

**ABSTRAK****PENGUKURAN MODULUS YOUNG SENAR PANCING BERBAHAN  
NYLON MONOFILAMENT DAN STAINLESS STEEL NYLON COAT  
DENGAN ANALISIS FREKUENSI ALAMI PADA SEBUAH DAWAI**

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Telah dilakukan penelitian untuk menentukan nilai Modulus Young senar pancing dengan analisis frekuensi alami pada sebuah dawai menggunakan sensor bunyi. Senar pancing yang digunakan terdiri dari bahan *Nylon Monofilament* dan *Stainless Steel Nylon Coat*. Diameter senar pancing divariasikan masing-masing setiap bahan terdiri dari 0.25 mm, 0.35 mm, dan 0.45 mm. Peristiwa getaran senar pancing ditampilkan dalam grafik hubungan antara tekanan dengan waktu dalam program *Logger pro*. Grafik hubungan antara tekanan dengan waktu kemudian diubah ke dalam bentuk grafik FFT hubungan amplitudo terhadap frekuensi. Kemudian nilai frekuensi yang diperoleh dari FFT digunakan untuk menentukan nilai kecepatan gelombang dari senar pancing. Nilai kecepatan gelombang rata-rata diperoleh dengan membuat grafik hubungan frekuensi terhadap satu per panjang senar. Setelah memperoleh nilai kecepatan gelombang rata-rata senar pancing nilai Modulus Young dapat ditentukan dengan persamaan hubungan kecepatan gelombang kuadrat dikali massa per pertambahan panjang dikali luas penampang. Pada penelitian ini nilai Modulus Young senar pancing *Nylon Monofilament* diperoleh sebesar  $(1.29 \pm 0.11)$  GPa dan nilai Modulus Young senar pancing *Stainless Steel Nylon Coat* diperoleh sebesar  $(29.34 \pm 2.40)$  GPa.

Kata kunci: Modulus Young, senar pancing, sensor bunyi, FFT.

**ABSTRACT*****THE YOUNG'S MODULUS MEASUREMENT OF FISHING LINE MADE BY NYLON MONOFILAMENT AND STAINLESS STEEL NYLON COAT WITH ANALYSIS OF NATURAL FREQUENCY IN A STRING****Nidar Karyati Gulo**Sanata Dharma University**Yogyakarta**2020*

*The research has been conducted to determine the Young Modulus value of the fishing line with frequency analysis on a string by using a sound sensor. The fishing line made of Nylon Monofilament and Stainless Steel Nylon Coat. The diameter of the fishing line was varied with each material consisted of 0.25 mm, 0.35 mm and 0.45 mm. The fishing line vibration events were displayed on the graph of the relationship between pressure and time in the Logger pro program. The graph of the relationship between pressure and time was then transformed into an FFT graph of the amplitude relationship to frequency. Then the frequency value which was obtained from the FFT was used to determine the wave velocity value of the fishing line. The average wave velocity value was obtained by graphing the frequency relation to one of each string length. After obtained the average wave velocity value of the fishing line the Modulus Young value can be determined by the equation of the square wave velocity relationship times the mass per length times the cross-sectional area. In this study, the Young Modulus value of Nylon Monofilament fishing line was  $(1.29 \pm 0.11)$  GPa and the Young Modulus value of the Stainless Steel Nylon Coat fishing line was  $(29.34 \pm 2.40)$  GPa.*

*Keywords: Young Modulus, fishing line, sound sensor, FFT*