

INSECT 2007

International Symposium on ElectroChemical Machining Technology



TECHNISCHE UNIVERSITÄT
CHEMNITZ



Invitation and Program

October 25-26, 2007
Fraunhofer IWU Chemnitz
Germany



Fraunhofer Institut
Werkzeugmaschinen
und Umformtechnik

Preface

Dear Ladies and Gentlemen, dear Colleagues,
It is an honor for me to invite you to the 4th INSECT 2007.

The International Symposium on ElectroChemical Machining Technology INSECT serves as a platform for researchers and engineers working on electrochemical machining technologies. The Symposium concentrates on the technical aspects of applications, e.g. in macro and micro structuring focusing on quality and efficiency, as well as on the fundamental understanding of the processes at the electrode electrolyte interface.

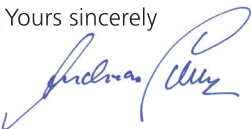
The 4th INSECT 2007 will take place in Chemnitz and ties up to the successful past conferences in Düsseldorf (2004), Freiburg (2005) and Dresden (2006).

Chemnitz is the heart of an emerging industrial area in Saxony with great history in the machine tool industry and automotive manufacturing. Nowadays, the strong connection of basic as well as applied research with the manufacturing industry is one of the drivers for the outstanding economic success in Saxony during the last years. Chemnitz lies at the foothills of the Erz Mountains and in its vicinity are impressive historical places such as the Augustusburg Castle, where the conference dinner will take place.

I am convinced that the 4th INSECT 2007 will serve as a platform for discussions and as a place for meeting colleagues and learning about new developments in electrochemical machining.

See you in Chemnitz.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Andreas Schubert', with a stylized flourish at the end.

Prof. Andreas Schubert

Thursday, October 25

- 09.00** Registration
- 10.00** **Welcome and Introduction**
A. Schubert
Fraunhofer IWU Chemnitz, Germany
- 10.05** **Research and Development for Efficiency and Precision at Fraunhofer IWU**
R. Neugebauer
Fraunhofer IWU, Germany

Session 1: Industrial Applications

- 10.30** **ECM – Electrolytic Machining in Mass Production**
U. Burmester
Extrude Hone GmbH, Germany
- 10.55** **Ultra Precise Sink Erosion of Steel Using Ultrashort Voltage Pulses**
T. Gmelin; H. Kück
ECMTEC GmbH, Germany
- 11.20** **Machine and Generator Design for Electrochemical Machining of Parts in Small- and Middle-Sized Quantities**
S. Kirsten; J. Lämmel; M. Scharrnbeck
SITEC Industrietechnologie GmbH, Germany
- 11.45** Lunch

Thursday, October 25

Session 2: Fundamentals of ECM

- 13.15 Analysis of Reaction Products During ECM of Hard Metals**
B. Walther; M. Schneider; A. Michaelis; M. M. Lohrengel
Dresden University of Technology, Germany
- 13.40 In-situ Investigation of the Surface-Topography under ECM-Conditions**
M. Schneider; D. Fiebiger; C. Lämmel; A. Michaelis
Fraunhofer IKTS, Germany
- 14.05 Thermal Limitations in Pulse Electrochemical Machining (PECM)**
J. Kozak; Z. Gulbinowicz
Warsaw University of Technology, Poland
- 14.30** Coffee Break

Session 3: Simulation and Modeling

- 15.00 Simulation of a Piezo-Based Vibration Drive for Electrochemical Etching**
R. Neugebauer; H. Knüpfer; K. Wolf; H.-J. Roscher
Fraunhofer IWU, Germany
- 15.25 Simulation and Two Dimensional Tool Design of Electrochemical Machining Process by Using Finite Element and Cos(θ)Methods**
A. Mehrvar; M. Ghoreishi
K.N.T. University of Technology, Iran
- 15.50 Numerical Solution of Non-Stationary Axisymmetric Hele-Shaw Problems for Electrochemical Machining**
R.A. Badamshin; O.R. Zinnatullina; V.P. Zhitniko
Ufa State Aviation Technical University, Russia
- 16.15 Time Averaged Temperature, Concentration and Efficiency Calculations in Pulse Electrochemical Machining (PECM)**
N. Smets
Vrije University of Brussels, Belgium
- 16.40 Visit to Precision and Micromanufacturing Labs at Fraunhofer IWU**
- 17.45** Bus transfer to Augustusburg Castle
- 18.15** Guided tour through Augustusburg Castle's highlights
- 19.30** Conference dinner at "Augustuskeller"
- 21.30** Bus transfer to hotel

