



MECHANICAL ANALYSIS OF JUTE + RAMIE HYBRID COMPOSITE IN POLYESTER MATRIX

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Abstract: Currently, natural fibre reinforced composites (NFRC) have attracted the attention of researchers because of their advantages over synthetic fibres that are applied in various industrial segments such as aerospace, civil and automotive. The principal advantages of plant fibres compared to synthetic fibres are the low cost of extraction, ease of processing, low density and non-abrasiveness of the material which is important for mechanical equipment. However, there are some disadvantages such as: mechanical and dimensional inconsistencies, incompatibility between vegetable and polymer (one being hydrophilic and the other hydrophobic), that affects the adhesion between the matrix and fibres reducing its mechanical properties. Consequently, various chemical treatments are utilized to improve the compatibility of the fibre and the matrix, and thus increasing the mechanical properties.

The principal objective of this research is to study the hybridization between jute + ramie fibres using the intralaminar method in a polyester matrix. The natural composite underwent mercerized treatment, followed by tensile, flexural and impact tests to characterize the composite and the analysis of fractured surfaces by scanning microscopy (SEM). The results showed excellent mechanical properties in the tensile and impact tests compared to the untreated composite, and the SEM images showed that the alkaline treatment changed the fibre surface morphology, improving fibre matrix adhesion.

Keywords: Polyester, Jute + Ramie, Mechanical Properties, Composite