



ModWoodLife

Evaluation of hardness of heat treated yellow poplar wood

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Cost Action FP1407 2nd Conference

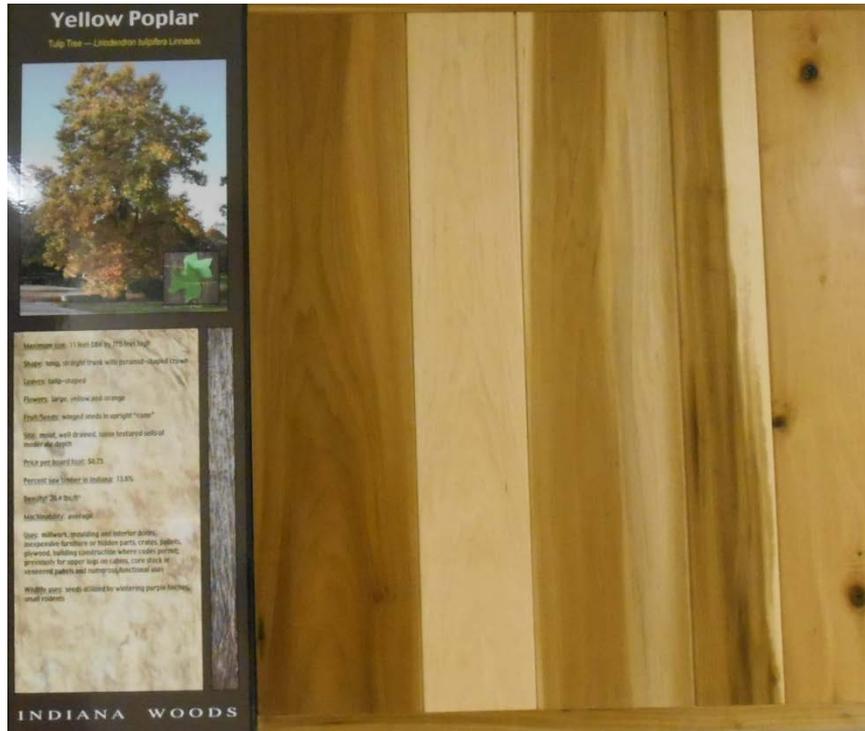
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Yellow poplar



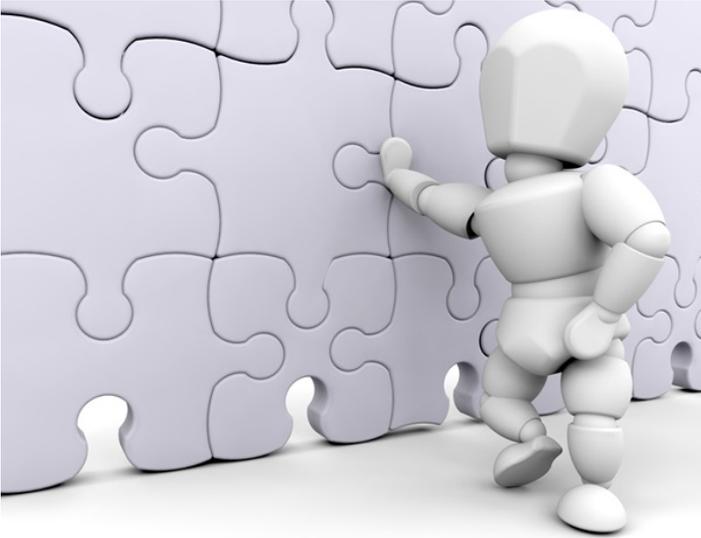
Yellow poplar (*Liriodendron tulipifera*) also known as the tulip tree or tulip poplar is a popular tree in the USA.

Yellow poplar



Wood from this fast-grown species is extensively used for many indoor and outdoor applications, such as for siding, moulding, millwork, cabinetry, and decking.

Objective



- This study aims to evaluate the influence of heat treatment on hardness of yellow poplar specimens.
- SEM micrographs were also taken to observe the anatomical structure of the samples.

Material and method

- 15 defect free samples
- 55 x 38 x 19 mm
- 3 groups were set
- a temperature of 190°C was applied in a laboratory oven for 3 and 6 hours



Hardness measurement

- Janka hardness
- Comten 95 Series Testing Machine
- by embedding a steel sphere with 11.2 mm Φ
- 4 measurements were taken from each sample



Comten 95 Testing Unit

SEM micrographs

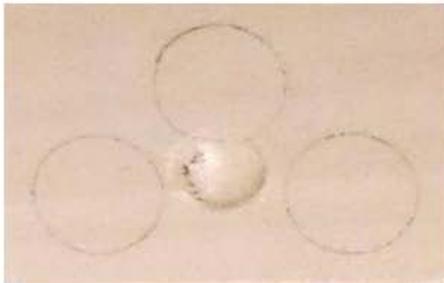
- The anatomical structure of samples was investigated by using SEM.
- The samples (3 x 3 x 3 mm) were put under vacuum and coated with a thin film of gold using an ion sputtering device, before micrographs of the surfaces were taken.



