

WOOD RESEARCH AND TECHNOLOGY HOLZFORSCHUNG

CELLULOSE - HEMICELLULOSES - LIGNIN - WOOD EXTRACTIVES

EDITOR-IN-CHIEF

Lennart Salmén, Sweden

EDITORIAL BOARD

G. Daniel, Sweden

H. Militz, Germany

T. Rosenau, Austria

H. Sixta, Austria

T. Vuorinen, Finland

ADVISORY BOARD

D.S. Argyropoulos, USA

M.Y. Balakshin, Canada

J. Barnett, UK

I. Burgert, Germany

D.V. Evtuguin, Portugal

C.E. Frazier, USA

K. Fukushima, Japan

W. Gindl-Altmutter, Austria

W.G. Glasser, USA

B. Holmbom, Finland

A. Isogai, Japan

J.F. Kadla, Canada

G. Koch, Germany

D. Lachenal, France

C. Laine, Finland

S.D. Mansfield, Canada

J.J. Morrell, USA

P. Niemz, Switzerland

A. Potthast, Austria

A.J. Ragauskas, USA

J. Ralph, USA

R.W. Rice, USA

J. del Rio, Spain

U. Schmitt, Germany

T.P. Schultz, USA

J. Sipilä, Finland

T. Takano, Japan

T. Tamminen, Finland

H. Theliander, Sweden

J. Welling, Germany

S.M. Willför, Finland

H. Yoshihara, Japan

DE GRUYTER

ABSTRACTED/INDEXED IN AGRICOLA (National Agricultural Library) · Baidu Scholar · Biobase · Cabell's Whitelist · CABI (over 50 subsections) · Chemical Abstracts Service (CAS): CAPlus; SciFinder · Chemical Engineering and Biotechnology Abstracts · CNKI Scholar (China National Knowledge Infrastructure) · CNPIEC: cnpLINKer · Dimensions · EBSCO (relevant databases) · EBSCO Discovery Service · Ei Compendex · Engineering Village · Gale/Cengage · Genamics JournalSeek · Google Scholar · Inspec · Japan Science and Technology Agency (JST) · J-Gate · Journal Citation Reports/Science Edition · JournalGuide · JournalTOCs · KESLI-NDSL (Korean National Discovery for Science Leaders) · Microsoft Academic · MyScienceWork · Naver Academic · Naviga (Softweco) · Norwegian Register for Scientific Journals, Series and Publishers · Paperbase · PaperChem · Pirabase · Polymer Library · Primo Central (ExLibris) · ProQuest (relevant databases) · Publons · PubsHub · QOAM (Quality Open Access Market) · ReadCube · Reaxys · SCImago (SJR) · SCOPUS · Semantic Scholar · Sherpa/RoMEO · Summon (ProQuest) · TDNet · TEMA Technik und Management · Ulrich's Periodicals Directory/ulrichsweb · WanFang Data · Web of Science: Current Contents/Agriculture, Biology, and Environmental Sciences; Science Citation Index; Science Citation Index Expanded · WorldCat (OCLC)

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions or liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 0018-3830 · e-ISSN1437-434X · CODENHOLZAZ

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at www.degruyter.com/holz

RESPONSIBLE EDITOR Lennart Salmén, Professor MiU, KTH, Treearch, 10044 Stockholm, Sweden, e-mail: lsalmen@kth.se

PUBLISHER Walter de Gruyter GmbH, Berlin/Boston, Genthiner Straße 13, 10785 Berlin, Germany

JOURNAL MANAGER Dr. Gunda Stöber, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05 – 279, e-mail: Holzforschung.editorial@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Kevin Göthling, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05-170, e-mail: anzeigen@degruyter.com

© 2021 Walter de Gruyter GmbH, Berlin/Boston, Germany

TYPESETTING TNQ Technologies, Chennai, India

PRINTING Franz X. Stückle Druck und Verlag e.K., Ettenheim

COVER ILLUSTRATION Richter, H.G., and Dallwitz, M.J. 2000 onwards. Commercial timbers: descriptions, illustrations, identification, and information retrieval. In English, French, German, Portuguese, and Spanish. Version: 25th June 2009. <http://delta-intkey.com>



Contents

Original articles

Yusuke Takahashi, Futoshi Ishiguri, Haruna Aiso, Yuya Takashima, Yuichiro Hiraoka, Taiichi Iki, Jyunichi Ohshima, Kazuya Iizuka and Shinso Yokota
Inheritance of static bending properties and classification of load-deflection curves in *Cryptomeria japonica* — 105

Juliette Triquet, Pierre Blanchet and Véronique Landry
Hardness of chemically densified Yellow birch in relation to wood density, polymer content and polymer properties — 114

Ping Li, Yuan Zhang, Yingfeng Zuo, Yiqiang Wu, Guangming Yuan and Jianxiong Lu
Comparison of silicate impregnation methods to reinforce Chinese fir wood — 126

Yanan Wang, Xiaotong Wu, Yibo Wang, Yongqi Tian, Hongbo Mu and Jingkui Li
Hydrophobic and UV-resistant properties of environmentally friendly nano-ZnO-coated wood — 138

Robert Pečenko and Tomaž Hozjan
A novel approach to determine charring of wood in natural fire implemented in a coupled heat-mass-pyrolysis model — 148

Uasmim Lira Zidanes, Matheus Cordazzo Dias, Mário Sérgio Lorenço, Elesandra da Silva Araujo, Maryella Júnna Ferreira e Silva, Thaís Brito Sousa, Saulo Rocha Ferreira, Júlio César Ugucioni, Gustavo Henrique Denzin Tonoli, Maria Lucia Bianchi and Fábio Akira Mori
Preparation and characterization of tannin-based adhesives reinforced with cellulose nanofibrils for wood bonding — 159

Maree Brennan, David Hentges, Sylvain Cosgun, Stéphane Dumarcay, Francis Colin, Christine Gérardin and Philippe Gérardin
Intraspecific variability of quantity and chemical composition of ethanolic knotwood extracts along the stems of three industrially important softwood species: *Abies alba*, *Picea abies* and *Pseudotsuga menziesii* — 168

Tatsuki Kurei, Rino Tsushima, Yoko Okahisa, Satoshi Nakaba, Ryo Funada and Yoshiki Horikawa
Creation and structural evaluation of the three-dimensional cellulosic material “White-Colored Bamboo” — 180

Wanju Li, Minghui Liu, Hankun Wang, Hongbo Zhai and Yan Yu
The furfuryl alcohol (FA) resin distribution in the furfurylated bamboo — 187

Short note

Robert B. Currie, Bobby Kanji, Alexander Bruce and Robert G. Schmidt
Use of LA-ICP-MS for determination of elemental concentrations of boron in preservative treated solid wood and engineered wood panels — 195