

# **MILACRON** Processing II Seminar

## Injection Molding Process Optimization

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### Course Outline for 2-Day Seminar

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#### Day 1:

##### Set-up and Processing Considerations

- Milacron Inc. A, B and C screw sizes
- 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 Mosaic, Xtream or other process monitors
- 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 hydraulic transfer on the Mosaic, Xtream or other controllers
- 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
- Adaptive shot control on the Mosaic, Xtream or other controllers

#### Day 2:

##### Packing and Hold Pressures

- Packing & holding phase separation on Mosaic, Xtream or other controllers
- Monitoring transfer & holding pressures
- Processing techniques for better dimensional control
- Hold 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 Mosaic, Xtream or other controllers
- 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

##### SPC Setup on the Mosaic, Xtream or other Controllers

- Relating SPC data to the molding process
- Identifying key process parameters for SPC
- SPC sample data and analysis chart interpretation
- Interpreting the X-bar and R charts

**For more information contact: Milacron Training Administration at (513) 536-2265**

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