

Selected properties of hand-laid and compression molded vinyl ester and pineapple leaf fiber (PALF)-reinforced vinyl ester composites.

ABSTRACT

Pineapple leaf fibers (PALF) are of little use in Malaysia despite being mechanically and environmentally sound. Untreated and bleached PALF were used to reinforce vinyl ester (VE) utilizing hand lay-up (HLU) and liquid compression molding (LCM). Mechanical properties, water absorption and thermal stability were compared to neat resin and glass fiber-reinforced VE. Adding PALF reduced machinability dramatically while generally enhancing VE mechanical properties. Bleached PALF improved fiber-matrix adhesion compared to untreated PALF. Molding resin and composites with pressure enhanced water resistance by 2 – 3 times. Water absorption increased with increasing PALF while bleached PALF somewhat decreased water absorption due to improved wetting. PALF slightly reduced VE thermal stability although enhancement is expected upon using bleached PALF. Molding pressure has no effect on thermal stability of VE and PALF-reinforced VE. This study indicated that PALF may be used to reinforce VE to produce composites utilizing LCM and inexpensive bleach pretreatment.

Keyword: Liquid compression molding; Mechanical properties; Natural fibers; PALF; Vinyl ester.