

# Improvement of torque density spoke type BLDC motor using new hollow rotor topology

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## Abstract

This paper discusses an improvement of high torque density spoke type BLDC motor by using new hollow rotor topology. Hollow rotor topology could maximize the contribute flux from permanent magnet and eliminate unused flux which limit the performance of standard spoke type BLDC motor. This method is used by improving rotor of spoke type BLDC motor where area below permanent magnet is fill with air. Finite Element Method (FEM) is used in modelling hollow rotor topology. Prototype of hollow rotor BLDC motor had been fabricated and measured experimentally. For validation, FEM result is compared with measurement where the difference between both result is 8%. The analysis is further carried out for torque and speed characteristics. Torque density of new hollow rotor is the highest which is 62 Nm/m<sup>3</sup> when compared to other selected motor that are available in the market. © 2017 Praise Worthy Prize S.r.l. - All rights reserved.

### Author keywords

BLDC, Hollow-Rotor, Spoke Type, Torque Density