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Roller Compression of Wood

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Abstract: Sugi (*Cryptomeria japonica* D. Don) and balsa (*Ochroma lagopus* Sw) specimens in the air-dried condition were compressed using a roller press. We measured the frequency and degree of defects and fractures in the specimens caused by the compression.

The cell wall was sequentially compressed due to shear deformation. The specimens were densified in thickness and slightly elongated in width. As a result, alligatoring cracks, longitudinal splits, surface cracks, cup, crook and shear cracks occurred after roller pressing under extreme conditions. Both the frequency and the degree of alligatoring cracks, longitudinal splits and surface cracks increased in proportion to the thickness or the degree of compression of the specimen, or in inverse proportion to the size of the roller diameter.

Moreover, the frequencies of the alligatoring cracks and the surface cracks had a positive relation to the contact angle, which was calculated from thickness, degree of compression and roller diameter. The macroscopic defects of sugi and balsa specimens tended to increase at, respectively, 8 and 12 or more degrees of contact angle.

Keywords: roller press, wood, compressive deformation, defects, contact angle

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