

INTISARI

Velocar merupakan kendaraan kayuh yang diinovasikan agar menjadi moda transportasi yang dapat dijadikan penunjang kegiatan pariwisata sehingga dapat beroperasi di beberapa destinasi wisata. Untuk meningkatkan kapabilitas alat, maka *velocar* dilengkapi motor listrik sehingga dapat menjadi moda transportasi yang dapat meringankan kerja pengemudinya namun tetap ramah lingkungan. Dengan demikian, dilakukan perancangan *velocar* beserta *frame*-nya yang mampu memenuhi kebutuhan tersebut, dimana *frame* harus cukup tangguh untuk menopang beban penumpangnya.

Gambar 3D dibuat menggunakan *software Autodesk Inventor Professional 2018* kemudian *frame* dianalisis kekuatannya berdasarkan metode elemen hingga. Pembebanan diberlakukan secara statis dengan berat pengemudi utuh dikenai pada *seatpost*, dan juga berat penumpangnya dikenai pada permukaan *frame* penumpang.

Desain dinyatakan aman setelah mencapai faktor keamanan minimal 2,01 dengan beban maksimal total penumpang 600 kg. Bahan yang dipilih, yaitu *mild steel hollow* dengan ketebalan 2 mm. *Frame* dibentuk dari beberapa potongan besi *hollow* yang disatukan dengan menggunakan sambungan las.

Kata kunci: transportasi, motor listrik, *velocar*, desain, *stress analysis*, *Autodesk Inventor 2018*.

ABSTRACT

Velocar is a paddle vehicle innovated in order to become a transportation mode can be used as a tourism activities purpose so that it can operate in several tourist destinations. To improve its capability, the Velocar is equipped with an electric motor so it can become a transportation mode that can ease the work of the driver but still be environmentally friendly. Thus, the design of velocar and its frame is made to meet these needs, where the frame must be strong enough to support the load of its passengers.

The 3D drawing are designed using Autodesk Inventor Professional 2018 then the frames are analyzed based on the finite element method (FEM). Static load was applied by putting the whole driver weight on seatpost, and the whole passengers weight on the surface of the passengers frame.

The design was claimed safe under condition of minimum safety factor of 2.01 when frame maximum loaded with a 600 kg of total passengers. The material chosen was mild steel hollow with a thickness of 2 mm. The frame is formed from several hollow steel pieces which are joined using a welded joint.

Keywords: transportation, electric motor, velocar, design, stress analysis, Autodesk Inventor 2018.