SIM20765

Achieving Accurate Part Shrinkage Data from Moldflow Insight

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Learning Objectives

- Explain the importance of Volumetric Shrinkage in mold building.
- Show that Plastic Industry has been facing a dilemma of cutting steel with published shrinkage values.
- Describe the limitations in the current Autodesk Moldflow software in predicting accurate shrinkage.
- Show the work done to eliminate this dilemma and predict accurate part shrinkage by re-characterizing a material.

Description

Building a Mold with the correct material shrinkage values is crucial for a given plastic material. One of the burning issues that the injection molding industry has been struggling with for decades is to determine the correct material shrinkage prior to cutting steel. Currently, a Tool maker guesses the shrinkage value from the range published by a material supplier prior to cutting steel. Most of the time, this single shrinkage value applies to all 3 coordinate directions. Usually, a mid-point of the range for the shrinkage value has been guessed for tool building.

For glass filled materials, however, the shrinkage in the cross-flow direction is often 2 to 3 times the shrinkage in the flow direction. Thus, choosing one shrinkage value at the mid-point of the range results in a part with vastly different shrinkages in the flow, cross-flow and transverse directions. Subsequently, many compromises may have to be made in order to qualify the part and approve the tool prior to routine production. There is a serious need for a solution to this long standing dilemma. We have therefore been working with Autodesk Moldflow to improve and fine tune the material testing and plastic part simulation in order to predict accurate shrinkage values to eliminate the guess work and make more educated decisions prior to ordering tools.

We have attempted only one material (a 10% Glass Filled Polycarbonate) for this study so far. We will discuss the results with the old and new Moldflow Data during this presentation. This is an on-going project and will expand to several different class of Thermoplastic materials in future.

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Jaykant Desai has been with Schneider Electric (formerly Square D Company), Raleigh North Carolina, for last 17 years. After obtaining his Master's Degree in Plastic Engineering from University of Massachusetts, Lowell, he joined Schneider Electric. Currently, he has been working with the company as a Senior Staff Engineer. He has been using the Simulation Software since the beginning and contributing towards the goal of molding quality parts at the first attempt. Jaykant has also been working with Autodesk Moldflow in order to improve the software capabilities.