



POLISH ACADEMY OF SCIENCES - COMMITTEE OF MATERIALS SCIENCE
SILESIA N UNIVERSITY OF TECHNOLOGY OF GLIWICE
INSTITUTE OF ENGINEERING MATERIALS AND BIOMATERIALS
ASSOCIATION OF ALUMNI OF SILESIA N UNIVERSITY OF TECHNOLOGY

Conference
Proceedings

12th INTERNATIONAL SCIENTIFIC CONFERENCE
ACHIEVEMENTS IN MECHANICAL & MATERIALS ENGINEERING

Preface

The task for engineers made by employers, managers, politicians and also finally by the whole society is the fulfilment of needs of those societies by design, manufacturing and exploitations of newer and newer products fulfilling higher and higher requirements making easier everyday life, work and many other expectations. The way of the realisation of those expectations at a large extend depends on a designer who must pay attention to shape and form of a product or its elements and at the same time decide what material that product will be made of and what will be its technological process. It follows that design is a complex process requiring the involvement of specialists at least of those three branches, however it is difficult to establish whether any of them plays an important role. It surely requires not infrequently the cooperation of specialists in the field of the organisation and production management, applied computer science and others. From the point of view of product design all engineering materials including also advanced ones, which develop dynamically and can ensure the required properties of products, the ones developed in automation and robotics, electronics and optoelectronics, intelligent and biomimetic products and those connected with nanotechnology are equal. Multi-criterial optimisation is a basis of the selection of materials having the best working and technological properties and the lowest possible costs of production, processing and exploitation of material and a product. Therefore, a correct solution of tasks standing at the engineering society requires a broad interdisciplinary cooperation. That need was perceived in 1992 when the first in the series of a very successful International Scientific Conferences on “Achievements in Mechanical and Materials Engineering – AMME” was organised. Since the very beginning the initiative was supported by the consecutive Chairmen of Committee of Materials Science of the Polish Academy of Sciences Prof. Zbigniew Bojarski, Prof. Tadeusz Bołd and Prof. Adolf Maciejny who for 12 years held the scientific patronage of the conference. The conference was also affiliated by the Committee of Materials Science of the Polish Academy of Sciences. Invariably for many years the conference is organised by the group of scientific staff of the Division of Materials Processing Technology and Computer Techniques in Materials Science of the Institute of

Engineering Materials and Biomaterials of the Silesian University of Technology in Gliwice. About 80 outstanding scientists of many countries of the world in all continents support the undertaking yearly by their authorities participating in the activity of the International Programme Committee of the AMME conferences. Every year many of them participate actively in all conferences of that series and since the very beginning of that series the majority in the makeup of that Committee. The conferences of that series owe the high level just thanks to their work because they review submitted papers qualifying them for print in the conference proceedings or special issues. The conferences of that series are pleased with the great support of the consecutive editors-in-chief of the Journal of Materials Processing Technology until 2000 Prof. Frank W. Travis from Scotland and then Prof. Saleem M.S.J. Hashmi from Ireland. They are great friends of Poland, the Polish scientific society and created volumes of that Journal in which yearly the Special Issue appears consisting of the outstanding papers presented in the successive conferences of AMME series. The last one appeared in February 2003. The next two issues are in press and the proceedings of the 11th conference being in the last phase of review and edition wait for the publication. In that way the number of publications included in the worldwide circulation of scientific information earlier presented at one of the conferences of AMME series approaches to 500. It is worth mentioning that just those papers are found among those reviewed by the Institute of Scientific Information in Philadelphia in the USA and put in the Science Citation Index.

