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Micro Cavity Filling Behavior Studies of 1mm Diameter Micro Gear

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For cavity filling behavior analysis of micro components using the Moldflow, the mid-plane and fusion mesh method may not be suitable to precisely represent the 3D structures of the micro molded parts as micro parts usually do not have the relatively thin and uniform features that support the use of the mid-plane and fusion mesh method. As the volume of the 1mm diameter micro gear studied is very tiny, the volume ratio between the runner system and the micro part is very large. The cavity fill time is therefore extremely short compared with the injection molding conditions encountered for normal plastics components. In this case study, a hybrid approach is applied in handling the runner and gate system in order to capture the cavity filling details. The 3D flow phenomena have been fully explored visually during the mould filling stage. The physical molding experiment results on melt filling pattern and pressure distribution profile have shown good agreement with the Moldflow predictions.