SL 8.5

Initial Steps for a Simulative Prediction of Shear-induced Crystallisation Phenomena in Injection Moulded Parts

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The prediction of inner properties is essential to bridge the gap between injection moulding and mechanical part simulation. To reach this aim , it is essential to feed the mechan ical simulation with initial simulated inner parts properties. These data input , like crystallinity or spherulite diameter, strongly depend on the chosen process parameters and its local position in a plastic part. Initial simulations are fulfilled by self- developed software using internationally accepted and published calculation formula. By doing so it was possible to approximate real-time quiescent crystallisation processes of moulded cross-sections. The obtained results showed a good correlation between simulation and reality. Since then the self-developed software tool SphaeroSim was developed further. Especially a new way of temperature field distribution calculation now enables the software to simulate crystallisation phenomena closer to reality. This evolution offers new potentials for the software to solve even more detailed problems. Thus, a new field of interest aims at the simulation of shear-induced crystallisation phenomena. A selection of approximation methods for its prediction in a cooling polymer melt are presented and discussed in this paper.