



Cycletime Tips - Automotive

Volume 6: First-Stage Injection Pressure Set Point

The Scientific approach to processing involves optimizing first stage fill time, gate freeze-off time, second stage time, pressure, and cooling.

In this Tech Tip I want to talk about first stage only. Recently I've noticed that molders are setting first stage pressure to the maximum limit. This is fine when you are initially optimizing first stage using the scientific approach. After you have established the fill time, there is a transfer pressure associated with the position of actual transfer to second stage. In order for the ram to attenuate for viscosity changes, the 1st stage injection pressure set point has to be set higher than the average transfer pressure. How much higher will vary from machine-to-machine. For example, the pressure needed to operate the velocity control valve on a Van Dorn or Cincinnati machine may be 250/300 P.S.I. while an Engles machine may require as high as 500/600 P.S.I. to repeat fill speed.

If the average transfer pressure is 900 P.S.I., for example, do not set the first stage pressure set point at maximum. That's because if you are running a 4-cavity tool and one gate gets restricted the ram will fill the other three cavities using the machines maximum pressure. This can cause serious cavity damage and possibly cause personal injury. I had one gentleman tell me that he always uses a maximum high-pressure set point. He stated that as a back up to protect the tool from damage he adjusts the injection timer slightly over established actual fill time. My question to him was, "What happens if this timer fails?"

My suggestion to our molders is to know at what pressure your machine's velocity control valves operate and adjust your first stage injection pressure set point accordingly.

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