

Injection Defect Trouble Shooting Guide

Problem	Possible Cause	Suggested Remedies
Acetaldehyde High Level (AA)	Incorrect profile for Low AA level	1) Reduce Machine Heats 2) Reduce Mold Temperatures 3) Reduce Screw R.P.M.(Shear heat) 4) Reduce injection fill (Shear heat) 5)Reduce Transfer Rate 6) Minimize Screw Cushion 10 - 20 mm 7) Minimize residence time. 8) Remove barrel head filter 9)Q.A. check Material I.V.
Bubbles in preforms	Incorrect Profile Set Up	1) Check Master Process Sheet 2) Transfer Cushion too high , reduce cushion to 10-20mm
	Melt Too Cold	1) Barrel Heats Too Low, Increase Barrel Heats 2) Screw R.P.M. Too Slow , Increase R.P.M. 3) Increase Back Pressure
	Wet Material **UPON DETERMINATION OF WET MATERIAL , SHUTDOWN PRESS AND CORRECT	1)Check Dryer Temperature is at Set Point 2)Check for low level problem reducing residence time. (Previous loading faults) 3)Check Dryer Dew Point 4) Check for proper residence time 5)Check for proper air flow in dryer
	Trapped Air /Gasses	1)Increase Screw Back Pressure 2)Increase/ Decrease Screw R.P.M. 3)Increase/ Decrease Drying Time Temperature 4)Gasses trapped in compression zone of screw profile lower Heats at feed throat
	Bad Resin	1)QA check IV 2)Contact MPT, Supervisor, Material Mngr.
	Damaged extruder/ Check Valve	1)Contact Maintenance Mngr. 2) Check Screw / Check valve
Burn Marks	Nozzle tips temperature too high (brown color)	1) Check Master Process Sheet 2) Lower nozzle tip by 2% at a time until burn stops 3) Check duties cycle
	Thermocouple Fault	1)Check manifold thermocouple(s) use spare for quick check. Replace next Mold Maintenance 2)Check sprue thermocouple 3)Check nozzle thermocouple
	*Manifold *Sprue *Nozzles (Brown Color)	
	Nozzle: Nozzle heater touching cavity plate	1) reposition nozzle heater 2)Tighten the nozzle tip using cleaning & installation procedure
	Tip unscrewed	3)Replace or rework gate detail to specification
	tip touching gate	4)Vespel insert missing loaded with p.e.t. and degraded. Install vespel insert.
	Burnt material from barrel	1) Maximize Shot for barrel and Shooting pod and purge 2) Raise heats while performing step one 3) Lower Heats while performing step one

Crystallinity	Process	1)Check Master Process Sheet 2) Raise tip heaters 2% until corrected 3) Raise Manifold temperatures 5 degrees until corrected 4)Add time/ decrease time to valve gate delay close 5)Change position when valve gate open signal
Contamination	Black particles * generated by material degradation	1) Reduce Machine Heats 2) Reduce Mold Temperatures 3) Reduce Screw R.P.M.(Shear heat) 4) Reduce nozzle tips 5) reduce transfer cushion
	Foreign matter in molded preform	1) Hopper contaminated (Drain Hopper) 2) Check material System 3) Check other presses drawing material from same blender, bin 4) Ensure color blender clean from previous run
Degradation of Material	(yellow tint preforms)	1)Check Resin Dryer for proper operation 2)Check machine, mold heats for proper operation
Drool In Cavities	Valve gates function or set point	1)Check Master Process Sheet 2)Position when valve gate open signal is set to open at mold reaches open , select start of mold close. 3)Check valve gate pneumatic valves
Flash	Thread Flash Plastic /debris behind split	1) Check Master Process Sheet 2) Check for debris behind split, plastic in core base 3) Check for slides closing properly, check ejector rods, debris in gib rails 4)Check for parts missing/ or not making transition position 5) Check injection fill rate
	Incorrect Profile Set Up	
	Prime "E" Flash Plastic /debris behind split/core base	1)Check Master Process Sheet 2)Check for plastic in core case 3)Check for split damage
	Parting line flash Plastic/debris behind split/core base	1)Check Master Process Sheet 2)Check Clamp tonnage is not below injection max fill pressure 3)Check for loose/ worn split
	End Cap Flash Separated / damaged end cap	1)Check cavity for damage end cap 2)Pull end cap/cavity replace
Gate Quality	Long Gate / Stretched gate /Vested	1)Check Master Process Sheet 2)Tips too High lower tips (especially at start up) 3)Melt Viscosity low, injection fills quicker causing sheer at tip. Add 1.second of cooling (return to master process sheet after press runs for a half hour)
	Sunken Gate/ dimple	1)Check Master Process Sheet 2)Tips too High lower tips (especially at start up) 3)Melt Viscosity low, injection fills quicker causing sheer at tip. Add 1.second of cooling (return to master process sheet after press runs for a half hour)
	Gate Flaking/ blemish	1)Check Master Process Sheet 2)Increase nozzle tip temperature 3) Reduce hold pressure 4)adjust valve stem close delay time *excessive clearance in gate insert Maintenance item
	Delamination	Check water cooling system pressure, flow, and temperature Ex. Recent mold c/o, check all water valves.
	Crystal gate	*see Crystallinity
	Pin hole /Void in gate	* See Pin Hole

