

# **ANALYSIS OF THE DIFFERENCE BETWEEN LITHIUM ION 16850 AND VRLA BATTERIES ON TORQUE AND MAXIMUM POWER IN A 1 KW 48V ELECTRIC VEHICLE**

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## **ABSTRACT**

The increasing population of conventional 2-wheeled motorcycles is causing a decrease in petroleum reserves and an increase in pollution, leading to the development of electric vehicles. Electric vehicles use electric motors (BLDC) as their driving force, powered by batteries. Currently, the batteries produced for electric vehicles mostly use lithium-ion 16850 batteries and VRLA batteries. Therefore, this research aims to determine the effect of different batteries on torque and maximum power in a 1 kW 48V electric vehicle, as well as the current flow, voltage, and battery consumption during testing. The differences in batteries were tested using dynotests and a watt-hour meter. Lithium-ion batteries showed better results compared to VRLA batteries. Testing with lithium-ion batteries resulted in an average maximum torque of 8.99 Nm and power of 1.4 HP, with a voltage consumption of 1.9 V, energy output of 4 Wh, and a maximum current of 22.5 A. On the other hand, VRLA batteries showed an average maximum torque of 8.2 Nm and power of 1.23 HP, with a voltage consumption of 3.8 V, energy output of 4 Wh, and a maximum current of 22.7 A.

**Keywords:** *Electric vehicles, BLDC (Brushless DC) motor, Battery.*