



# DAY 1 – Hotel Mercure

## Wednesday 17<sup>th</sup> November 2010

**Time 08:00h - 09:00h**

**Registration**

**Time 09:00h to 09:30h**

**Opening**

- Conference Opening
- Response/welcome by Bertrand Fillon

**Time 09:30h to 10:45h**

**Invited Talks**

**Chair:** B. Fillon

**"Thin Film Organic Devices as a platform for Roll to Roll Production of Sensor Systems"**

H. Schoo

**"Process structuring of polymers and polymer composites in micromoulding"**

P. Coates.

**Time 10:45h to 11:15h**

Coffee Break

**Time 11:15h to 12:30h**

**Session 1**

**Systems Design**

**Chair:** T. Velten, Fraunhofer IBMT, Germany

**176. Modelling and simulation of electrostatic self-assembly of dies and microparts**

P. Lazarou, N. Aspragathos, Univeristy of Patras, Greece  
J. Dalin, J. Wilde, IMTEK, University of Freiburg, Germany.

**139. Development of a nanoscale strain sensor with electron beam induced deposition**

T. Luttermann, S. Fatikow, University of Oldenburg, Germany

**156. Design and investigation of CD-based injection-moulded micro-patterned polymer substrates for cell immobilization**

D. Trifonov, K. Kostadinov, V. Kotev, T. Petrov, Bulgarian Academy of Sciences, Bulgaria.  
M. Al-Wahab, University Otto-von-Guericke, Germany.

**169. A novel approach for high-precision blanking of thin metal foils using monocrystalline silicon as tool material**

S. Hildering, U. Engel, University of Erlangen-Nuremberg, Germany

**Session 2**

**Components Fabrication**

**Chair:** Pieter BOLT, TNO, Netherlands

**135. Manufacturing routes costs comparison for emerging micro and nano technologies**

S. Bigot, P. Dorrington, S. Dimov, Cardiff University, UK.

**125. Large-area surface micro structuring with a linear coating device**

Z. Tebby, J. Gavillet, P. Fugier, C. Ducros, T. Catelain, CEA, France.

**149. Demoulding force prediction for micro polymer replication: a review of relevant literature**

K. Delaney, D. Kennedy, Dublin Institute of Technology, Ireland,  
G. Bissacco, University of Padova, Italy.

**171. Micro-injection moulding using an exchangeable microstructured Si mould insert**

A. Singh, G. Michel, S. Queste, L. Robert, B. Gautier-Manuel, C. Khan-Malek, FEMTO-ST Institute, France.

**Time 12:30h to 14:00h**

**Lunch**

**Time 14:00h to 15:30h**

### FlexPAET Session

Chair: Christoph BAUM



#### 189. FlexPAET: Flexible Patterning of Complex Micro Structures using Adaptive Embossing Technology

C. Brecher, C. Baum, C. Wenzel, Fraunhofer Institute for Production Technology IPT, Aachen, Germany.

#### 168. Fabrication of 3D micro and nanostructures for photonic applications

D. Cristea, P. Obreja, A. Dinescu, R. Rebigan, National Institute for R&D in Microtechnologies (IMT-Bucharest), Romania.  
G. Konstantinidis, FORTH IESL Heraklion, Greece.

#### 190. Electroforming: from Rocket Engines to Nanotweezers

P. Tang, IPU Technology Development, Denmark.

#### 191. Diamond machining of nano structures using an automated work piece referencing and alignment procedure

C. Brecher, M. Weinzierl, C. Wenzel, Fraunhofer Institute for Production Technology IPT, Aachen, Germany.

### MultiLayer Session

Chair: Luc FEDERZONI



#### 165. New trends in room temperature embossing process: from conception to potential industrial applications

S. Bredeau, L. Federzoni, J. Bancillon, I. Karweta, Commissariat à l'Energie Atomique et aux Energies Alternatives, France.

#### 172. Variants of Micro Multi-Component Powder Injection Moulding

E. Vorster, V. Piotter, M. Kruchem, K. Plewa, H.-J. Ritzhaupt-Kleissl, Karlsruhe Institute of Technology, Institute for Materials Research III, Germany.