Glycon screws ***	Low IV material "bubbles "	Set transfer cushion to 10 - 15 mm Increase Screw backpressure / Trade off between screw r.p.m.
	High IV material " Bubbles "	Set transfer cushion to 25 - 35 mm Increase barrel heats Increase Screw backpressure / Trade off between screw r.p.m.
Haze	Insufficient mold cooling	Check water cooling system pressure, flow, and temperature Inline water filter clogged reducing flow Blockage in cooling channels
	Resin moisture level too high	Check moisture level Check dryer operation functions
	Resin temperature too cold	Check dryer operation functions Check cone in dryer
	Insufficient melt temperature	Increase barrel heats Increase shear heat back pressure/ screw speed Melt head pressure loss Increase screw cushion
Hot core (preform buckling)	Insufficient mold cooling	Check water cooling system pressure, flow, and Temperatures Increase cooling time Check robot for partial part in take out tube
	insufficient packing	Increase hold time / pressure
	over packing	Reduce hold pressure / time
	Excessive shrinkage (preform temperature too high)	Reduce machine heat temperature Reduce mold temperature
Intrinsic viscosity (IV) drop	Check incoming resin IV	Measure IV before/ After drying
	Moisture level in resin too high	Check moisture level Check dryer operation functions
	Thermal degradation	Reduce machine heat temperature Reduce shear heat (screw r.p.m.) Reduce shear heat (Transfer / injection rate) Reduce screw cushion (cushion should range 10 -20 mm) Reduce material residence time by cycle time reduce mold temperature
Minute short shots (Sealing surface voids) (voids in support ledge)	Mold Venting	Check/ clean mold neck ring vents clean Check vent size to mold drawings Reduce fill rate Reduce clamp tonnage
Moisture	Mold condensation Water on mold surfaces	Check room dewpoint Check for water leaks ejector plate hoses Check for cavities , splits ,cores
Nicks on the support ledge	Parts not clearing the thread splits	Leader pins dry , lube pins ejector back plate binding up , lube back plate Check knockout block for being loose Check knockout rods for being loose/broken
	Ejector over stroking causing pinched parts	Reduce ejector pressure / speed check clearance between robot plate and ejector plate fully forward
	Splits opening too early	Shim cam bars to start splits opening later
Parting Line Indentation	Mold over packed	Reduce hold pressure Increase injection transition position Reduce shot size
	Insufficient part shrinkage	Increase cooling time Check water cooling system pressure, flow, and temperature Increase valve gate delay close time

Pinhole (void in gate)	Gate area too hot	Check water cooling system pressure, flow, and Temperature Reduce nozzle tip temperature Increase cooling time check tip heater band is not touching gate insert
	Valve gate not closing properly	Adjust vale gate open time after hold as necessary Increase manifold temperature Check proper valve gate pressure Check valve gate air muffler/ pneumatic spool Check for worn valve stem replace as needed Check for worn valve stem piston seals
	Insufficient packing	Reduce hold pressure
Scratches /surface blemishes	Mold surface damage	Check core , cavity split for damage
	Parts too hot	Check water cooling system pressure, flow, and temperature Check robot cooling Increase robot dwell time Increase cooling time
	Mold dust on cavity surface	Clean cavity * Dust will reappear in time see AA profiling to help reduce the frequency needed to clean dust from tool
Short shots	insufficient shot	Increase shot size Reduce transition position Increase hold time / pressure
	Injection rate too slow	Increase injection speed/ pressure * injection fill time should reflect a second for every gram a part weights 21g would fill 2.1 seconds
	Resin viscosity too high Melt temperature too low	Increase melt temperatures increase nozzle tip temperatures
	Mechanical failure	valve stem not shifting properly Check valve stem pneumatic valve for failure Vent is crushed on threadsplit causing insufficient venting. Replace split
Splay	Heat Splay	Reduce nozzle tip temperature Reduce manifold temperature reduce sheer heating * screw r.p.m. * back pressure * transfer rate check for tip/ mold heater overriding
	Moisture Splay	Resin not completely dry (check dryer) Trapped gas from unmelt ,increase back pressure Increase transfer cushion
Warped parts (sink marks)	Insufficient material	Increase shot size Reduce transition position
	Insufficient packing	Increase hold pressure/time
	Excessive shrinkage	Reduce machine heat temperature reduce mold temperature
	Mold cooling	Check water cooling system pressure, flow, and Temperature Increase cooling time
	Mold venting	Clean mold vents Reduce injection pressure/speed
	Over packed	Reduce hold pressure
	Mechanical failure	Check valve stem pneumatic valve for failure

Wall Thickness Variation (T.I.R.)	Core deflecting high pressure	Reduce injection fill pressure Reduce injection fill speed Reduce hold pressure / time
	Core deflecting uneven melt flow	Check manifold heats are even Check distributor , nozzle zones Check remixer filter is not clogged
	Mold misaligned	Check for worn components Check core pin bent / damaged Check mold level Check for shim stock clamp half
Weld Lines	Melt flow too cold (slow injection)	Increase injection speed Increase injection pressure Increase hold speed Increase hold pressure
	Melt flow too cold (Mold Venting)	Clean mold neck rings and locking vents Check mold vents against drawings (crushed) Reduce clamp tonnage
	Melt flow disrupted (Contamination)	Check for moisture Check for contamination (oil , silicone, etc.)
Unmelts	Resin temperature too cold insufficient melting temperature	Check dryer operation functions Increase extruder temperatures Increase shear heating process (screw r.p.m. / back pressure) Increase transfer cushion
Voids in the support ledge		Reduce injection fill rate Check mold venting, clean as needed Replace thread split (vents crushed) Reduce mold tonnage Increase hold pressure/time