

Abstract

Parallel strand lumber is defined as a composite of wood strand elements with wood fibers primarily oriented along the length of the member. In this research, the physical and mechanical properties of Parallel strand lumber (PSL) made from *Eucalyptus camaldulensis* wood strands were investigated. The variables used in the manufacture of this product include Nano silica with percentages of 0, 1.5, 3 and Urea Formaldehyde adhesive to Melamine Formaldehyde, including ratios of 90 : 10, 80 : 20, and 70 : 30, respectively. Factors such as pressure press (150 kg / cm²), press temperature (180°C), and press time (22 min) were considered constant and the Ammonium Chloride as a hardener was 2% dry weight of glue with 30% solution used. Thus, 9 treatments and 3 repeats were made from each treatment. Properties of Water absorption, Thickness swelling, Static bending (Rupture Modulus, Modulus of Elasticity), Internal Bonding, Shear strength and Screw Withdrawer Capacity of joints were investigated. It was determined that all the physical and mechanical properties of the boards studied, with the exception of thickness swelling and screw holding capacity, increased with increasing Melamine adhesive ratio. The best performance in the product of the Parallel strand lumber (PSL) based on the Rupture Modulus, Modulus of Elasticity and Shear strength made out of 3% nano silica and 70 to 30 Urea Formaldehyde adhesive to Melamine Formaldehyde.

Key words: Parallel strand Lumber, Nano silica, Eucalyptus, physical and mechanical properties



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Graduate school
Faculty of Agriculture
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**The Thesis Submitted For the Degree of Master of Science
(In Composite and Products)**

**The Effect of nanosilica on the beam characteristics
parallel strand Lumber made from Eucalyptus**

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December 2017