

Mechanical and thermal properties of Josapine pineapple leaf fiber (PALF) and PALF-reinforced vinyl ester composites

ABSTRACT

Although the pineapple leaf fibers (PALF) are long known as domestic threading material in Malaysia, they are currently of little use despite being mechanically and environmentally sound. This study evaluated some selected properties of Josapine PALF and PALF-vinyl ester composites as well as the effects of simple abrasive combing and pretreatments on fiber and composite properties. Using PALF vascular bundles extracted from different parts of the leaves did not significantly affect PALF-vinyl ester composite mechanical properties. At low weight fraction and consolidating pressure, PALF fibers regardless of diameters and locations performed equally well in enhancing composite flexural properties under static loading. Finer bundles enhanced PALF-vinyl ester composite toughness indicated by tests at higher speeds. Abrasive combing produces cleaner and finer bundles suitable for reinforcing composites for applications not requiring high toughness.

Keyword: PALF; Abrasive combing; Thermal stability; Mechanical properties; Vinyl ester