

Caractérisation et modélisation numérique d'un composite époxy/Alfa.

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Abstract: Nowadays, natural fiber composites are increasingly getting great interest on an industrial scale. This undeniable success is linked to the intrinsic properties of natural fibers reinforcements and to their ecological character. Our study consists in characterizing the mechanical properties in tensile, bending and ultrasonic as well as morphological characterization by optical and scanning electron microscopy in order to evaluate their aptitude to replace synthetic fiber composites. The material to be characterized is composed of an epoxy matrix reinforced with 20% in weight Alfa short fibers. Numerical modeling using the finite element method allowed us to predict the Young's modulus of our randomly reinforced biocomposites. The ANSYS modeling software was used to generate the 3D representative elementary volume and to calculate the Young's modulus of the composite. The experimental results recorded are close to those obtained by numerical modeling. The latter remains therefore the goal to reach.

Keywords : natural fibers, Alfa fibers, biocomposites, mechanical characterization, numerical modeling, ecology