

EVALUATION OF MECHANICAL STRENGTH OF FINGER JOINT CONNECTION USING DIFFERENT MODES OF BENDING TESTS

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Abstract

Performance of wooden constructions depends a lot on the static bending strength of their components, which determines the loading capacity of own constructions. In many cases, a big share of these components is produced by joining wood pieces by means of different types of connections; one of the most used is finger-joint. By the other side, different testing modes for measuring static bending strength are in use, the most common used are those of one point and two points applying load. In this framework, a comparison study was carried out with the aim to determine the most appropriate mode for evaluation of static bending strength of finger-joint connections, referring to modes mentioned above. Wood material for production of samples was selected from pieces of kiln dried poplar (*Populus alba* L.) boards. From selected pieces were sawn blocks without deformations or structure defects with dimensions of cross-section 5×6 cm, and various lengths. Fingers profiles were produced on one head of each block by means of a spindle moulder. They were produced with edged tips. The geometric profile of cutter heads (knives) which means the geometric profiles of fingers, was with pitch 6 mm, length 10 mm and slope angle 17°. After gluing of blocks combining two by two, the jointed blocks were cut and planed to final dimensions to produce bending strength samples. For each testing mode, 24 finger-joint samples were conditioned and tested by means of mechanical testing machine. Other 24 clear solid wood samples, for each testing mode, were tested as well. From statistical analyses of results was noted that for clear wood, bending in one loading point gave a better performance, while for finger-joint samples there was no significant difference between two modes. This, because of finger-joint is the decisive element to determine the strength. As conclusion we can say that in case of finger-joint connections, there is no matter the mode of static bending test to be applied.

Keywords: *finger joint, bending strength, testing modes.*