

Machinability study of biocomposite: Palm oil based wax/LLDPE/Palm oil fiber blends for prototype application

Abstract

This paper is to find the possibility of developing a new blend composite in order to produce a prototype for engineering application. The new palm oil based wax is a waste material produced from palm oil refining process. Recent prototyping activity, industrial blue wax is normally used to produce part prototypes from the machining process. Hence, the tensile strength of new palm oil based wax/LLDPE/Palm oil fiber blends was investigated. The result shows that the tensile strength of new palm oil based wax/LLDPE/Palm oil fiber blend was obtained is higher compared to the existing industrial blue wax. Machinability study covered surface roughness, chip formation characteristic, dimensional consistency and cutting tool wear. The higher tensile strength of the blend was selected to proceed for the machining test. The comparison results between LLDPE/palm oil based wax/ Palm oil fiber blends and Industrial blue wax were recorded. However, since the cost of this new palm oil based wax is lower, it will be an attractive option to replace the existing industrial blue wax for prototype application.

Keywords; Machinability; Palm Oil; Industrial Wax; LLDPE; Prototype