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Mold Fatigue and Lifecycle Prediction

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Injection Mold designers and mold makers are facing increasing challenges due to newly developed molding technologies such as rapid Heating and Cooling Molding (RHCM) or Rapid Temperature Cycle (RTC), as the mold life cycles could be less or uncertain. Even for traditional mold design and making, the lifecycle is typically based on experiences only. These lead to the need for a new feature that we have just developed: Mold Fatigue Analysis. It is about the progressive and localized structural damage that cause mold failure due to cyclic loading which happens during injection molding process.

In this lecture, we present the complete simulation sequence: transient thermal analysis, mold filling analysis, core-shift analysis, clamping influence, mold stress analysis, and eventually fatigue analysis. This sequence is automated in Autodesk Simulation Moldflow Insight (ASMI) to identify where mold damage could happen first, and up to how many molding cycles it can last.

Learning Objectives

At the end of this class, you will be able to:

- Understand the nature of mold lifecycle: costs, quality and productivity
- Understand the components of integrated analysis tool
- Know how to set up the right mesh and boundary conditions
- Interpret the results from Mold Fatigue Analysis

About the Speaker

Xiaoshi Jin (a.k.a. Jin Xiaoshi), is currently Principal Research Engineer in Autodesk Inc.

Based in Ithaca, NY, U.S.A., Jin is a senior research leader with two decades of experience in R&D of simulation. He got his Ph.D. in 1992 in injection molding simulation at University of Glasgow, and then Post-doc researcher in Aerospace Engineering (CFD) in U.K., and Post-doc research fellow at Cornell University (Cornell Injection Molding Program --- CIMP) in 1993.

He joined C-MOLD in 1994, it later became a part of Moldflow in year 2000, and in 2009 it becomes a part of Autodesk. Jin has a long experience in R&D and managing various programs, and he has a solid expertise in Flow, Fiber, Warp and Stress analyses and he has published many papers and presented in quite some major conferences.

Why Predict Mold Lifecycle?