

# The development of exhaust fan housing with ceiling mounting for high rise buildings by using DFMA

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## **ABSTRACT**

Design for manufacturing and assembly (DFMA) is widely applied in many industries to optimize the manufacturing and assembly process at the early stage of design, with the aid of the CAD model. Many researchers apply the DFMA to increase assembly efficiency, by decreasing the number of parts from a product, decreasing the manufacturing cost, and reducing assembly time. Therefore, this research applies DFMA to develop exhaust fan housing with ceiling mounting for high rise building type with the same purpose, and at the same time to justify that the method can overcome the problem of assembly time in a production line. Both designs from before and after the application of DFMA, are being compared by using finite element simulation and experimental. The simulation employs stress analysis, to predict the strength of those designs. While the experimental uses a manufacturing cost survey, real assembly time survey and failure test to show the advantages of DFMA design results. The research result shows that the DFMA method can decrease the manufacturing cost by 0.44%, and the assembly time by up to 2%, and able to withstand the entire mass of the ceiling mounting fan.

## **KEYWORDS**

DFMA; Exhaust fan; FE model; Manufacturing cost; Total assembly

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