

Manufacturing New Insulating Materials: A Study on Thermal Properties of Date Palm Wood

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Abstract : The fiber-matrix compatibility can be improved if suitable enforcements are chosen. Whenever the reinforcements have more thermal stability, they can resist to the main processes for wood-thermoplastic composites. Several researches are focused on natural resources for the production of biomaterials intended for technical applications. Date palm wood present one of the world's most important natural resource. Its use as insulating materials will help to solve the severe environmental and recycling problems which other artificial insulating materials caused. This paper reports the results of an experimental investigation on the thermal proprieties of date palm wood from Algeria. A study of physical, chemical and mechanical properties is also carried out. The goal is to use this natural material in the manufacture of thermal insulation materials for buildings. The local natural resources used in this study are the date palm fibers from Biskra oasis in Algeria. The results have shown that there is no significant difference in the morphological proprieties of the four types of residues. Their chemical composition differed slightly; with the lowest amounts of cellulose and lignin content belong to Petiole. Water absorption study proved that Rachis has a low value of sorption whereas Petiole and Fibrillum have a high value of sorption what influenced their mechanical properties. It is seen that the Rachis and leaflets exhibit a high tensile strength values compared to the other residue. On the other hand the low value of bulk density of Petiole and Fibrillum leads to high value of specific tensile strength and young modulus. It was found that the specific young modulus of Petiole and Fibrillum was higher than that of Rachis and Leaflets and that of other natural fibers or even artificial fibers. Compared to the other materials date palm wood provide a good thermal proprieties thus, date palm wood will be a good candidate for the manufacturing efficient and safe insulating materials.

Keywords : composite materials, date palm fiber, natural fibers, tensile tests, thermal proprieties

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