

Success story



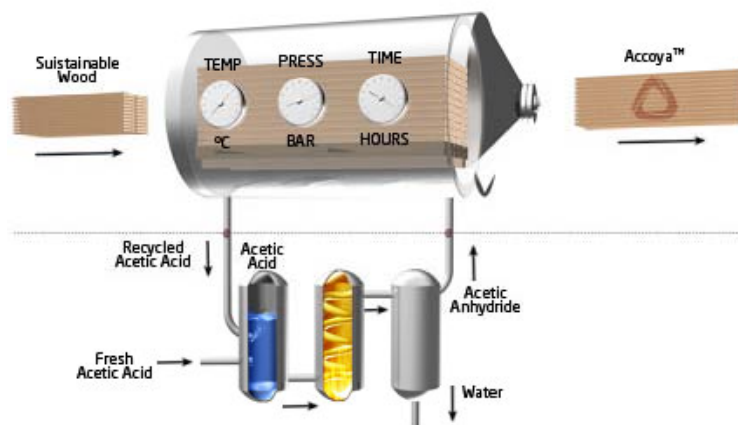
SHR Timber Research, Wageningen, Netherlands

Evaluating acetylated Radiata pine under load bearing situations: building a road bridge

SHR was member of the “technical team” formed for the development of the technical design of the timber bridges and establishing all the necessary research.

Modification of wood opens a whole new and broad range of innovative or renewed applications for timber. Applications of which until now architects and designers only considered using steel, synthetic materials or concrete are now coming accessible. The initiative and implementation of the province of Fryslân in the Netherlands to build two heavy load-bearing traffic bridges of timber offers a unique chance for modified timber to demonstrate what will be possible using this innovative material. From an early stage on it was clear that this specific design of the traffic bridges, chosen by the local inhabitants in a contest, could not be built using the known natural wood species. This provided an ideal opportunity for acetylated wood to be used.

The design consists of structural parts of three dimensional double bended glue-laminated beams, with exceptional dimensions of 140 by 108 cm in cross-section and specific wood-wood-connections to join these elements in the construction. The minimal required life-expectancy of these bridges is 80 year, with minimal maintenance efforts and a high safety level. For this purpose several high demanding qualities, durability, dimensional stability, mechanical strength, bending- and glue-ability, should be combined within one single timber species. These are all properties known for acetylated wood.



Acetylation is a method of chemical modification where acetyl groups are bound to reactive sites in the wood. This makes the wood more resistant to decay and movement due to moisture. The method has been considered for wood processing for several decades but it is only recently that sufficient technological advances have allowed feasible commercialisation.

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In the same period the world's first industrial scale production plant of acetylated wood under the trademark Accoya™ was launched by Titan Wood B.V., starting production in the beginning of 2007. This enabled the constructors and designers to explore the possibilities of using this novel material for the bridges and to proceed with their challenging plans. The initial design of the bridges by the architects was further developed into the technical design by the constructor with support of a specific composed "technical team timber bridges".

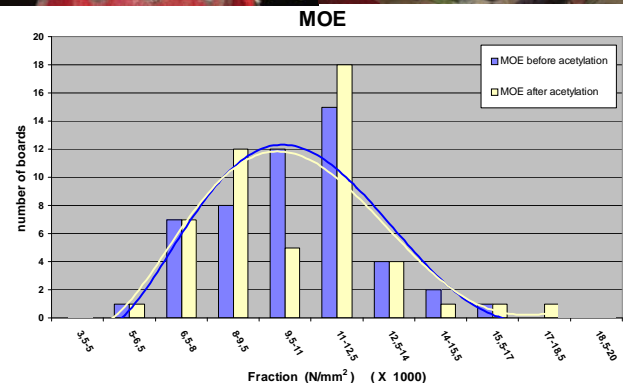


Specific research for the traffic bridges

- glue-ability and (industrial) lamination
- compatibility with metal fasteners (corrosion)
- strength properties and assembling of specific wood joints (in-glued rods)

Strength grading of acetylated wood

- mechanical properties of Radiata pine and acetylated Radiata pine (Accoya™).



Results from the tasks above have shown that Accoya™ is suitable for use under load bearing conditions, where extended service life is required. It is hoped that this work will pave the way for the increased use of acetylated wood in high-demanding uses in the future.

Further information on Accoya™ can be found on the website www.accoya.com

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