



TENSILE STRENGTH OF POLYMER COMPOSITES REINFORCED WITH VEGETABLE FIBERS OF JUTE-COTTON VIA RTM AND WATER SORPTION

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Abstract: Currently there is a growing concern with the ecosystem, which includes stricter legislation and education / awareness of the population as to the consumption and disposal of products. This work deals about the use of vegetable fibers as reinforcement in polymer matrix composites. The composites reinforced with vegetal fibers are biodegradable reasonably strong, light in weight and do not damage health, have low elastic modulus, poor moisture resistance and low mechanical properties when compared to synthetic fiber reinforced polymer composites of. the aim of this work is to mechanically characterize hybrid jute-cotton fabric/polyester composites in before and after water sorption at different temperatures using two volume fractions of fibers. The composites were molded by the RTM (Resin Transfer Molding) with volume fiber fractions of 32 and 48% in fiber contents. Water sorption tests were conducted at 25, 50 and 75 ° C for all composites. Then, tensile (ASTM D3039), samples were immersed in water at, 50 and 75 ° C and their properties were determined at different time intervals. Results indicate that the higher the water bath temperature, the shortest the time for the composite reach the maximum saturation This was decisive for choosing the temperatures of 50 and 75 ° C in order to decrease the amount of material in the experimental studies. Mechanical properties of tensile strength, specimens indicates that composite mechanical properties decreased with water sorption and higher fiber content, which can be attributed to the plasticizing effect of water, fiber hygroscopy and to the displacement of the fiber layers in the composites reducing fiber/matrix interfacial adhesion.

Keywords: vegetable fiber, hybrid composites, jute-cotton fabric.