

# Journal

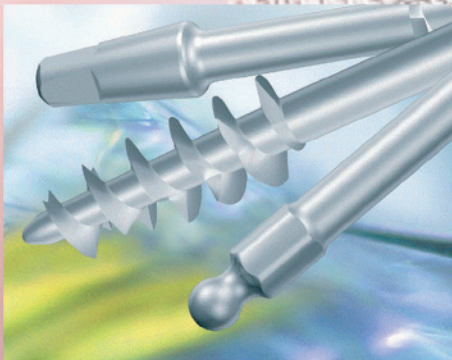
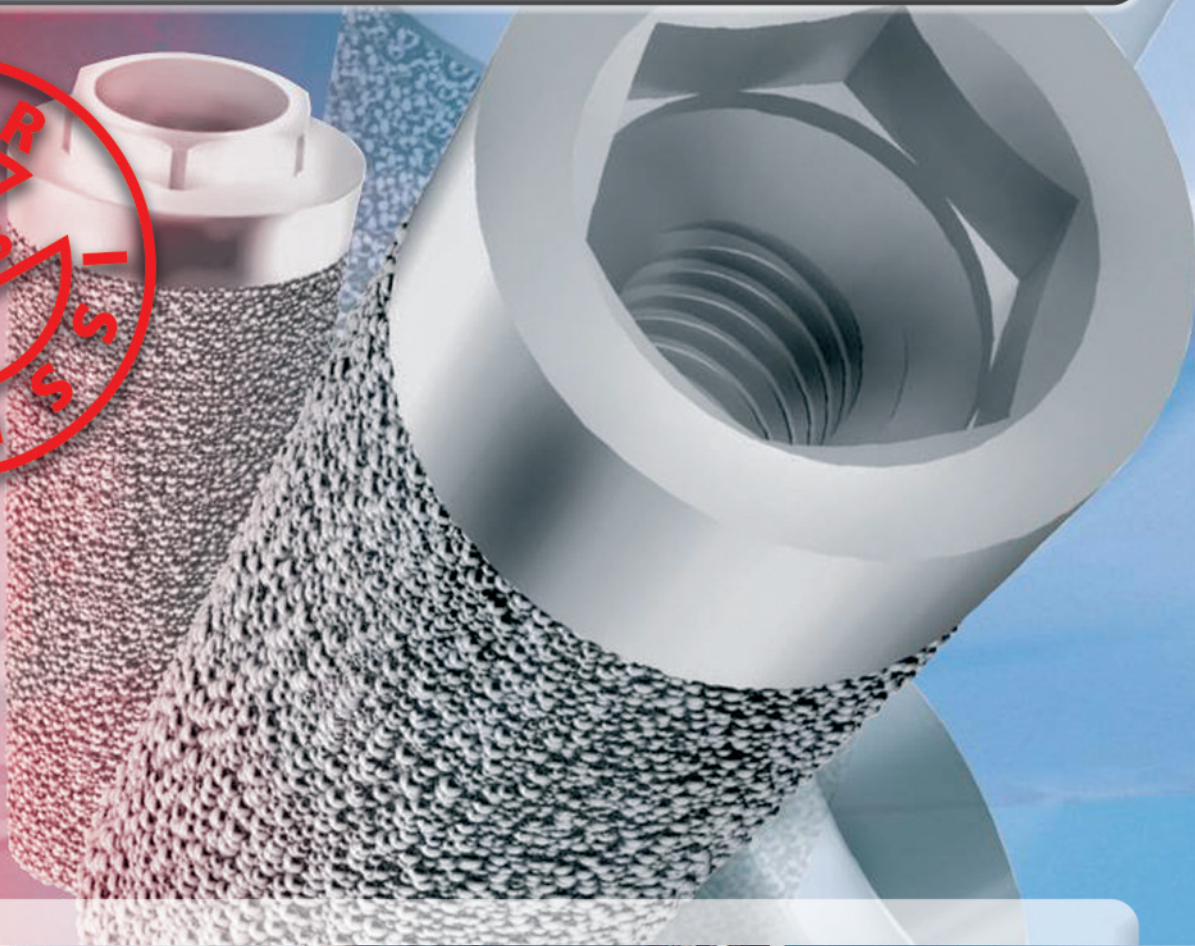
of Achievements in Materials  
and Manufacturing Engineering



