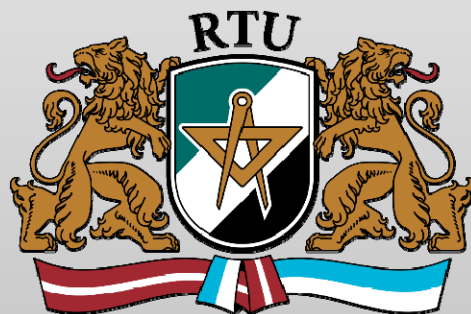




ARTIFICIAL WEATHERING (QUV) OF WOOD PLASTIC COMPOSITES MADE WITH THERMALLY MODIFIED WOOD RESIDUES

**Edgars Kuka, Dace Cirule, Janis Kajaks, Ingeborga Andersone and
Bruno Andersons**



Acknowledgements



NIR & wood workshop – San Michele all'Adige (TN) 19--21 April 2016



Wood Plastic Composites (WPC) are...

Natural fibers

- Wood
- Flax
- Hemp
- etc.



<http://www.composite-deck.com/why-green/wood-fibers.png>



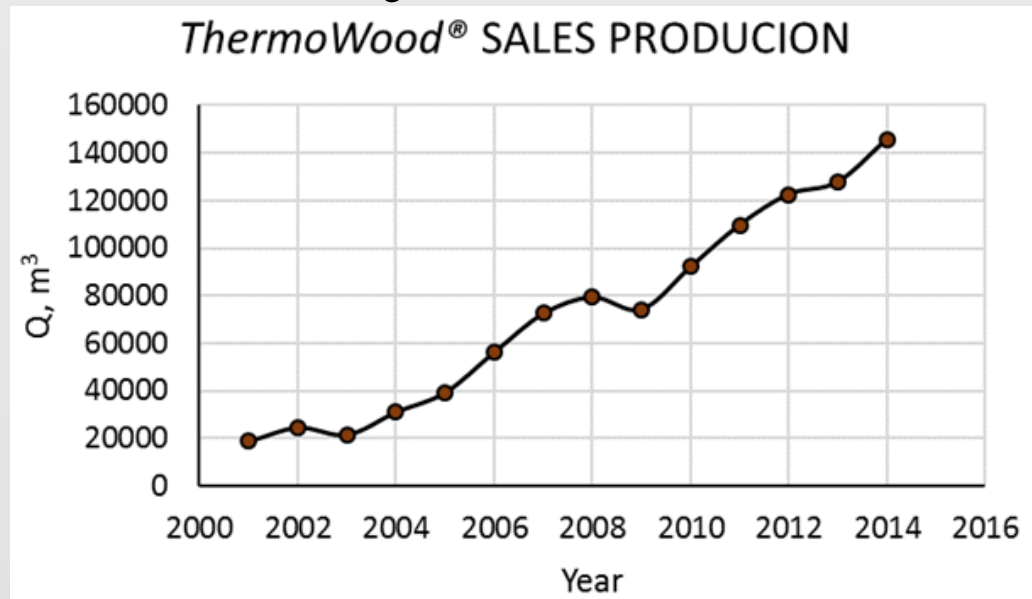
Thermoplastics

- PP
- HDPE
- LLDPE
- etc.



http://www.hunterlab.com/images/content-images/PLASTIC_Pellets.png

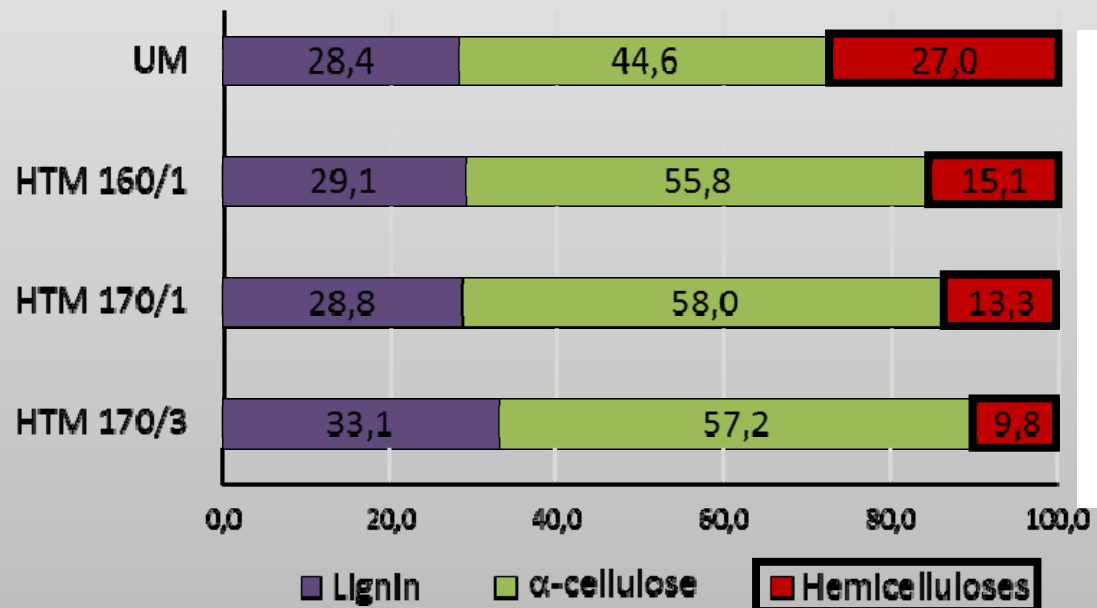
Why thermally modified wood?!



