

Parametric Screening and Design Refinement of Ceiling Fan Blades

Authors : Shamraiz Ahmad, Riaz Ahmad, Adnan Maqsood

Abstract : This paper describes the application of 2k-design of experiment in order to screen the geometric parameters and experimental refinement of ceiling fan blades. The ratio of the air delivery to the power consumed is commonly known as service value (SV) in ceiling fan designer's community. Service value was considered as the response for 56 inch ceiling fan and four geometric parameters (bend position at root, bend position at tip, bent angle at root and bent angle at tip) of blade were analyzed. With two levels, the 4-design parameters along with their eleven interactions were studied and design of experiment was employed for experimental arrangement. Blade manufacturing and testing were done in a medium scale enterprise. The objective was achieved and service value of ceiling fan was increased by 10.4 % without increasing the cost of production and manufacturing system. Experiments were designed and results were analyzed using Minitab® 16 software package.

Keywords : parametric screening, 2k-design of experiment, ceiling fan, service value, performance improvement

Conference Title : ICIEMS 2014 : International Conference on Industrial Engineering and Management Sciences

Conference Location : Singapore, Singapore

Conference Dates : July 05-06, 2014