end IC design and back-end structural analysis software into a co-simulation platform. It enables users to have smoother workflow, eliminating unnecessary file format transformation.



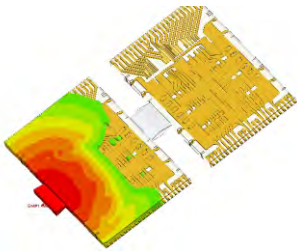
Evaluate and optimize Epoxy flow pattern

- Visualize dynamic melt flow advancement
- Evaluate gate and runner designs
- Optimize flow balance and reduce cycle time



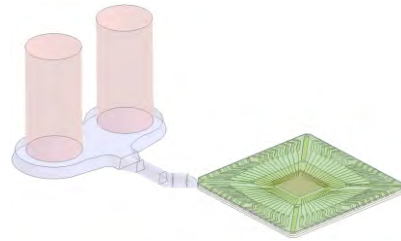
Visualize the effects of process design variation

- Evaluate temperature-dependent material properties
- Predict thermal stress due to temperature distribution
- Optimize thermal performance and avoid overheating



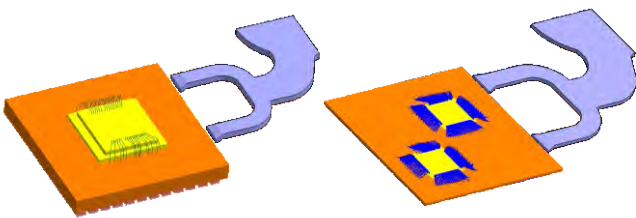
Analyze potential molding problems

- Evaluate wire sweep and paddle shift behaviors
- Predict short shot, welding line or void
- Predict residual stress and part deformation



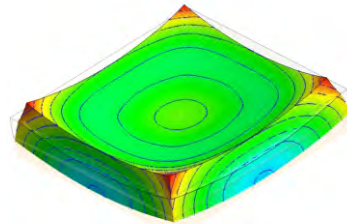
Study complex composite material properties

- Support realistic elastic properties to enhance analysis accuracy
- Evaluate thermal expansion coefficient effect on stress
- Evaluate warpage due to the PVTc relation of EMC



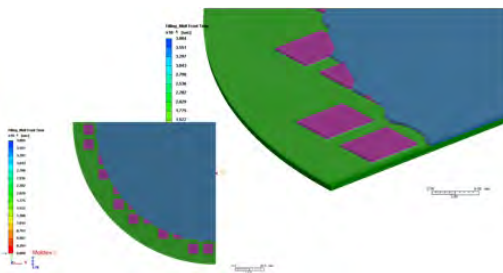
Validate design with alliance co-simulation solution

- Analyze structural performance with ANSYS and ABAQUS
- Analyze thermal stress based on temperature variation
- Support Cadence 3DI models and properties



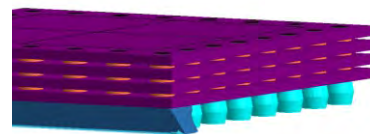
In/Post Mold Cure warpage simulation

- Visualize stress relaxation through annealing
- Predict temperature and stress distributions
- Predict potential deformation or cracking



Compression molding simulation

- Optimize process conditions
- Evaluate shear stress distribution and die shift
- Support particle tracking for result interpretation



Underfill molding simulation

- Visualize capillary driven filling behavior
- Analyze dispensing parameters and contact angle
- Evaluate the effects of bump pitch and bump pattern

PROCESS SOLUTION	Transfer Molding	Compression Molding	Capillary Underfill (CUF)	No Flow Underfill (NUF)	Molded Underfill (MUF)	Embedded Wafer Level Package (EWLP)	Annealing In/Post Mold Cure
MOLDING MATERIAL TEST							
Viscosity (Rheometer)	●	●	●	●	●	●	●
Curing Kinetics (DSC)	●	●	●	●	●	●	●
Specific Volume (PVTC)	○	●		●	○	●	●
Visco-elastics Modulus (DTMA)	○	○		○	○	○	●
Contact Angle			●	○	○	○	
MESHING							
Interactive Mesh	●	●	●	●	●	●	●
Auto Mesh	○	○	○	○	○	○	○
SOLUTION FEATURES							
Welding Line	●	●	●	●	●	●	●
Short Shot	●	●	●	●	●	●	●
Air Trap / Void	●	●	●	●	●	●	●
Wire Sweep	●	●	●	●	●	●	●
Paddle Shift	●	●	●	●	●	●	●
Die Sweep	●	●	●	●	●	●	●
Die Shift	●	●	●	●	●	●	●
Warpage	●	●	●	●	●	●	●
ALLIANCE CO-SIMULATION							
Cadence Interface	○	○	○	○	○	○	○
FEA Interface	○	○	○	○	○	○	○
COMPUTING CAPABILITIES							
Parallel Processing	○	○	○	○	○	○	○
Cluster Computing	○	○	○	○	○	○	○

● Essential features contained | ○ Optional features



Platform	Windows	Microsoft Windows 8.1, 8, 7, Server 2012, 2008
Hardware	Minimum	Intel® Core i7 processor, 8 GB RAM, and at least 100 GB of free space
	Recommended	Intel® Xeon® E5 processor, 32 GB RAM, and at least 500 GB of free space

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