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## Racking Performance of Floor Diaphragms with Thick Particleboard

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**Abstract:** Racking tests of floor diaphragms with 30 mm thick particleboard, and the JIS 13 type, were conducted to confirm this board's feasibility as a sheathing material. Racking resistance of the diaphragms was also numerically analyzed. As a result, racking resistance of floor diaphragms with the particleboard sheathed with screws seemed to be stronger than that of floor diaphragms with the particleboard sheathed with nails, but the ductility of floor diaphragms sheathed with screws was less than that of floor diaphragms sheathed with nails. Also, the racking resistance of floor diaphragms with narrow particleboard was lower than that of floor diaphragms with standard size particleboard. Estimated load-shear strain curves of floor diaphragms analyzed with numerical calculation agreed with the observed curves of floor diaphragms sheathed with nails until ultimate deformation, by using load-slip curves of timber joints with nails or screws and the observed shear stiffness of the particleboard. On the other hand, estimated curves of floor diaphragms sheathed with screws somewhat differed from the observed curves after maximum load. This disagreement seemed to depend on the differences in failure modes between the single shear joint tests and racking tests.

**Keywords:** [floor diaphragm](#), [thick particleboard](#), [Tuomi's assumption](#)

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