Academy Lecture Holger Militz, Sopron 2014

“Wood modification from a European perspective”

Abstract

In the last decades there is an increase in the use of wood for widespread building purposes. As the worldwide most important renewable material, wood, beside having a very aesthetical appearance, its mechanical properties in relation to its low density are very favorable. As a consequence, wood is not only anymore used in traditional buildings but in modern constructions, in solid form, as wood composite and in combination with other materials. However, wood has some technological drawbacks. It is biodegradable, in contact with water it reacts with dimensional changes, it is susceptible to degradation induced by light. In this respect, due to the lack of the right types and amounts of natural extractives, most European wood species are inferior to some other, mostly tropical, wood species. These from nature given disadvantages can be considerably improved by artificially changing the cell wall anatomy and chemistry, with so named “wood modification processes”. In the last decade several wood modification processes were developed and made its step from laboratory to an industrial level.

In this lecture, the most important processes of wood modification are introduced. Used wood species, process parameters and gained material properties are presented and discussed. Physical processes (by use of elevated temperatures) are nowadays widely used in Europe (approx. 300.000 m3 production/ year) as well as several chemical processes (acetylation, furfurylation, reactive resins) are described. The new materials are more fungi resistant, dimensional stable, harder and weathering resistant. However, mainly dynamic strength properties can decrease. Challenges on the way from laboratory scale to a business on market scale are discussed.

The Lecturer

Holger Militz (1960) studied Wood Science at University Hamburg and finished his PhD in 1990 at the University Wageningen/ The Netherlands on the improvement of impregnation of wood by anatomical cell wall changes. From 1987-2000 he worked in the Netherlands and was first head of wood technology at TNO Timber Research, later director of SHR Timber Research in Wageningen/ NL. Since 2000, Militz is a full professor for Wood Biology and Wood Products at the Georg-August-University Göttingen/ Germany, Faculty of Forest Sciences and since 2010 part-time professor at the Norwegian University of Life Sciences (NMBU).

His research is devoted to biotic and abiotic wood degradation processes and to wood protection against those, by biocides, wood coatings and new wood modification processes. Over 200 publications in scientific journals and book articles have been published. Under his guidance, some new processes were developed and found its way from laboratory to practical application. For some of his developments he was awarded by international prices (Schweighofer Prize, Josef-Umdasch-Prize). Militz is member of several editorial advisory boards of scientific journals (Holzforschung,

European Journal of Wood and Wood Products, Wood Research, Holztechnologie). He is chairman of the German Technical Committee for Wood Preservation, chairman of the European Conference on Wood Modification ECWM. In 2005 Militz was elected as fellow of IAWS, for which he became chairman of the Scientific Board in 2012.