#### 178. Environmentally sound production of thin alumina sheets by aqueous tape casting

J. Stiernstedt, M. Cristea, E. Carlström, Swerea IVF, Sweden  
G. Rossiquet, Saint-Gobain CREE, France.

#### 184. Development and implementation of technology for laser micro structuring of rollers

P. Petkov, Cardiff University, UK

#### 187. Depth profiling in alumina ceramic by optical coherence tomography

R. Su, L. Mattsson, Department of Production Engineering, KTH - the Royal Institute of Technology, Stockholm, Sweden

Time 15:30h to 16:00h

Coffee Break

Time 16:00h to 17:30h

### Session 3

#### Process Characterisation

Chair: Andreas SCHOTH, IMTEK, Uni. of Freiburg, Germany

#### 142. The Study of Thin Glass Cutting Using Ultrafast Pico-second Laser

Yu-Ting Lyu, Chao-Yung Yeh, Fu-Chuan Hsu, Chung-Li Tsai, Antony H. C. Lee, Metal Industries Research & Development Centre (MIRDC), Taiwan.

#### 145. Low cost master fabrication for roll-to-roll hot embossing based on epoxy resin

T. Velten, F. Bauerfeld, H. Schuck, T. Knoll, Fraunhofer Institute for Biomedical Engineering (IBMT), Germany.

#### 161. End of life environmental assessment of microtechnology: the need for sticks or carrots?

A. de Grave, E.C.Gentil, H.N.Hansen, Technical University of

### Session 4

#### Metrology and Inspection

Chair: L. Mattson, KTH, Sweden

#### 124. FT-IR spectroscopic investigations of nanocomposites on the basis of Co nanoparticles and micronized AlN-powder for Getters

I. Markova-Deneva, University of Chemical Technology and Metallurgy, Bulgaria  
Galia Ivanova, Iovka Dragieva, Bulgarian Academy of Sciences, Bulgaria.

#### 188. MEMS mechanical characteristics determination using Virtual Prototyping

G. Todorov, K. Kamberov, L. Dimitrov, Technical University of Sofia, Bulgaria.

Denmark.

**148. Observation of specific polymer morphologies in a microinjection moulded part**

J. Giboz, P. Mélé, University of Savoie, France,  
A.B. Spoelstra, H. E. H. Meijer, Eindhoven University of  
Technology (TUE), the Netherlands,  
Thierry Copponnex, Cendres & Métaux SA, Switzerland.

Y. Lai, Harbin University of Science & Technology, China.

**183. Assessment of electrode wear measurement in micro EDM milling**

J. Valentinčič, University of Ljubljana, Slovenia.  
G. Bissacco, G. Tristo, University of Padova, Italy.

**180. Comparison of the local mechanical properties of a microinjection moulded part with a classical one through nanoindentation tests**

J. Giboz, P. Mélé, M. Vite, University of Savoie, France,  
Sandrine BEC, Jean-Luc LOUBET, Ecole Centrale de Lyon,  
Ecully, France,  
Thierry Copponnex, Cendres & Métaux SA, Switzerland.

Time 19:00h to 22:30h

**Conference Banquet at Hotel Mercure sponsored by RONDOL**





# DAY 2 – PEP, Oyonnax

## Thursday 18<sup>th</sup> November 2010

**Time 09:00h - 10:15h**

### Invited Talks

**Chair:** Chantal Khan-Malek, FEMTO-ST Institute, CNRS, France.

**"Origination of complex masters for injection molding and hot embossing"**

A. Stuck

**"Potential of Moulded Interconnect Devices for the Packaging of Miniature Multifunctional Systems"**

H. Kück

**Time 10:15h - 10:20h**

**Announcement of dates and venue of 4M2011**

**Time 10:20h – 11:15h**

**Coffee Break and Sponsors Exhibition**

**Time 11:15h - 12:45h**

### Session 5

#### Ceramics Processing in Microtechnology

**Chair:** P. Johander, SWEREA – IVF, Sweden

**128. Development of polymer-high-k-ceramic-functional composites for applications as embedded capacitors**

T. Hanemann, B. Schumacher, Karlsruhe Institute of Technology, Institute for Materials Research III, Germany

**132. Sintered Reaction Bonded Silicon Nitride for Micro Mechanical Components**

J. Roegner, K-H. Lang, V. Schulze, Karlsruhe Institute of Technology, Institute of Materials Science & Engineering I, Germany.

M Mueller, Karlsruhe Institute of Technology, Institute for Materials Research III, Germany.

