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A Study on the Compression Strength Performance of Finger Joints in Commonly Used Timber Species in Sri Lanka

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Abstract

Finger joint technique is used to eliminate wood defects which weaken the strength of sawn wood plank. The variation of compression strength of seven wood species commonly used for manufacturing furniture in Sri Lanka was investigated to assess finger joint efficiencies of wood species. Stratified random sampling was applied to measure compression tests in un-jointed and finger-jointed samples. BS 373:1957 was used as the standard for test conducted with one Softwood species Pine (*Pinus caribaea*) and Hardwood species; Grandis (*Eucalyptus grandis*), Jack (*Aartocarpus heterphyllus*), Kumbuk (*Terminelia arjuna*), Big leaf Mahogany (*Swietenia macrophylla*), Satin (*Chloroxylon swietenia*) and Teak (*Tectona grandis*). Two finger lengths (13 mm and 19 mm) were used and tested by Universal Testing Machine, using polyvinyl acetate adhesive. Data were analysed by using ANOVA and Duncan's Multiple Range Test at 0.05 significant level. It was observed that the highest joint efficiency was recorded in 19 mm finger-jointed specimen of Grandis followed by 13 mm finger jointed Pine specimen for compression parallel to grain. The least joint efficiency was recorded in 13 mm finger jointed specimen of Kumbuk. Strength of compression perpendicular to grain of 19 mm finger-jointed specimens showed better performance than clear specimens, except Jack and Teak. Limited availability of historical data was a constraint during the study and Sri Lankan context, little effort has so far made on finger jointed manufacturing. The results will be utilised in the commercial application of finger joint manufacturing industry and useful to the traders and planners of the timber industry.

Keywords: Compression strength, Finger joint, Efficiencies, Timber