

**CHARACTERISTICS OF CEMENT BONDED PARTICLE BOARD MADE FROM  
WOOD WASTES OF *Khaya senegalensis* (DESR.) A. JUSS AND *Afzelia africana*  
SM. EX. PERS. IN NIGERIA**



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**ABSTRACT**

*Khaya senegalensis* and *Afzelia africana* are among the major timber species that are used extensively in the semi arid areas of Nigeria to meet the wood needs of the people. Consequently, large volumes of wastes of these two species are constantly generated in the wood conversion mills or timber sheds across the region. Thus, the study has examined the use to which wastes of *K. senegalensis* and *A. africana* which form a large number of timber species usually reprocessed and which generate quite a large volume of wastes in the process. The two species have not so far been studied in the production of cement bonded particle board (CBPB) either singly or in mixtures. Consequently, mixed sawdust and wood shavings of *K. senegalensis* and *A. africana* were used to produce cement bonded particle boards of the following dimensions; 350mm x 350mm x 12mm with three replicates. Three ratios of cement/wood (2:1, 2.5:1 and 3:1) and board densities of 1000 Kg/m<sup>3</sup>, 1100 kg/m<sup>3</sup> and 1200 kg/m<sup>3</sup> were investigated. The physical characteristics such as thickness swelling (TS), water absorption (WA) and mechanical characteristics such as modulus of rupture, (MOR) and modulus of elasticity (MOE) were tested to determine the best mixing ratio and the effect of species on strength characteristics. The results obtained showed that *K. senegalensis* had 0% TS, WA 7.69% MOR 4.29 N/mm<sup>2</sup> and MOE 1372.13 N/mm<sup>2</sup>. Similarly *A. africana* had 0% for TS, WA 5.99% MOR 2.06 N/mm<sup>2</sup> and MOE 1324.72 N/mm<sup>2</sup>. The separate mixtures of both sawdust and wood shavings of the two species also had 0% TS, WA 6.67%, 1.67 N/mm<sup>2</sup> MOR and 1607.42 N/mm<sup>2</sup> MOE. Result showed that increase in cement/wood ratio and board density caused an increase in the mechanical strength and dimensional stability of the boards. Boards produced at the highest cement/wood ratio (3:1) and board density (1200 Kg/m<sup>3</sup>) were strongest and more dimensionally stable than those produced at the lower levels. The results of this study showed that *K. senegalensis* produced the highest strength characteristics at 3:1 mixing ratio when put under a pressure of 1200 Kg/m<sup>3</sup>

**Keywords:** Cement-bonded particle board, *Khaya senegalensis*, *Afzelia africana*, characteristics, properties, dimensional stability.