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

Editor-in-Chief Prof. Leszek A. Dobrzański

Volume 28 • Issue 1 • May 2008





# 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

Mr Wojciech Borek, MSc  
Ms Barbara Dołżańska, MSc  
Ms Justyna Hajduczek, MSc  
Ms Katarzyna Bałdys, MSc

## Reading Direct

Dr Adam Polok  
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 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 - Selangor, Malaysia  
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

In 2008 the publication of the Journal is financially supported by the Ministry of Science and Higher Education in Poland.

## 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 procedure leading to the citation of that journal by Abstracting Services has already 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

© 2008 International OCSCO World Press. All rights reserved  
The paper used for this Journal meets the requirements of ♻️ free paper  
Printed in Poland

## Cover story

Dental prosthetics is the dentistry branch focused on carrying out the functional restorations or rectifying the function with artificial appliances as substitutes for the missing soft or hard tissues of the oral cavity and surrounding area. Therefore, it deals with restoration and maintaining the oral cavity functions and also improvement of the patient's comfort, appearance, and health by rebuilding the natural teeth and/or by restoration with the artificial materials the missing teeth and adjoining tissues in the oral cavity area. The goal of the prosthetic dental treatment of the organ is revitalisation of the impaired or lost mastication functions, elimination of dysfunctions with the simultaneous prevention of the denture base foundation pathological states, and also retaining or improvement of the aesthetic appearance of the face and resulting in improvement of the general feeling, and therefore also patient's health with the important role played by prophylaxis in this area.

Aesthetic dentistry is developing also in the last decades as an important branch of dentistry. Requirements pertaining to aesthetics grow along with improvement of living conditions and affluence of the society, as the realisation of the philosophical strive to beauty, which should be clearly differentiated from the notion of cosmetics, as interventions aimed at attaining the appearance satisfying the patient only. Adaptation of the patient to prostheses is also connected both with their functioning in the patient's oral cavity without injury, resulting from their correct fabrication and seating according to the rules of the medical and engineering crafts and also with their psychical acceptance by the patient, connected with his personality and competent tending him or her by the dentist. Thanks to introduction of many contemporary materials and materials technologies into the scope of the dental techniques and also in case of implementation of the new clinical methods, the modern dental prosthetics offers big potential of not only rebuilding and restoration of the missing dentition, deciding directly the patient's health improvement, but also reinstating or improvement of the face aesthetics, and with this improvement of his or her psychical state. Dental prostheses are the artificial appliances custom designed and fabricated in each case for the particular patient in the complex clinical and fabrication process. Clinical activity in the area of dental prosthetics is, therefore, inseparably connected with the technical procedure in the prosthetic laboratory and therefore the good collaboration is so essential of the dental technician or even engineer with the dentist. Responsibility for the correct fabrication of the dental prosthetic devices rests both with the dentist, who is – however – irrevocably responsible for the entire treatment, but also with the dental technician or even engineer, therefore, each of them can expect from the other party not only carrying out of the particular tasks in a competent way, but also demand carrying this work at the highest level, thanks to which it becomes possible to reduce and even eliminate the risk of the wrong workmanship without prosthetic restoration, elimination of pain and exposing the patient to the unnecessary health complications, discomfort of using the prostheses and disappointment resulting from the unsatisfied aesthetical expectations. The result of the dentist's efforts in rehabilitation of the dental apparatus is dependant equally on his or her knowledge and practical skill, as on the level of the cooperating dental technician or even engineer. These are the two equiponderant partners forming the cooperative team, whose collaboration may shape much more when the dental technicians are educated at the same level as the dentists. Expanding this idea one may conclude that educating engineers and masters of engineering majoring in the area of dental engineering is purposeful. This opinion differs from the approach prevailing in Poland nowadays, consisting in the specialist education of dental technicians and even engineers by circles of the dental faculties of the medical academies, because of the significant extension of the general knowledge in the area of dentistry with the teaching of engineering topics, which makes difficult a deeper understanding of the materials and technological issues to the specialists trained in their profession in this way and most probably may feature a restraint to development of this branch of knowledge.

