Troubleshooting Guide for INJECTION MOLDING Phenolic & Granular Polyester

PROBLEM	CORRECTIONS: Mold Temperature	Primary Pressure	Holding Pressure	Injection Speed	Barrel Temperature	Screw Speed	Screw Back Pressure	Clamp Pressure	Shot Size	Hold Time	Cure Time	Refer to Comment Sheet
Ball & Socket		3D	4D	2D								1S
Bulge Opposite Insert	1I										2I	3C,4E
Cure Blister	1I				2I		3I				4I	
Dull Appearance	1I				2I						3I	4CC,5U
Flash - Excessive		2D	3D	4D			5D	6I	1D			
Flow Lines	5I	1D	2D	4D						3I		6S
Gas Burns		3D	4D	2D								1G,5T,6GG,7HH, 8K
Hard Spots												1B,2P
Injection Too Slow		2I		1I	3I		4I					
Mold Staining												1G,2CC,3U
Non-fills or Short Shots	2D	3I	41				5I		1I			6F
Nozzle Freezes Up		3I	4I	5I	1D		2D					6B
Orange Peel	1I		3I				2I	4I		5I		
Part Shrinkage - Excessive	3I	1I	2I		4I		5I				6I	
Part Shrinkage - Insufficient	1D	2D	3D							4D	5D	
Rubbery Parts or Runner	2I				4I		3I				1I	5Q
Screw Does Not Go "Home"		1I	2I		3I		4D		5D			6B
Screw Pickup is Erratic						1D	2I					3A,4F,5W
Screw Pickup is Too Slow						4I	2D					1F,3A,5W
Sink Marks	5I	3D	4D	1D	2D							6S
Skin Blisters		3D		1D			4I					2G
Sprue Sticking	5I	3D	4D								6I	1J,2AA,7BB,8H
Sticking in Mold		2D	3D					5D			4I	1Y,6U
Subgates Sticking in Mold												1EE,2FF,3R
Warpage when Ejected	1I				2I		3I					4L,5M,6Q,7N
Warpage after Cooling	1I				2I		3I				4I	5Z,6Q
Wood Screwing						1D	2D					3A,4F

Legend: Number = Priority I = Increase D = Decrease Other Letters = Comment ID

Comment Sheet for INJECTION MOLDING Phenolic & Granular Polyester

Process Related Suggestions

A. Increase the barrel temperature of only the rear zone.

B. Check the sprue tip for a "soft bulb" on the end. If it is not soft, one of the following methods can be used to reduce the heat transfer from the mold to the nozzle:
   - Put an air blow on the nozzle.
   - Use a 1/2" spherical radius nozzle in conjunction with a sprue bushing having a 3/4" spherical radius.

C. Heat inserts to mold temperature before using.

E. Use a reduced size insert.

F. Check to see if there is a problem with the material feeding out of the hopper and into the feed throat of the injection unit. Material may be bridging in the hopper or feed throat.

G. Check the vents for blockage.

H. Decrease Clamp Slow Open Speed.

J. Make sure that the orifice of the sprue bushing is larger than the orifice of the nozzle.

K. If mold is vacuum vented, check if system is pulling a minimum of 21" Hg in the mold. If not, resolve problem with vacuum system. Vacuum venting has been shown to be more effective when used for processing polyester materials than processing phenolic materials

L. Decrease ejection speed.

M. Decrease ejection pressure.

N. Observe parts as they drop from mold onto landing for potential deformation as well as condition from part picker if being used.

Material Supplier Related Suggestions

P. Contact Material Supplier to discuss hard spots within material.

Q. Request from material supplier a version of the material that has a *lower hot rigidity or deflection specification.*

R. Request from material supplier a version of the material that has a higher hot rigidity or deflection specification.

Tooling Related Suggestions

S. Review mold design, and if design allows, relocate gate to a side of the part to create turbulence instead of parallel flow with the part geometry.

T. Add a mold breathe to the process.

U. Check the condition of the mold plating and re-plate if necessary. If the mold is un-plated, polishing and plating may be necessary.

V. Check the parting line for wear or damage and repair as needed.

W. Check the screw and barrel for wear and if necessary, recondition or replace them.

X. Check the mold for wear or staining. Polish out any mold stains and remove any undercuts that may have been worn into the mold.

Y. Add undercuts to hold the part in the moving half of the mold until it is ready to be ejected.

Z. Use cooling fixtures to hold the part flat as they cool.

AA. Check sprue for undercuts / damage. Address as needed.

BB. Check the sprue puller design and revise as needed.

CC. Polish the area(s) of mold that are dull or are stained.

DD. Increase the gate and runner size.

EE. If a new mold, check subgate design and correct as needed.

FF. If an existing mold, check subgates for damage or wear and repair or replace as needed.

GG. Review vent depth.

HH. Review vent location. If tool allows, add additional vent(s) or change location of current vent.