

NUMERICAL OPTIMISATION OF GATING SYSTEM PARAMETERS FOR ALUMINUM METAL CASTING BY USING TAGUCHI'S ROBUST DESIGN TECHNIQUE

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ABSTRACT

An optimization technique for design of gating system parameters of a cylindrical aluminium casting based on the Taguchi method is proposed in this paper. The various gating systems for a casting model of aluminium are designed. Mould filling and solidification processes of the aluminum casting were simulated with the PROCAST 2009.1. The simulation results indicated that gating system parameters significantly affect the quality of the aluminum casting. In an effort to obtain the optimal process parameters of gating system, an orthogonal array, the signal-to-noise (S/N) ratio, and analysis of variance (ANOVA) were used to analyze the effect of various gating designs on cavity filling and casting quality using a weighting method.

KEYWORDS: Taguchi method, Computational simulation, Optimisation, Gating system, Aluminium casting.