

**EFFECT OF GEOMETRICAL SIZE
ON THE TENSILE STRENGTH OF FINGER JOINT**

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ABSTRACT

The objective of this study is to analyse the strength of finger joint using Finite Element Analysis under tensile load with different geometrical size which have different length, pitch and tip of finger joint. The analysis will use program LUSAS 13 for the selected types of model which contains modules for designing the finite element mesh modes for performing the analysis itself, and for analyzing and post-processing the results. The computer output analyzed the stresses and displacement of all model and strength of finger joints is largely influenced by the outermost finger. The Modulus of Elasticity of the finger joint can be obtained by analyzing the displacement of the joint to get the stress – strain relationship. It can be concluded that when tip/pitch ratio is higher, the tensile strength reduces while when length/pitch ratio is higher, the stress concentration is higher too.

CHAPTER 1 : INTRODUCTION

1.1 GENERAL

Malaysia has a land mass which mostly covered by natural rainforests and plantation crops. Timbers structure is mostly used in the form of solid member either in permanent or temporary structure. Wood is being widely used in structural applications such as buildings, bridges, foundation and trusses. Recent study has shown that structures built using tropical hardwood has high strength to weight ratio, easy to maintain and lighter than others material.

To avoid the disadvantages of solid wood, which often related to the fact that wood is a highly an isotropic and non-homogeneous material, several engineered wood-based materials have been developed over the years. Glued laminated timber is a two or more layers of wood glued together with the grain of all layers which approximately parallel and when at the ends of the pieces are cut then it is called a finger joint.

Since there is very expansive to design variety of finger joint profile, the experimental study of finger joint is limited. Therefore, the Finite Element Method is made to provide suitable result in the determination of strength of the finger joint.