

Final Program

November 13, 2023

- 12.00 - 13.00 **Registration and Snacks**
- 13.00 - 13.30 **Opening**
Andreas Noss
CFO Center for Mechatronics and Automation Technology (ZeMA gGmbH)
Dirk Bähre
CEO Center for Mechatronics and Automation Technology (ZeMA gGmbH),
Head of Institute of Production Engineering, Saarland University
- Session 1 – Fundamentals and Material**
Chairman: Prof. Andreas Schubert
- 13.30 - 13.50 Influence of contact impedance by using ECM
Herzig, Mathias^a; Schulze, H.-P.^a; Boetger-Hiller, Falko^b; Kroening, Oliver^a.
^aLeukhardt Schaltanlagen Systemtechnik GmbH,
Gustav-Ricker-Straße 62, 39120 Magdeburg, Deutschland
^bAMtopus GmbH & Co. KG, Technologie-Campus 1,
09126 Chemnitz, Deutschland
- 13.50 - 14.10 Pulse electrochemical machining of amorphous and crystalline states of
the bulk metallic glass AMZ4
*Frank, Alexander^a; Hall, Thomas^{a,b}; Adam, Bastian^c; Busch, Ralf^c; Bähre,
Dirk^{a,b}.*
^aInstitute of Production Engineering, Saarland University, Campus A4 2, 66123 Saarbrücken,
Germany
^bCenter for Mechatronics and Automation Technology (ZeMA gGmbH),
Gewerbepark Eschberger Weg 46 Gebäude 9, 66121 Saarbrücken, Germany
^cChair of Metallic Materials (LMW), Saarland University, Campus C6.3, 66123 Saarbrücken,
Germany
- 14.10 - 14.30 Investigation of Different Electrolytes in Electrochemical Machining of
Copper
Jakob, Leonie; Rieck, Lasse; Bartsch, Jonas.
Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstraße 2, 79110 Freiburg, Germany.
- 14.30 - 14.50 The Effect of Plasma Electrolytic Polishing on Surface characteristics of Ti-
6Al-4V alloy
Kumar, Sushil^a; Chandrapakash, C.^a; Ramkumar, J.^b
^aDepartment of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, UP,
208016, India
^bDepartment of Design, Indian Institute of Technology Kanpur, Kanpur, UP, 208016, India

15.00 - 15.30

Coffee break

Session 2 – Processing I

Chairman: Prof. Matthias Hackert-Oschätzchen

15.30 - 15.50

Electrolyte Jet Machining using a non-aqueous electrolyte to process Ti and its associated surface problems

Shamraze, Ahmed^a; Speidel, Alistair^b; Clare, Adam T.^{a,b}

^a*Advanced Component Engineering Laboratory (ACEL), Faculty of Engineering, University of Nottingham, Nottingham NG7 2RD, UK*

^b*Department of Mechanical Engineering, University of British Columbia, Vancouver Campus, 6250 Applied Science Lane, Vancouver, Canada*

15.50 - 16.10

Analysis of bubble evolution in a channel flow with moving walls: an experimental analogy to precise electrochemical machining (PECM)

Tchoupe Sambou, Elio^a; Herrig, Tim^a; Klink, Andreas^a; Lauwers, Daniel^b; Meinke, Matthias^b; Schröder Wolfgang^b.

^a*Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University, Campus-Boulevard 30, Aachen 52074, Germany*

^b*Chair of Fluid Mechanics and Institute of Aerodynamics (AIA), RWTH Aachen University, Wüllnerstr. 5a, 52062 Aachen, Germany*

16.10 - 16.30

Influence of the type of flushing on the recording of material characteristics in electrochemical machining

Zeiner, Matthias^{a,b}; Hall, Thomas^{a,b}; Schnur, Jennifer^a; Bähre, Dirk^{a,b}.

^a*Institute of Production Engineering, Saarland University, Campus A4 2, 66123 Saarbrücken, Germany*

^b*Center for Mechatronics and Automation Technology (ZeMA gGmbH), Gewerbepark Eschberger Weg 46 Gebäude 9, 66121 Saarbrücken, Germany*

17.00 – 17.30

Transfer to Saarbrücken City

17.30 – 18.30

Sightseeing Saarbrücken City

19.00 – 22.00

Conference Dinner at “Ratskeller” Saarbrücken

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08.30 - 09.00 **Coffee**

Session 3 – Application

Chairman: Dr.-ir. Krishna Saxena

09.00 - 09.20 Investigations on the surface texture after pulsed electrochemical machining (PECM) of the magnetic shape memory alloy NiMnGa
Bötcher, Falko^a; Schneider, Jörg^a; Ul Husnain, Riszwan^b; Edelmann, Jan^a
^aFraunhofer IWU, Institute for Machine Tools and Forming Technology, Reichenhainer Straße 88, 09126 Chemnitz, Germany
^bChemnitz University of Technology Reichenhainer Straße 70, 09126 Chemnitz, Germany

