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[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(902K\)\]](#) [\[References\]](#)

Effects of Various Treatments for Improving Bondability on the Properties of Fiberboard Bonded with Phenol Formaldehyde Resin

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Abstract: In order to improve the bonding of fiberboard, the penetration of phenol formaldehyde (PF) resin was prevented. The means of preventing penetration were acetylation of wood fibers and the addition of filler to PF resin. Acetylation improved internal bond strength (*IB*) due to the resulting lack of penetration. In addition, the *IB* of fiberboard made from acetylated wood which had been ozonized (acetyl-ozonized board) was much higher than that of merely acetylated fiberboard due to improved wettability by the ozonization. The durability of the acetyl-ozonized board was significantly increased, resulting in 0.84 MPa for *IB* and 74% retention of *IB* after an ASTM 6-cycle accelerated aging test. In another test, fiberboard was made from untreated wood bonded with PF resin to which strained soybean meal was added as a filler, and the *IB* showed a roughly 40% increase. The retention of *IB* after the ASTM 6-cycle accelerated aging test was lower than that of the acetyl-ozonized fiberboard, but the addition of the filler was effective for improving properties for conventional uses.

Keywords: fiberboard, phenol formaldehyde resin, acetylation, penetration, ozone

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