



ON THE EFFECT OF MELT COMPRESSION ON MOLD FILLING

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In-mold measurements show that the actual mold filling rates can be significantly smaller than the injection rates that are imposed by the screw of the injection molding machine. The physical cause of this effect is the compressibility of the melt, and the extent of the effect depends on the material that is injected, the mold geometry and the injection molding machine. Particularly for thin-walled parts, where mold filling is a cutting-edge competition between filling speed and rate of solidification, the compression effect can be dramatic. Using a simple model that employs the governing equations in dimensionless form, we analyze the parameters that play a role and summarize their effects in a “melt compression graph.”