

MATERIALS TESTING

MATERIALPRÜFUNG

MATERIALS – COMPONENTS – TECHNOLOGY – APPLICATION

EDITOR-IN-CHIEF

Thomas Böllinghaus

EDITORIAL BOARD

Suresh Babu, Knoxville, Tennessee, USA

Manfred Bacher-Höchst, Stuttgart, Germany

Y. Frank Chen, Middleton, Pennsylvania, USA

Carl E. Cross, Estes Park, Colorado, USA

Dan Eliezer, Be'er Scheva, Israel

Cagatay Elibol, Istanbul, Turkey

Norbert Enzinger, Graz, Austria

Petrina Johannes, Ongwediva, Namibia

Gobboon Lonthongkum, Bangkok, Thailand

Peter Mayr, Munich, Germany

Andreas Neidel, Berlin, Germany

Peter Starke, Kaiserslautern, Germany

Tanju Teker, Sivas, Türkiye

Frank Walther, Dortmund, Germany

Ali Riza Yildiz, Bursa, Turkey

ASSOCIATE INSTITUTIONS

German Association for Materials Research and Testing (DVM)

Martin Brune, Munich, Germany

German Society for Nondestructive Testing (DGZfP)

Matthias Purschke, Berlin, Germany

VDI-Society Materials Engineering (VDI-GME)

Hans-Jürgen Schäfer, Düsseldorf, Germany

DE GRUYTER

Please see the journal's homepage for Abstracting & Indexing Services information.

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 0025-5300 · e-ISSN 2195-8572

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

EDITOR-IN-CHIEF Prof. Dr.-Ing. Thomas Boellinghaus, University of Namibia (UNAM) Advisor to the Vice Chancellor Faculty of Agriculture, Engineering & Natural Sciences 340 Mandume Ndemufayo Avenue, Pioneerspark PB 13301, Windhoek, Namibia mt@degruyter.com

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

JOURNAL COORDINATOR Birgit Zoglmeier, De Gruyter, Neumarkter 28, 81673 München, Germany,
Tel.: +49 (0) 89 76902-426, Fax: +49 (0) 89 76902-497, e-mail: birgit.zoglmeier@degruyterbrill.com

© 2025 Walter de Gruyter GmbH, Berlin/Boston, Germany

TYPESETTING TNQ Tech Private Limited, Chennai, India

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

Questions about General Product Safety Regulation: productsafety@degruyterbrill.com



Contents

Burak Bekircan and Faruk Güner

FEA of stress distribution in firearms: evaluation of composite materials for gun slides — 1423

Serdar Osman Yilmaz, Tanju Teker and Anıl Erisen

Effect of heat treatment on mechanical performance of hydraulic breaker alloys — 1431

Oğuz Tekin and Tanju Teker

Analysis of friction welded square sections of AISI 430/HARDOX 450 steels — 1444

Tanju Teker, Serdar Osman Yilmaz and Sinan Aydın

Wear performance of PTA coated NiTi composite on AISI 430 steel — 1453

Dildar Gürses, Pranav Mehta, Sadiq M. Sait and Ali Rıza Yıldız

Battery box design of electric vehicles using artificial neural network-assisted catch fish optimization algorithm — 1463

Qintao Zhou, Xuebing Hu, Mensah Martinson Kwame Yeboah, Maxwell Edem Ametepe, Yifan Yang and Hamdy Maamoun Abdel-Ghafar

Design and synthesis strategy of high-performance black alumina membrane support by adding manganese dioxide — 1476

Meenatchisundaram Paramasivam, Muthusamy Chinnian and Vinayagar Karanthamalai

Experimental and numerical analysis of the impact behavior in truncated thin-walled tubes under axial loading — 1483

Mustafa Tekin, Hasan Kotan, Murat Baydoğan, Mertcan Kaba, Erdem Balcı, Kübra Gürcan Bayrak and Erhan Ayas

Unveiling the creep mechanisms of rare earth element yttrium added and SPS consolidated CoCrFeNi high entropy alloys — 1495

Muhammed Cihan Tezel, Nursev Erdoğan and Erdem Acar

Design optimization of a multi-layer aircraft canopy transparency plate against bird strike — 1507

Pranav Mehta, Sadiq M. Sait, Dildar Gürses and Ali Rıza Yıldız

Aircraft wing rib component optimization using artificial neural network-assisted superb fairy-wren algorithm — 1520

Sadiq M. Sait, Pranav Mehta, Dildar Gürses and Ali Rıza Yıldız

Artificial neural network-assisted supercell thunderstorm algorithm for optimization of real-world engineering problems — 1528

Dildar Gürses

Optimum design of electric vehicle battery enclosure using the chaotic metaheuristic algorithms — 1537

Tugba Simsek and Zafer Evis

Additive manufacturing of overexpanded honeycomb core lattice structures and their characterization — 1545

Ahmet Şanlı and Serkan Ateş

Hardness and fatigue behavior of SiC, Al₂O₃, and blast furnace slag reinforced hybrid composites with Al6061 matrix — 1557

Gnanasekaran Muthusamy, Jeyaprakasam Sellappan, Karthick Rasu and Vigneshkumar Murugesan

Tribo-mechanical behavior of pectin-filled aloe vera fiber-reinforced polyester composites — 1568