

材料科学与工程

优化带加强筋ABS材料制件沉降斑的气体辅助成型技术

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摘要 详细介绍了气体辅助注射成型的物理过程及其关键工艺参数对成型的影响。以带加强筋的绣花机外壳为例, 考察了传统注射成型与气体辅助注射成型的优缺点。针对气体辅助注射引入的新工艺参数, 介绍了一种CAE技术与统计学的Taguchi正交实验相结合的方法, 设计L9(3⁴)正交实验表在可成型范围内寻求最优工艺参数。结果表明, 气体辅助技术能减少原料, 对有加强筋的制件能有效地去除沉降斑、减弱不均匀收缩及减少内应力, 大大改善制件的表面质量, 增强制件尺寸的稳定性。

关键词 [气体辅助注射成型](#) [传统注射成型](#) [工艺参数](#) [加强筋制件](#) [沉降斑](#) [实验设计](#)

分类号

Optimizing sink marks of ABS part with ribs by gas assisted injection

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Abstract

Gas assisted injection molding (GAIM), as an innovative molding technique, has received extensive attention in recent years. GAIM can effectively decrease sink marks and volumetric shrinkage of the part, while GAIM is inherently more complex than conventional injection molding. At the same time, it involves many additional process parameters, such as gas delay time, gas pressure and gas injection time. In this study gas channels supplant ribs were used to achieve stable and smooth surface quality. In order to find optimum process parameters of GAIM, the experimental design of the Taguchi method was used to determine the GAIM conditions, and the cases were simulated by using the integrated commercial software packages. All molding conditions and affecting factors were discussed regarding the depth of sink marks of the shell of a machine. The results showed that the gas channels supplant ribs can effectively reduce raw material consumption, eliminate sink marks, diminish differential shrinkage and residual stress, improve finish surface, and enhance stability of part dimension.

Key words [gas assisted injection molding](#) [conventional injection molding](#) [parameter](#) [ribs part](#) [sink marks](#) [design of experiment](#)

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