

HOUT BEHOUD – WOOD PRESERVATION

Reuse of scrap wood

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“The results of this project show potential of recycled Wood Fibre Composites to be used at industrial scale”

Introduction

A lot of demolition waste is released during construction. For a large number of materials, including the A-wood (untreated, not painted or impregnated wood), there are already recycling routes. Other materials do not yet have a well-defined recycling route, among this B-wood (wood containing glues, adhesives, paintings but not contaminated with toxic substances with which C-wood is usually treated)

The total amount of B-wood burned in the Netherlands in 2015 was 542 kton.

The aim of the project is to manufacture wood-fibre composites from the recycled A and B wood on a lab scale and to study its mechanical properties.

It aims at the application of renewable raw materials, to avoid the incineration of the wood, so reducing the environmental impact.



Approach

In order to analyse the nature of the compounds of some materials (present in the B-wood), FTIR is used.

To obtain wood fibres, the raw material is dried and shredded. After this, the particle size distribution is determined by sieving. By adding polypropylene (in different percentages) and other additives to improve the adhesion between fibre and matrix, wood fibre composites are

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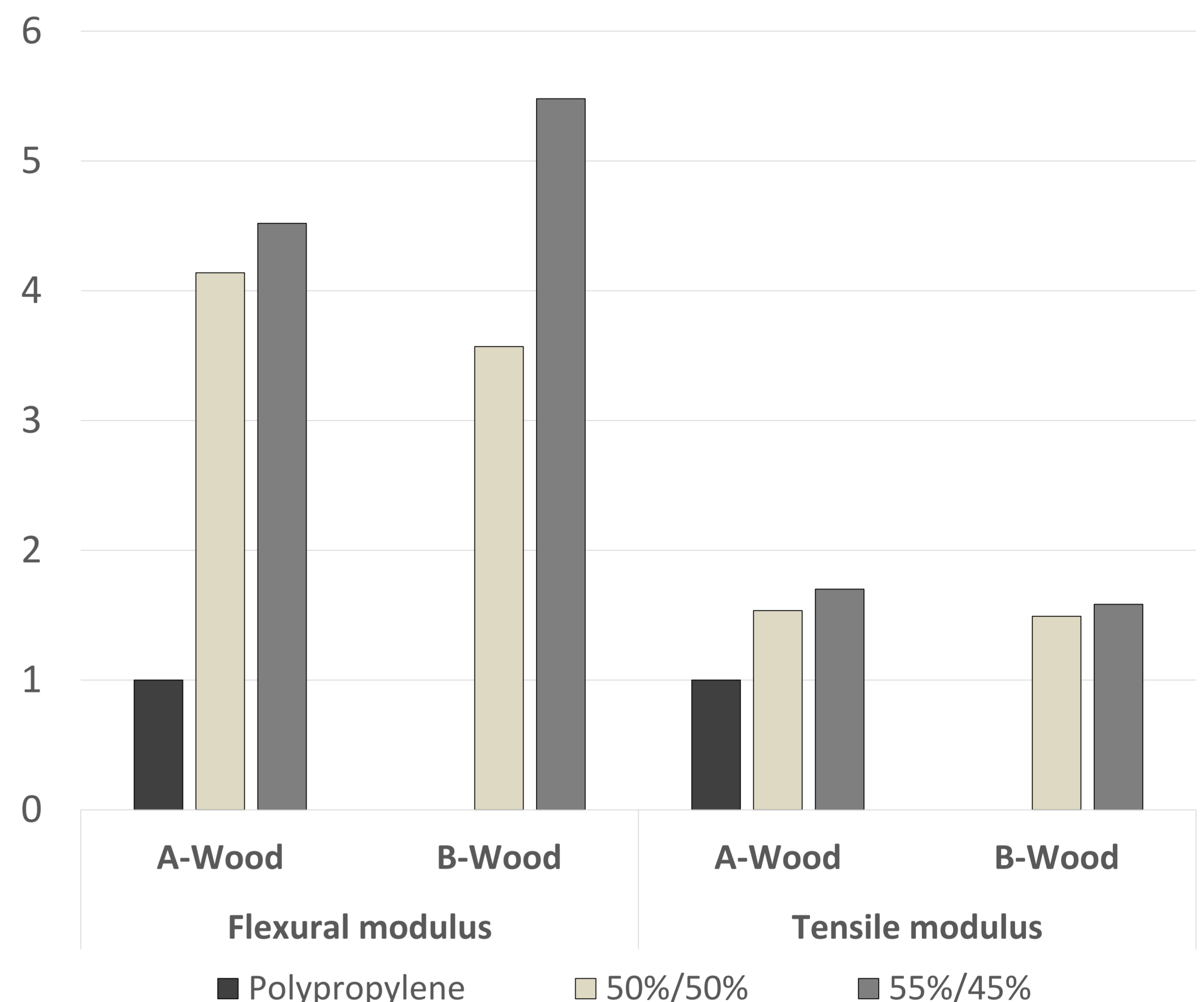
compression moulded, injection moulded (in dumbbell shape) and extruded.

The mechanical properties (tensile and flexural) are investigated.



Results

Flexural and tensile moduli



The graphs above shows that wood fibres with polypropylene will increase the tensile modulus and the stiffness: the tensile modulus increases by a factor of 1.75, while the stiffness is increased by a factor 4-5.

Conclusions

The main conclusion of the project is that the processing of A-B wood composites on a lab scale is possible.

Furthermore, suitable mixing methods are achieved and the fibre content has a great effect on the mechanical properties of the processed wood fibre composites.

A trial on industrial scale of A-wood composites would be a next step.

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The process



<https://thermoplasticcomposites.nl/research-areas/recycling/hout-behoud/>