The conference has also its regular participants who for several times already actively participated in it presenting main, invited and submitted papers, and lately even posters on plenary and poster sessions. That great interest of participants altogether exceeding 2000 surely can be connected with the mood and friendly atmosphere which usually accompany those events, a high level and an interesting subject matter of presented papers and also attractive place to which the organisers invite its participants. The conferences has already taken place in the royal castles on the Wawel Hill in Cracow and in Rydzyna near Leszno, in the historical buildings such as a Main Hall in Gdańsk, in the Palaces in Pawłowice, Rokosowo and Promnice, in outstanding hotels in Wisła, Sopot and Zakopane. The present 12th conference again will take place in Zakopane, the winter capital of Poland, which always adds the charm to the conference by its winter landscape. A highlander's sleigh ride in the snowy Chochołowska Valley with the beautiful views of the Tatra mountains and regional folkloristic evening accompanied by highlanders' folk groups belongs to experiences which are remembered especially by foreign guests. 150-200 persons, ca. 100 out of all continents

usually participates in the conference. In the present 12th AMME'2003 the participants of 28 countries including Brazil, Bulgaria, Canada, Croatia, Czech Republic, France, Germany, Hungary, India, Iran, Ireland, Israel, Italy, Japan, Korea, Lithuania, Republic of Macedonia, Norway, Portugal, Romania, Slovak Republic, Slovenia, Spain, Turkey, Ukraine, the United Kingdom, and the USA and of a dozen or so scientific centres in Poland have announced their participation. The papers accepted for the publication in the AMME'2003 Conference Proceedings has been worked-out altogether by 400 authors and co-authors. Traditionally the AMME conferences creates the possibility of the exchange of knowledge among scientists of various parts of the world working in numerous fields of mechanical and materials engineering. The conferences enable the presentation of the first scientific achievements by PhD students and also their personal familiarisation with outstanding professors from numerous world universities whose surnames they have known so far from the covers of superb academic books or publications of the leading worldwide scientific Journals.

The close cooperation links were established among the conference participants, either within the frameworks of CEEPUS programmes and also within the framework of the bilateral international agreements or agreements between universities from various countries and numerous agreements that were possible because of the personal friendships, currently carried out within the Socrates Erasmus programmes, in which mostly students coming from professors participating in the conference participate. The fruits of these links are multiple mutual publications co-authored by the international teams of authors, appearing more and more often, among others in the conference proceedings, and medium and long term scientific stages of both foreign guests in Poland and also in many countries, to which young scientific workers go, as well as visits of scientists from other countries participating in the conference. This brought, among others, many PhD and MSc dissertations that were worked out thanks to this collaboration, and also many awards and honorary titles for the scientific collaboration whose beginning was possible by contacts established within the framework of the conference. In this sense, the community of the conference participants creates the international association promoting young scientific workers and scientific disciplines in which they work.

The conference is accompanied by important events among others Country-wide Scientific-Technical Conference on "Contemporary Achievements in Materials' Science CAMS" for a few years the Meeting of the Permanent Conference of the Deans of the

Faculties of Mechanical Engineering of the Polish Universities of Technology, the meeting of the bodies of the Polish Academy of Sciences connected with materials engineering, the ceremonial opening of new scientific and didactic laboratories in the Silesian University of Technology in Gliwice, sessions and workshops of groups realising international didactic and scientific projects including the Central European Exchange Programme for University Studies CEEPUS.

Undoubtedly, the handing of honorary awards of the Golden Owl in the name of Prof. Fryderyk Staub for achievements in promoting the Polish Science and higher education on the international arena and for achievements in collaboration with the Polish scientific society belongs to the most important events. The award is connected with the statuette of a golden owl – a symbol of wisdom, and a magnificent diploma. The first of those awards for the year 1997 was granted in 1998 to Prof. Marcel Hubert Van de Voorde from Belgium and then Prof. Frank William Travis from Scotland in 1999, in 2000 Prof. Jose Manuel Torralba Castello from Spain, in 2001 Professor Saleem Mahammed Sarwar Jang Hashmi from Ireland, Prof. Maria Helena Robert from Brazil and Prof. Boris Ivanov Tomov from Bulgaria, in 2002 Prof. Yosef Katz from Israel, Prof. Janez Kopac from Slovenia and Prof. Marcel Zitnansky from Slovakia.

This year the Award Chapter has made a decision to distinguish simultaneously three eminent scientists originating from three different countries: Spain, Italy and Croatia, although, due to the global format of their activities they are known throughout the world.