09.20 - 09.40 Accuracy of pulsed electrochemical machining of NdFeB rotor magnets
Martin, Andre^a; Berger, Thomas^a; Loebel, Sascha^a; Schulze, Robin^b; Thielecke, Alexander^c; Hackert-Oschätzchen, Matthias^c; Schubert, Andreas^a.
^aProfessorship Micromanufacturing Technology, Faculty of Mechanical Engineering, Chemnitz University of Technology, 09126 Chemnitz, Germany
^bSITEC Industrietechnologie GmbH, 09114 Chemnitz, Germany
^cChair of Manufacturing Technology with Focus Machining, Faculty of Mechanical Engineering, Otto von Guericke University Magdeburg, 39106 Magdeburg, Germany

09.40 - 10.00 Plasma electrolytic polishing of additively manufactured bulk metallic glasses Cu Ti Zr Ni Sn
Navickaite, Kristina^{a,b}; Nestler, Klaus^a; Wegner, Jan^c; Kleszcynski, Stefan^{c,d}; Böttger-Hiller, Falko^a; Penzel, Michael^{a,b}; Zeidler, Henning^{a,b}.
^aBeckmann Institute for Technology Development e.V., Annaberger Str. 73, 09111 Chemnitz, Germany
^bTechnical University Bergakademie Freiberg, Institute of Machine Elements, Engineering Design and Manufacturing, Chair for Additive Manufacturing, Agricolastrasse 1, 09599 Freiberg, Germany
^cUniversity of Duisburg-Essen, Faculty of Engineering, Chair of Manufacturing Technology, Lotharstraße 1, D – 47057 Duisburg, Germany
^dCenter for Nanointegration Duisburg- Essen (CENIDE), Carl-Benz-Str. 199, Duisburg, 47057, Germany

10.10 - 10.40 **Coffee break**

Session 4 – New Methods/Hybrid Processes

Chairman: Prof. Henning Zeidler

10.40 - 11.00 Influence of green laser assistance in improving passive layer penetration and surface quality during ECM
Arshad, Muhammad^{a,b}; Saxena, Krishna^{a,b}; Reynaerts, Dominiek^{a,b}.
^aMicro -& Precision Engineering Group, Division Manufacturing Processes and Systems (MaPS), Department of Mechanical Engineering, KU Leuven, Belgium
^bMember Flanders Make, Belgium

- 11.00 - 11.20 Development of a suitable electrolyte and voltage for plasma electrolytic rounding of cutting edges on cemented carbide tools
Quitze, Susanne^a; Martin, Andre^a; Eberhardt, Kevin^b; Schubert, Andreas^a.
^aChemnitz University of Technology, Professorship Micromanufacturing Technology, Reichenhainer Str. 70, 09126 Chemnitz, Germany
^bEberhardt GmbH, Eichendorffstr.5, 91586 Lichtenau, Germany
- 11.20 - 11.40 Experimental and numerical analysis of nano finished tool based electrochemical polishing of additively manufactured metallic part
Dadi, Sri Satya Omkar^a; Patel, Divyansh^b; Garg, Girish Kant^a.
^aDepartment of Mechanical Engineering, Birla Institute of Technology and Science Pilani, Pilani-333031, Rajasthan, India
^bSchool of Mechanical Sciences, Indian Institute of Technology, Bhubaneswar, Bhubaneswar-752050, India
- 11.50 - 12.50 **Lunch**
- Session 5 – Simulation and Modeling/Processing II**
Chairman: Prof. Dirk Bähre
- 12.50 - 13.10 Effect of pulse parameters on gas bubble evolution during ECM process: experiments using high speed videographic observations
Saxena, Krishna^{a,b}; Arshad, Muhammad^{a,b}; Reynaerts, Dominiek^a; Kunieda, Masanori^b
^aMicro -& Precision Engineering Group, Division Manufacturing Processes and Systems (MaPS), Department of Mechanical Engineering, KU Leuven, Belgium
^bDepartment of Precision Engineering, University of Tokyo, Bunkyo City, Tokyo, Japan
- 13.10 - 13.30 Optical in situ analysis of gas evolution in the transient working gap in precise electrochemical machining (PECM) using high-speed recordings
Klink, Andreas^a; Tchoupe Sambou, Elio^a; Herrig, Tim^a; Lauwers, Daniel^b; Meinke, Matthias^b; Schröder Wolfgang^b.
^aLaboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University, Campus-Boulevard 30, Aachen 52074, Germany
^bChair of Fluid Mechanics and Institute of Aerodynamics (AIA), RWTH Aachen University, Wüllnerstr. 5a, 52062 Aachen, Germany
- 13.30 - 13.35 **Announcement INSECT 2024**
- 13.35 - 13.40 **Closing Remarks INSECT 2023**
- 14.00 – 15.15 **Shop floor visit ZeMA**