

Properties and durability of MUF-bonded particleboard treated with boron compound

ABSTRACT

A mixture of 1:1.54 boric acid (H_3BO_3) to borax, (disodium tetraborate decahydrate ($Na_2B_4O_7 \cdot 10H_2O$)) at 0.5% and 1.0% boric acid equivalent (w/w of oven-dried weight particles) were incorporated in rubberwood (*Hevea brasiliensis*) particleboards by immediately spraying the boron compounds solution onto the furnish during the blending process. Melamine urea formaldehyde (MUF) resin was used as a binder. The targeted density of the boards was 650 kg/m³. Standard titration method MS 995-1986 was employed to analyse the boric acid loading in the particleboard. The properties and durability against white rot fungus (*Pycnoporous sanguineus*) of the treated board were evaluated in accordance with JIS-5908-1994 and ASTM D2017671, respectively. The boric acid loading in the board was in the range of 0.30-0.49% and 0.63-0.86%, respectively when 0.5% and 1.0% of boron compounds were incorporated in the boards. The treatment did not affect the modulus of elasticity (MOE) of the board, however, modulus of rupture (MOR) was slightly reduced. The presence of boric acid significantly increased the durability of the board against white rot fungus, and the resistance towards the fungus increased as the boric loading increases.

Keyword: Particleboard; Boron compound; Melamine urea formaldehyde (MUF)