

Sifat mekanik komposit sandwich woven S-glass dengan matriks epoxy dan inti honeycomb polypropylene = The mechanical properties of woven S-glass with epoxy matrix and honeycomb polypropylene core sandwich composites

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Abstrak

Komposit sandwich telah banyak digunakan pada rancang bangun struktur ringan karena memiliki perbandingan strength to weight yang tinggi. Penelitian ini bertujuan untuk mengetahui sifat mekanik komposit sandwich woven S-glass dengan matriks epoxy dan inti honeycomb polypropylene. Bahan komposit dibuat dengan metoda hand lay-up dan dilanjutkan dengan vacuum bagging. Uji tekan serta uji tekuk dilakukan untuk mengetahui kekuatan mekanik, pengamatan dengan Scanning Electron Microscope dilakukan untuk mengetahui kerusakan material komposit sandwich sesudah uji mekanik.

Hasil penelitian ini menunjukkan komposit sandwich 0/90/PP/0/90 memiliki sifat mekanik yang lebih baik dibandingkan komposit sandwich 45/-45/PP/0/90, yaitu memiliki kekuatan tekan, kekuatan tekuk, kekuatan geser inti, dan flexural stiffness secara berurutan sebesar (2.21 ± 0.33) MPa, (97.90 ± 0.56) MPa, (0.28 ± 0.02) MPa, $(9.63 \pm 0.47) \times 10^6$ Nmm².

Sandwich composites have been used for light weight structures because the materials have high strength to weight ratio. The purpose of this research was to determine the mechanical properties of woven S-glass with epoxy matrix and honeycomb polypropylene core sandwich composites. The materials were fabricated using a hand lay-up and followed by a vacuum bagging method. Compressive and flexural tests were carried out to study the mechanical properties and the fracture surfaces were observed using Scanning Electron Microscope.

The test results showed that 0/90/PP/0/90 sandwich composites had a better mechanical properties than 45/-45/PP/0/90 sandwich composites, with compressive strength, flexural strength, core shear stress and flexural stiffness were (2.21 ± 0.33) MPa, (97.90 ± 0.56) MPa, (0.28 ± 0.02) MPa, $(9.63 \pm 0.47) \times 10^6$ Nmm² respectively.