

## In-depth Study of Hot Runner Technology and Industrial Applications

**Limited Seats. Register Now!**

### Course Introduction

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Hot runner technology has been applied to many injection products. Its application product field is very board and diverse, ranging from large-sized parts (bumper, LCD panel front/back cover etc.) to small-sized parts (bottle cap, optical component etc.). It can replace traditional cold runner to solve some product and molding issues, such as weld line elimination, product surface quality improvement, injection pressure/ clamping force reduction, and molding cycle decrease. In addition, it can reduce wasted material and energy consumption to realize "Green Molding". However, the mechanism is very extensive and mysterious inside of such a complex system. Flow imbalance, dead spot, and no-uniform heating are the significant issues in hot runner system development. More severely, material degradation occurs due to overheating and ultimately affects product quality. As a result, how to maintain melt temperature is the key and it is closely related to geometric designs for the entire system and heating control methods.

### Goals

- Hot runner system and its current industrial applications
- The issues in design and development of hot runner system
- The bottlenecks for traditional product development cycle
- The breakthrough with CAE in hot runner system development
- An advanced hot runner analysis technology and application
- The benefits to practical cases from using advanced hot runner CAE

### Course Information

**Date :** Please refer to official website

**Organizer :** CoreTech System

**Contact :** [mkt@moldex3d.com](mailto:mkt@moldex3d.com)

Time	Content
60 min	Reception
	Introduction to hot runner technology and its Industrial Applications
	Issues in Hot Runner System Development and CAE Analysis Tool
	Advanced Hot Runner Analysis Technology and Application
	Practical case study (1) Temperature investigation into single-gate hot runner system <i>The effects of heating with different sensor node controls on hot nozzle melt temperature and experimental validation</i>
	Practical case study (2) Discussion of hot nozzle heating coil designs in multiple-gate hot runner system <i>The effects of different heating coil designs on melt temperature distribution in the hot nozzle channel.</i>
	Practical case study (3) Problem and solution for heating rod designs on the manifold <i>Temperature difference issue from manifold heating rod design and its solution</i>
20 min	Q & A

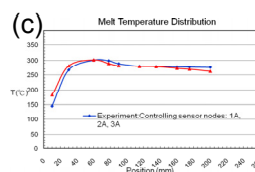
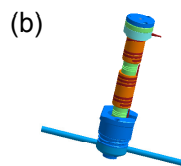
\*The agenda is subject to changes.

## Course Content

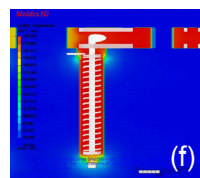
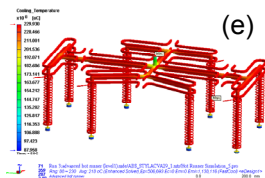
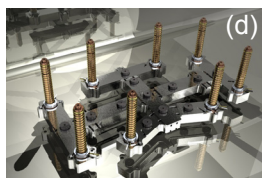
Based on this, the course begins with an introduction to hot runner technology and its industrial applications. Afterwards, the challenges and issues in hot runner system development are addressed for understanding the importance and benefits of using CAE tools. Then an innovative advanced hot runner analysis simulation is unveiled. In order to deepen the understanding of this technology, some case studies are discussed. The first case is about melt temperature distribution in a single-gate hot runner system. The effects of heating with different sensor node controls on hot nozzle melt temperature are explored and validated with the experiments. The second case is on the heating coil designs around hot nozzles in an eight-gate hot runner system. The effects of different heating coil designs on melt temperature distribution in the hot nozzle channel are investigated. The third case is a heating rod design issue for the manifold. Temperature difference problem from manifold heating rod design and its solution is discussed. Through this course, students can learn how to use CAE to reach solutions and optimizations for hot runner system design and development.

## Participants

- Boss and managers
- Supervisors in Research or Production Departments
- Part design/production engineers
- Mold design/manufacturing engineers
- Molding experts/ engineers
- Material suppliers
- People interested in hot runner system
- People interested in CAE injection molding analysis
- People interested in plastic injection products and processing



- (a) Experimental picture of single-gate hot runner system
- (b) CAE Model in advanced hot runner analysis
- (c) Hot nozzle melt temperature prediction and experimental measurement



- (d) Experimental picture of eight-gate hot runner system
- (e) Melt temperature simulating result in the channel
- (f) Mold temperature profile in hot runner system mold

## Instructor



### Dr. Enoch Chen

Current Position : Senior engineer in Technical and Research Division of CoreTech System

Education : PhD in Mechanical Engineering at University of Florida

Specialization : Experimental mechanics /Residual strain analysis in composite materials/Shrinkage property study for concrete materials /Finite element analysis

- Research assistant in “Experimental Stress Analysis Laboratory” at University of Florida, specialize in the optical measurement of process-induced residual strains in composites and finite element analysis.
- Research assistant in “Advanced Material Characterization Laboratory” at University of Florida, specialize in, focus on shrinkage property study on concretes applying the optical method.
- In recent years, engage in plastic injection molding analysis and the solutions to molding problems. In addition, research on many special molding processes, including injection compression molding, gas-assisted injection molding, hot runner, and optical application. Moreover, experience with integration of injection molding and structural analyses in PLM.