

# Roboshot #2: Process Optimization

## Two-Day Outline

### DAY ONE:

#### **ROBOSHOT Controllers**

- Key process set-up & configuration menus
- Optional features & their set-up

#### **Set-up and Processing Considerations**

- Melt Pressure on Roboshot
- Effect of screw size on pressure and shot size capability
- Optimizing the match between mold and press
- Optimizing the dry cycle and clamp tonnage
- Integrating information from the Roboshot process monitor
- Techniques for duplicating a process on another machine

#### **Tooling Considerations**

- Runner and gate optimization techniques
- Optimal cavity venting principles
- Part design features that influence processing
- Evaluating the mold cooling system

#### **Controlling the Cavity Fill Rate**

- Filling with velocity as a control principle
- Milacron Inc. closed loop velocity controls
- Fountain flow principles and melt flow front development
- Setting and optimizing the injection speed profile controls
- Evaluating velocity and pressures traces and fill time variation

#### **Controlling the Fill to Pack Transfer**

- Operating principles for velocity to pressure control
- Setting up and optimizing position based transfer processes
- Setting up in melt pressure transfer on the Roboshot controller
- Specialized cavity pressure transfer applications

#### **Shot Size and Cushion Control**

- Types of non-return valves and their effectiveness
- Effects of check ring and barrel wear on cushion control
- Processing solutions to control cushion variation

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### **DAY TWO:**

#### **Packing and Hold Pressures**

- Packing on Roboshot controller
- Monitoring transfer & packing pressures
- Processing techniques for better dimensional control
- Pack pressure profiling strategies and case studies

#### **Melting Mechanisms and Temperature Control**

- Techniques for optimizing the barrel heat zone profiles
- Screw plastication and shear heating principles
- Back pressure control techniques on Roboshot controller
- Balancing the conductive heat with the shear heat input
- Measuring and controlling melt temperature

#### **Controlling the Cooling Rate and Cooling Time**

- Principles of plastic part solidification and crystallization
- Effects of the melt and mold temperatures on cooling time
- The effects of cooling time and temperature on part dimensions
- Optimizing and controlling mold coolant flow

#### **Plastic Materials and Their Behavior**

- Effects of molecular weight and crystallinity on processing
- Molding plastics with additives, fillers and reinforcements
- Causes and effects of orientation and molded-in stress
- Processing case studies with specific plastics

#### **Troubleshooting Molded Part Defects**

- Fill related defects and their solutions
- Pack related defects and their solutions
- Surface defects and their solutions
- Causes of part warpage and distortion
- Post molding part problems and solutions

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