

ABSTRAK (Indonesia)

Komposit merupakan material yang terdiri dari satu atau beberapa serat serta matriks. Serat berperan sebagai elemen penguat atau struktur utama dalam membentuk komposit, sedangkan matriks berfungsi untuk mengikat serat-serat tersebut menjadi satu kesatuan material. Tujuan penelitian ini untuk mengetahui pengaruh perbandingan fraksi volume antara serat daun nanas dan serat sabut kelapa bermatriks *epoxy* terhadap sifat mekanik komposit yang ditinjau dari pengujian tarik dan *bending*. Pencetakan komposit dilakukan dengan mencampurkan serat daun nanas 20% : serat sabut kelapa 10% : 70% resin *epoxy*, serat daun nanas 15% : serat sabut kelapa 15% : 70% resin *epoxy*, serat daun nanas 10% : serat sabut kelapa 20% : 70% resin *epoxy*, dengan susunan serat acak menggunakan metode *hand lay up*. Analisa sifat mekanik dari pengujian tarik berstandarkan ASTM D638 *TYPE 1* dan untuk pengujian *bending* berstandarkan ASTM D790. Dari hasil data pengujian tarik diperoleh nilai kekuatan tegangan tarik dan regangan tarik terbesar terletak pada variasi fraksi volume serat daun nanas 20% : serat sabut kelapa 10% : 70% resin *epoxy* dengan nilai kekuatan tegangan tarik rata-rata sebesar 34,61 N/mm² dan kekuatan regangan tarik rata-rata sebesar 1,71% , sedangkan untuk nilai kekuatan tegangan tarik terendah terletak pada variasi fraksi volume serat daun nanas 10% : serat sabut kelapa 20% : resin *epoxy* 70% dengan nilai kekuatan tegangan tarik rata – rata sebesar 29,07 N/mm² dan untuk nilai regangan tarik terendah terletak pada variasi fraksi volume serat daun nanas 15% : serat sabut kelapa 15% : resin *epoxy* 70% dengan nilai kekuatan regangan tarik rata-rata sebesar 1,36%. Untuk hasil data pengujian *bending* diperoleh nilai kekuatan *bending* terbesar terletak pada variasi fraksi volume serat daun nanas 20% : serat sabut kelapa 10% : 70% resin *epoxy* dengan nilai kekuatan *bending* rata-rata sebesar 63,74 N/mm², sedangkan untuk nilai kekuatan *bending* terendah terletak pada variasi fraksi volume serat daun nanas 15% : serat sabut kelapa 15% : resin *epoxy* 70% diperoleh nilai kekuatan *bending* rata-rata sebesar 53,43 N/mm². Berdasarkan data pengujian tarik dan pengujian *bending* tersebut dapat disimpulkan bahwa semakin banyak persentase serat daun nanas pada komposit *hybrid* serat daun nanas dan serat sabut kelapa bermatriks *epoxy* maka kekuatan tarik dan *bending*nya semakin meningkat.

Kata Kunci: Komposit, Serat Daun Nanas, Serat Sabut Kelapa, Resin *Epoxy*, Uji Tarik, Uji Bending, Visor

ABSTRACT (Inggris)

Composites are materials consisting of one or more fibers and a matrix. Fiber acts as a reinforcing element or main structure in forming a composite, while the matrix functions to bind the fibers into a single material. The purpose of this study was to determine the effect of the volume fraction ratio between pineapple leaf fiber and coconut coir fiber with epoxy matrix on the mechanical properties of composites in terms of tensile and bending tests. Composite molding was carried out by mixing 20% pineapple leaf fiber: 10% coconut coir fiber: 70% epoxy resin, 15% pineapple leaf fiber: 15% coconut coir fiber: 70% epoxy resin, pineapple leaf fiber 10%: coconut coir fiber 20%: 70% epoxy resin, with random fiber arrangement using hand lay up method. Analysis of the mechanical properties of ASTM D638 TYPE 1 standardized tensile testing and ASTM D790 standardized bending testing. From the results of tensile testing data obtained, the value of tensile stress strength and the largest tensile strain is located in the variation of the volume fraction of pineapple leaf fiber 20%: coconut coir fiber 10%: 70% epoxy resin with an average tensile stress strength value of 34.61 N/mm² and an average tensile strain strength of 1.71%, while for the lowest tensile stress strength value is located in the variation of the volume fraction of pineapple leaf fiber 10%: coconut coir fiber 20%: 70% epoxy resin with an average tensile stress strength value of 29.07 N/mm² and for the lowest tensile strain value is located in the variation of the volume fraction of pineapple leaf fiber 15%: coconut coir fiber 15%: 70% epoxy resin with an average tensile strain strength value of 1.36%. For the results of bending test data, the largest bending strength value is obtained in the variation of the volume fraction of 20% pineapple leaf fiber: 10% coconut fiber: 70% epoxy resin with an average bending strength value of 63.74 N/mm², while for the lowest bending strength value is located in the variation of the volume fraction of 15% pineapple leaf fiber: 15% coconut fiber: 70% epoxy resin obtained an average bending strength value of 53.43 N/mm². Based on the tensile testing data and bending testing, it can be concluded that the more the percentage of pineapple leaf fiber in the hybrid composite of pineapple leaf fiber and coconut coir fiber with epoxy matrix, the tensile and bending strength increases.

Keywords: Composite, Pineapple Leaf Fiber, Coconut Fiber, Epoxy Resin, Tensile Test, Bending Test, Visor