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An Investigation of Melt Rotation Technology for Enhanced Injection Molding

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Abstract

This project will focus on studying variations of melt rotation technologies in order to improve BTI's design capabilities with this emerging technology. BTI seeks improved methods to streamline and improve their design methods for applying their patented melt rotation technology marketed as MeltFlipper® technology. The shear induced imbalances developed in runners can not currently be accurately predicted by today's standard injection molding simulation programs. Not being able to use these predictive programs limits their design capabilities. After extensive research with these programs, BTI has found evidence that though the magnitude of imbalance is significantly under predicted, some of the simulation programs can provide a reasonable prediction of the asymmetric melt conditions developed across a runner.

The project will investigate the potential of extrapolating data predicted by various melt flow simulation programs for use in improving BTI's design methods for faster turnaround and improved accuracy of the melt rotation technology. The study will include use of injection molding simulation programs and specially designed test molds/tools to verify the data generated by the programs. The project will include the design and build of the test molds/tools which play a critical role in any simulation verification and application development. The test molds/tools will be of modular design providing an economical means of evaluating the effects of shear induced imbalances and melt rotation on product formation (in single and multi-cavity molds) and product variations which develop within a given multi-cavity molds.