

Effects of Impregnation Time on Physical and Tensile Properties of Impregnated Sugar Palm (*Arenga pinnata*) Fibres.

ABSTRACT

The aim of this study is to investigate the effect of impregnation time on physical and tensile properties of sugar palm (*Arenga pinnata*) fibres. The fibre was impregnated with phenol formaldehyde (PF) and unsaturated polyester (UP) with various impregnation times (0, 5, 10, 15, 20, 25 min) at constant impregnation pressure of 1000 mmHg, before it was released within 30 s. Significant improvement in physical properties was observed after being impregnated for 5 min especially for fibre impregnated with PF due to its low moisture content (MC) and water absorption (WA). However, no significant changes in specific gravity for both impregnated fibres were observed. Fibre impregnated with UP for 5 min shows notable improvement in tensile strength and better fibre toughness while the fibre impregnated with PF showed lower tensile strength and elongation at break and higher tensile modulus than un-impregnated fibre. Since the PF-impregnated fibre become brittle and results in lower fibre toughness as shown in the stress strain behavior, this causes for poor fibre properties. However, there was no significant difference ($p \leq 0.05$) between all impregnated fibres in physical and tensile properties after impregnation time was extended from 10 to 25 min. In general, by increasing time of impregnation did not give much effect in improving physical and tensile properties of fibres.

Keyword: Sugar palm fibre; Vacuum resin impregnation; Impregnation time; *Arenga pinnata*.