

# Preface

The International Conference on Extrusion and Benchmark is gathering for the fourth time. The peer reviewed papers presented on this occasion are collected in this special issue of the journal “Key Engineering Materials”.

ICEB is a two-in-one event, merging a conference on the “Latest Advances in Extrusion Technology and Simulation“ with an industrial worldwide contest of commercial simulation codes - the “Extrusion Benchmark“. Invited keynote speakers and contributors from academia and industry report on the latest advances in extrusion technology and its simulation. The contributions cover a wide range of topics and are grouped into the categories of: benchmark, microstructure, seam welds & composite extrusion, material flow & constitutive equations, friction evaluation, dies & tools, and process control & optimization. However, many more topics such as new materials and new profiles have been covered.

The “Extrusion Benchmark” exploits FEM code capabilities and users’ knowledge in the simulation of an industrial extrusion process as it was designed and experimentally realized by the ICEB organizers. Participants are asked to simulate a special designed extrusion process on the base of process input parameters. The results will be undisclosed until the day of the conference, where they will be presented and published to the audience.

In the 2013 edition of the benchmark, a bridge die for the simultaneous extrusion of two rectangular profiles was designed and tested. The experimental investigation aimed at the measurement of the mandrel deflection, the pressure in the die cavity and an extensive local die temperature monitoring. These results allow a clear and reliable comparison of the simulation results.

In general, the Extrusion Benchmark is considered as more than a bare contest: It is an opportunity to detect, explore and discuss various issues about common simulation practice, with each participant having his/her own particular interest. This approach will hopefully lead to even further improvement of existing simulation skills, contribute to process optimization research and encourage future benchmark experiments.

Finally, we would like to express our sincere thanks to all authors and co-authors, to the reviewers as well as to the members of the conference committee who contributed to the quality of the conference. Furthermore, we owe our very special gratitude to our co-organizers Professor Luca Tomesani, Dr. Lorenzo Donati, Dr. Barbara Reggiani and Eng. Antonio Segatori for their kind support in realizing the ICEB 2013. We also thank the IUL team, especially the department of bulk metal forming, and in particular Martin Schwane, Ramona Hölker, Alessandro Selvaggio and Thomas Kloppenborg for their efforts in the conference organization and the extrusion trials.

We also thank the generous sponsors for their financial assistance, which made it possible to organize this conference and to carry out the benchmark trials.

We hope that these proceedings will become a source of valuable information and will be useful to scientific and industrial researchers, engineers and students. We cordially welcome you in Dortmund to our International Conference on Extrusion and Benchmark.

Prof. Dr.-Ing. Dr.-Ing. E.h. A. Erman Tekkaya  
Conference chairman

Dr.-Ing. Andreas Jäger  
Conference organizer

## **Committees**

### **Conference Chair**

Prof. A. Erman Tekkaya, IUL, TU Dortmund University, DE

### **Conference Organizer**

Dr. Andreas Jäger, IUL, TU Dortmund University, DE

### **Scientific Committee**

Dr. N. Ben Khalifa, IUL, TU Dortmund University, DE

Dr. L. Donati, DIEM, University of Bologna, IT

Dr. F. Gagliardi, University of Calabria, IT

Prof. J. Hirsch, Hydro, DE

Prof. P. Hora, IVP, ETH Zurich, CH

Prof. M. Hoshino, MECST, Nihon University, JP

Prof. J. Hueting, DET, University of Twente, NL

Prof. Matthias Kleiner, TU Dortmund University, DE

Dr. A. J. Koopmann, DET, University of Twente, NL

Dr. A. Jäger, IUL, TU Dortmund University, DE

Dr. F. Kraft, Ohio University, US

Dr. M. El Mehtedi, DIPMEC, Marche Polytechnic University, IT

Prof. F. Micari, DTMPIG, University of Palermo, IT

Prof. W. Misiulek, Lehigh University, US

Dr. S. Müller, ERC, TU Berlin, DE

Prof. T. Neitzert, School of Engineering, Auckland University of Technology, NZ

Dr. B. Reggiani, DIEM University of Bologna, IT

Eng. A. Segatori, DIEM, University of Bologna, IT

Prof. G. Tani, DIEM University of Bologna, IT

Prof. A. E. Tekkaya, IUL, TU Dortmund University, DE

Prof. L. Tomesani, DIEM, University of Bologna, IT

Prof. H. Valberg, NTNU, Norwegian University, NO

Dr. X. Velay, University Bournemouth, GB

Dr. J. Zhou, LMP, Delft University, NL

### **Industrial Committee**

F. Bagagli, Alutitan, IT

W. Dalla Barba, Italtecno/Interall, IT

P. Celani, Gruppo Profilati, IT

A. Den Bakker, Nedal Aluminium B.V., NL

H. Gers, Martinrea Honsel Germany GmbH, DE

V. Giacomelli, Compes S.p.A., IT

J. Gijbels, Aleris Aluminium Europe, BE

J. Maier, WEFA Inotec GmbH, DE

U. Muschalik, SMS Meer GmbH, DE

T. Pinter, Almax Mori, IT

G. T. Rajsky, Extrusion Technology for Aluminum Profiles Foundation, USA

M. Rompato, Pandolfo Alluminio, IT

T. Rosenbaum, Wilke Werkzeugbau GmbH & Co. KG, DE