ISSN 1734-8412

# Journa

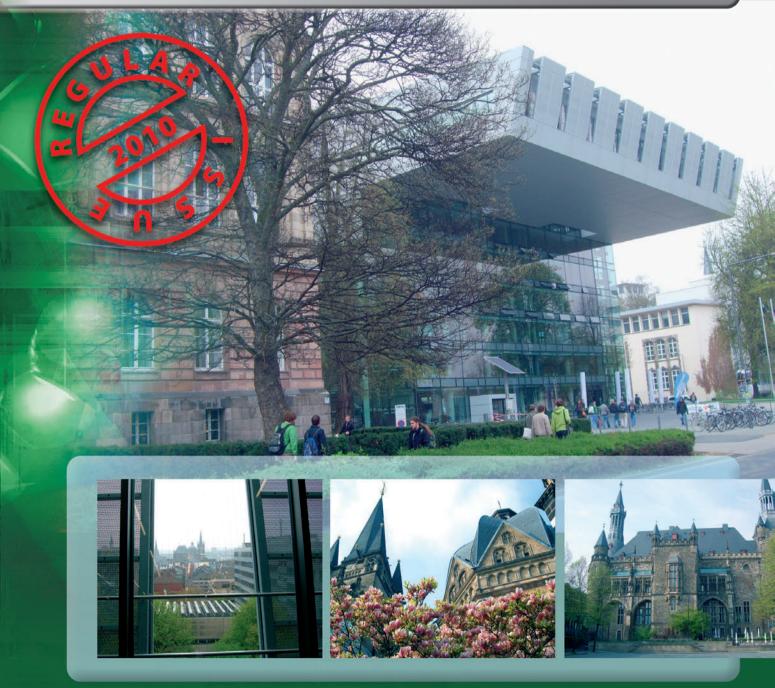
## of Achievements in Materials and Manufacturing Engineering



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

Editor-in-Chief Prof. Leszek A. Dobrzański

Volume 40 • Issue 1 • May 2010





### Journa

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

**Europe**Prof. Jose Manuel Torralba - Madrid, Spain

Asia Prof. Yong Taek Im - Daejeon, South Korea

Australia

Prof. Kanaka Durga Vara Prasad Yarlagadda

- Brisbane, Australia

**Africa** 

Prof. Abdalla Wifi - Cairo, Egypt



#### **Associate Editors**

Dr Mirosław Bonek

Dr Małgorzata Drak

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 Anna Achtelik, MSc

Ms Justyna Hajduczek, MSc

Mr Paweł Jarka, 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. Petr Louda - Liberec, Czech Republic

Prof. Stanisław Mitura - Łódź, Poland

Prof. Andrew Nee - Singapore, Singapore

Prof. Jerzy Nowacki - Szczecin, Poland

Prof. Abraham Ogwu - Paisley, United Kingdom

Prof. Fusheng Pan - Chongqing, 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 2010 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 (6 points). The Journal is cited by Abstracting Services such as:









DICALS DIRECTORY...

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 

2010 International OCSCO World Press. All rights reserved 

The paper used for this Journal meets the requirements of acid-free paper Printed in Poland

#### Cover story

On 19<sup>th</sup> Anril 2010 in a lecture room on the sixth floor of SuperC the new central service building for students, opened in 2008 together with the Main Building of the Rheinisch-Westfaelische Technische Hochschule and seen on the cover - RWTH Aachen University in Aachen in Germany organised a discussion meeting of the representatives of the Polish scientific society with the Authori-



ties and Professors of RWTH Aachen University. On 25th January 1858, prince Frederic William of Prussia, the later German emperor, was presented a donation of 5,000 talers for charity, and in March, the prince chose to use the donation to found the first Prussian institute of technology somewhere in the Rhine province. Aachen finally won in the competitions. Groundbreaking for the new Polytechnic took place on 15th May 1865, so exactly 145 years ago, and lectures started amidst on 10th October 1870. In the small pictures the Aachen Cathedral seen from the windows of the lecture room is presented and on the next picture seen among the early spring flowers of magnolia as the first German building listed in the list of the UNESCO World Heritage in 1978. In 794-801 on Charles the Great's recommendation the chapel in the form of the octagon probably coming from Master Odo of Metz was built. The octagon forms the core of many buildings added later to the Chanel. In the 14th and 15th century the Gothic choir, a high tower and several side chapels were added. In 1719 Carolingian mosaics were replaced by stuccos. In 1756-1767 the reconstruction of the Hungarian Chapel, built in 1367 adjusting it to the chapel of baroque style, was carried out. In 1879-1981 stucco decorations were replaced by parts covered with mosaics. The City Hall, presented in the third photo was built in 1349 in the Gothic style on the foundations of the former imperial Palatine Charlemagne. Some elements of this building coming from the Carolingian times were integrated in the City Hall. On the western side of the tower it includes the parts of a fair tower and on the eastern Granus Tower. During the two great fires (1656 and 1883) the City Hall was greatly damaged and in the 18th century it was rebuilt in the Baroque style and became an urban palace. During the Second World War the next almost complete destruction of this building took place. Today's City Hall is decorated by 50 statues of German kings, out of which 31 were just crowned in Aachen.