

Developments and Innovative Design of Portable Cross Flow Cooling Fans

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ABSTRACT

The purpose of the study is to generate an innovative cross-flow fan to fulfill the thermal demand of notebooks. The design characteristics have small volume, light weight and portability. This study was executed by fan design theory, CFD simulation, aluminum extrusion manufacturing and experiment verification. First of all, the fan blade shape was designed by choosing from the cross-flow fan geometric design parameters. Thereafter, by using ANSYS CFX numerical software, the flow field associated with the fan was simulated. To manufacture the make-up for experimental verification, the designed fan will be manufactured by the aluminum extrusion; the fan housing geometry will be expressed in the CAD/CAM format the CNC mill. Consequently, the accuracy and feasibility of design scheme and numerical system can be verified according to these experimental results. The research results show that the innovative design of portable cross-flow fan with five blades, motor speed of 4500rpm will export the average wind speed value up to 1.87m / s. Comparison of experimental results with simulation analysis of flow field, the difference is around 16.6%.

Keywords : Cross-Flow Fan、ANSYS CFX、aluminum extrusion

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