

Evaluating the Machining Characteristics of Oil Palm Lumber

ABSTRACT

A series of machining experiments were carried out using a CNC multi-function machine, to evaluate the sawing, routing and boring as well as the tool wearing properties of the oil palm lumber. The result found that the resultant machined surface of the oil palm lumber of higher densities ($>500 \text{ kg m}^{-3}$) is comparable to that of solid Rubberwood. Further, it was also found that the machining properties of oil palm lumber was markedly improved when machining at high cutting speeds, which in turn significantly reduced the incidence of machining defects such as fiber tear out and chip out. However, with higher cutting speeds, accelerated tool wear is inevitable and coupled with the fact that the oil palm lumber is markedly abrasive due to its high silica content, the resulting tooling cost is a concern. Hence, the development of new tooling for the machining oil palm lumber is recommended. Despite this shortcoming, the lower cost and environmental friendly reputation of the oil palm lumber should encourage wider utilization of the material in the furniture industry.

Keyword: sawing, routing, boring, tool wear, smoothness, environmental friendly