Quanta SEM device



Colour changes



Control sample



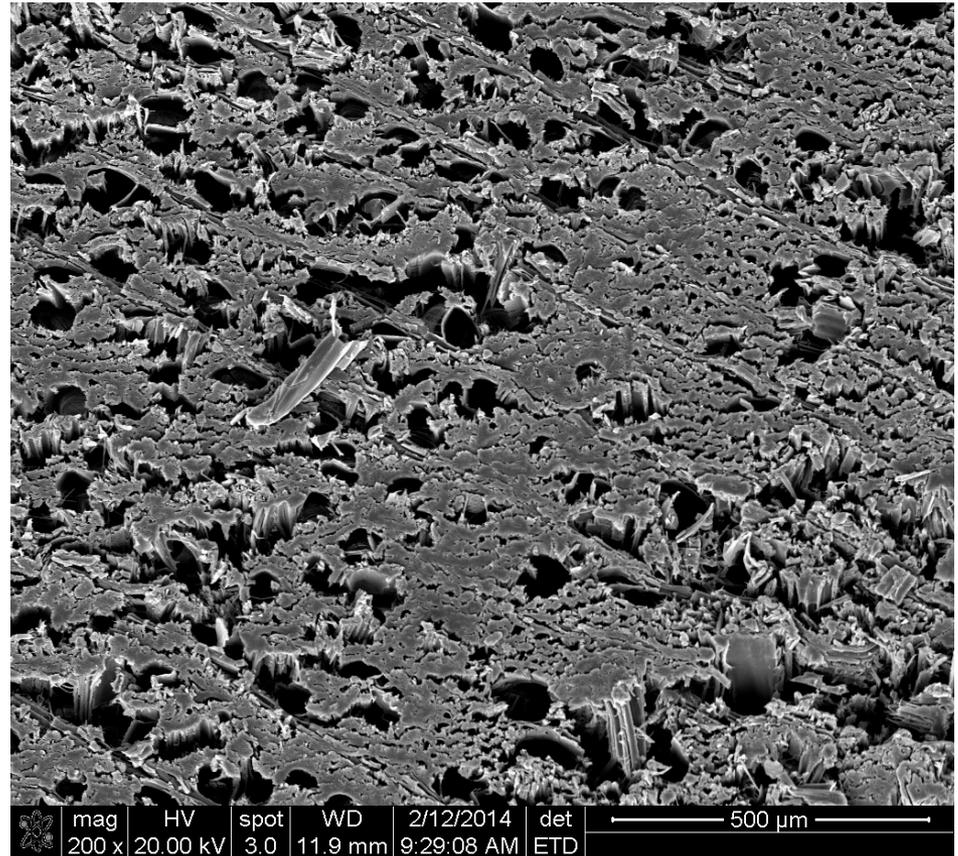
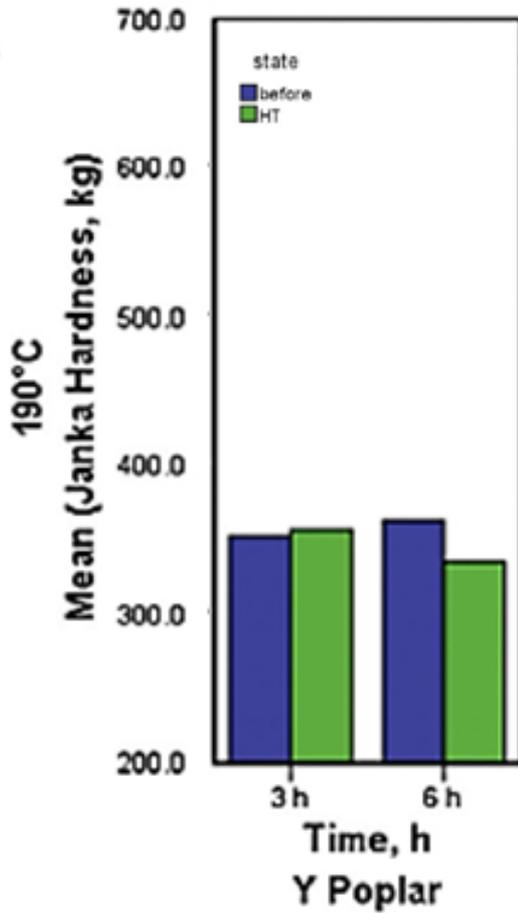
HT at 190°C for 3h



HT at 190°C for 6h

Progress of discoloration as function of heat treatment

Results



Influence of heat treatment on hardness and anatomical structure of the samples

Conclusive remarks



- It was found that the hardness of the samples was influenced by the treatment.
- But the results were found to be sufficient for different uses of yellow poplar.
- The application of heat treatment could therefore enhance the use of yellow poplar wood for high value product.

Acknowledgements

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Thank you for your attention!

