



Cycletime Tips - General

Volume 43: First Stage Injection Set Point

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

In this letter I want to talk about first stage only. During the past several weeks I've noticed that molders are setting first stage pressure to the maximum limit. This is fine when you are optimizing first stage initially using the Scientific Molding 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. A delta pressure can be established by continuing to raise the first-stage pressure set point and observing the fill time. When the fill time stabilizes, the set point can be recorded and used as the standard for all molds.

If the average transfer pressure is 900 P.S.I., for example, don't set the 1st stage pressure set point at maximum. The reason being that 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 1st stage injection pressure set point accordingly.