

ABSTRACT

The rapid growth of electric motorcycles in Indonesia aligns with the issuance of the Presidential Regulation on Electric Motorcycles, seen as a precise solution to the increasing consumption of fossil fuels. The frame, a critical vehicle component, plays a vital role in supporting diverse component loads. In this context, the selection of frame types becomes crucial, considering design and safety parameters. An ideal frame should have a lightweight structure with high rigidity. Carbon, a composite material, offers lighter weight and stronger than steel. In this study, the authors merge classical structural concepts with carbon fiber composites, particularly in H-beam designs. Through this approach, thin and lightweight H-beams can perform similarly to their thicker counterparts. Drawing inspiration from BMW's use of carbon reinforcement adhered to aluminum frames, although originating from MotoGP, its implementation in production motorcycles remains limited. This research aims to design the frame of the Selve-19 electric motorcycle using an H-beam structure and composite materials. Employing the SCAMPER method, the research and development approach creates a frame lighter than steel yet stronger. The result is the Selve-19 electric motorcycle frame design, adopting an H-beam structure with carbon fiber composite material, offering benefits of reduced weight and strength surpassing steel.

Keywords : Electric Motorcycle, Frame, Composite, H Beam.