

WOOD RESEARCH

61(4): 2016

Wood Research publishes original papers aimed at recent advances in all branches of wood science (biology, chemistry, wood physics and mechanics, mechanical and chemical processing etc.) Authors are responsible for the fact that the paper has not been published before and it is not under consideration for publication elsewhere.

EDITORS:

Štefan ŠTELLER, Slovak Forest Products Research Institute, Dúbravská cesta 14, SK-841 04 Bratislava, Slovak Republic.

Marián BABIAK, Technical University in Zvolen, Masarykova 24, SK-960 53 Zvolen, Slovak Republic

ASSOCIATE EDITOR:

Eva NEUSCHLOVÁ, Slovak Forests Products Research Institute, Dúbravská cesta 14, SK-841 04 Bratislava, Slovak Republic

EDITORIAL BOARD:

Štefan BARCÍK, Faculty of Environmental and Manufacturing Technology of Technical University in Zvolen, Študentská 26, 960 53 Zvolen, Slovak Republic

Ingo BURGERT, ETH Zürich, Institute for Building Materials, HIF E 23.2, Stefano-Franscini-Platz 3, 8093 Zürich, CH-Switzerland

Ignacio J. DIAZ-MAROTO, University of Santiago de Compostela, High School Polytechnic, University Campus s/n, 27002 Lugo, Spain

Miha HUMAR, University of Ljubljana, Jamnikarjeva 101, SI-1001 Ljubljana, Slovenia

Jan KANÓCZ, Technical University of Košice, Letná 9, 042 00 Košice

Bohuš KASAL, Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI, Bienroder Weg 54 E, D-38108 Braunschweig, Germany

Svetozár KATUŠČÁK, Slovak Technical University, Radlinského 9, SK-812 37 Bratislava, Slovak Republic

Radomír KLVÁČ, Mendel University in Brno, Zemedelska 3, CZ-613 00 Brno, Czech Republic

Jozef KÚDELA, Faculty of Wood Sciences and Technology of Technical University in Zvolen, Masarykova 24, 960 53 Zvolen, Slovak Republic

Bartłomiej MAZELA, Poznań University of Life Sciences, ul. Wojska Polskiego 28, PL-60-637 Poznań, Poland

Holger MILITZ, University of Göttingen, Büsgenweg 4, D-37077, Göttingen, Germany

Róbert NÉMETH, University of West Hungary, Bajcsy Zs. u. 4, H-9400 Sopron, Hungary

Milan ORŠANIĆ, University of Zagreb, Svetošimunska 25, HR-40000 Zagreb, Croatia

Alfred TEISCHINGER, Boku-University of Natural Resources and Life Sciences, Institute for Wood Technology and Renewable Materials, Konrad Lorenz Strasse 24, 3430 Tulln, Austria

Aleš ZEIDLER, Czech University of Life Science in Prague, Kamýcká 1176, CZ-165 21 Praha 6 Suchbátka, Czech Republic

EDITORIAL OFFICE

Slovenský drevársky výskumný ústav/ Slovak Forest Products Research Institute

Dúbravská cesta 14, SK-841 04, Bratislava, Slovak Republic

Phone: 0911 728 624

E-mail: woodresearch.sdvu@vupc.sk, WEB: www.woodresearch.sk

SUBSCRIPTION INFORMATION:

Wood Research is published six times a year. Subscription rate 150 EUR (including mailing expenses). Subscription order should be sent to Slovak Forest Products Research Institute, Dúbravská cesta 14, SK-841 04 Bratislava, Slovak Republic

© 2016 by SDVÚ Bratislava, Slovak Republic

All rights reserved. By submitting a manuscript, the authors agree that the copyright for their article is transferred to their publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in retrieval system or transmitted in any form or by any means, photocopying, electronic, recording, etc. without the prior written permission of the publisher as mentioned in Slovak Copyright Law No 383/1997.

