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ANNOUNCEMENT

Mokuzai Gakkaishi **(**Journal of the Japan Wood Research Society**)**

Mokuzai Gakkaishi is another official journal of the Japan Wood Research Society. This journal publishes original articles, notes, review articles, and announcements from the Society in Japanese but with English abstracts, tables, and figure captions for original reports. Contents of the latest issue of Mokuzai Gakkaishi are as follows:

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Category I

Ken Watanabe, Hideaki Korai, Isao Kobayashi, Takashi Yanagida, Keisuke Toba, Yasuhiro Teranishi, Tatsuya Naruse

Evaluation of internal checks of kiln-dried lumber using a hierarchical model I: factors affecting internal check length

The goal of this study is to establish a method for evaluating test data obtained in kiln-drying lumber. Experimental data on radio-frequency drying of sugi (*Cryptomeria japonica*) beams without pith were used to present a data evaluation method for the length of internal checks of kiln-dried lumber based on a hierarchical model. Occurrence of the internal check phenomenon was determined with the underlying data-generating process, and the length of internal checks was modeled in relation to heating temperature, initial moisture content, final moisture content, and basic density. The diagnosis of the posterior model parameters revealed that heating temperature, initial moisture content, and basic density have a positive influence on the occurrence of internal checks, while final moisture content has a negative influence. A comparison between the developed hierarchical model and conventional statistical analysis used in research on lumber drying showed that a much more detailed analysis of internal check length could be performed by the hierarchical model.

Category II

Yo Ochiai, Kenji Aoki, Masahiro Inayama

Fundamental research of an evaluation method of splitting failure in timber II: effect of specimen shape on splitting strength when loaded parallel to grain

The mechanism of splitting of timber loaded parallel to grain is not clear and it is difficult to evaluate the splitting strength. In this research, splitting tests on Japanese cedar and Douglas fir were conducted to clarify splitting strength. A monotonic tensile force was applied to a drift-pinned joint with steel side plates and splitting failure originated from the pin hole. In order to evaluate the splitting strength, specimens with various parameters, i.e., diameter of drift pin, end margin, edge margin and thickness were used. All parameters affected the splitting strength, but particularly, end margin and thickness also affected the failure mode. As the end margin lengthened, the failure mode was transferred from shear to splitting. On the other hand, as thickness increased, the drift pin bent more at splitting. This bending of the drift pin caused a lag of bearing stress to timber, and the failure mode was transferred from full width splitting to partial width splitting. The splitting strength under various conditions could be evaluated by consideration of the difference in failure modes.

Category II

Masayuki Kawarasaki, Ryoichi Hiradate, Yasushi Hirabayashi, Shinichi Kikuchi, Yoshifumi Ohmiya, Jaeyoung Lee, Masaki Noaki, Noboru Nakamura

Fire retardancy of fire-retardant-impregnated wood after natural weathering I: effects of chemical types and coatings at up to 60-months of exposure

Fire-retardant-treated (FRT) woods were tested for natural weathering for up to 60 months at three places in Japan. Water-soluble and leach- resistant fire-retardants were used for the FRT woods. Half of the FRT woods were coated with high durability paint, using a combination of fluorine

resin-based and polybutadiene-based paints. Fire retardancy of uncoated FRT woods decreased after 3 months for the water-soluble fire retardant and after 12 months for the leach-resistant fire retardant. The change in fire-retardant retention of uncoated FRT woods after weathering indicated that the decrease in fire retardancy had been strongly influenced by the resistance of fire retardants to leaching. Coated FRT wood that used both fire retardants maintained fire retardancy for up to 60 months. However, coated FRT wood made with water-soluble fire retardants led to the coat being separated from the FRT wood and a decrease in fire-retardant retention after 36 months.

Category III

Erika Heki, Akio Koizumi, Yoshihisa Sasaki, Hiroyuki Torita

Verification of trunk modulus of elasticity obtained by improved tree bending tests

The tree bending test is a non-destructive method for evaluating the Young's modulus (modulus of elasticity, MOE) of a tree trunk. We attempted to improve the method to obtain increased accuracy of the estimated MOE. In the proposed method, the load–deflection relationship was graphically displayed on a tablet PC, and the MOE was calculated using the linear section of the load–deflection relationship. As a result, errors caused by wind pressure or contact with neighboring tree crowns could be easily eliminated. The proposed tree bending tests were conducted at plantations of todomatsu (*Abies sachalinensis*), karamatsu (*Larix kaempferi*), and larch hybrid. The calculated trunk MOEs were compared with the results obtained from stress wave velocity measurements of the trunks, as well as dynamic MOE obtained by longitudinal vibration tests of the logs harvested after the tree tests. The correlation between the trunk MOE and the dynamic MOE for logs was found to be as high as that obtained for the correlation between the square of the stress wave velocity and the log MOE. The results demonstrated that the trunk MOE obtained by the proposed tree bending test could be used as a practical reference index for the mechanical properties of the wood. The dynamic MOE for log specimens obtained by the longitudinal vibration tests was approximately 30 percent lower than the trunk MOE. This could be partially explained by the high MOE of the mature wood formed at the outer part of the trunk, which might affect the trunk MOE.

Category III

Ryuya Takanashi, Masahiko Toda, Teruhisa Miyauchi, Mitsunori Mori, Takuro Mori

Shear strength of multi-screw joints connected to decayed lumber

This study aimed to investigate the performance of joints in decayed lumber made with a fastener with multiple connectors. We conducted shear resistance tests of a hold-down connected to Sakhalin fir (*Abies sachalinensis*) lumber exposed to a brown-rot fungus (*Fomitopsis palustris*). This hold-down was connected with seven screws. We measured depth of pin penetration with a Pilodyn in the main members after shear tests. We concluded that joint performance when the main member decays is not much reduced for fasteners with multiple connectors when compared to those with a single connector. Depth of pin penetration showed negative correlation with maximum, yield, and ultimate shear resistance. Yield shear resistance of multi-screw joints connected to decayed lumber could be calculated safely by the European Yield Theory.