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**Evaluation of research, scientific and educational achievements, and of international cooperation of Assistant Professor Roman Réh, Ph.D., in relation to an application for granting him a title of Professor**

**Legal background**

A basis for the review is a letter from Professor Jan Sedliacik, Ph.D., the Dean of the Faculty of Wood Technology TUZVO, informing me that pursuant to the law §76, 131/2002 Z.z., Vyhláška MŠVVaŠ SR č.246/2019 and on a basis of the consent of the Scientific and Art Council, I was appointed a reviewer of the inaugural proceedings of doc. Ing. Roman Réh, CSc.

**Candidate background**

Mr Roman Réh graduated from the College of Forestry and Wood Technology in Zvolen in 1983. In 1993, at the same institution, he was awarded the academic degree of Doctor in wood technology (33-01-9). In 1999, he was granted the habilitation in Wood Processing Technologies at the Wood Technology Department, Technical University (33-01-09). Currently, he is employed at the Technical University in Zvolen as an Assistant Professor, at the Department of Wood Technology.

Following completion of his engineering course, in the years 1983-1988 he worked at various positions both at scientific institutions and at industrial plants, expanding his professional experience. He was employed as a technician at the Faculty of Furniture of the College of Forestry and Wood Technology in Zvolen, a master and a technologist at the plywood department of Preglejka n. p. Žarnovica, and at the fiberboard department of Bučina n. p. Zvolen.

**Research and scientific activities**

His main research interests concern the issues described below, associated with main types of wood materials, i.e., plywood, LVL, particleboard, fiberboard, and solid wood panels. In this area, the research interests of Assistant Professor Réh focus on the following subjects:

- Utilization of Lesser Known and Lesser Used Hardwoods for Decorative Veneers Purposes;
- Wood and veneer properties of prospective species for central European woodworking industry;
- Application of bark from different tree species for production of insulating decorative boards;
- Addition of bark to adhesives to decrease formaldehyde emission from proposed types of panels;
- New types of composites based on wood, thermoplastic foils and different reinforcing laminates – especially thermoplastic plywood.

His most important research achievements in the above areas include:

- Demonstrating that the use of beech bark as a filler in UF resin for plywood production leads to at least 50% reduction in formaldehyde emissions; and this is very important taking into account current trends focusing on manufacturing materials with a significantly reduced formaldehyde content. On one side, this method greatly improves the hygiene properties of the product, while on the other, with this solution bark, being a waste material, can be used. Furthermore, demonstrating that the use of this type of filler leads to at least 25% reduction in plywood pressing time, and this translates into economics of the pressing process and, additionally, supports protection of the environment due to lower energy consumption.
- Demonstrating that although the use of larch bark as a surface layer of floor panels renders a material of worse mechanical properties than typical flooring materials with a cork layer, with this solution waste in form of bark can be used, and the obtained product has interesting decorative values.
- Results of Assistant Professor Réh research on design of furniture intended to be used for sitting (chairs) and sleeping (beds) also are of a considerable value. As the Author notes, currently an increase in height and weight is observed in adult populations all over the world. Although designs available in the market meet the requirements of standards for users of a body weight of 110 kg, they do not take into account an increase in the weight of the population. Research results obtained by the Candidate in this area provided comprehensive safety-related standards and regulations for sleeping room furniture designated for users of the weight exceeding 110 kg, and this should ensure production of high quality products not only in Slovakia, but also at the European and global levels.

### **Evaluation of educational activities**

Assistant Professor Roman Réh has been actively teaching at Technical University in Zvolen for over 30 years. During that time, he gave lectures and taught classes and seminars at university courses at all levels. Currently, he is a head of the following subjects: Wood Composite Materials, Technologies of Production of Composite Materials, Decorative Modification of Wood, Processes of Production of Composite Materials, Plywood Panel and Decorative Veneers, Wood Based Particle and Fiber Panels, Production of Wood Composites Materials.

He is an author of eight scripts and textbooks published by national publishers, including two titles that he published as an independent author. The scripts and textbooks focus on a widely understood issue of wood-based materials, especially plywood and veneers.

One of his most important achievements is the chapter Wood Composites by Irle, Mark; Réh, Roman et al. in the Handbook of Wood Chemistry and Wood Composites printed in CRC PRESS-Taylor & Francis Group.

His important educational activities also cover supervision of bachelor's and master's theses and education of Ph.D. students. During his active educational work, he was a supervisor of as many as 49 bachelor's theses, 64 diploma papers, and 8 Ph.D. dissertations, and currently he is a supervisor of another Ph.D. student. I also find his work related to practical aspects of university courses highly valuable. In this respect, he implemented ITMS projects concerning development of university courses in the global language and supporting teaching of foreign languages at universities, as well as increasing the potential of human resources related to transfer of research and development knowledge on biomass production and processing to practical applications.

### **Scientific authority in professional circles**

Assistant Professor R. Réh is a renowned scientific authority and expert, especially in mechanical wood technology, as reflected by his scientific achievements. To date, he has authored 3 monographs, including one as an independent author, published by national publishers. He is also an author of selected chapters in 4 monographs published by foreign publishers, and of 13 research papers published in foreign IF journals registered in WOS and SCOPUS databases. Furthermore, he is an author of one patent. In total, all his publications, including educational ones, amount to 284 papers. Results of his research work were presented at numerous national and international conferences, and cited 221 times by other researchers,

with 80 citations registered in WOS and SCOPUS, and 141 citations not registered in those databases. He did numerous scientific internships at leading global centers: Istituto per la Tecnologia di Legno (Italy), University of California, Forest Products Laboratory, University of Michigan, University of Maine (USA), and École Nationale Supérieure d'Arts et Métiers (ENSAM) (France), where he conducted research and lectured.

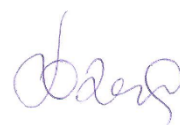
He also was a head or a deputy head of 4 research projects (VEGA and KOCHRAN), and a researcher under numerous other projects. He is a member of an editorial board of a wood industry scientific journal (Wood Research), and chaired plenary meetings at numerous international scientific conferences. Furthermore, he was a member of the most important European organizations, including CEIBOIS, UEA, EFIC, and EUMABOIS. Currently, he is a head of numerous evaluation committees at fairs and exhibitions in Nitra, Bratislava, Trenčín, Brno, Prague, and Budapest.

### **Summary of the review**

The scientific achievements of Assistant Professor R. Réh are significant and valuable, and this places him amongst experts in wood sciences. His achievements so far bring new aspects of scientific and practical knowledge into the literature on this subject, in the widely understood field of wood technologies. His educational activities, reflected in the number of published scripts, and especially, the number of supervised degree candidates and PhD students, deserve particular distinction. Furthermore, he is a renowned scientific authority in his area of interest, as confirmed by his cooperation with leading centers all over the world. He is also actively engaged in organizational work, being a member of editorial boards of scientific journals, international organizations, and competition committees.

Summing up overall activities of Assistant Professor Roman Réh I deem his scientific, research and educational work invaluable to the development of wood composite materials in his country and abroad.

Taking the above into account, I recommend submitting an application for appointing Assistant Professor Réh as a Professor in the wood processing technology at the Technical University in Zvolen.



Poznań, August 19, 2020

Dorota Dziurka