

Processing IV: Cavity Filling and Cavity Pressures XTREEM / VSX / 486 CONTROL

Two-Day Outline

Material Fill Rate & Flow Characteristics

- Effects of Fill Speed on Melt Viscosity
- Effects of Fill Rate on Orientation
 - Exercise Evaluating Orientation with Polarized Plates
 - Exercise Machine Operation - Orientation Shrinkage Test
- Material Viscosity & Flow Length Characteristics
 - Exercise - Material Flow Rate Data
 - Exercise - Machine Operation Exercise Flow Length Comparison Test

Filling The Cavity

- Short Shot Development
 - Exercise - Machine Operation, Exercise Short Shot Development with Position Cut-off.
- Filling Thin Walled Parts
 - Exercise - Parts with Different L/T Ratios
- Developing High Fill Speeds or Pressures
 - Exercise - Identifying Machine Injection Capacities

Setting Up for Injection Speed Profiling

- Types of Speed Profile Controllers
 - Exercise - Speed Profiling Controllers
 - Exercise - Speed Profiles & Reference Plots
- Matching Cavity Fill Points with Screw Stroke Position
 - Exercise - Gate Flow Calculation for Speed Profiling
 - Exercise - Machine Operation Exercise Systematized Short Shot Development
- Filled Related Defects
- Defects Influenced by Fast Filling Speeds

Injection Speed Profiling Case Studies

- Fill Speed at the End of Flow
- Injection Speed Through the Gate
 - Exercise - Machine Operation Exercise Tissue Paper Test
 - Exercise - Machine Operation Exercise Speed Profiling Through the Gate Area
- Flow Past Intersecting Walls and Obstruction
 - Exercise - Machine Operation Exercise Optimizing the Injection Speed Profile
- Limitations of Injection Speed Profiling
 - Exercise - Monitoring the Injection Speed Profile

Understanding Pressures in the Cavity

- Pressure Effects in the Cavity
- Measuring Cavity Pressure
- Cavity Pressure Curves
- Relating Hydraulic Pressure to Cavity Pressure
- Containing Cavity Pressure with Clamp Force
 - Exercise - Converting Hold Pressures
 - Exercise - Clamp Tonnage Calculation
 - Exercise - Minimizing Clamp Tonnage
 - Exercise - Determining the Average Pressure in the Cavity

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Controlling the Packing Process

- Evaluating Melt & Hydraulic Pressures
- Controlling Hydraulic Pressures
- Machine Parameters Which Affect Packing
 - Exercise - Survey of Hydraulic Pressure Readout Capability (of Microprocessor Controlled Machines)
 - Exercise - Pressure Readability
 - Exercise - Effect of Machine Parameters on Packing (Interactive Machine Exercise)
 - Exercise - Nozzle Orifice Check

Packing Effects on the Part

- Effects of Mold Design on Packing
- Effects of Material Type on Packing
- Packing - Related Defects
 - Exercise - Runner Diameter Calculations
 - Exercise - Tooling Evaluation of Runner and Gates
 - Exercise - Packing - Related Defect Evaluationw

Controlling the Hold Pressure Over Time

- Determining the Gate Freeze Time
- Establishing the Holding Time
- Profiling the Hold Pressure Over Time
- Types of Hold Pressure Profile Controllers
 - Exercise - Determining the Gate Freeze Time (Interactive Machine Exercise)
 - Exercise - Hold Time Evaluation
 - Exercise - Profiling the Hold Pressure (Interactive Machine Exercise)
 - Exercise - Determining the End of the Packing Phase
 - Exercise - Machine Hold Pressure Control Survey

Controlling Part Dimensions

- Understanding the Effects of Materials Shrinkage
- Dimensional Process Capability
- Controlling Dimensions
 - Exercise - Determination of Differential Shrinkage Rates
 - Exercise - Process Capability Evaluation
 - Exercise - Improving the Cpk Value with Hold Pressure Profiling (Machine Exercise)
 - Exercise - Determining Transfer Pressure Limits (Interactive Machine Exercise)

Special Exercises

- Identification of Inadequately Vented Molds
- Survey of Tooling with Gating Related Defects
- Basic Runner Optimization Calculation
- Survey of Inadequate Sprue Sizes

NOTE: Not all exercises will be used because of time constraints

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