The Role of Melt Viscosity in Injection Molding

The melt viscosity of a given polymer melt is very important in injection molding. Polymers are non-Newtonian fluids and their viscosity is dependent on shear rate, as well as temperature. The biggest reductions in polymer viscosity occur at higher shear rates. Shear rates are measured in reciprocal seconds. The optimum shear rates at a given temperature occur at very fast injection fill times.

I usually recommend generous tool venting to allow for fast injection fill times, and low polymer melt viscosities. This becomes especially important in tools with thin wall sections and long flow lengths.

It is suggested that the tooling be optimized for the part design and the injection-molding process. The additional venting will allow for fast displacement of any trapped air in the tool. This air could lead to burning of the part as well.

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