

ABSTRAK

Velg *cast wheel* sering mengalami kerusakan yang menyebabkan rusaknya pada bagian bibir velg atau pecahnya *spoke* jika menopang beban berlebih. Aspek keselamatan sangat penting diperhatikan dalam industri otomotif karena menyangkut nyawa penumpang. Optimalisasi struktural berbagai komponen kendaraan telah menunjukkan bahwa kinerja kendaraan sangat dipengaruhi oleh berat komponen. Berdasarkan permasalahan tersebut maka tujuan dibuatnya penelitian ini untuk merancang model desain velg *cast wheel* yang ringan namun mampu menahan beban sebesar 503 N. Sehingga perlu dibuat analisis menggunakan perbandingan model desain dan variasi material, serta dilakukan simulasi statis menggunakan *software Solidworks 2018*. Hasil yang dicari adalah *von mises, displacement, strain, factor of safety*, dan menghasilkan desain yang ringan. Hasil simulasi pada ketiga model masih aman dalam menahan beban 503 N, karena nilai *factor of safety* tidak kurang dari 1. Untuk massa desain dengan variasi material, mendapatkan hasil yang lebih ringan dari velg aslinya.

Kata Kunci: Velg, Sepeda Motor, Solidworks, Metode Elemen Hingga.



**DESIGN OPTIMIZATION FIX FRONT VELG CAST WHEEL MOTORCYCLE
USING FINISH ELEMENT METHOD ON SOLIDWORKS**

ABSTRACT

Cast wheel rims often experience damage that causes damage to the lip of the rim or the spokes rupture if it supports excessive load. The safety aspect is very important to be considered in the automotive industry because it involves the lives of passengers. Structural optimization of various vehicle components has shown that vehicle performance is strongly influenced by component weight. Based on these problems, the purpose of this research is to design a lightweight cast wheel wheel design model that is able to withstand a load of 503 N. So it is necessary to make an analysis using a comparison of design models and material variations, as well as static simulations using Solidworks 2018 software. The results sought are von mises, displacement, strain, factor of safety, and produce a lightweight design. The simulation results on the three models are still safe in holding a load of 503 N, because the value of the factor of safety is not less than 1. For the design mass with material variations, the results are lighter than the original wheels.

Keywords: *Rim, Motorcycle, Solidworks, Finite Element Method.*