**143. Application of Design Patterns for the Development of Primary Shaped Microsystems: a Case Study**

A. Albers, P. Boersting, T. Turki, Karlsruhe Institute of Technology, Institute of Product Engineering IPEK, Germany.

**163. Influence of load and surface condition on the tribological performance of zirconia for applications in high-performance microsystems**

J. Schneider, Karlsruhe Institute of Technology, Institute for

### Session 6

#### Process Modelling

**Chair:** U. Engel, University of Erlangen-Nuremberg, Germany

**134. Factors affecting the force variability in micro-end-milling**

M. Annoni, Q. Semeraro, Politecnico di Milano, Italy

**151. A numerical analysis of dimensional tolerance effects on the failure of micro end-mills**

D. Zdebski, D. Allen, D. Stephenson, Cranfield University, UK.

**186. Material Microstructure Effect-Based Experimental Analysis of Tool Wear Development in Micro-endmilling of Multi-phase Material**

A. Elkaseer, K. Popov, S. Dimov, R. Minev, Cardiff University, UK.

**159. FE modelling of size-effect in micro-machining using the strain gradient plasticity theory**

S.Afazov, S. Ratchev, J. Segal, University of Nottingham, UK.

**160. On the interaction of a micro object with the working arm of a gripper immersed in a nonpolar fluid**

D. Dantchev, G. Valchev, K. Kostadinov, Bulgarian

Reliability of Components and Systems, Germany,  
Thomas Polzer, K-H. Zum Gahr, Karlsruhe Institute of  
Technology, Institute Materials Science and Engineering II,  
Germany

**179. Micro-EDM machining behaviour of ZrO<sub>2</sub>-TiN  
ceramic composites**

E. Ferraris, D. Reynaerts, Mechanical Department,  
Katholieke Universiteit Leuven, Belgium

M. Galbiati, Sarix SA, Switzerland

F. Modica, Institute of Industrial Technology and  
Automation, CNR, Italy.

Academy of Sciences.

**Time 12:45h - 14:15h**

**Lunch sponsored by PEP, Oyonnax, and sponsors Exhibition**



**Time 14:15h - 15:30h**

**Project Session**



**EUMINAFab**

**Chair:** S. Anson, Karlsruhe Institute of Technology,  
Germany.

**141. Methodology for Capability Maturity Assessment  
of MNT chains**

R. Minev, E. Brousseau, S. Dimov, Cardiff University, UK  
P. Vella, University of Malta.

**150. Capability Maturity Study of the Horizontal and  
Vertical Integration of Structuring, Patterning and  
Characterization MNTs**

R. Minev, E. Brousseau, S. Dimov, S. Scholz, Cardiff  
University, UK.  
P. Vella, University of Malta.

**154. Utilizing a grid method for accuracy study of  
micro SLA parts**

E. Minev, K. Popov, R. Minev, M. Packianather, Cardiff  
University, UK.  
V. Gagov, Rousse University, Bulgaria.

**182. Repeatability and limitations of water jet based  
micro-tooling process chain**

I. Sabotin, J. Valentinčič, M. Cvjetičanin, M. Junkar,  
University of Ljubljana, Slovenia

**Project Session**



**CoTech**

**Chair:** H. Noll, University of Applied Sciences Wiener  
Neustadt, Austria

**136. Process condition monitoring of micro moulding  
using a two-plunger micro injection moulding  
machine**

G. Tosello, H.N. Hansen, P. Guerrier, Technical University  
of Denmark

**138. Tolerance verification of micro and nano  
structures on polycarbonate substrates**

S. Gasparin, G. Tosello, H.N. Hansen, Technical University  
of Denmark

**164. Cavity Pressure behaviour in micro-injection  
moulding**

C. Griffiths, S. Dimov, S. Scholz, H. Hirshy, E. Williams,  
Cardiff University, UK,  
G. Tosello, H.N. Hansen, Technical University of Denmark

**177. In-mould plating and plasma treatment of  
polymer components**

P. Bolt, H. Winands, M. Theelen, A. Hovestad, TNO Science  
and Industry, The Netherlands.

**158. Optimization of the Rheological Properties of a  
PA66 – LCP Blend for Micro Injection Moulding**

M. Berton, G. Lucchetta, University of Padova, Italy

Time 15:30h - 16:45h

Coffee Break and Sponsors Exhibition

Time 16:45h - 18:00h

Session 7

Novel Processes

Chair: S. Azcarate, TEKNIKER, Spain.

