

Program of INSECT 2022

Program at a glance

Day 1	Monday, November 14, 2022
9:00	Registration
9:20	Opening and welcome address INSECT 2022 by Prof. Masanori Kunieda
9:30	Session 1: Fundamentals of electrochemical processes (1)
10:30	Coffee break
11:00	Session 2: Fundamentals of electrochemical processes (2) and Materials
12:20	Lunch
14:00	Session 3: Applications of electrochemical processes (1)
15:20	Coffee break
15:50	Session 4: Applications of electrochemical processes (2)
16:50	Closure day 1
17:30	Conference dinner at Sanjo Conference Hall

Day 2	Tuesday, November 15, 2022
9:00	Session 5: Process control/process monitoring
10:00	Coffee break
10:30	Session 6: New electrochemical processes
11:50	Lunch
13:30	Session 7: Hybrid electrochemical processes (1)
14:30	Coffee break
15:00	Session 8: Hybrid electrochemical processes (2), and Simulation and modeling
16:00	Closing remarks INSECT 2022 by Masanori Kunieda
16:10	Closure Conference

Monday, November 14, 2022

9:20-9:30 Opening and welcome address INSECT 2022 by Prof. Masanori Kunieda

9:30-10:00

Session 1: Fundamentals of electrochemical processes (1)

Time	Title, Authors, Affiliations	Page
9:30	Pulsed electrochemical machining (PECM) of additively manufactured parts with focus on removing support structures <u>Matthias Zeiner</u> ¹ , Thomas Hall ¹ , Franziska Herter ¹ , Dirk Bähre ^{1,2} 1 Institute of Production Engineering, Saarland University, Germany 2 Center for Mechatronics and Automation Technology (ZeMA gGmbH), Germany	15
9:50	Effect of permeable mold and recovery of air-permeability of porous insert by electrochemical machining <u>Koharu Horikawa</u> ¹ , Shuhei Kodama ¹ , Wataru Natsu ¹ , Kazuyoshi Oota ² 1 Tokyo University of Agriculture and Technology, Japan 2 Polytechnic University, Japan	23
10:10	Investigations on the pH value of corrosion-sensitive steels after PECM <u>Falko Böttcher</u> ¹ , Rizwan Ul Husnain ² , Jan Edelmann ¹ 1 Fraunhofer IWU Chemnitz, Germany 2 Chemnitz University of Technology	31

10:30-11:00 Coffee break

11:00-12:20

Session 2: Fundamentals of electrochemical processes (2) and Materials

Time	Title, Authors, Affiliations	Page
11:00	Online monitoring of flushing quality in PECM based on electric process signals <u>Elio Tchoupe</u> ¹ , Lukas Heidemanns ¹ , Ugur Küpper ^{2,1} , Tim Herrig ¹ , Andreas Klink ¹ , Thomas Bergs ^{1,2} 1 WZL-RWTH Aachen, Germany 2 Fraunhofer Institute for Production Technology IPT, Germany	39
11:20	Texturing of Large Surface Using Electrolyte Jet Machining <u>Janggeon Lee</u> ¹ , Hirotaka Imaizumi ¹ , Masanori Kunieda ¹ 1 The University of Tokyo, Japan	45

11:40 Comparison of electrochemical removal characteristics between magnetized and demagnetized NdFeB 51
Sascha Loebel¹, Tom Petzold¹, André Martin¹, Philipp Steinert¹,
 Andreas Schubert¹, Alexander Thielecke², Gunnar Meichsner²,
 Matthias Hackert-Oschätzchen², Robin Schulze³
 1 Chemnitz University of Technology, Germany
 2 Otto von Guericke University Magdeburg, Germany
 3 SITEC Industrietechnologie GmbH, Germany

12:00 An experimental approach to determine CO during the ECM of carbides 57
Lenka Simunkova¹, Michael Schneider², Alexander Michaelis^{1,2}
 1 TU Dresden, Germany
 2 Fraunhofer IKTS Dresden, Germany

12:20-14:00 Lunch

14:00-15:20

Session 3: Applications of electrochemical processes (1)

Time	Title, Authors, Affiliations	Page
14:00	Wire-electrochemical surface finishing of cold tool steel SKD 11 using bipolar pulse <u>Sei Nakano</u> ¹ , Masanori Kunieda ¹ , Daiki Saito ² , Toshiaki Kurokawa ² , Takashi Yuzawa ² 1 The University of Tokyo, Japan 2 Mitsubishi Electric, Japan	65
14:20	Pulse Electrochemical Machining of Bulk Metallic Glasses <u>Thomas Hall</u> ¹ , Bastian Adam ² , Ralf Busch ² , Dirk Bähre ^{1,3} 1 Institute of Production Engineering, Saarland University, Germany 2 Chair of Metallic Materials, Saarland University, Germany 3 Center for Mechatronics and Automation Technology (ZeMA gGmbH), Germany	71
14:40	On micro-pillar generation by through-mask electrochemical micromachining using a flexible electrode <u>Divyansh Patel</u> ¹ , Vyom Sharma ² , Ameya Kale ¹ 1 Birla Institute of Technology and Science Pilani, India 2 Indian Institute of Technology Kanpur, India	77
15:00	Experimental investigations to machine micro cutting tools using Precise Electrochemical Machining (PECM) <u>Abdul Wali</u> ¹ , Alexander Leonard Meijer ¹ , Timo Platt ¹ , Dirk Biermann ¹ 1 Technical University Dortmund, Germany	85

15:20-15:50 Coffee break

15:50-16:50

Session 4: Applications of electrochemical processes (2)

