STRENGTH ANALYSIS OF DOWEL JOINTED RUBBERWOOD (*Hevea brasillensis*) CHAIR SIDE FRAME

By

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The purpose of this study is to develop a method to analyze the strength impact of chair members with different load and location of stretcher. The main objective of this research are to determine stress in each element and the amount of rotation of each joint or mode by using Finite Element Method (FEM). The results showed that the critical moment occurs at the joint which is connected the back post to the seat. The loads that acting at the front post and seat are linearly increased when the position of the stretcher decrease, but, the load at the back post will decreased. This situation lead us to think that the most suitable stretcher position to support the maximum moment at the seat is, wherever possible to place it closely to the rail and as lower as possible to restrain the higher moment at the back post to the rail joint. From this analysis, we can optimize the dimension of each members form for ideal condition for furniture and optimize the condition of test with minimize design joint. Beside that, we also can determine or develop a method to analyze the strength impact of chair members with different load and location of stretcher, which can produce suitable and efficient design and shorter development times.

CHAPTER 1

INTRODUCTION

A structure may be defined as an as assemblage of members whose purpose it to support a given load in a given. Furniture may be regarded as a type of structure, it may be designed using the procedure followed in the design of other structures, which consists of three steps and leads to what is called the strength design of furniture. First, the loads that will act on the structure are determined, second, the forces in the members arising under the action of these loads are analyzed and finally, the amount and distribution of material needed in the structure are computed so that no member or joint is overstressed.

The design of structural members of furniture is almost never the subject for mathematical consideration. Instead, the designer rests on empirical experience and constructs for example chairs with dimensions of structural members based on tradition an aesthetic reason. By the much more common use of computers it is nowadays possible to use modern finite element programs in various stages of the design process (S.I. Gustafsson 1995).