

Study of the Green Composite Jute/Epoxy

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Abstract : Work presented is interested in the characterization of the quasistatic mechanical properties and in fatigue of a composite laminated in jute/epoxy. The natural fibers offer promising prospects thanks to their interesting specific properties, because of their low density, but also with their bio deterioration. Several scientific studies highlighted the good mechanical resistance of the vegetable fiber composites reinforced, even after several recycling. Because of the environmental standards which become increasingly severe, one attends the emergence of eco-materials at the base of natural fibers such as flax, bamboo, hemp, sisal, jute. The fatigue tests on elementary vegetable fibers show an increase of about 60% of the rigidity of elementary fibers of hemp subjected to cyclic loading. In this study, the test-tubes manufactured by the method infusion have sequences of stacking of $0/90^\circ$ and $\pm 45^\circ$ for the shearing and tensile tests. The quasistatic tests reveal a variability of the mechanical properties of about 8%. The tensile fatigue tests were carried out for levels of constraints equivalent to half of the ultimate values of the composite. Once the fatigue tests carried out for well-defined values of cycles, a series of static tests of traction type highlights the influence of the number of cycles on the quasi static mechanical behavior of the laminate jute/epoxy.

Keywords : jute, epoxy resin, mechanical, static, dynamic behavior

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