Investigation of the Bond Quality of Semi Industrially Produced Ash Glulam

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Summary:

Delamination resistance and tensile shear strength (TSS) are essential for structural adhesives used in timber industry. Thus these two factors were investigated on bonded ash (Fraxinus excelsior L.) to check the suitability of adhesively bonded ash as building material. For determination of the delamination resistance industrially bonded ash glulam was used. The specimens for the tensile shear tests where produced in the laboratory. Four different adhesives types and different pre-treatment were investigated. The samples for TSS were tested in dry and wet condition. 80% of the tested series met the requirements of the standards at dry, and only 30% passed at wet condition. None of the adhesives tested was able to pass the delamination test. No distinct influence of the different parameters studied is notable for most of the adhesive systems, only extended closed assembly time and lower mixing ratios seem to improve the bond quality of MUF. Additional chemical analyses, conducted to find evidence for the poor bonding performance, showed that fatty acid content, pH and acidic extractives are in between the range of beech (Fagus sylvatica L.) and Spruce (Picea abies Karst.). However the formic acid is an exception with a four times higher amount as the other two species investigated.

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