Friday, October 26

Session 4: Anodic Dissolution and Passivation

- 9.00 Electrochemical Machining with Additional Cathode**
T.V. Kosarev; T.R. Idrisov; A.N. Zaitsev; V.P. Zhitnikov
Ufa State Aviation Technical University, Russia
- 9.25 Intervening Variables in Electrochemical Machining of AISI 202**
T. Sekar; R. Marappan
Government College of Engineering, India
- 9.50 Electrochemical Machining of Silicon**
O. Naumann; E. Knösel; H. Rüfer; K. Künanz
Dresden University of Technology, Germany
- 10.15 Electrochemical Machining of refractory and Hard Metals: Fundamental Investigations and Modelling**
S. Stoimaier; B. Mollay; G. E. Nauer
ECHEM Centre of Competence in Applied Electrochemistry, Austria
- 10.40** Coffee Break

Session 5: Applications 1

- 11.10 Three Dimensional Electrochemical Micromachining by CAD/CAM Using Non-profiled Tool**
L. Gong; Z. Yu; M.M. Sundaram; K.P. Rajurkar
University of Nebraska-Lincoln, USA
- 11.35 Fast Micro Structuring with Electrolyte Jet Machining**
M. Hackert; G. Meichsner; A. Schubert
Chemnitz University of Technology, Germany
- 12.00 Influence on the EC Process on Hole Structure Through Hybrid ED-EC Machining**
P. Schulze; S. Burkert
Otto-von-Guericke-University Magdeburg, Germany
- 12.25 Laser-Electrochemical Machining of Metallic Microparts**
A. Stephen; F. Vollertsen
BIAS Bremer Institut für angewandte Strahltechnik GmbH,
Germany
- 12.50** Lunch

Friday, October 26

Session 6: Application 2

- 14.15 Application of Ultrasonic Vibration to Improve Technological Factors in Electrochemical Machining of Titanium Alloys**
S. Skoczypiec; A. Ruszaj
The Institute of Advanced Manufacturing Technology, Poland
- 14.40 Solutions for Automation of Surface Topology Detection, Gap Control and Quality Management Especially for Inlying Boreholes During Electrochemical Manufacturing (ECM)**
B. Hommel; A. Schulze; T. Gerber
SITEC Industrietechnologie GmbH, Germany
- 15.05 Manufacturing of Tungsten Carbide Tools with Pulse Electrochemical Machining**
A. Hassan; J. Helml; U. Guth; H. Reinecke; M. Schuster
Fachhochschule Deggendorf, Germany
- 15.30 Conclusion and Farewell**
A. Schubert
Fraunhofer IWU, Germany
- 15.35 End**

General Information

Conference Organizers

Prof. A. Schubert

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The INSECT 2007 is organized under the auspices of

- Chemnitz University of Technology
- Heinrich-Heine-University Düsseldorf
- International Society of Electrochemistry (ISE)
- Working Committee of Electrochemical Research Institutions,
Institute at the Heinrich-Heine-University Düsseldorf (AGEF)
- German Bunsen Society for Physical Chemistry (DBG)
- German Research Society for Electroplating and Surface Technology (DGO)
- German Chemical Society, Division of Applied Electrochemistry (GDCh)
- Society for Corrosion Protection (GfKORR)
- Central Association for Surface Treatment Technology (ZVO)

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- R. Neugebauer; Fraunhofer IWU/Chemnitz University of Technology
- H. Reinecke; IMTEK Freiburg
- A. Schubert; Fraunhofer IWU/Chemnitz University of Technology
- R. Schuster; University of Karlsruhe
- G. Schmitt; University of Applied Sciences Südwestfalen, Iserlohn
- M. Stratmann; Max Planck Institute for Iron Research GmbH,
Düsseldorf