

Water absorption behaviour on the mechanical properties of woven hybrid reinforced polyester composites

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Abstract:

Water absorption restrains the mechanical performance of natural fibre reinforced matrix polymer. This paper aims to investigate the influence of water absorption on the different types of natural woven fibre reinforced with polyester resin. The water absorption and thickness swelling study were performed by an immersed composite sample in the distilled water for 30 days. The mechanical performance testing such as tensile testing, flexural and impact was performed on the single and hybrid composite. Based on the results obtained, water absorption of the single type and hybrid composite sample yield about 3–6%. Furthermore, the effect of thickness of swelling is at a minimum. The result of the tensile properties reveals that the layering size has more influence than the layering sequences. The flexural properties are likely to be affected by the type of fabric fabricated on the top. The results of the Charpy impact test show that there is possibly less variation for the value regardless of the layering sequence and the layering size. The water absorption drops the tensile strength about 12–27% and tensile modulus for 15–35% on the 30th day. The result shows that the resistance toward water absorption improved significantly toward hybridisation

Keywords: Natural fibre; Jute; Ramie; Roselle; Water absorption; Mechanical properties

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