

## Abstract

The demand of wood as construction material always increases. However, sawn-wood with large size is more difficult to find in the market due to decreasing in stock dimension. In addition, it makes price more expensive Indonesia has many trees from fast-growing species: however, they have low wood quality, and still limited in usage. To obtain a better performance of fast-growing species as construction material, it needs to be combined to produce glulam. This research observed the influence of position and longitudinal connections of wood glulam beam on strength and stiffness with damage species glulam beams sengon.

Preliminary testing was done to obtain physical and mechanical properties of clear specimen of sengon wood, testing method followed ISO-1976 standard. Fifteen glulam beam specimen had 70 mm wide, 200 mm depth, 3000 mm length were constructed: They represented variations of position and connection work of 0 %, 25 %, 50 %, 75 % and 100 %. Each layer of lumber glued with thermosetting phenol formaldehyde(PA-302)adhesive at pressure 1 up to 1,1 MPa for 10 hour pressing time. The static lateral loading step was done continuously until the beam damage.

The result indicated that sengon Species was V class of strength. Glulam testing showed that in terms of strength and stiffness, the higher the number of connections, the lower the value, the strength reduction percentase of 0%, 25%, 50%, 75% and 100% produces 0%, 13,08%. 28,11%. 29,42%. 70,72 %. Respectively and the degradation of glulam stiffness was 100%. 99,92%. 87,86%. 83,06%. 67,08%. The failure of glulam beam with 0% and to have a shear followed by flexure damage 25%, 50%, 75% and 100%. Send to have a flexure damage followed by shear damage.

**Keywords:** Sengon (*Paraserianthes falcataria*), Connection, Glulam Beam, Strength, Stiffness.

## INTISARI

Kebutuhan kayu sebagai bahan konstruksi selalu meningkat, namun ketersediaan kayu gergajian mutu yang baik semakin sulit ditemui di pasaran dan harga semakin mahal. Di Indonesia banyak terdapat jenis kayu yang cepat tumbuh, tetapi mutunya rendah dan pemanfaatannya terbatas, jenis kayu tersebut dapat di manfaatkan sebagai kayu struktural bila dikombinasi menjadi produk laminasi. Penelitian bertujuan untuk mengetahui pengaruh posisi dan jumlah sambungan longitudinal pada balok laminasi kayu sengon terhadap kekuatan dan kekakuan serta jenis kerusakan balok glulam sengon (*Paraserianthes falcataria*).

Penelitian pendahuluan dilakukan untuk mengetahui sifat-sifat fisik dan sifat mekanika serta kekuatan rekat kayu sengon, standar pengujian ISO-1995. Benda uji balok laminasi terdiri 15 balok dengan ukuran lebar 70 mm, tinggi 200 mm dan panjang 3000 mm. Varisi posisi dan jumlah sambungan dibuat 0%, 25% ,50%, 75% dan 100%. Antar lapisan papan sengon direkat dengan perekat phenol formaldehida (PA-302) pada tekanan 1 sampai 1,1 MPa selama 10 jam, pembebanan lateral statik dilakukan bertahap sampai balok mengalami kerusakan.

Hasil pengujian diperoleh kekuatan kayu sengon termasuk kerapatan rendah dan kelas kuat V. Dari pengujian diperoleh kekuatan dan kekakuan semakin menurun bila jumlah sambungan semakin banyak. Penurunan kekuatan balok untuk persentase posisi dan jumlah sambungan 0%, 25%, 50%, 75%, 100% secara berurutan sebesar 100 %, 86,93 %, 71,89%, 70,56%, 29,28%. Kekakuan balok juga mengalami penurunan sebesar 99,92 %, 87,86%, 83,06%, 67,08%. Jenis kerusakan kayu sengon pada persentase 0% cenderung rusak geser kemudian lentur sedangkan untuk persentase 25%, 50% ,75%, 100% rusak lentur baru diikuti geser .

Kata kunci : Sengon (*Paraserianthes falcataria*), Sambungan, Balok Laminasi, Kekuatan, Kekakuan.

