Book of Abstracts

COST Action FP1407 - 3rd Conference

„Wood modification research & applications“

Kuchl, September 14-15, 2017

Salzburg University of Applied Sciences
Forest Products Technology & Timber Constructions

in collaboration with
the Society of Wood Science and Technology &
the European Conference on Wood Modification
COST Action FP1407

Understanding wood modification through an integrated scientific and environmental impact approach (ModWoodLife)

Wood modification research & applications

Third COST Action FP1407 International Conference

Kuchl, Austria

14-15 September 2017

Editors: Gianluca Tondi, Marko Posavčević, Andreja Kutnar and Rupert Wimmer

Salzburg University of Applied Sciences

Kuchl, 2017
Print ■ Druckerei Schönleitner
Print-run ■ 150 copies
© 2017 Salzburg University of Applied Sciences Press

COST Action FP1407
3rd International Conference
Kuchl, Austria
14-15 September 2017
“Wood modification research & applications”

Organizer ■ Salzburg University of Applied Sciences; Forest products technology & Timber constructions
Co-organizers ■ Society of Wood Science and Technology (SWST) & European Conference on Wood Modification (ECWM).
Editors ■ Gianluca Tondi, Marko Posavčević, Andreja Kutnar, Rupert Wimmer

ISBN 978-3-200-05255-0
Proceedings of the 3rd COST Action FP1407 International Conference - Wood modification research & applications
Edited by Gianluca Tondi, Marko Posavčevič, Andreja Kutnar, Rupert Wimmer
Organizer Salzburg University of Applied Sciences, Forest products technology & Timber constructions.
Co-organizers Society of Wood Sciences and Technology & European Conference on Wood Modification.

All papers have been reviewed.

Cover pictures Gianluca Tondi, Hermann Huber, Alexander Petutschnigg; Salzburg University of Applied Sciences
Cover design Gianluca Tondi, Ingrid Seidl; Salzburg University of Applied Sciences

Published by Salzburg University of Applied Sciences Press, Marktstraße 136a, A-5431 Kuchl, 2017

ISBN 978-3-200-05255-0 (printed edition; not for sale)
Modified wood with lactic acid oligomers: assessment of performance

Charlotte Grosse1,2, Marion Noël1, Marie-France Thévenon3, Philippe Gérardin2

1Department Architecture, Wood and Civil Engineering, Berne University of Applied Sciences, Solothurnstrasse 102, Postfach 6096, CH-2500, Biel, Switzerland; e-mails : charlotte.grosse@bfh.ch, marion.noel@bfh.ch

2LERMaB, EA 4370, Université de Lorraine, Faculté des Sciences et Technologies, BP 70 239, F-54506 Vandoeuvre-lès-Nancy, France ; philippe.gerardin@univ-lorraine.fr

3CIRAD, UR B1OWooEB, TA B-114/16, 73 Rue Jean-François Breton, F-34398 Montpellier CEDEX 5, France ; marie-France.thevenon@cirad.fr

Keywords: wood modification, lactic acid, dimensional stability

Treatment based on lactic acid has been developed and optimized for wood modification by Noël et al. (2009, 2015) and Grosse et al. (2016). This treatment aims to improve wood dimensional stability and biological resistance for its usage outdoor. The process consists in oven-dried beech wood (Fagus sylvatica L.) impregnation with lactic acid oligomers (OLA), followed by curing in dry conditions.

Treatment efficiency depends on curing conditions and increases with temperature (Grosse et al, 2016). At 160°C, treatment conferred very promising properties to wood, in particular regarding anti-swelling efficiency (ASE), moisture exclusion efficiency (MEE) and biological resistance and it was persistent in wood (respectively ASE*, MEE, WLcv and Wlcp, and LR in Table 1). Mechanical performance evaluation through 3 points bending test, showed the modified wood was more brittle but could resist higher loads. OLA polycondensation was assessed by Fourier transform infrared (FTIR) spectroscopy (Fig. 1).

In order to evaluate possible up-scaling of this treatment, larger samples were impregnated. Density profile was studied on 100x100x550 mm³ samples and showed a homogeneous repartition of product in wood. Homogeneity of resistance against fungal decay was assessed with EN113 on samples of 15x25x500 mm³ (Fig. 2).

Table 1: Results of test.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ASE* [%]</th>
<th>MEE [%]</th>
<th>WLcv [%]</th>
<th>Wlcp [%]</th>
<th>LR [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLA</td>
<td>61.1 ±3.2</td>
<td>39.4 ±0.7</td>
<td>2.0 ±0.2</td>
<td>2.7 ±0.2</td>
<td>2.3 ±0.2</td>
</tr>
</tbody>
</table>
Figure 1: FTIR spectra of untreated wood, impregnated wood and treated wood.

Figure 2: Samples exposed to *Coriolus versicolor* following the EN 113 standard procedure

References


Acknowledgments

The research leading to these results was supported by funding from the WoodWisdom-Net Research Program, which is a transnational R&D programme jointly funded by national funding organisations within the framework of the ERA-NET+ Action WoodWisdom-Net+.