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PARTIAL REPLACEMENT OF UREA-FORMALDEHYDE WITH MODIFIED OIL PALM STARCH BASED ADHESIVE TO FABRICATE PARTICLEBOARD

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**PARTIAL REPLACEMENT OF UREA-FORMALDEHYDE WITH  
MODIFIED OIL PALM STARCH BASED ADHESIVE TO FABRICATE  
PARTICLEBOARD**

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**ABSTRACT**

This study investigated the efficacy of epichlorohydrin-modified oil palm starch as an adhesive in addition to urea formaldehyde, to minimise the use of urea formaldehyde adhesive in particleboard manufacturing. A single-layer particleboard was fabricated from rubberwood particles and urea formaldehyde resin supplemented with modified oil palm starch adhesive. The adhesive performance was analysed by studying the physical properties (actual density, moisture content, thickness swelling and water absorption) and mechanical properties (bending strength and internal bond strength) of the prepared panels. The panels of two target densities were manufactured (600 and 800 kg/m<sup>3</sup>) at two different pressing times (15 min and 20 min). The performance of manufactured panels were analysed by scanning electron microscopy, Fourier transform infrared spectroscopy, X-ray diffractometry, thermogravimetric analysis and differential scanning calorimetry. The panels manufactured in this study met the minimum required strength as stated in Japanese Industrial Standards (JIS) but a lower water resistant property. Furthermore, a panel with a density of 800kg/m<sup>3</sup> had

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