

ABSTRAK

Dalam Kontes Mobil Hemat Energi (KMHE), mahasiswa ditantang untuk merancang kendaraan prototipe yang efisien, dimana salah satu komponennya adalah front arm yang berperan penting dalam sistem suspensi depan. Penelitian ini bertujuan menemukan ketebalan plat *front arm* menggunakan material Aluminium 6061 dengan variasi ketebalan 2 mm, 3 mm, 4 mm, dan 5 mm. Metode ini menggunakan perangkat lunak (CAD) seperti SolidWorks memungkinkan analisis statik untuk mengevaluasi kekuatan dan kekakuan komponen sebelum proses manufaktur. Berdasarkan hasil analisis perbandingan von Mises *stress*, *resultant displacement*, *equivalent strain* dan massa *front arm*, ketebalan 4 mm terbukti sebagai pilihan optimal. Meskipun ketebalan 2 mm menunjukkan tegangan terendah, ketebalan 3 mm menawarkan keseimbangan terbaik antara kekuatan dan ketahanan material, sementara ketebalan 5 mm memiliki strain tertinggi namun perbedaan nilainya dengan 3 mm dan 4 mm tidak signifikan.

Kata Kunci: Simulasi statis, Solidworks, plat Aluminium, *front arm*



ABSTRACT

In the context of the Kontes Mobil Hemat Energi (KMHE), students are challenged to design an efficient prototype vehicle, one of the components of which is the front arm which plays an important role in the front suspension system. This research aims to find the thickness of the front arm plate using Aluminium 6061 material with thickness variations of 2 mm, 3 mm, 4 mm and 5 mm. This method use (CAD) software such as SolidWorks to allow static analysis to evaluate the strength and stiffness of components before the manufacturing process. Based on the results of the comparative analysis of von Mises stress, resultant displacement, equivalent strain and front arm mass, a thickness of 4 mm was proven to be the optimal choice. Although 2 mm thickness shows the lowest stresses, 3 mm thickness offers the best balance between material strength and durability, while 5 mm thickness has the highest strains but the difference in value with 3 mm and 4 mm is not significant.

Keywords: Static simulation, Solidworks, Aluminum plate, front arm

