EXTRUSION COATING TROUBLESHOOTING GUIDE

Problem / Issue	Cause(s)	Potential Solution(s) /Action(s)
Adhesion	Low melt temperature	Increase the melt temperature to help oxidise the surface and prevent premature cooling Increase back pressure in the extruder
	Air gap too low	Increase the air gap to get adequate oxidation of the surface
	Line speed too high	Decrease the line speed to allow additional time in the air gap for oxidation of the surface
	Substrate surface untreated	Pre-treat substrate (such as corona treatment, flame treatment and ozonation) or add a chemical primer to improve wettability
	Pre-treatment ineffective	Inspect treatment method, adjust treatment settings as required, ensure primer coverage is adequate and drying time is sufficient
	Sticking to chill roll	Decrease the chill roll temperature
	Low nip roll pressure	Increase the pressure of nip rolls, ensure pressure is evenly distributed
	Air gap too high	Decrease the air gap to avoid premature cooling
	Low chill roll temperature	Increase the temperature of the chill roll to help overcome quick cooling
	High melt temperature	Decrease the melt temperature to avoid thermal degradation, decrease back pressure in extruder
	Surface active additives (e.g. slip)	Modify the additive package
	Inadequate resin selection	Ensure resin is compatible with substrate, lower viscosity (high melt index) resins adhere better to porous substrates
Apple sauce	High melt temperature	Decrease the melt temperature
	Inadequate mixing or poor melt quality	Increase the back pressure of the extruder and use finer screen packs
	Interfacial instability in coextrusion	Check flow properties of resins
	Contamination	Ensure adequate purging time and cleaning of transfer lines Check resin for any foreign material
Die Lip Build-Up	Additives	Modify the additive package
	High melt temperature	Decrease the melt temperature to avoid thermal degradation
	Melt scraping against die lip	Machine the die lip Change angle at which the melt contacts the chill roll
	Excessive resin shear	Lower output Increase the die lip temperature Increase the die gap
Draw Resonance	High draw ratio	Decrease the die gap Increase the coating weight
	High melt temperature	Decrease the melt temperature
	Melt strength of polymer is too low	Select higher melt strength resin
Edge Tear	High draw ratio	Decrease the die gap Increase the coating weight
	Low melt temperature	Increase the melt temperature
	Incorrect deckle settings	Decrease the off-set between internal deckle settings
	Inadequate die design	Seek advice from manufacturer

Problem / Issue	Cause(s)	Potential Solution(s) /Action(s)
Edge Tear continued	Melt strength of polymer is too high	Select lower melt strength resin
	Splicing	Reverse splice direction, seek advice from machine manufacturer
	Melt index too low for coating weight	Use higher melt index resin
Gauge bands	High melt temperature	Decrease the melt temperature to increase melt viscosity
	Dirty die	Clean the die to remove any build-up of material
	Variation in temperature control	Check the temperature zones are running correctly and use flat temperature profile
	Inadequate die set-up	Adjust the die bolts accordingly
	Poor melt quality	Increase the back pressure of the extruder and use finer screen packs
Gels and voids	Moisture	Check raw materials for moisture (e.g. resin and substrate) Ensure storage conditions are dry
	Degradation of polymer	Decrease the melt temperature Check temperature zones are running correctly
	Contamination	Ensure adequate purging time and cleaning of transfer lines Check resin for any foreign material
	Inadequate mixing	Increase the back pressure of the extruder and use finer screen packs
	Dirty die	Clean the die to remove any build-up of material
Neck-in	High melt temperatures	Decrease the melt temperature
	High draw ratio	Decrease the air gap Increase the coating weight
	Melt strength of polymer is too low	Select higher melt strength resin
Odour/Taint	High melt temperature	Decrease the melt temperature to reduce thermal degradation
	Air gap too high	Decrease the air gap to reduce the time for oxidation of the surface
	Additives	Modify the additive package
Pinholes	Substrate roughness	Use flame treatment on the substrate
	High melt temperature	Decrease the melt temperature
	Low coating weight	Increase the coating weight
	Dirty or damaged idler rollers	Inspect and clean the idler rollers or replace if necessary
	Excessive tension	Decrease the tension accordingly
Sealability	High melt temperature	Decrease the melt temperature to reduce thermal degradation
	Air gap too high	Decrease the air gap to reduce the time for oxidation of the surface
	Additives (e.g. slip)	Modify the additive package as some additives may bloom to the surface and contaminate the seal
	Inadequate sealing conditions	Increase the sealing temperature or dwell time
	Contamination	Clean the chill roll surface and limit handling of coating surface
	Inadequate resin selection	Use higher melt index resin
	Excessive corona treatment	Check treatment level and adjust if necessary
Surging	Inadequate screw design	Seek advice from manufacturer, increase back pressure in extruder
	Inconsistent hopper feeding	Decrease the temperature at the feed zone to stop bridging

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.