**140. The European Project MultiPlat: "Biomimetic Ultrathin Structures as a Multipurpose Platform for Nanotechnology-Based Products"**

N. Adamovic, J. Matovic, W. Brenner, Institute of Sensor and Actuator Systems (ISAS), T U Wien, Austria.

L. Federzoni, DRT/LITEN, CEA, France

**174. Flexible Compression Injection Moulding Platform for Multi-Scale Surface Structures : the IMPRESS FP7 project**

M. Moguedet *et al*, Pôle Européen de Plasturgie, France

**181. Plasmon-induced enhancement of light absorption in metallic nano-scale surface-modified semiconductor**

W. Jacak, L. Jacak, Wroclaw University of Technology, Poland

J. Krasnyj, International University of Odessa, Ukraine

**185. New Technologies For Nanocomposite Preparation**

G. Camino, Polytechnic of Turin, Italy

D. Tabuani, Proplast, Italy

A. Terenzi, ENCP, Italy

Session 8

Micro & Nano Structuring

Chair: TBA

**147. Fabrication of 3D structures using Atomic Force Microscopy scratching**

E. Brousseau, S. Scholz, A. Rees, Cardiff University, UK.

**167. New Developments in Hot Embossing MID Technology**

H. Richter, S. Lapper, Hahn-Schickard-Institute of Microassembly Technology, Germany

H. Kappl, K. Petrikowski, fem Research Institute for Precious Metals & Metals Chemistry, Germany

T. Booz, Schlenk Metallfolien GmbH Co. KG, Germany.

**131. 2-component-micro injection moulding processes for a diaphragm pump**

W. Michaeli, T. Kamps, IKV Institute of Plastics Processing, RWTH Aachen University, Germany.

**166. Nanostructured electrode materials for hybrid Li battery-capacitor systems**

M. Mladenov, P. Zlatilova, Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, Bulgaria

Time 18:00h - 20.00h

A cocktail reception sponsored by Plastipolis





# DAY 3 – Hotel Mercure

## Friday 19<sup>th</sup> November 2010

**Time 09:00h - 10:15h**

### Invited Talks

Chair: Stefan Dimov, Cardiff University, UK

**"Continuous Polymer Nanolayer Processing by Forced Assembly."**

E. Baer

**"Development of a new micro machining technique and its eco-efficiency evaluation"**

N. Mishima

**10:15h – 10:45h**

**Coffee Break**

**Time 10:45h to 12:00h**

### Session 9

#### Novel Manufacturing Concepts

Chair: TBA

#### 127. A Novel Concept of HDI Microvias

**Manufacturing: for RF microsystems by Laser Precision Technology**

D. Ulieru, E. Ulieru, A. tantau, SITEX45, Bucharest, Romania,

F. Pistritu, IMT Bucharest, Romania.

#### 152. Micro-structure Machining by Ultra-fast Laser on Titanium Thin Film

Yu-Ting Lyu, Chao-Yung Yeh, Fu-Chuan Hsu, Chung-Li Tsai, Antony H. C. Lee, Metal Industries Research & Development Centre (MIRDC), Taiwan.

#### 157. Femtosecond non-diffracting Bessel beams for laser micro- and nanoprocessing

M. Bhuyan, F. Courvoisier, P-A. Lacourt, M. Jacquot, L. Furfaro, FEMTO-ST Department of Optics P.M. Duffieux, Universite de Franche-Comte, France.

#### 175. Micro EDM milling with automated electrochemical fabrication of the cylindrical microtool

Y. Layouni, G. Girardin, A. Benilov, V. Semet, P. Morin, M. Cabrera, Institut des Nanotechnologies de Lyon, France.

#### 173. Abrasive Water Jet Cutting for Micro Manufacturing

T. Åklint, P. Johander, K. Brinkfeldt, SWEREA IVF, Sweden  
C. Öjmertz, T. Ryd, Finecut AB, Sweden

### Session 10

#### Product & Process Integration

Chair: TBA

#### 130. Variothermal injection moulding of superhydrophobic surfaces

W. Michaeli, M. Schoengart, F. Klaiber, IKV Institute of Plastics Processing, RWTH Aachen University, Germany  
S. Beckemper, Fraunhofer Institute for Laser Technology (ILT), Aachen, Germany.

#### 137. Assembly of a microfluidic system by means of ultrasonic welding

W. Michaeli, M. Weber, IKV Institute of Plastics Processing, RWTH Aachen University, Germany

#### 153. Techniques for peripheral connections and assembly on 3D-MID

U. Kessler, P. Buckmueller, W. Eberhardt, H. Richter, H. Kück, Hahn-Schickard-Institute of Microassembly Technology HSG-IMAT, Stuttgart, Germany.

#### 146. Impact Analysis on Auto Focusing Actuator of a Cellular Camera Phone

M. Yeon-wook Sung, Won Gi Lee, Moon G. Lee, Ajou University, South Korea.  
Kyu Sub Park, Jaeyoung Solutec, South Korea.

#### 129. Determination and comparison of process- and quality-characteristics of injection-compression moulded polymer optics

W. Michaeli, S. Hessner, P. Walach, IKV Institute of Plastics Processing, RWTH Aachen University, Germany.

**Time 12:00h - 13:00h**

**Lunch & finish**

