

Abstract

Cross laminated timber (CLT) as an engineered product, a new product family of engineered wood products, called composite wood. In this study, the mechanical and physical properties of Cross laminated timber products made from species of poplar as raw material were investigated. Factors that used in the manufacturing of this product included three types of urea-polyvinyl acetate resin, polyvinyl acetate and Eremurus and the amount of press pressure in two level of 15 and 20 kg cm square and size of width of strips in three levels 3, 4 and 5 cm with a thickness of was 8 mm. Factors such as press temperature (80 ° C), press time (20 minutes) and amount of adhesive consumption (150 grams per square meter in case of glue line between each surface) was considered constant. Statistical analysis showed that the effects of resin type, amount of press pressure, size of strips to measured properties and also their interaction effects on each other in most cases is significant at the 95% level. Static bending properties included modulus of rupture, modulus of elasticity, parallel pressure and perpendicular on the long axis, shear strength, holding capacity of screw and nailed, thickness swelling and water absorption of the boards was examined and it was found on the modulus of rupture and modulus of elasticity with decreasing width and increases press pressure with urea-polyvinyl acetate resin significant difference existed; but, have to point out also be noted that Eremurus adhesive due to low price In some cases the difference is too little had with other resins. And in the parallel pressure and perpendicular to the long axis of the boards, between the variable factors were not significantly different and by reducing press pressure in the shear strength and increase the size of the strips, the resistance increased and no significant differences were observed between variable factors. In case of characteristic of water absorption and thickness swelling (after 2 hours of immersion in water), given that the all of the resins were water solvent and not have resistance against water, all of the boards were opened after two hours in water. But in some cases, urea-polyvinyl acetate resin and Eremurus after two hours has a little resisted and were not splintered. holding capacity of screw in boards with Polyvinyl acetate adhesive was the most resistance and holding capacity of nailed in boards obtained from Eremurus adhesive was the most resistance. Total, the best performance in terms of resistive was had the boards made with urea-polyvinyl acetate resin and with 3 cm size and 20 kg per square meter pressure.

Keywords: Cross laminated timber (CLT), poplar, urea-polyvinyl acetate resin, Eremurus adhesive, mechanical properties, wood composite.



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Properties of cross-laminated timber (CLT) made from Poplar

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