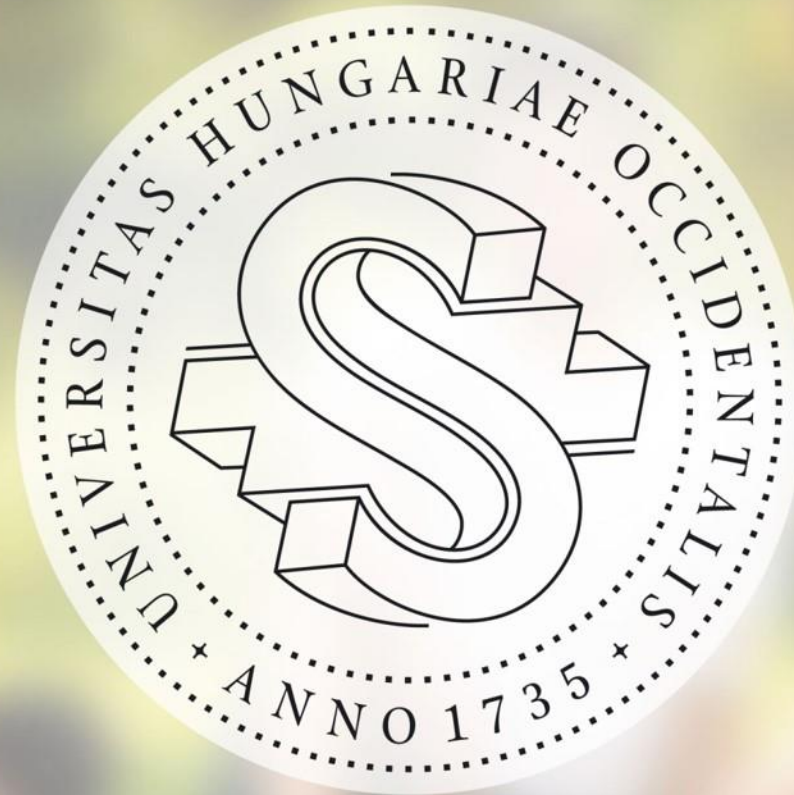


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SIMONYI KÁROLY FACULTY OF ENGINEERING,
WOOD SCIENCES AND APPLIED ARTS

Comparison of a new and a 40 years old robinia glued-laminated
load bearing element



Materials and Methods

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- Focus on a plantation grown timber → robinia (*Robinia pseudoacacia*)
- Favourable material properties:
 - airdry density ~770 kg/m³,
 - MOR ~135 MPa,
 - MOE ~12000 MPa)
- And shows a high growth rate among cultivated wood species in Europe





Materials and Methods

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- The topic of this research was the comparison of the delamination and mechanical properties of a new and a 40 years old robinia glued-laminated load bearing element.
- The old element was manufactured in 1974 by the firma Agrokomplex and it was used in the spa in Harkány (Hungary) until 2014.
- The exposure during the utilization of the old element was quite high, as it was working under highly moist conditions. It was exposed in this environment also to dissolved salts in the thermal water.



Materials and Methods

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- The investigated properties were:
 - delamination (EN 391:2002),
 - bending strength of the material (EN 310),
 - moisture content,
 - density,
 - surface roughness,
 - bonding quality (EN 314-1 and 2:2004).



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Robinia glulam elements in the spa of Harkány (Hungary)



Materials and Methods

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Piece of the 40 years old element



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Old element before – during – and after delamination test



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Delamination



Conclusions

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- The old element showed that some glue layers were delaminated exceeding the limit defined by the standard.
- In case of the new element the delamination occurred even before the delamination test. The main question about this result is that is the used glue suitable for the gluing of robinia.
- The exposure during the utilization of the old element was quite high, as it was working in a spa under highly moist conditions. This was well explained by the low value and high variance of the bonding strength (shear strength).
- However, the material of the old element would fit in the GL 24h bending strength category according to the standard EN 1194, but the bonding quality is below the regulations of the standard EN 314.
- These results confirm the replacement of the elements after the 40 years of usage.



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Thank you for your attention!

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