

Reliability Enhancement by Parameter Design in Ferrite Magnet Process

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Abstract : Ferrite magnet is widely used in many automotive components such as motors and alternators. Magnets used inside the components must be in good quality to ensure the high level of performance. The purpose of this study is to design input parameters that optimize the ferrite magnet production process to ensure the quality and reliability of manufactured products. Design of Experiments (DOE) and Statistical Process Control (SPC) are used as mutual supplementations to optimize the process. DOE and SPC are quality tools being used in the industry to monitor and improve the manufacturing process condition. These tools are practically used to maintain the process on target and within the limits of natural variation. A mixed Taguchi method is utilized for optimization purpose as a part of DOE analysis. SPC with proportion data is applied to assess the output parameters to determine the optimal operating conditions. An example of case involving the monitoring and optimization of ferrite magnet process was presented to demonstrate the effectiveness of this approach. Through the utilization of these tools, reliable magnets can be produced by following the step by step procedures of proposed framework. One of the main contributions of this study was producing the crack free magnets by applying the proposed parameter design.

Keywords : ferrite magnet, crack, reliability, process optimization, Taguchi method

Conference Title : ICIET 2015 : International Conference on Industrial Engineering and Technology

Conference Location : Istanbul, Turkey

Conference Dates : January 26-27, 2015