ABSTRACT

The development of electric motors is very popular in Indonesia, besides that electric motors include environmentally friendly vehicles. In general, electric motors in Indonesia use one type of in wheelhub brushless DC motor (Wheelhub type BLDC motor). BLDC in wheelhub motors have advantages including easy installation, having a light mass, optimal torque, high power density, and easy to get on the market. The BLDC motor in wheelhub has a brushless DC motor performance that is strongly influenced by the aspect of the thickness of the motor magnet so that it has an impact on the torque and efficiency produced in the motor. So that to get the optimal torque and rpm output results from the wheelhub brushless DC motor application is done by identifying the appropriate motor magnet thickness. The existing wheelhub motor design is simulated using Ansys Motor CAD software. In the simulation, the thickness of the magnet in the motor will be varied by 2.2 mm, 2.6mm, and 3 mm so as to obtain various torque and rpm values. The magnetic thickness of the wheelhub motor produces the highest torque and rpm values and is then realized to modify the existing wheelhub motor (Volta). The main objective of this research is to analyze the changes in magnetic thickness that occur in wheelhub motors. This research makes a significant contribution to our understanding of the dynamics of the motor wheel hub industry in Indonesia by providing insights into changes in magnetic properties and technological advancements. These implied findings can be used as a starting point for a more thorough design process for more efficient and durable motor wheel hubs in the long run.

The tests were conducted to validate the simulation results of the existing wheelhub motor and the wheelhub motor that has been modified in terms of magnet thickness. The existing testing process is carried out using ANSYS Motor CAD software, researchers can analyze the performance and characteristics of the motor virtually before it is applied to the motor device. ANSYS Motor CAD, used to simulate various simulations and designs to provide the best rpm, torque, and efficiency values of the modified wheelhub motor.

Keywords: BLDC Motor, Torque, RPM