

Envalior Engineering Materials

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Following Envalior's Injection Molding Recommendations available online, they will allow you to mold Envalior's Engineering Materials with the best performance.

In some cases unexpected problems may occur influencing the molding process or part performance. In these trouble shooting guidelines we try to give an overview of most commonly seen problems, the root cause(s) and solutions to solve them.

Depending on the polymer type, one can be more or less applicable to use.

Problem	Cause	Remedy
NOZZLE DROOL	Material is wet	Check moisture content Preferably max moisture level according molding recommendations. Dry when applicable
	Melt temperature too high	Check real melt temperature (using purge out method and temperature probe). Reduce barrel temperature when applicable Reduce nozzle temperature (prevent frozen nozzle tip)
	Melt residence time too long	Use smaller barrel size Shorten cycle time
	Backpressure too high	Reduce back pressure Use screw decompression
NOZZLE FREEZE OFF	Nozzle temperature too low	Increase nozzle temperature Retract nozzle from mold (cold runner mold) after plasticizing
	Heating capacity too low	Install heater band with higher heating capacity Create temperature control as close as possible to the nozzle tip
	Not optimum nozzle design	Use nozzle with larger diameter Use reverse taper nozzle tip

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Problem	Cause	Remedy
MOLDING CONTAINS UNMELTED GRANULES	Insufficient energy input	Create additional shear
		Increase barrel temperature
		Increase back pressure
		Increase screw speed
		Preheat granules to 80-100°C/176-212 F
SCREW SLIP	Low friction or premature melting	Reduce temperature in rear zone
		Preheat granulate
		Decrease back pressure
		Decrease screw speed
		Purge to cool down
SHORT SHOTS	Insufficient material	Check hopper content
		Adjust feed setting
		Check transfer point
	Insufficient flow	Increase injection pressure
		Increase injection speed
		Check melt temperature; if necessary, increase temperature
	Too much resistance	Increase diameter of gate, runner, sprue and nozzle orifice
		Increase venting
		User more gates
FLASH	Insufficient locking force	Increase clamping force
		Reduce injection speed
		Reduce injection pressure
		Use profiled injection speed/pressure
		Check transfer point
		Reduce holding pressure
		Reduce melt temperature
	Over-molding	Reduce injection volume
		Check transfer point
		Reduce holding pressure
	Mold problems	Check if mating area is clear
		Clean vents
		Clean parting line
		Check if mold design applicable for the material in use
SINK MARKS AND/OR VOIDS	Too much shrinkage	Increase holding time
		Increase holding pressure
		Decrease injection speed for thick sections
		Increase injection speed for thin sections
		Increase mold temperature
	Mold problems	Increase diameter of gate, runner, sprue and nozzle orifice
		Change position of gate towards thickest section
		Use more gates

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Problem	Cause	Remedy
WELD LINES	Incomplete mixing of two melt fronts	Increase injection speed
		Increase holding pressure and time
		Improve venting at weld line area
		Increase melt temperature
		Increase mold temperature
		Add an overflow well at the weld line area
		Change position of the gate to move weld line to a less critical area
	Air traps	Increase diameter of gate, runner, sprue and nozzle orifice
		Decrease injection speed
		Improve venting
BURN MARKS	Diesel effect due to compressed air	Improve flow
		Change location of the gate
		Improve venting
		Decrease injection speed
FLOW LINES; DELAMINATION	Melt temperature too low	Decrease melt temperature
		Increase melt temperature
		Increase mold temperature
		Increase injection pressure
		Increase injection speed
	Contamination of granulate with other polymers	Increase diameter of gate, runner, sprue and nozzle orifice
		Use clean, virgin granulate
		SILVER STREAKS; SPLAY MARKS.
Degraded material	Reduce melt residence time	
	Use smaller barrel	
	Reduce melt temperature	
	Reduce screw speed	
	Increase gate diameter	
	Reduce injection speed	
	Reduce injection pressure	
Air trapped in the melt	Avoid/minimize decompression	
	Increase back pressure	
	Reduce screw speed	
	Reduce injection speed	
	Reduce injection pressure	
	Reduce temperature in rear zone	
Improve mold venting		

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DISCOLORATION; BROWN STREAKS	Overheated material	Check for dead spots; nozzle and/or hot runner and non-return valve
		Reduce residence time (cycle time)
		Use smaller cylinder
		Reduce melt temperature
		Reduce nozzle temperature
		Check injection unit for wear, causing excessive shear
		Check for contamination in dryer, hopper, etc.
		Reduce injection speed
		Reduce decompression
		Contamination of granulate
Use clean virgin granulate		
BLACK STREAKS	Contamination of granulate	Clean injection unit
		Use clean virgin granulate
	Overheated material	Check for dead spots; nozzle and/or hot runner and non-return valve
		Reduce residence time (cycle time)
		Use smaller cylinder
		Reduce melt temperature
		Reduce nozzle temperature
		Check injection unit for wear, causing excessive shear
		Check for contamination in dryer, hopper, etc.
		Reduce injection speed
Reduce decompression		
Too low melt temperature	Increase cylinder temperature, esp. at hopper side	
BRITTLENESS	Degraded material	Reduce residence time (cycle time)
		User smaller cylinder
		Reduce melt temperature
		Reduce screw speed
		Increase gate diameter
	Too cold material	Reduce amount of regrind
	Wet material	Increase melt temperature
	Internal stresses	Use dried material
		Reduce holding pressure
	Non-homogeneous melt	Check transfer point
Increase mold temperature		
Contamination of the granulate	Increase back pressure	
Components are dry	Check for contamination	
Design problem	Moisture condition components	
	Avoid sharp corner; apply radii	

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Problem	Cause	Remedy
DULL SURFACE	Insufficient mold finish	Poor mold surface
	Unreinforced grades	Increase mold temperature
		Reduce thermal hot spots in mold (opposite gate)
		Increase melt temperature
GLASS FIBERS ARE VISIBLE	Glass fiber reinforced grades	Increase injection speed
		Increase melt temperature
		Increase holding time
		Wet material
DELAMINATION	Wet material	Use dried material
	Internal shear stresses	Use moderate injection speed
		Increase mold temperature
		Increase melt temperature
		Increase gate diameter
	Contamination	Use clean virgin material Clean injection unit
MOLD EJECTION PROBLEMS	Overpacking	Reduce injection speed
		Check transfer point
		Reduce holding pressure
		Reduce holding time
	Mold design problems	Check for mold damage or undercuts
		Use draft angle
		Use longer cooling time
		Change mold temperature
WARPAGE	Differential shrinkage (unreinforced grades)	Adjust mold temperature of each mold half
		Assure uniform wall thicknesses
		Increase cooling time
	Differential shrinkage (glass fiber reinforced grades)	Change location of the gate
		Reduce injection speed
		Increase mold temperature
		Increase melt temperature
		Use mineral filled/low warpage material
	Internal stresses	Reduce holding pressure
		Reduce holding time
		Check transfer point
		Increase mold temperature

Please contact Envalior in case more information is required from the aspect of material processing.

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