I have the honour to declare on the behalf of the Award Chapter that:

- **Prof. Belén Levenfeld Laredo from the University of Carlos III in Madrid, Spain**
- **Prof. Mario Rosso from Politecnico di Torino, Italy**
- **Prof. Božo Smoljan from the University of Rijeka, Croatia**

have become the laureates of the honorary award in the name of Prof. Fryderyk Staub for achievements in promoting the Polish Science and higher education in the area of materials engineering on the international arena and for achievements in collaboration with the Polish scientific community in this area.

To the numerous congratulations that the distinguished laureates receive on this occasion I add my warm congratulation of their prestigious distinctions on behalf of myself and the whole conference community and wish them further great scientific and didactic achievements and also further satisfaction of wonderful results of the international cooperation.

This year as a result of the careful selection ca. 230 papers has been qualified for the publication in the conference proceedings in the form of short papers. Authors of the best papers will be invited for the preparation of full 8 or 12-page-long versions for the publication in the *Journal of Materials Processing Technology* (Elsevier). In the plenary sessions the following papers will be presented: 2 opening one, 3 award holders' ones, 31 invited plenary papers, 54 invited session papers, 24 polish oral papers and over 110 poster presentations.

The organisation of the world-wide conference requires the efforts of many people. I would like to thank all whose activity and effort contributed to its success. Many thanks go to authors of the papers and speakers, reviewers, chairmen of the sessions, poster session commissioners, and members of the Organisational Committee and also of the International Programme Committee who propagate so widely the AMME'2003 conference in the world.

The special thanks go to Prof. Adolf Maciejny from Poland for taking the patronage of the conference and Prof. Saleem M. S. J. Hashmi from Ireland for making the possibility of the publication of the chosen papers in a very prestigious worldwide *Journal of Materials Processing Technology* edited by him.

I would like to thank the director of the Printing House of the Silesian University of Technology Mr Marek Warecki, BSc Eng for a very fast and efficient publication and outworking of the conference proceedings.

Particular thanks go to the members of the Conference Secretariat which took all the tasks connected with the organisation and the preparation of the Conference, mostly to my daughter Marzena Kraszewska, MA, Dr Klaudiusz Gołombek, Dr Adam Zarychta and also Dr Marcin Adamiak, Dr Eugeniusz Hajduczek, Dr Janusz Madejski, Dr Janusz Mazurkiewicz, Dr Wojciech Sitek, Mr Mirosław Bonek, MSc, Mr Zbigniew Brytan, MSc, Ms Aleksandra Drygała, MSc, Mr Jarosław Konieczny, MSc, Mr Mariusz Krupiński, MSc, Mr Jarosław Mikuła, MSc, Ms Magdalena Polok, MSc and the rest of my co-workers from the Division of Materials Processing Technology and Computer Techniques in Materials Science of the Institute of Engineering Materials and Biomaterials of the Silesian

University of Technology in Gliwice whose job and a great involvement contributed to the realisation of all the tasks necessary for carrying out the AMME'2003 conference.

I would like to wish all the Conference participants fruitful debates and successful presentations, a nice stay in Gliwice and Zakopane. Your satisfaction will make us very happy as hospitality is one of values of which we as Poles think very highly.

At the same time I do hope that already today you will become interested in the next proposal addressed to you. In May 2005 on the occasion of the 60th anniversary of the Silesian University of Technology in Gliwice we will organise the International Scientific Congress probably in Wisła in the Congress Centre and the Gołębiewski Hotel (5 stars). In the framework of that Congress among other the next conferences of very successful series such as:

- „Achievements in Mechanical and Material Engineering AMME'2005”
- „Advances in Materials Processing Technology AMPT'2005”
- „Manufacturing, Materials and Mechanical Engineering M³E'2005”
- „Contemporary Achievements of Material Science CAMS'2005”

will be organised. Only today I have an honour and pleasure to invite you in that very important event.

Dr h.c. Prof. Leszek A. Dobrzański
Chairman
of the Organising and Programme Committees
of the International Scientific Conferences on
“Achievements in Mechanical and Materials Engineering”

Dean
of the Mechanical Engineering Faculty
of the Silesian University of Technology

Gliwice, November 2003