

## **Strength properties of bio-composite lumbers from lignocelluloses of oil palm fronds agricultural residues**

### **ABSTRACT**

The physical and strength properties of bio-composite lumbers from agricultural residues of oil palm fronds were studied. Resins of phenol formaldehyde and urea formaldehyde were used as the binders. The oil palm fronds were obtained from an oil palm plantation in Kota Belud, Sabah. The fronds were segregated into three (3) groups of matured, intermediate and young of oil palm fronds. The leaflets and the epidermis were removed from the fronds before they were sliced longitudinally into thin layers. The layers were then compressed into uniform thickness of 2 - 3 mm. The layers were air-dried and later mixed with resins using 12-15% of phenol and urea formaldehyde and recompressed with other layers forming the bio-composite lumbers. The bio-composite lumbers were then tested for their physical and strength properties. Testing was conducted in accordance to the International Organization for standardization (ISO) standard. The result on the physical and strength properties shows that the oil palm fronds bio-composite lumbers to be at par with solid rubberwood. Statistical analysis indicated significant differences between bio-composite lumbers made from each groups and portion, but no differences were observed in the type of resin used. The bio-composite lumbers from oil palm fronds agricultural residues has potential to be used as an alternative to wood to overcome the shortage in materials in the wood industry.