



**THE EFFECTS OF GLUE SPREAD AND COMPRESSION PRESSURE TO PHYSICAL MECHANICAL PROPERTIES OF CROSS LAMINATED TIMBER OF SENGON WOOD (*Falcataria moluccana*)**

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**ABSTRACT**

Increased awareness of buildings that are environmental friendly makes wood widely used nowadays. In this research wood product to be made is laminated beam using idea of Cross Laminated Timber (CLT) or it call cross laminated beams. This research was aimed to find out interaction between variations of compression pressure and glue spread for effecting characteristics of cross laminated beams sengon.

To produce a good standard for cross laminated beams, factors that need to considered are compression pressure and glue spread. Sengon wood and *Polyvinyl Acetate* (PVAc) adhesive are used with glue spread variation of 30 #MSGGL; 40 #MSGGL; and 50 #MSGGL and compression pressure which include variation of 150 Psi, 200 Psi, and 250 Psi for 24 hours. There are 2 main parameters that observed in this study, there are physical properties and mechanical properties. The physical properties that observed in this study are moisture content, and density. The mechanical properties that observed are modulus of elasticity (MoE), modulus of rupture (MoR), bonding strength, and wood failure percentage. ASTM D 143-94 standard for moisture content, density, modulus of elasticity (MoE), and modulus of rupture (MoR). For bonding strength and wood failure percentage using ASMT D 905 standard. The result of data then has been analyzed with softwre SPSS and then tested with HSD (Honestly Significant Difference) Tukey with test level 95% and 99%. Simple regrestion analyze, multiregrestion, and corelation analyze was done to find the correlation between the two factors.

As the results, Interaction between factor highly effecting on modulus of elasticity and also effecting shear bond strength and percentage of wood failure. The optimum cross laminated beams where found structure of 50 #MSGGL and 250 Psi with resulted moisture content 13,28 %, specific gravity 0.27, modulus of elasticity 3,6 GPa, modulus of rupture 22,25 MPa, shear bond 9,63 kg/cm<sup>2</sup> and percentage of wood failure 13,24%

**Keyword:** glulam, cross laminated timber, sengon wood, glue spread, compression pressure

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## PENGARUH PEREKAT LABUR DAN TEKANAN KEMPA TERHADAP SIFAT FISIKA MEKANIKA BALOK LAMINASI SILANG SENGON (*Falcataria moluccana*)

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### INTISARI

Meningkatnya kesadaran akan bangunan yang ramah lingkungan, membuat kayu banyak digunakan. Pada penelitian ini produk olahan kayu yang akan dibuat yaitu balok laminasi dengan menerapkan prinsip *CLT* (*Cross Laminated Timber*) atau dapat disebut balok laminasi silang. Tujuan dari penelitian ini untuk mengetahui interaksi antara faktor tekanan kempa dan perekat labur terhadap sifat fisika dan mekanika balok laminasi silang kayu sengon

Untuk menghasilkan balok laminasi silang sengon yang baik, faktor yang harus diperhatikan adalah pengempaan dan perekatan. Pada penelitian ini digunakan kayu sengon (*Falcataria moluccana*) dan perekat Polyvinyl Acetate (PVAc) dengan berat labur 30 #MSGSL; 40 #MSGSL; dan 50 #MSGSL, serta variasi tekanan kempa sebesar 150, 200, dan 250 Psi selama 24 jam. Pengujian balok laminasi silang meliputi sifat fisik yaitu kadar air dan berat jenis, serta sifat mekanika berupa keteguhan lengkung statis dan keteguhan geser rekat juga persentase kerusakan kayu. Dalam penelitian balok laminasi silang ini menggunakan standar ASTM D 143-94 untuk uji kadar air, berat jenis, keteguhan lengkung statis, dan keteguhan patah, sedangkan uji keteguhan geser rekat menggunakan standar uji ASTM D 905. Data hasil pengujian lalu dianalisis menggunakan *software* SPSS, dan diuji lanjut HSD (*Honestly Significant Difference*) Tukey pada taraf uji 95% dan 99%. Analisis regresi sederhana, multiregresi, serta analisis korelasi dilakukan untuk mengetahui hubungan antar variabel beserta hubungan fungsionalnya.

Hasil pengujian menunjukkan terjadinya interaksi antar faktor pada penelitian ini. Interaksi antara perekat labur dan tekanan kempa berpengaruh pada MOE, keteguhan geser rekat, dan persen rusak kayu. Balok laminasi silang optimal terdapat pada balok laminasi silang dengan perekat 50 #MSGSL dan tekanan kempa 250 Psi dimana nilai kadar air 13,28%, berat jenis 0,27, modulus elastisitas 3,6 GPa, modulus patah 22,25 MPa, keteguhan geser rekat 9,63 kg/cm<sup>2</sup>, dan persentase rusak kayu 13,24%.

Kata Kunci: balok laminasi silang, sengon, perekat labur, tekanan kempa

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