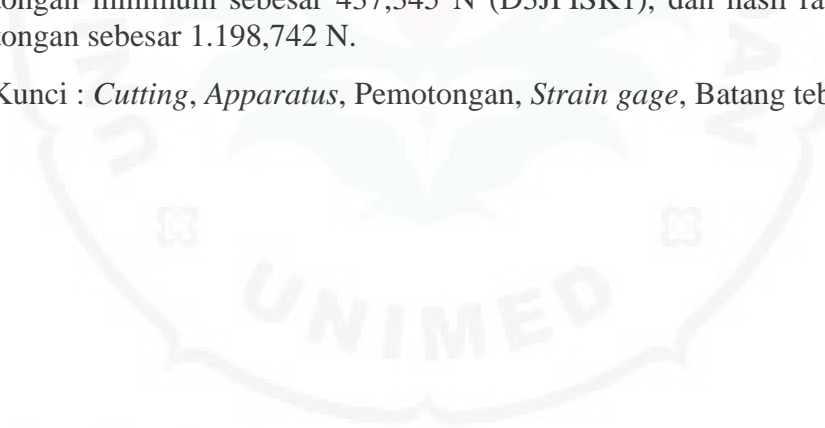


ABSTAK

Mhd Rionur Alfandi NIM : 5183520005 Uji Kinerja Alat Pemotongan (*Cutting Test Apparatus*) Bahan Pertanian Berbasis Sensor Strain Gage. **Tugas Akhir.** Fakultas Teknik Universitas Negeri Medan. 2022

Penelitian ini bertujuan untuk mengetahui kinerja alat uji pemotongan serta untuk mengetahui gaya pemotongan pada alat uji pemotongan (*Cutting Test Apparatus*) bahan pertanian berbasis sensor strain gage. Alat uji pemotongan (*Cutting Test Apparatus*) menggunakan variasi putaran mesin pada *reducer* (92 rpm, 61 rpm, 46 rpm), variasi kecepatan potong/*feeding* (4.6 mm/detik, 3.07 mm/detik, 2.30 mm/detik). Jenis pisau yang digunakan (rata) dan sudut kemiringan pisau ($0^{\circ}, 20^{\circ}, 30^{\circ}, 40^{\circ}$). Batang tebu yang di gunakan (Panjang 45 cm, diameter 3 cm) dengan umur tanaman batang tebu ± 6 bulan. Dari hasil uji fungsional (sensor strain gage) dapat berfungsi sangat baik dan presisi dengan persamaan kalibrasi: $y = 1,4175x - 1,9705$ dan $R^2 = 0,9803$ ($y = \text{strain}(u/\text{mm})$), $x = 0,70547y + 1,38998$ ($x = \text{beban (N)}$). Hasil pengujian yang dilakukan dapat diperoleh gaya potong maksimum sebesar 1.876,382 N (D2JP1SK0), gaya pemotongan minimum sebesar 437,345 N (D3JPISK1), dan hasil rata-rata gaya pemotongan sebesar 1.198,742 N.

Kata Kunci : *Cutting, Apparatus, Pemotongan, Strain gage, Batang tebu.*



ASBTRACK

Mhd Rionur Alfandi NIM: 5183520005 *The Performance Test of Cutting Test Apparatus for Agricultural Materials Based on Strain Gage Sensors. Final Project. Faculty of Engineering, State University of Medan. 2022*

This study aims to determine the performance of the cutting test equipment and to determine the cutting force on the cutting test equipment (Cutting Test Apparatus) of the diamond material with strain gage sensor. The cutting test equipment (Cutting Test Apparatus) uses variations in engine speed on the reducer (92 rpm, 61 rpm, 46 rpm), variations in cutting / feeding speed (4.6 mm / second, 3.07 mm / second, 2.30 mm / second). The type of knife used (flat) and the angle of inclination of the blade (0°, 20°, 30°, 40°). The sugarcane stalks used (Length 45 cm, diameter 3 cm) with the age of the sugarcane stem plant ± 6 months. From the results of functional tests (strain gage sensor) can function very well and precisely with the calibration equation: $y = 1.4175x - 1.9705$ and $R^2 = 0.9803$ ($y = \text{strain}(u/mm)$), $x = 0.70547y + 1.38998$ ($x = \text{load}(N)$). The test results carried out can obtain a maximum cutting force of 1,876,382 N (D2JP1SK0), a minimum cutting force of 437.345 N (D3JP1SK1), and an average cutting force result of 1,198,742 N.

Keywords : Cutting, Apparatus, Cutting, Strain gage, Sugarcane rods.

