CARACTERIZATION OF KENAF / PLA COMPOSITES

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Advanced composite materials based on natural fibers and thermoplastic matrices have received great scientific attention especially in the area of lightweight, environmentally friendly, cost-effective composite materials. Special interest has been paid to kenaf fibers as potential reinforcing fillers in many thermoplastic composites. Bio-plastics such as polylactic acid (PLA) are currently in the spotlight as eco-friendly plastics that effectively utilize reproducible materials.

In this paper the research is focused on preparation and characterization of an eco-friendly and cost – effective polymer composites as constructive materials for houses and offices.

The technological procedure for production of PLA /kenaf fiber composites was determined. Kenaf / PLA preforms were molded by thermo compression in a closed mold. Various kinds of kenaf/PLA preforms with different thickness, specific weight and fiber / matrix ratios were molded.

The composites have been constructed as multiple prepreg layers (2 or 4 layers) in the mold cavity, depending on the thickness of the starting kenaf / PLA performs and in accordance with the targeted thickness. The composites were cured at 175 ^{O}C for 20 minutes, under pressure.

The basic physical and mechanical properties of the composites were tested. Higher mechanical properties (flexural strength 21,7 MPa, modulus 1,22 GPa, impact resistance 60,3 kJ/m^2 and compression strength 6,5 MPa) were obtained for composites containing 60% fibers and 40% matrix, 20 mm thin and with specific weight of 40 kg/m^3.

The obtained mechanical results, indicate that properties such as flexural strength and modulus, compression strength and impact resistance are superior to the most types of traditional building composites, such as wood boards, hardboards, thermo panels, plaster carton panels for walls and ceilings, knauf - systems for wall covering, etc. From this point of view, it can be concluded that kenaf fibers /PLA composites are environmentally friendly and economically adjustable when compared to traditional building materials.