ABSTRAK

Komposit adalah material yang terdiri dari dua atau lebih komponen dengan sifat mekanik berbeda, yaitu resin sebagai matriks dan serat sebagai penguat. Penelitian ini menggunakan serat alam dari ampas tebu (*bagasse sugarcane*) yang *biodegradable*, diaplikasikan pada *Handle Reclining* Toyota Kijang Kapsul. Komposit dibuat dengan metode *Hand Lay Up* menggunakan resin *epoxy* dan *polyester* dengan perbandingan serat-resin 25:75, dan serat direndam larutan NaOH 5% selama 60 menit. Pengujian dilakukan melalui simulasi *ANSYS* dan *Compression Testing* menggunakan UTM. Hasil uji specimen *Compression Testing* menunjukkan bahwa komposit dengan resin *epoxy* memiliki kekuatan tertinggi dengan nilai *Maximum Compressive Load* 10.673,486 N dan *Compressive Stress* 66,176 MPa. Simulasi menunjukkan bahwa *handle reclining* depan komposit memiliki *maximum deformation* 0,024444 mm, *maximum equivalent stress* 15,92 MPa, dan *minimum safety factor* 3,4297, sedangkan *handle reclining* belakang memiliki *maximum deformation* 2,2181 mm, *maximum equivalent stress* 23,184 MPa, *dan minimum safety factor* 2,3551. Hasil pembuatan *handle reclining* dari komposit serat tebu memiliki bentuk yang sama dengan *handle reclining* Toyota Kijang Kapsul asli.

Kata Kunci: *Komposit, Bagasse Sugarcane, Handle Reclining, Simulasi, Compression Testing*

ABSTRACT

Composites are materials consisting of two or more components with different mechanical properties, namely resin as a matrix and fiber as reinforcement. This research uses natural fibers from biodegradable sugarcane bagasse, applied to the Toyota Kijang Kapsul Reclining Handle. The composite was made by Hand Lay Up method using epoxy and polyester resin with fiber-resin ratio of 25:75, and the fiber was soaked in 5% NaOH solution for 60 minutes. Testing was conducted through ANSYS simulation and Compression Testing using UTM. The Compression Testing specimen test results show that the composite with epoxy resin has the highest strength with a Maximum Compressive Load value of 10,673.486 N and Compressive Stress of 66.176 MPa. Simulation shows that the composite front reclining handle has a maximum deformation of 0.024444 mm, maximum equivalent stress of 15.92 MPa, and minimum safety factor of 3.4297, while the rear reclining handle has a maximum deformation of 2.2181 mm, maximum equivalent stress of 23.184 MPa, and minimum safety factor of 2.3551. The result of making the reclining handle from sugarcane fiber composite has the same shape as the original Toyota Kijang Kapsul reclining handle.

Keywords*: Composite, Bagasse Sugarcane Handle Reclining, Simulation, Compression Testing*