Birch sawdust



TM birch sawdust



Hydrophobic nature

Uses in outdoor applications



Artificial UV weathering

WPC with **unmodified** wood fibers



Colour changes $\Delta E_{ab} = 12.9 \pm 2.1$



Before

After 280 h

WPC with **thermally modified** wood fibers



Colour changes $\Delta E_{ab} = 31.2 \pm 1.7$



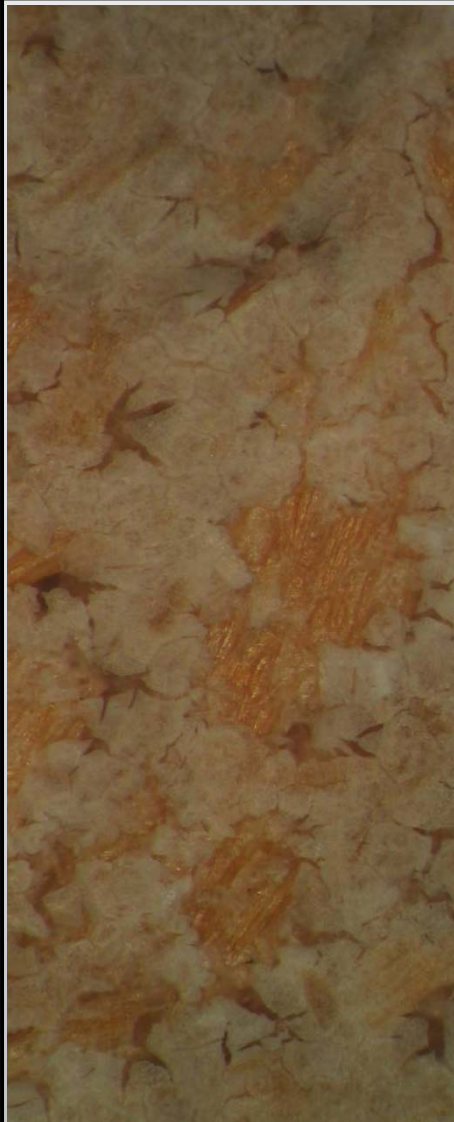
Before

After 280 h

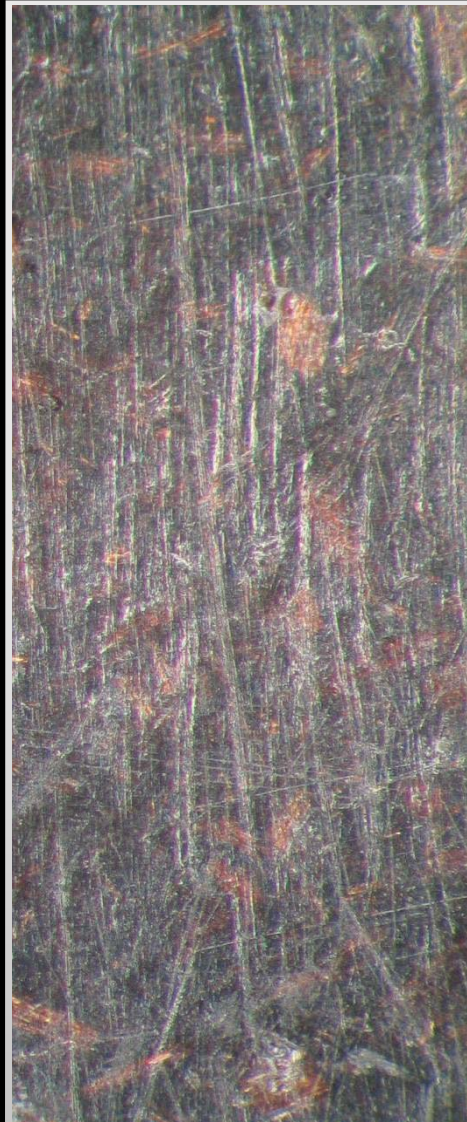
Optical microscope (50x MAG)



Before



After 280 h



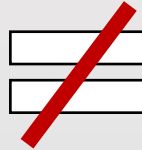
Before



After 280 h

Conclusion and the next step!

WPC with
unmodified wood
fibers



WPC with **thermally
modified** wood
fibers



Problem

Mauruschat D. et al. *"Application of near-infrared spectroscopy for the fast detection and sorting of wood-plastic composites and waste wood treated with wood preservatives"* (2015)

- It is possible to distinguish and separate WPCs made with different plastics (PP, PE, PVC, PLA) by using NIR spectroscopy.

Is it possible to separate WPCs with different fiber reinforcements by using NIR spectroscopy?

(FOR MATERIAL PURPOSES)

RECYCLING

