

## **171e Flow Dynamics in Injection Molding with Microfeatures**

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Filling the microchannels is very important in designing micro-injection molding, microdevices, etc. In this paper, flow dynamics was studied in injection molding with microchannels. Transparent PMMA molds were designed and the flow dynamics was observed using fluorescence microscope and PS fluorescence spheres. The experiment was performed with PEO solutions, HEC solutions and silicone oil. The effect of main flow velocity, inlet pressure, viscosity, relaxation time and extensional properties on the flow pattern, vortex, and flow competition between the base plate and the microchannels was studied. The flow observation was used to explain previous filling length results in microchannels during micro-injection molding. Finally, the simulation with FENE dumbbell (chain) model based on the CONNFESSIT approach was carried out to compare with the experimental results on the vortex size at the steady state.