

# 5 INJECTION MOULDING

## INJECTION MOULDING TROUBLESHOOTING GUIDE

Problem/Issue	Cause(s)	Potential Solution(s)/Action(s)
Brittle mouldings	Sharp corners, notches	Increase radii
	PE grade has insufficient impact strength	Use lower flow and/or lower density grade of PE
	Excessive orientation	Increase melt temperature
	Inadequate thickness	Increase thickness of moulding
Burn marks. Carbonised material at end of flow path	Insufficient venting	Increase venting
	Injection speed too high	Reduce injection speed
	Melt temperature too high	Reduce barrel and nozzle temperature settings
Delamination	Incompatible masterbatch	Ensure PE based masterbatch is used
	Contaminant	Check feed for contamination
	Material freezing prematurely	Increase temperature settings. Increase gate size
Demoulding difficulties	Poor design, insufficient draft angles	Increase draft angles, incorporate “slip” additive
	Over packing	Reduce injection speed and or second stage time/ pressure, use higher flow PE grade
	Excessive second stage	Reduce second stage pressure and/or time
Distortion	Moulded in stress/ orientation	Increase melt temperature. Use increased melt flow index grade of PE
	Ribs too thick	Employ more, but thinner ribs to impart stiffness
	Variation in thickness	Use ribs for varying thickness rather than solid walls
	Variation in mould cooling	Increase cooling channels in difficult to cool areas
	Sink marks	Increase second stage pressure and or time
	Gate freezing off too quickly	Increase gate size
Flashing	Inadequate clamp force	Increase clamp force. Move mould to a higher clamp force machine
	Excessive vent size	Reduce venting
	PE melt flow index too high	Change to a low flow grade of PE
	Excessive injection speed	Reduce injection speed
Matt or streaky surface	Gate inappropriately positioned resulting in snake – like jetting	Position gate so that the material is forced to change direction immediately upon entering the mould
	Melt disturbance resulting Matt – Gloss pattern	Increase melt temperature. Reduce injection speed
	Moisture	Dry the polyethylene or masterbatch
	Incompatible masterbatch	Change masterbatch to one with a PE base
Poor colour homogenisation	Back pressure too low	Increase back pressure
	Masterbatch not compatible	Ensure PE based masterbatch is used
	Barrel size too small, insufficient shots in barrel	Move to a larger machine
	Masterbatch add rate too low	Use masterbatch with lower pigment concentration at higher add rate
	Temperature too low	Increase temperature settings

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<b>Short shots. Incompletely filled mouldings</b>	PE melt flow index too low	Change to higher melt flow index grade
	Melt temperature too low	Increase melt temperature.
	Inadequate vent size	Increase venting
	Inadequate thickness	Increase thickness
	Insufficient injection speed	Increase injection speed
	Insufficient gating	Increase gate size or number
<b>Weak weld lines</b>	Melt temperature too low	Increase temperature settings
	Flow of polymer too low	Use higher melt flow grade
	Injection speed too low	Increase injection speed
	Gate(s) too far from weld line	Move gate or increase number of gates

### Disclaimer

The proposed solutions in this guide are based on conditions that are typically encountered in the manufacture of products from polyethylene. Other variables or constraints may impact the ability of the user to apply these solutions. Qenos also refers the user to the disclaimer at the beginning of this document.