

Panus Kalanin 2012: An Investigation on Wall Thickness Distribution in Polymer Blow Molding Process. Master of Engineering (Materials Engineering), Major Field: Materials Engineering, Department of Materials Engineering. Thesis Advisor: Assistant Professor Somjate Patcharaphun, Dr.-Ing. 103 pages.

The effect of processing parameters on the wall thickness distribution of injection and extrusion blow molding parts was investigated in this work. The processing parameters for stretch blow molding included size and temperature of preform, distance and velocity of stretch rod. In the case of extrusion blow molding process, the influences of size and temperature of parison, mold temperature, and blow pressure were studied in details. In addition, the selected experimental results were also extensively verified against the analytical results obtained from Finite Element Method (FEM) which based on Mooney-Rivlin and K-BKZ models. Both simulated and measured results indicated that the size of preform and parison, and distance of stretch rod had significant effect on the wall thickness of blow molding products in comparison with the changes of preform and mold temperatures, velocity of stretch rod, and blow pressure. The analytical results obtained from Mooney-Rivlin model were in good agreement with the experimental results from stretch blow molding process, while the predicted results from K-BKZ model were found to agree very well with extrusion blow molding process.

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