Abstract

Due to lack of forest resources in Iran, furniture durability against external loads is necessary and required. Detailed engineering design and furniture industry using low-diameter forest species that can satisfy the needs of the furniture industry. Member joints and furniture designs are very important in them making and structure resistance are affects by joints and designs. Operation of chairs made with poplar and ziziphus wood against the front to back load test and also, mechanical strength of mortise and tenon and dowel joints were evaluated and compared. Two types usual wooden chairs include with side stretcher or without side stretcher, and also these chairs structured by common joints and poly vinyl acetate (PVA) adhesive and their maximum strength were measured. The results are shown that treatments and intercept treatments were statistically significant with the 95% confidence based on the variable analysis. Duncan analysis for comparison of the average values are showed that maximum load of varied treatments can be classified into eight category as following respectively; ziziphus wood and Pattern of side stretcher and joint of mortise and tenon (1436.7 N), ziziphus wood and Pattern of side stretcher and dowel joint (1209.9 N), ziziphus wood and Pattern without side stretcher and joint of mortise and tenon (380.68 N), ziziphus wood and Pattern without side stretcher and dowel joint (325.08 N), poplar wood and Pattern of side stretcher and joint of mortise and tenon (991.98 N), poplar wood and Pattern of side stretcher and dowel joint (891.86 N), poplar wood and Pattern without side stretcher and joint of mortise and tenon (306.4 N), poplar wood and Pattern without side stretcher and dowel joint (261.18 N). Since, all treatments have difference each other by statistically significant and pattern of side stretcher and then joint of mortise and tenon improved the maximum strength of the chairs significantly.

Key words: Mechanical strength, construction pattern, mortise and tenon joint, dowel joint
Title:

Comparison of mechanical strength of mortise and tenon and dowel joints in wooden chairs

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