Some of the most frequently used words in the scientific and political world of the new millennium are sustainability, new renewable energy sources, emissions of products and cascade utilization of bio-resources. A large number of studies and research work aim to develop, to adapt, to improve and to reinterpret materials in order to reduce the direct use of natural ones and their impact on the environment.

The 97 papers, posters and keynotes presented during the 3rd PTF BPI 2014 Conference represent studies and research that constitute an important reference for the major industrial companies and players in this field to take into consideration and perhaps use as starting points for further innovative projects.

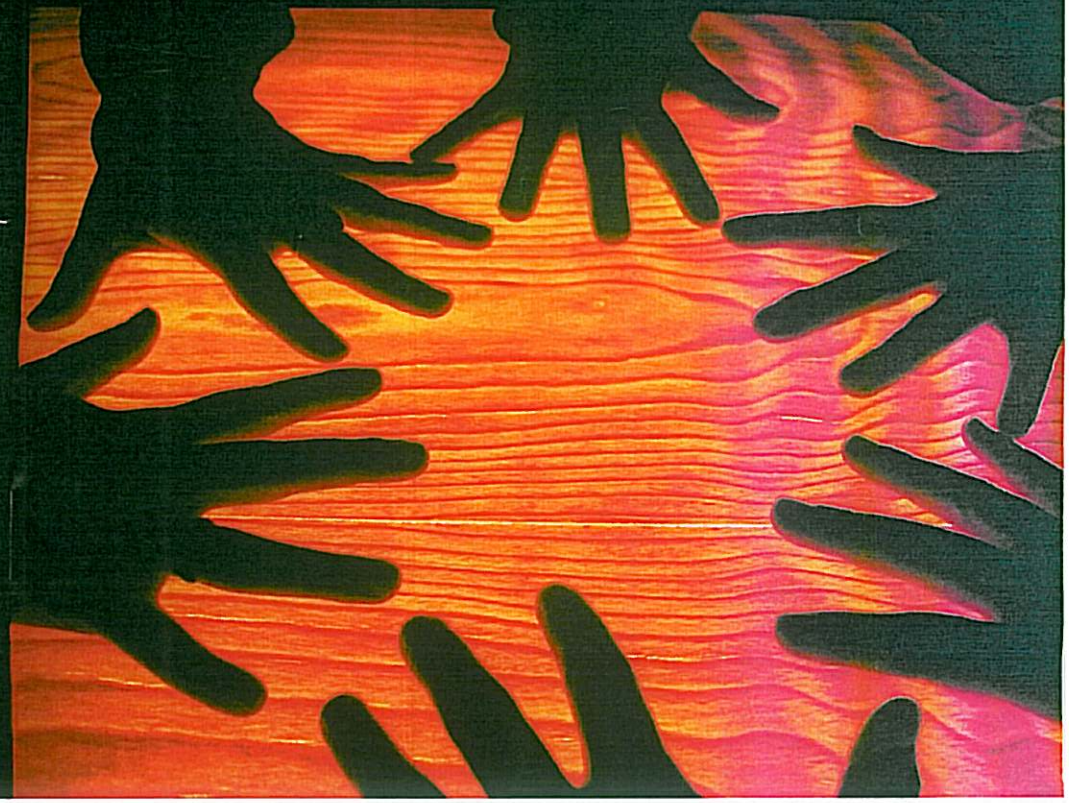
In this way we would like to thank all the contributors to this conference, speakers and all participants that gathered at this alpine location for ensuring that this event was successful.

Alexander Petutschnigg
Marius C. Barbu

BOOK OF ABSTRACTS

Processing Technologies for the Forest and Biobased Products Industries

PTF BPI 2014. Salzburg University of Applied Sciences
Kuchl/Austria



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Foreword

The aim of the 3rd Conference on Processing Technologies for the Forest and Biobased Products Industries (PTF BPI) is to facilitate interaction between scientists, researchers and experts from companies, who gathered in Kuchl from 24th to 26th of September 2014 to share their new studies and the results of scientific activities.
This edition of the conference is hosted and organized by the Salzburg University of Applied Sciences at Campus Kuchl and scientifically supported by Cost Action „Bringing new functions to wood through surface modification" (FP1006), Forest Products Society (FPS), International Union of Forest Research Organizations (IUFRO), University of Tennessee in Knoxville (UT), University of Natural Resources and Life Sciences, Campus Tulln (BOKU), and Transylvania University of Brasov (UTBv).
The conference builds upon the previous successful editions held in St. Simons Island, Georgia, USA (PTF BPI 2012) and Kuchl/Salzburg, Austria (PTF BPI 2010). The following topics are covered in 11 parallel and 3 plenary sessions:

- *Raw Materials for the Wood Industry*
- *Bio-refinery and Energy from Wood*
- *Modern Wood Constructions*
- *Wood Drying Technologies*
- *Wood Modification Processes*
- *Wood-based Composites*
- *Finishing Technologies*
- *Emissions of Wood Products*
- *Service Life and User expectations*

This conference book of abstracts contains 97 works written by 319 authors from 30 different countries, whereby each paper was subject to an identical full review procedure. The book of abstracts was compiled under the supervision of FH-Prof DI(FH) Dr. Alexander Petutschnigg, FH-Prof Univ.-Prof. Dr.-eng. Dr. Marius C. Barbu and Eng. Eugenia Tudor. This intensive review process, carried out for a total of 156 papers in a period of four months, could not have been accomplished without the assistance of the members of the Scientific Committee and the reviewers listed below.
For the 3rd Edition, PTF BPI introduced a new concept of special keynote sessions held by specialists from industry, who will present the latest technologies and know-how to participants. Experts from top quality and successful companies are ready to impart their state-of-the-art knowledge during their keynotes planned every conference day.

