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[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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Mechanical Properties of Built-up Members Composed of Sugi Planks Fastened Together with Wood Pegs I.

Edgewise bending properties of Sugi planks and 2ply built-up beams

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Abstract: Built-up beams were made of two Sugi (*Cryptomeria japonica* D. Don) planks fastened together with wood pegs. In this study we investigated the edgewise bending properties of Sugi planks and 2ply built-up beams. 20 planks and 20 built-up beams were tested edgewise to destruction. The results are summarized as follows : 1) The modulus of elasticity (*MOE*) of planks in edgewise bending could be predicted well from the flatwise *MOE* of the same plank. 2) Modulus of rupture (*MOR*) and deflection at maximum stress of the planks were affected by *MOE* and edge-knot diameter ratio. 3) The *MOE* of built-up beams was very close to the average of the two *MOE* values of the component planks. Especially if the plank pairs are combined in taking account of the *MOE* distribution of planks, the variation in *MOE* of built-up beams can be reduced. 4) The average values of *MOR* and stress at proportional limit (σ_p) of built-up beams were lower than those of planks. However, the lower 5 percent exclusion limits for *MOR* and σ_p of built-up beams were approximately equal to those of planks.

Keywords: Sugi, plank, built-up beam, wood peg, edgewise bending test

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