

COST MC Chair:

Dr Stefanie Wieland

Salzburg University of Applied Sciences

STSM SCIENTIFIC REPORT

Action: COST FP1006

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COST STSM Reference Number: COST-STSM-FP1006-06338

STSM Research Theme: Veneer surface densification using heated plates

STSM Applicant: Dr Pavlo Bekhta, National University of Forestry & Wood Technology of Ukraine, Department of Wood-Based Composites

Host: Dr Tomasz Krysztofiak, Poznan University of Life Sciences, Department of Glueing and Finishing of Wood

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1. Purpose of the STSM

The purpose of this STSM to Poznan University of Life Sciences was to study the effect of densification on the surface properties of veneer. The objectives of this study were: (a) to understand how various parameters of the densification process affect the surface properties of veneer; (b) to understand the influence of densified veneer surface parameters, such as roughness on the glueability of the adhesive bond between veneer and polymeric materials and hence veneer-based product performance; (c) to establish the relationship between surface properties of densified veneer and plywood.

2. Description of the work carried out during the STSM

Wood veneer 300 x 700 mm² specimens made with birch (*Betula pubescens*) were densified using heat and pressure. Hot plates of hydraulic press were used for veneer densification. Temperatures of 100, 150, and 200°C and press hydraulic pressures of 4, 8, and 12 MPa were applied. The duration of densification process was 4 min.

The surface roughness, static and dynamic contact angles, adhesion, and colour of densified and non-densified veneers were evaluated using contact roughness meter, Goniometer PG-2, PosiTest Pull-off Adhesion Tester, and Minolta Chroma Meter CR-310, respectively.

3. Description of the main results obtained

After densification, the density increased significantly, veneers darkened, and lathe checks that were present on veneers before densification were conglomerated and veneer surface roughness decreased. A moderate improvement on surface roughness was achieved, while wood wettability was reduced, as determined by contact angle measurement.

4. Future collaboration with host institution (if applicable)

The STSM allowed us to exchange literature, knowledge, and research experiences. Directions for future collaboration were discussed during the visit and as the final result, some activities were decided on: (a) collaboration through publications: on international journals or through joint participations in international workshops; (b) collaboration through research projects; (c) collaboration through specific STSM actions to be investigated further.

5. Foreseen publications/articles to result from the STSM (if applicable)

The described work will hopefully lead to joint publications as agreed with Dr. Kryzstofiak. The results obtained during this mission will be presented in the future meetings within COST Action FP1006 and will be the issue for 1-2 articles in scientific journals. The results of this mission are stimulating new investigations on the application of the densification process for enhancing surface properties of veneer, which could be the issue of future collaboration between Poznan University of Life Sciences and National University of Forestry & Wood Technology of Ukraine.

6. Confirmation by the host institution of the successful execution of the STSM

The confirmation is in a separate file.

7. Other comments (if any)

As a matter of conclusion, this one month spent at the Poznan University of Life Sciences provided a very good opportunity for discussions with various people coming from various backgrounds and horizons.

I would like to thank the COST network for funding this visit. I would also like to thank my hosts, prof. Stanislaw Proszyk and Dr Tomasz Kryzstofiak for inviting me to the Poznan University of Life Sciences. I would like to thank them for offering me an office space for the duration of my visit as well as for their providing me with such a welcoming and warm atmosphere. I am looking forward to continuing our collaborations very much.

March 20, 2012, Lviv, Ukraine



Prof. Ing. Pavlo Bekhta, DrSc.