

SUMMARY

This study has tested the bending strength and modulus of elasticity (MOE) and shear strength of gray alder and black alder plywood at different log soaking temperatures (20 °C, 40 °C, 70 °C).

If to analyse the results within longitudinal direction of plywood, the highest modulus of elasticity (MOE) was observed for the black alder test specimens at soaking temperature 70 °C with lignin-phenol-formaldehyde (LPF) adhesive. The lowest MOE result was produced by gray alder at soaking temperature 20 °C and used LPF adhesive. If to analyse the results within perpendicular direction of plywood, the highest MOE was observed for the black alder test specimens at soaking temperature of 40 °C with lignin-phenol-formaldehyde (LPF) adhesive. The lowest MOE result was produced by gray alder at soaking temperature 70 °C and used phenol-formaldehyde adhesive.

The highest gray alder bending strength result in perpendicular direction came out at soaking temperature 40 °C and used LPF adhesive. The lowest bending strength result occurred at soaking temperature of 20 °C, when used LPF adhesive and direction was longitudinal. The highest black alder bending strength result in perpendicular direction come out at soaking temperature 40 °C and used PF adhesive. The lowest bending strength result occurred at soaking temperature of 20 °C, when used LPF adhesive and direction was longitudinal.

If to compare gray alder and black alder bending strength and MOE results, can be inferred, that black alder plywood is stiffer than gray alder.

The highest shear strength result of gray alder come out at log soaking temperature 40 °C with LPF adhesive. The lowest shear strength result occurs at log soaking temperature 20 °C with PF adhesive. The highest shear strength result of black alder come out at log soaking temperature 70 °C with PF adhesive. The lowest shear strength result occur at log soaking temperature 20 °C with PF adhesive.

Shear strength results shows that the black alder veneer can create stronger bonding connections between layers than the gray alder.

When to analyse the test results, then it is difficult to say which of the adhesives (LPF, PF) is more justified to use in plywood production. Based on the results which come out in this study then for gray alder is recommended to use LPF adhesive and for black alder PF adhesive. It cannot say that LPF adhesive results was significantly worse than with PF. Can be said that

LPF adhesive has proved itself during the test and is suitable for production of plywood for alders.

The results show that black alder at soaking temperature 40 °C gives the most stable bending strength and MOE results, which would make such a combination most suitable for plywood production.