

Journal

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 39 • Issue 1 • March 2010





Journal

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-Rubinić

Dr Anna Włodarczyk-Fligier

Dr Bogusław Ziębowicz

Ms Anna Achtełik, MSc

Ms Justyna Hajduczek, MSc

Mr Paweł Jarka, MSc

Reading Direct

Mr Adam Jagiełło, MSc

Mr Piotr Zarychta, MSc

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 Cunha - 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 - Rösraath, 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 Jędrzejewski - 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 - Istanbul, Turkey

Prof. Bekir Sam Yilbas - Dhahran, Saudi Arabia



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>

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:



The procedure of its registration in the databases of Compendex, 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

The island of Sri Lanka lies in the Indian Ocean, to the southwest of the Bay of Bengal. It is separated from the Indian subcontinent by the Gulf of Mannar and the Palk Strait. The island consists mostly of flat-to-rolling coastal plains, with mountains rising only in the south-central part. Among the trees of the dry-land forests, there are some valuable species such as satinwood, ebony, ironwood,

mahogany and teak. In the wet zone, the dominant vegetation of the lowlands is a tropical evergreen forest, with tall trees, broad foliage, and a dense undergrowth of vines and creepers. Subtropical evergreen forests resembling those of temperate climates flourish in the higher altitudes. Forests at one time covered nearly the entire island, but by the late 20th century lands classified as forests and forest reserves covered around 1/3 of the land. The Yala National Park in the southeast protects herds of elephant, deer, and peacocks, and the Wilpattu National Park in the northwest preserves the habitats of many water birds, such as storks, pelicans, ibis, and spoonbills. The island has four biosphere reserves, Bundala, Hurulu Forest Reserve, the Kanneliya-Dediyagala-Nakiyadeniya, and Sinharaja. Sri Lanka is an attractive tourist destination. On the cover you can see Kandy, the last royal capital of Sri Lanka, situated 115 km from Colombo at 465 metres above sea level, famous for the Temple of the Tooth and many other temples, which the city could be called the cultural capital of the island. Small pictures show the golden sandy beaches on the south west coast of Sri Lanka near the Galla, the region that was tragically afflicted by the Tsunami in 2004 and fishermen on typical seats made of wooden poles fishing directly in the Indian Ocean. The third from small pictures presents Pinnawela Elephant Orphanage – a reserve for elephants raised in captivity, only in order to assure them a normal life after the tragic civil war, which crippled or killed not only people but also wild animals. The war has lasted since 1983 with Tamils, who demanded their own, independent country Ilam, and for a long time in the northeast part of the island in fact ruled an autonomous country and after 2000 were defeated by the government army, who took over Tamil Tigers. On 17th May 2009 defeated Tamil Tigers declared cease fire and the president of Sri Lanka proclaimed the end of quarter-century-long civil war.

