The 2026 MWP Award – Prize motivation

Citation

The 2026 Marcus Wallenberg Prize is awarded to Prof. Holger Militz for his groundbreaking contributions to wood modification technologies.

Prof. Holger Militz has significantly advanced the fundamental understanding of how chemical modification processes improve wood properties across multiple hierarchical scales. His research has revealed mechanisms leading to improvements in dimensional stability and resistance to biological degradation. Prof. Militz's groundbreaking work has paved the way towards commercialization of several sustainable wood protection technologies. His scientific work has been instrumental in bringing wood acetylation to an industrial scale, resulting in wood products with exceptional durability and dimensional stability while preserving recyclability and non-toxicity. These industrial successes have expanded the use of modified wood in construction and other sectors, extending product life cycles and strengthening wood's role as a long-term carbon storage material.

Background and Prize Motivation

Wood's limitations in both durability and dimensional stability often impair its long-term use, particularly for industrially relevant wood species found outside tropical regions. Scientific work on wood modification to increase its dimensional stability and durability evolved in the first half of the last century (Fuchs 1928; Stamm & Hansen 1935). Legislative restrictions on toxic biocides and on the use of more durable tropical hardwoods from rainforests accelerated research activities in search of more sustainable solutions for wood protection and responsible utilization (Militz 2020; Rowell & Diekerson 2014; Sandberg et al. 2017).

The German wood scientist Holger Militz started to work on different wood modification technologies in the 1980s. His work has had a key role in scaling up of the acetylation process, currently known under the brand name Accoya. Acetylation process is recognized for enhancing the durability and dimensional stability of wood products, while also ensuring the recyclability and non-toxicity of wood. Wood treatment with water-soluble dimethylol resin is another example of Holger Militz's innovative approach to the successful advancement and implementation of a wood modification technology, which was later commercialized under the brand name Belmadur (Militz 1993). Holger Militz also played an essential role in the further development of thermal treatments of wood (Tjeerdsma et al. 1998), which, among others, resulted in the implementation of the Plato process, a technology that was commercialized in the Netherlands (brand name Platowood). Beyond paving the way to these commercialized processes, Holger Militz conducted groundbreaking research on various silicone compounds for wood protection purposes, which has been very influential for a multitude of wood treatments (Mai & Militz 2004; Xie et al. 2010).

Notably, the powerful combination of groundbreaking research and application-driven innovations has been a key enabler for the commercialization of these various wood modification processes. Holger Militz effectively integrated fundamental scientific research with process scale-up, as exemplified by the pilot plant build-up for the transition of wood acetylation from a laboratory scale to industrial implementation (Bongers & Beckers 2003). Beyond many leading involvements in process developments, Holger Militz took significant steps to strongly enhance the design and application possibilities, specifically for wood species with low natural durability. In his pursuit of a more sustainable future for wood products, Holger Militz considered resource provision and availability as guiding factors in the diversification of modification protocols. He dedicated significant effort to the treatment of underutilized or improperly utilized wood species, particularly beech (Militz 1991).

Holger Militz's work has relied heavily on detailed investigations into the fundamental mechanisms of treatments and the interactions of modifying agents with wood polymers at the cell wall level (Xie et al. 2011; Beck et al. 2017). These studies of wood at various structural scales utilize sophisticated methods, such as X-ray micro-computed tomography, to assess process-relevant anatomical characteristics (Wentzel et al. 2020). By applying advanced characterization methods to practical application properties of modified wood, including fire resistance, bonding ability, durability, mechanical behavior, dimensional stability, and surface properties, Holger Militz has broadened the use of wood for various applications, including durable facades, outdoor furniture, and load-bearing structures exposed to weathering.

Holger Militz

Holger Militz is Professor at the University of Göttingen, Germany, and Head of the Department of Wood Biology and Wood Products. In the 1980s, he studied wood science and technology at the University of Hamburg, Germany, followed by a PhD work at the University of Wageningen in the Netherlands, which focused on enhancing the impregnation of spruce wood through pretreatments with enzymes and chemicals. From 1987 to 2000, he first served as the head of wood research at TNO Timber Research in Delft and later as the founder and director of SHR Timber Research in Wageningen. His main research interests in wood technology include wood modification, wood decay, wood protection, and wood drying. He has published more than 400 journal articles, conference proceedings, and book chapters, as well as more than 30 patents. He is an elected fellow and distinguished member of the International Academy of Wood Science (IAWS), and received various honours and awards, including the Schweighofer Prize in 2007. He has been an active editorial board member of the international wood journals, Holzforschung, Wood Research, and Holztechnologie, and serves as the chair of the Scientific Committee of ECWM - Wood Modification in Europe.

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