Quality Improvement of a Casting Process Using Design of Experiments

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Resumen

To minimize the amount of castings which do not meet customer specifications, it is necessary not only to identify the parameters related to specific defects, but also to identify the levels of these parameters to produce acceptable parts. This research study was aimed at the optimization of centrifugal pumps production, using the Response Surface Methodology (RSM) in a company producing cast iron components. Factors such as clay and moisture percentages and mold hardness were predominant for the control of the production process. Three different levels of each factor were considered for experimentation. The statistical software package Statgraphics Centurion was used to analyze and optimize the process parameters whose values were adjusted by experiments confirmation. The most important parameters were identified by analysis of variance (ANOVA). The optimal configuration of process parameters validated by confirmatory experimental runs produced a high percentage of non-defective impellers. This led to the conclusion that the careful adjustment of the parameters of prevalence of process is necessary because these have significant effects on improving the quality of the parts produced.

Palabras clave

Design of Experiments, Quality of Castings,Variance (ANOVA), Optimization, Quality Improvement in Foundry.

Texto completo:

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