



Impact of Cracks to the Hygrothermal Properties of CLT Water Vapour Resistance and Air Permeability

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Summary:

Current research is focused on crack formation and propagation in cross laminated timber (CLT) panels and its impacts on the water vapour resistance and air permeability of panels. Crack formation was examined by means of climate tests with five layer CLT-panels with a thickness of 95 mm. Results of climate tests showed that decreasing the moisture content (MC) from 11 % to 7 % caused mean crack widths in panels of 0.27 mm and 0.38 mm, and an MC decreasing from 17 % to 7 % caused mean crack widths of 0.89 mm and 2.0 mm. From these test results it was concluded that in CLT panels which were produced and stored in a humid environment there was an approximate 200% increase in the mean maximum width of cracks compared to panels stored in a dry environment. The water vapour transmission increased by about 9 % with smaller cracks (that were imitated with 2 mm holes) and 30 % with larger cracks (6 mm holes). The air permeability of CLT at a maximum air pressure difference of 550 Pa was 2.25 l/(s*m²) with 2 mm holes and 5.56 l/(s*m²) with 6 mm holes. It can be concluded from the afore mentioned test results that cracks significantly influence the hygrothermal properties of CLT. Deeper investigation as to the reasons, formation and propagation procedures are needed to avoid inadvisable cracks in CLT.

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Influence of Interior Layer Properties to Moisture Dry-out of CLT Walls

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