ABSTRAK

PENGUKURAN MODULUS YOUNG *STAINLESS STEEL* DENGAN ANALISIS GETARAN MENGGUNAKAN *FORCE SENSOR*

Telah dilakukan penelitian untuk mengukur nilai Modulus Young *stainless steel* dengan analisis getaran menggunakan *Force sensor*. Frekuensi alami ditentukan dari analisis getaran yang diukur dengan menggunakan *Force sensor*. Peristiwa getaran *stainless steel* ditampilkan dalam grafik hubungan antara gaya dengan waktu dalam program *Logger pro*. Grafik hubungan antara gaya dengan waktu diubah ke grafik *Fast Fourier Transform* (FFT) untuk mendapatkan nilai frekuensi alami getaran tersebut. Nilai Modulus Young diperoleh berdasarkan persamaan *Euler-Bernoulli* dengan analisis grafik hubungan antara frekuensi alami terhadap satu per kuadrat panjang *stainless steel*. Nilai Modulus Young *stainless steel* berdasarkan hasil penelitian sebesar (121 ± 3) GPa.

Kata kunci: Modulus Young, *stainless steel*, analisis getaran, *Force sensor*, *Logger pro*, frekuensi alami.

ABSTRACT

THE MEASUREMENT OF YOUNG'S MODULUS ON STAINLESS STEEL WITH ANALYSIS OF VIBRATION USING FORCE SENSOR

A research to measure the value of Young's Modulus on stainless steel with analysis of vibration using Force sensor was conducted. The natural frequency was determined from analysis of vibration using Force sensor. The stainless steel's vibration was presented in relation of force with time graph using Logger pro. The relation of force with time graph was changed into Fast Fourier Transform (FFT) graph to obtain the natural frequency. The value of Young's Modulus was determined based on Euler-Bernoulli equation with analyzing the relation of natural frequency versus one per squares of stainless steel length graph. Based on the research, the Young's Modulus value was (121 ± 3) GPa.

***Key words**: Young's modulus, stainless steel, analysis vibration, Force sensor, Logger pro, natural frequency.*