

# Effect of Water Absorption on Tensile Properties of Pineapple Leaf Fibre Reinforced Polymer Composites

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## ABSTRACT

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In recent years, natural plant fibres have been in the limelight for its feasibility as the reinforcement for composites. In the pursuit of sustainable development whereby achieving the present needs without compromising the future, there is a paradigm shift of interest from synthetic fibres to natural fibres. Natural fibres are deemed to be the potential replacement for the synthetic fibres for its favourable mechanical properties, biodegradable, and low cost features. Pineapple leaf fibre is one of the potential selections as the reinforcement in composites for vast industrial applications. Nevertheless, natural fibres are subjected to doubts due to its tendency of absorbing moisture which may compromise its mechanical feasibility. In this paper, the effect of water absorption by the PALF reinforced polyester composite is studied. The specimens are fabricated using hand layup method and the tensile tests are carried out according to the standard of ASTM D3039. Specimens were immersed in tap water in the course of three weeks. It is revealed that the diffusion coefficient of water uptake increases as the fibre loading increases. The tensile strength and tensile modulus of the specimens show a significant drop as the immersion period increases. On the contrary, tensile modulus of 10% fibre loading specimens shows an increment trend of surpassing the pure polyester composite in each respective immersion period. Fibre volume fraction of 10% seems to be optimum ratio of producing the highest tensile properties of PALF reinforced polyester composite. In an overview, the tensile properties of immersed specimens are lower compared to standard specimens of no immersion. Hence, water absorption is a bane to the tensile properties of PALF reinforced polyester composite.