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Study on the Determination of Sri Lankan Timber with Least Shrinkage Movement for Furniture and Joinery Work

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Abstract

The moisture content of wood depends on the relative humidity and the temperature of air surrounding it. The cells of timber contain large amount of water in cell cavities as free water and in cell walls as bound water.

Wood shrinks in three directions when it is dried below fiber saturation point (FSP). The least shrinkage occurs along the length of the piece, the greatest shrinkage occurs along tangential (T) direction to the growth rings and intermediate shrinkage occurs along radial (R) direction (perpendicular to the growth rings).

When wood is used for furniture and joinery work it should be dimensionally stable with lower T/R shrinkage ratio. The present study was conducted to calculate T/R shrinkage ratios of commonly used local timbers for furniture and joinery work. Teak, Mahogany, Pine, Rubber, Kempus and Jak timbers. These timbers were collected at large scale furniture manufacturing factory at Dompe.

It was found that Kempus timber had the highest T/R value of 2.989 and Jak timber had the lowest value of 1.086 among the species tested. The T/R values for Mahogany, Teak, Rubber and Pine were 1.213, 1.342, 1.352 and 1.5857 respectively. This indicates that Jak, Mahogany, Teak and Rubber which have T/R ratio close to 1 are better to use for manufacturing of furniture.

Samples of Teak, one of the most common timber species used for joinery work were collected from four different locations: Anuradhapura, Kurunegala, Monaragala and Ampara. According to the results, Monaragala district Teak had highest T/R value of 2.2081 and Anuradhapura district Teak had the lowest T/R value of 1.246 indicating that Teak timbers in Anuradhapura are more dimensionally stable than Teak timbers in other regions. The T/R values for Teak in Ampara and Kurunegala were respectively 1.558 and 1.342.

The results indicate that when selecting timber for furniture manufacturing it is important to select timbers with lower T/R such as Jak, Mahogany, Teak and Rubber to reduce cracks, gaps, and weak joints in usage of timber for furniture production. However, other properties such as density, durability, appearance and availability should also be considered.

Keywords: Shrinkage, Moisture content, Commercial timber