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Manufacture and Properties of Gypsum-Bonded Particleboard III. Improvement of bending properties by overlaying with kenaf fiber mats and evaluation of the combustibility of the boards

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Abstract: Gypsum-bonded particleboards overlaid with kenaf bast fiber mats on top and bottom surfaces were manufactured. The effects of the kenaf fiber overlay on the mechanical and dimensional properties of the boards were examined. The combustibility of various types of gypsum-bonded particleboards was examined. The results are as follows:

- 1) Modulus of rupture (MOR) in the direction of kenaf fiber orientation in both dry and wet conditions, modulus of elasticity (MOE), and thickness swelling (TS) of gypsum-bonded particleboards were improved by the reinforcement with kenaf fiber mats.
- 2) The gypsum-bonded particleboards with particle/gypsum-dihydrate weight ratios less than 1/5 conformed to the standard requirements of quasi-noncombustible materials. Gypsum-bonded particleboards with a density greater than 0.8 g/cm³ reinforced with non-woven glass fabrics or kenaf fiber mats conformed to the standard for quasi-noncombustible materials.
- 3) Gypsum-bonded particleboards reinforced with non-woven glass fabrics or kenaf fiber mats could conform to the standard for noncombustible materials without a decrease in the bending properties of the boards.

Keywords: gypsum-bonded particleboard, kenaf fiber, incombustibility



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