Time	Title, Authors, Affiliations	Page
15:50	Electrochemical machining by circulation of electrolytes through coaxially cylindrical electrode to prevent scattering <u>Koki Matsuzawa</u> ¹ , Hiroto Teraoka ¹ , Ryoma Sakai ¹ , Mitsuo Uchiyama ¹ 1 Kanto Gakuin Univ., Japan	91
16:10	Influence of electrolyte flow on etching results in through-mask electrochemical micromachining <u>Leonie Jakob</u> ¹ , Jonas Eckert ¹ , Carl Podevijn ¹ , Jonas Bartsch ¹ 1 Fraunhofer ISE, Germany	97
16:30	Plasma electrolytic polishing of porous Nitinol structures Kristina Navickaite ^{1,3} , Karl Rossmann ² , Klaus Nestler ³ , Falko Böttger-Hiller ³ , Michael Penzel ³ , Thomas Grund ² , Thomas Lampke ² , <u>Henning Zeidler</u> ^{1,3} 1 TU Freiberg, Germany 2 TU Chemnitz, Germany 3 Beckmann Institute for Technology Development e.V., Germany	103

16:50 Closure day 1

17:30-19:30 Conference dinner at Sanjo Conference Hall

Tuesday, November 15, 2022

9:00-10:00

Session 5: Process control/process monitoring

Time	Title, Authors, Affiliations	Page
9:00	Investigation on parameters affecting tool during pulse electrochemical machining <u>Mandana Ghasemiansafaei</u> ¹ , Florian Schäfer Schäfer ¹ , Dirk Bähre ^{1,2} 1 Saarland University, Germany 2 Center for Mechatronics and Automation Technology (ZeMA gGmbH), Germany	109
9:20	Development of a constant electricity controller in variable-pulse-duration for electrochemical machining Jung-Chou Hung ¹ , Zong-Rui Wu ² , <u>Po-Jen Yang</u> ¹ 1 National Central University, Taiwan 2 Feng Chia University, Taiwan	117

9:40	Analysis of passivation during ECM and hybrid laser-ECM through automated current pulse analysis	123
	<u>Muhammad Hazak Arshad</u> ^{1,2} , Ming Wu ^{1,2} , Krishna Kumar Saxena ^{1,2} , Dominiek Reynaerts ^{1,2}	
	1 KU Leuven, Belgium	
	2 Flanders Make, Belgium	

10:00-10:30 Coffee break

10:30-11:50

Session 6: New electrochemical processes

Time	Title, Authors, Affiliations	Page
10:30	Experimental analysis on process performance as function of electrolyte properties and usage of sacrificial anodes in wire ECM	131
	<u>Florian Sous</u> ¹ , Andreas Klink ¹ , Tim Herrig ¹ , Thomas Bergs ¹	
	1 RWTH Aachen University, Germany	
10:50	Electrochemical drilling of deep-small hole with a wedged end face tube tool	137
	Liang Cheng ¹ , Zhisen Ye ¹ , <u>Xiaolei Chen</u> ¹	
	1 Guangdong University of Technology, China	
11:10	Limitation of current area of ECM with electrolyte confined by absorption material	145
	<u>Tamon Obe</u> ¹ , Wataru Natsu ¹ , Takahisa Masuzawa ²	
	1 Tokyo University of Agriculture and Technology, Japan	
	2 Masuzawa Micromachining Technology Consulting, Japan	
11:30	Surface Quality Improvement of Electrochemical Machining Using Porous Electrodes by Mixing Bubbles into Electrolyte	151
	<u>Tomohiro Koyano</u> ¹ , Jin Yoshida ¹ , Akira Hosokawa ² , Tatsuaki Furumoto ¹ , Yohei Hashimoto ¹	
	1 Kanazawa University, Japan	
	2 Komatsu University, Japan	

11:50-13:30 Lunch

13:30-14:30

Session 7: Hybrid electrochemical processes (1)

Time	Title, Authors, Affiliations	Page
13:30	Electrochemical-discharge grinding of Si-50%Al in glycol-based solution	157
	<u>Guodong Miao</u> ¹ , Zhao Han ¹ , Huihui Su ¹ , Yuankun Li ¹ , Xiaolong Fang ¹	
	1 Nanjing University of Aeronautics and Astronautics, China	

13:50 Influence of electrolyte flow conditions on magnetic-field assisted electrochemical machining 165
Ingo Schaarschmidt¹, Philipp Steinert¹, Andreas Schubert¹
1 Chemnitz University of Technology, Germany

14:10 Milling of Sintered Carbide via Electrochemical Reaction 171
-Investigation of factors of machining inhibition-
Akihiro Goto¹, Junda Chen¹
1 Shizuoka Institute of Science and Technology, Japan

14:30-15:00 Coffee break

15:00-16:00

Session 8: Hybrid electrochemical processes (2), and Simulation and modeling

Time	Title, Authors, Affiliations	Page
15:00	Fabrication of Micro Mold-Cavity by Hybrid Electrochemical Machining Processes <u>Albert Wen Jeng Hsue</u> ¹ , Zih-Yuan Huang ¹ 1 National Kaohsiung University of Science and Technology, Taiwan	179
15:20	Cu microprecipitation with electrolysis assisted short-pulsed laser irradiation in CuSO ₄ solution <u>Shuhei Kodama</u> ¹ , Reo Yabuuchi ¹ , Wataru Natsu ¹ 1 Tokyo University of Agriculture and Technology, Japan	187
15:40	Simulation and verification of electrochemical machining with electrolyte collected and confined by a porous solid ball <u>Jiankang Wang</u> ¹ , <u>Wataru Natsu</u> ¹ 1 Tokyo University of Agriculture and Technology, Japan	193

16:00-16:10 Closing remarks INSECT 2022 by Prof. Masanori Kunieda