The high quality of the papers represents the knowledge and experience of scientists and experts from universities, research institutes and companies from the field of forest products, wood-based composites, wood chemistry and renewable energies from wood. This book will provide scientific groups the world over with an excellent reference and should help to open up new avenues for research and provide scientists, researchers and industry experts with original ideas to help them improve their activity and research.
The conference organizers have put together excellent scientific and social programs that encompass both the latest research in the fields mentioned above and provide an opportunity to renew old friendships and make new acquaintances.
The editors and reviewers deserve special thanks for their outstanding efforts in preparing the manuscripts for publication. The reviewing process was not only critical, the suggestions the improvement or development of some sections in the papers led to the high quality of the final manuscripts.
Finally, we would like to thank all presenters for their willingness to share their latest research and ideas. Without all this effort, this conference would not have been possible.

Special thanks to:

M.Sc. DI DI(FH) Anton Astner (University of Tennessee, Center for Renewable Carbon) - Bio-refinery and Energy from Wood
Prof. Dr.-eng. Dr. Marius-Catalin Barbu (Salzburg University of Applied Sciences, Forest Products Technology and Timber Construction) – Wood-based composites
Dr. Pannipa Chaowana (Walailak University, School of Engineering and Resources, Thailand) - Raw Materials for the Wood Industry
DI Thomas Forte (Salzburg University of Applied Sciences, Forest Products Technology and Timber Construction) - Modern Wood Constructions
M.Sc.DI(FH) Hermann Huber (Salzburg University of Applied Sciences, Forest Products Technology and Timber Construction) - Wood Drying Technologies
Dr. Sergej Medved (University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology) – Wood-based Composites
Prof. Dr. Holger Militz (Georg-August Göttingen University) - Wood Modification Processes
Chem. Electra Papadopoulou (Chimar Hellas) - Finishing Technologies
Prof. Dr. Milan Šernek (University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology) – Wood-based Composites (Adhesives)
Dr. Jakub Sandak (Trees and Timber Institute CNR-IVALSA) - Service Life and User Expectations
Ingrid Seidl (Salzburg University of Applied Sciences, Campus Kuchl)
DI Dr. Martin Weigl (Holzforschung Austria) - Emissions of Wood Products
DI(FH) Dr. Stefanie Wieland (Chair of COST FP1006 "Bringing new functions to wood through surface modification")

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Chair:

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Chair: Electra Papadopoulou

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Chair: Martin Weigl

Session 11: Service Life and User expectations
Chair: Jakub Sandak

Poster Presentations

will especially find optimal compromise to meet the objectives of technical and environmental performance that can be contradictory. It is proposed to present the initial results of this project at the conference. These results will consist of a new strategy of material design. It combined several tools in different area such as characterization, modelling and decision making to reach an industrial goal: develop an innovative bioressources based insulation material product.

LOW DENSITY POLYESTER PARTICLES FOR LIGHTWEIGHT WOOD BASED COMPOSITES

Ângela DIAS[1], S. MONTEIRO[2], J. PEREIRA[2], L. CARNEIRO[3], J. FERRA[3], L. CARVALHO[4], J. MARTINS[4], F.D. MAGALHÃES[5]

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Key words: Lightfillers, polyester, lightweight

This work studies the synthesis of low density particles (LDPs) based on crosslinked polyester, each particle containing numerous air-filled vesicles. Due to its particular internal structure and rigidity they can be used as fillers in wood-based panels to reduce the final density and keep their desired mechanical performance. Important process variables as stirring conditions, type of cure initiator and drying conditions were studied. Well vesiculated particles and with diameters in the range 1-4 mm were prepared and its mechanical performance in wood-based panels is an on-going study.

WOOD-BASED PANELS WITH IMPROVED SURFACE PROPERTIES

Electra Papadopoulou[1], C. Markessini[1], P. Tsirogiannis[1], K. Siamos[2]

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Key words: Laminated wood-based panels, Particleboards, MDF, Water-repellency and Oil-repellency

Responding to the market trends, CHIMAR HELLAS S.A., a Greek SME company serving the wood-based panels' industry, has developed resins and impregnation syrups that offer improved water and oil repellency properties to wood-based panels. For this achievement, CHIMAR HELLAS S.A., has been cooperated with the pioneering nanotechnology company NanoPhos, located in Lavrio, Greece. The NanoPhos Company developed nanomaterials tailor made for CHIMAR products, while CHIMAR modified the synthesis process of its resins and syrups in order to fit with the special properties of the NanoPhos products. CHIMAR has used the nanomaterials as additives in the glue mixture of Urea-Formaldehyde (UF) resin suitable for the manufacturing of particleboards, as covering materials of particleboards and as additives in Melamine – Formaldehyde (MF) impregnation syrups for lamination papers. Tests have been carried out both at lab and industrial scale and the results show that the nanoadditive enhanced CHIMAR products can offer wood-based panels with improved oil and water repellency surfaces. Such products, with new attractive and easy care properties, are expected to find high appreciation in the market.