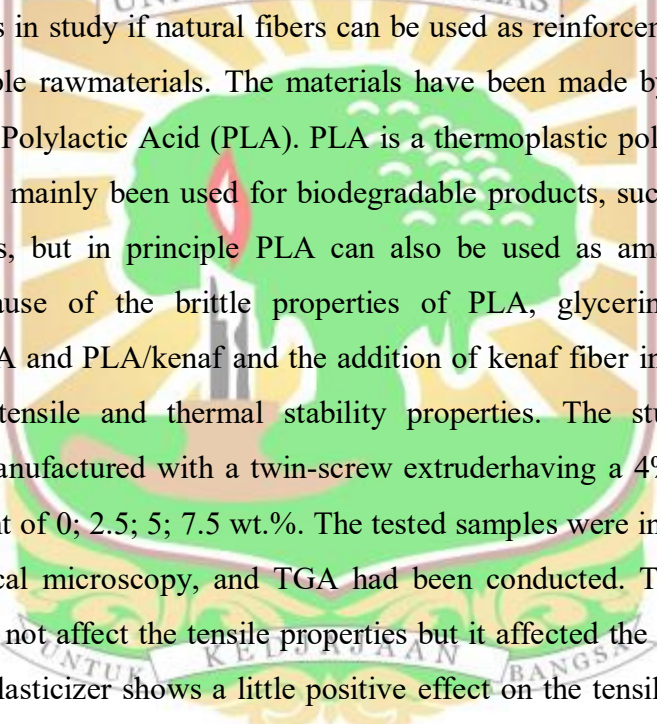


# THE EFFECTS OF ADDITION OF KENAF FIBER ON THE TENSILE AND THE THERMAL STABILITY PROPERTIES OF PLA/KENAF COMPOSITE

## ABSTRACT



This work focuses in study if natural fibers can be used as reinforcement in polymers based on renewable rawmaterials. The materials have been made by kenaf fibers in powder form and Polylactic Acid (PLA). PLA is a thermoplastic polymer made from lactic acid and has mainly been used for biodegradable products, such as plastic bags and planting cups, but in principle PLA can also be used as a matrix material in composites. Because of the brittle properties of PLA, glycerin was tested as plasticizer for PLA and PLA/kenaf and the addition of kenaf fiber in composite aims to improve the tensile and thermal stability properties. The studied composite materials were manufactured with a twin-screw extruder having a 4% glycerin and a kenaf fiber content of 0; 2.5; 5; 7.5 wt.%. The tested samples were in films form. The Tensile test, optical microscopy, and TGA had been conducted. The increasing of fibers content did not affect the tensile properties but it affected the thermal stability. The addition of plasticizer shows a little positive effect on the tensile strength of the composites. The best tensile strength belonged to composite with 2.5%wt kenaf whose tensile strength was 48.91 MPa while the most stable material belonged to composite with 7.5% wt kenaf whose degradation temperature due to thermal increasing is 290-430 °C. The study of interfacial adhesion shows that adhesion needs to be improved to optimize the mechanical properties of the PLA/kenaf composites.

*Keywords: PLA, Kenaf Powder, Composite, Tensile, TGA*