Issued: August 2016

IČO 31 380 051

Printed by Pulp and Paper Research Institute, Dúbravská cesta 14, Bratislava, e-mail: sekretariat@vupc.sk

WOOD RESEARCH

Volume 61, Number 4, 2016

CONTENTS

1. VLASTIMIL BORŮVKA, ALEŠ ZEIDLER, STANISLAV DOUBEK:
Impact of silicon-based chemicals on selected physical and mechanical properties of wood 513
2. VILÉM PODRÁZSKÝ, JIŘÍ REMEŠ, ROMAN SLOUP, KAREL PULKRAB,
STANISLAV NOVOTNÝ: Douglas-fir – partial substitution for declining conifer timber
supply – Review of Czech data 525
3. KLÁRA KROFTOVÁ, MARKÉTA ŠMIDTOVÁ: The current state of knowledge in
the field of the use of selected nanosystems in heritage preservation – nanotextiles as biocidal
protection of historic wood. 531
4. ELIŠKA OBERHOFNEROVÁ, MILOŠ PÁNEK: Surface wetting of selected wood species
by water during initial stages of weathering 545
5. MILOŠ LAVICKÝ, JAN PĚNČÍK, JAKUB DOHNAL, DAVID BEČKOVSKÝ,
TEREZA BEČKOVSKÁ: Static numeric and experimental analysis of prefabricated winder
wooden staircase with central stringer made from Scots pine (*Pinus sylvestris* L.) 553
6. VLADIMÍR DUCHOŇ, TOMÁŠ KLAS, ORSOLYA KATONA, JÁN
BRODNIANSKY, ĽUBOŠ BALCIERÁK, JAROSLAV SANDANUS, KRISTIAN
SÓGEL: Experimental tests of timber connections with glued-in rods in bending. 565
7. KRISTÝNA VAVRUŠOVÁ, ANTONÍN LOKAJ, DAVID MIKOLÁŠEK, ROMAN
FOJTÍK, LIBOR ŽÍDEK: Longitudinal glued joints of timber beams and the influence of
quality manufacturing onto their carrying capacity 573
8. PETR ČECH, DANIELA TESAŘOVÁ, JANA HADAČOVÁ, EVA JEŘÁBKOVÁ:
The quality of indoor air in wooden based buildings and the factors with impact of them. 583
9. JAROMÍR SRBA, MARTIN BÖHM, JITKA BERÁNKOVÁ, KAMIL TRGALA,
REGINA ORÁLKOVÁ, GUILLERMO VELARDE: Estimation of air leakage rate of
wood-based residential buildings constructed in the Czech republic in the years 2006-2014 using blower
door test 599
10. MARTIN SVITÁK, KAREL KRONTORÁD, JAN TOMEK: Defining of thermal
bridges of wood building and their elimination 607
11. PAVLA KOTÁSKOVÁ, ZDEŇKA HAVÍŘOVÁ, MILAN ŠMAK, BOHUMIL
STRAKA: Log buildings from the perspective of the current requirements. 615
12. DAVID BEČKOVSKÝ, LUCIE VACKOVÁ, TEREZA BEČKOVSKÁ, JINDŘICH
SOBOTKA, JAN PĚNČÍK, MILOŠ LAVICKÝ: Analysis of the diffusional properties of
peripheral walls of wooden houses during EMW radiation exposure..... 627
13. KAMIL STANĚK, JAN TYWONIAK, JAN RICHTER, MICHAL BUREŠ, PAVEL
KOPECKÝ, MARTIN VOLF: Studies on hygrothermal performance of wood elements in
building constructions– remarks on methodology 637
14. MILAN ŠMAK, JAN BARNAT, BOHUMIL STRAKA, PAVLA KOTÁSKOVÁ,
ZDEŇKA HAVÍŘOVÁ: Dowelled joints in timber structures experiment–design–realization 651
15. JAROSLAV BLAŽEK, MARTIN MŮČKA, KAMIL TRGALA: Cost and thermal - technical
optimization of wooden construction in the passive standard. 663