

Abstract

This research was carried to investigate the effect of particle size and type of resin on thin particleboard properties. Three different types of resin, phenol formaldehyde, urea formaldehyde and melamin formaldehyde, four sizes of particles (-8+12, -12+18, -18+25 mesh) and three press temperature (120, 180, 220 °C) was used to manufacture 3 millimeters particleboard. The measured mechanical properties included modulus of rupture (MOR), modulus of elasticity (MOE), and internal bond strength (IB) of the finished particleboards. Water absorption (WA₂, WA₂₄) and thickness swelling (TS₂, TS₂₄) were tested to evaluate the water resistance properties based on ASTM D-1037. In this study, the Analysis of Variance (ANOVA), Duncan Multiple Range Test (DMRT), were used to analyze the data. Analysis of variance (ANOVA) was used to measure the differences among treatments, while the comparison of the means was calculated by the Duncan's Multiple Range Test. The particleboards made from phenol formaldehyde resin with mixed size particles in 180 s press time, showed the maximum flexural strength (18/46 mPa). The highest MOE (2027/55 mPa) was found in particleboards that made from melamin formaldehyde resin with particle in size -12+18 mesh and 120 S press time. The IB of panels with melamin formaldehyde resin, particle size -12+18 mesh and 180 S pressing time were the best results (1/75 mpa). Besides, the best panels in term of thickness swelling were made from phenol formaldehyde with particle size -8+12 mesh and 180 S pressing time. While, the least amount of water absorption happened for panels made from phenol formaldehyde resin with mixed particles and -18+20 mesh and 180 S pressing time.

Keywords: Thin particleboard, resin type, particles area, pressing time, panel properties



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**Influences of particle size and adhesive type on thin particleboard
properties**

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