MECHANICAL PROPERTIES OF CEMENT-BONDED PARTICLE BOARD USING DIFFERENT RATIO OF RICE HUSK

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ABSTRACT

This study investigates the mechanical properties of cement bonded particle board (CBP) using different particle ratios of rice husk. A total of 5 set of ratios which are 1:2.00, 1:2.25, 1:2.50, 1:2.75 and 1:3.00 has been prepared and tested for their modulus of elasticity (MOE), modulus of rapture (MOR) and internal bonding (IB). All samples have a constant density which is 1300 kg/m^3 and the only variable that change is the ratios of rice husk and cement. The test was conducted by using Universal Testing Machines and all the data was analyzed to choose which ratios are ideal and suitable according to the value of MOR, MOE, and IB. It is known that all the 3 values indicate the values of load needed to break the CBP. The higher values of load, the better the strength that the CBP has. From the testing of MOE, the highest value of is obtained at the ratios of 1: 3.00 where the board has the highest ratio of rice husk and cement of 1202.44 MPa. On the other hand, for MOR testing, the strongest among all ratios is at ratio 1:2.25 which is 3.09 MPa. For IB testing, the highest value of strength needed to shear the bond between particles inside is at 0.24 MPa, at 1:3.00 ratio. Overall, the result for MOE and MOR is non-linear due to uneven spread of the mixture while preparing the sample, but the ideal ratios still can be identified by the best strength among the ratios while for IB, the result obtained is linearly to the strength of the board, due to its bonding between the particle inside. Generally, the best ratio to be used is between 1:2.50 and 1:3.00, according to the strength shown.