

THE INFLUENCE OF GEOMETRY PARTICLE COMPOSITION AND SYNTHETIC RESIN QUANTITY IN THE PHYSICAL AND MECHANICAL PROPERTIES OF THREE-LAYER PARTICLEBOARD BASE PLANER SAVING WITH UREA FORMALDEHYDE ADHESIVE

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ABSTRACT

A great amount of wood needs, as raw material to supply wooden industries in Indonesia requires a special idea. The possibility of utilizing small-dimension wood including residues from other wood industry and the availability of synthetic resins that facilitate mass production by fast curing, made particleboard industry became an excellent one.

The reason of this research was done to know the influence of geometry particle composition and synthetic resin quantity which affect in the physical and mechanical properties of three-layer particleboard. To fulfil that aim, there were two points applied and the approaches involve, first: particle geometry composition base planer saving with type A (length-thickness ratio 1: 26.8 – 70) in surface layers and type B (length-thickness ratio 1: 14.4 – 34.8) in core, seconds: to have the use of urea formaldehyde which is fixed by weight of dry particle condition in the layers (m.c 6 – 8%). The research uses three types of compositions are (1) 30% (surface layer), 40% (core), 30%, (2) 20%, 60%, 20%, (3) 10%, 80%, 10% and also three grades of adhesive quantity (resin solid 50%) are (1) 5%, (2) 10%, (3) 15%.

The result of the research was interior-type of middle density particleboard (sp.g 0.552 – 0.647). To have the use of type 2 (20%, 60%, 20%) geometry particle composition of three layer particleboard base-planer saving had highest density profil and static bending of the three. The use of urea formaldehyde at 5% (resin solid 50%) had lower spesific gravity and static bending. More resin (10%) had increase significant spesific gravity at level (95%), static bending at level (99%) and decrease water absorption at level (99%). Interaction of urea formaldehyde adhesive at 15% with type 2 (20%, 60%, 20%) of three layer particleboard base-planer saving had highest compression strenght parallel to surface (153,035.431psi), type 1 (10%, 80%, 10%) had lower thickness swelling (2.1%).