ISSN 1734-8412

Journa

of Achievements in Materials and Manufacturing Engineering



Published monthly as the organ of the World Academy of Materials and Manufacturing Engineering

Editor-in-Chief Prof. Leszek A. Dobrzański

Volume 46 • Issue 2 • June 2011





of Achievements in Materials and Manufacturing Engineering

PUBLISHED SINCE 1992

formerly as Proceedings on **Achievements in Mechanical** and Materials Engineering

Published monthly as the organ of the World Academy of Materials and Manufacturing Engineering



Editor-in-Chief

Prof. Leszek A. Dobrzański - Gliwice, Poland



Deputies Editor-in-Chief

South America

Prof. Maria Helena Robert - Campinas, Brazil **North America**

Prof. George Totten - Portland, USA

Prof. Jose Manuel Torralba - Madrid, Spain

Prof. Yong Taek Im - Daejeon, South Korea Australia

Prof. Kanaka Durga Vara Prasad Yarlagadda

- Brisbane, Australia

Prof. Abdalla Wifi - Cairo, Egypt



Associate Editors

Dr Mirosław Bonek

Dr Małgorzata Dziekońska

Dr Klaudiusz Gołombek

Ms Marzena Kraszewska, MA

Dr Janusz Madejski

Dr Daniel Pakuła



Editorial Assistance

Dr Magdalena Polok-Rubiniec

Dr Anna Włodarczyk-Fligier

Dr Bogusław Ziębowicz

Ms Justyna Hajduczek, MSc

Mr Paweł Jarka, MSc

Ms Magdalena Kałużna, MSc

Ms Małgorzata Ondrula, MSc



Reading Direct

Mr Adam Jagiełło, MSc Mr Piotr Zarychta, MSc



Reading Direct

This journal is a part of Reading Direct, the free of charge alerting service which sends tables of contents by e-mail for this journal and in the promotion period also the full texts of papers. You can register to Reading Direct at

http://www.journalamme.org

Editorial Board

Prof. Gilmar Batalha - Sao Paulo, Brazil

Prof. Emin Bayraktar - St-Ouen, France

Prof. Milan Brandt - Swinburne. Australia

Prof. Tara Chandra - Wollongong, Australia

Prof. Antonio Cuhna - Guimaraes, Portugal

Prof. Marek Dollar - Oxford, Ohio, USA

Prof. J. Paulo Davim - Aveiro, Portugal

Prof. Sabahudin Ekinović - Zenica, Bosnia and Herzegovina

Prof. Renato Esposito - Naples, Italy

Prof. Spilios Fassois - Patras, Greece

Prof. Swadhin Ghosh - Rösrath, Germany

Prof. Janez Grum - Ljubljana, Slovenia

Prof. Toshio Haga - Osaka, Japan

Prof. Abdel Magid Hamouda - Doha, Qatar

Prof. Stuart Hampshire - Limerick, Ireland

Prof. Lauri Holappa - Espoo, Finland

Prof. John Barry Hull - Nottingham, United Kingdom

Prof. Mark James Jackson - West Lafayette, Indiana, USA

Prof. Krzysztof Jemielniak - Warsaw, Poland

Prof. Jerzy Jedrzejewski - Wrocław, Poland

Prof. Yosef Katz - Beer Sheva, Israel

Prof. Andrzej Klimpel - Gliwice, Poland

Prof. Ivars Knets - Riga, Latvia

Prof. Janez Kopac - Ljubljana, Slovenia

Prof. Karl Kuzman - Ljubljana, Slovenia

Prof. Anatolij Kuzmenko - Khmielnitsky, Ukraine

Prof. Stanisław Mitura - Łódź, Poland

Prof. Andrew Nee - Singapore, Singapore

Prof. Jerzy Nowacki - Szczecin, Poland

Prof. Abraham Ogwu - Paisley, United Kingdom

Prof. Fusheng Pan - Chongging, China

Prof. Mario Rosso - Turin, Italy

Prof. Antonio Sousa - Fredericton, NB, Canada

Prof. Božo Smoljan - Rijeka, Croatia

Prof. Jerry Sokolowski - Windsor, Ontario, Canada

Prof. Zinovij Stotsko - Lviv, Ukraine

Prof. Jerzy Świder - Gliwice, Poland

Prof. Ming-Jen Tan - Singapore, Singapore

Prof. Boris Tomov - Rousse, Bulgaria

Prof. Marcel Van De Voorde - Brussels, Belgium

Prof. Senay Yalcin - Istambul, Turkey

Prof. Bekir Sam Yilbas - Dhahran, Saudi Arabia



Patronage



World Academy of Materials and Manufacturing Engineering



Polish Academy of Sciences, Committee of Materials Science, Section of Metallic Materials



International Federation of Heat Treatment and Surface Engineering



Association of Computational Materials Science and Surface Engineering



Institute of Engineering Materials and Biomaterials of Silesian University of Technology, Gliwice, Poland

Financial support

The efforts to achieve the financial support of the Journal in 2011 from the Ministry of Science and Higher Education in Poland have begun.

Abstracting services

This Journal is sent to individual receivers from ca. 50 countries of the world and is delivered to the National Libraries and Universities and also to other scientific institutions in ca. 50 countries of the world. The electronic system of Reading Direct allows to access to the electronic version of that journal on-line, in the promotional period free of charge. This Journal is included in the reference list of the Polish Ministry of Science and Higher Education (9 points). The Journal is cited by Abstracting Services such as:









SCOPUS"

Directory of Open Access Journals

Google Scholar

Scirus

Ulrich's Periodical Directory

The procedure of its registration in the databases of Compandex, CiteSeer, GetCited and Web of science has begun.

Journal Registration

The Journal is registered by the Civil Department of the District Court in Gliwice, Poland at number 279.

Publisher



Gliwice 44-100, Poland ul. S. Konarskiego 18a/366 e-mail: info@journalamme.org

Bank account

Stowarzyszenie Komputerowej Nauki o Materiałach i Inżynierii Powierzchni Bank name: ING Bank Śląski

Bank address: ul. Zwycięstwa 28, 44-100 Gliwice, Poland Account number/ IBAN CODE: PL76105012981000002300809767 Swift code: INGBPLPW

Gliwice - Campinas - Portland - Madrid - Daejeon - Brisbane - Cairo

 2011 International OCSCO World Press. All rights reserved
The paper used for this Journal meets the requirements of acid-free paper Printed in Poland



Selected materialographical photo



The research paper made by A.D. Dobrzańska-Danikiewicz, E. Hajduczek, M. Polok-Rubiniec, M. Przybył and K. Adamaszek on "Evaluation of selected

115

steel thermochemical treatment technologies using foresight methods" on a page 115 describes the development efficiency of classical steel thermochemical treatment. The criterion assumed for dividing the technologies into groups was the thermochemical treatment kind. Three technology groups were selected to the following realised researches: nitriding, carburising and diffusion boriding. The outcarried researches pointed out the great industrial importance of nitriding and carburising and good perspectives for these technology groups. However, diffusion boriding is obsolete and will slowly leave the market. The value of this paper is to evaluate the value of thermochemical treatment technologies in the background environment with their future development perspectives determination including the influence of thermochemical treatment on the quality, microstructure and properties of surface layers obtained by thermochemical treatment.