Properties of composite panels from modified rice hulls

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Abstract

In this paper, the internal bond (LB.) strength, flexural properties, and thickness swelling (TS) of composite panels produced ji'om hammer-milled amI steam pre-treate{l rice hulls bonded with phenol formaldehyde (PF) resin are presellled. Steam pre-treatment of the rice hull was carried out between 110 and 140°C, The LB. strellgth, flexural properties and TS of the resulting composite panels improved with steam pre-treatment of rice hulls. The highest mechanical properties and the lowest TS of the composite pallels were obtained from steam pre-treated rice hulls. Partial removal of surface impurities 011 the steam pre-treated rice hulls was partly respollsible for the improved properties. Further improvement observed after illcrease{l the dellsity from 1000 to 1400 kgm-3 was associated with enhanced interfacial billding stresses behveell the rice hull particles alld the PF resill. The LB. strellgth, flexural properties, and TS of the densified panels passed the requiremellts of EN 312-2 by 53%.

Keywords: Composite pallels, illterface, mechallical testillg, thicklless swelling testing, steam pre-treatment.