

Dear Reader,

The Network of Excellence (NoE) Patent-DfMM aims to establish a collaborative team to provide European industry with support in the

field of "Design for Micro & Nano Manufacture (DfMM)" to ensure that problems affecting the manufacturing and reliability of products based on micro & nano technologies (MNT) can be addressed before prototyping and production. For more information:

<http://www.patent-dfmm.org/>



Welcome to the new edition of our bi-monthly E-Newsletter, which will keep you updated on project related activities, but also on other DfMM activities that run outside of the project.

We apologise in case you have been added to our database in error: if so, please reply by e-mail with "UNSUBSCRIBE" in the subject field.

We welcome your comments and contributions.

Happy reading!
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In this edition:

[News from the NoE Patent-DfMM](#)

[Support Project to SME Sandvik Osprey in use of Controlled Expansion](#)

[Silicon / Aluminium Alloys for MEMS packaging](#)

[Electrical only testing of MNT based systems](#)

[PATENT-DfMM – AMICOM – ESREF Joint Workshop on MEMS Reliability](#)

[Common RF MEMS Lab THALES/LETI - PATENT-DfMM work transferred to](#)

[CEA-LETI](#)

[Event Announcements](#)

[NIST Metrology Workshop: Metrology Needs for Micro Nano Systems Technologies](#)

[MICRO SYSTEM Technologies, Munich, Germany, 5 - 6 Oct 2005](#)

[Abstract Deadlines for Conferences](#)

[Advanced Microsystems for Automotive Applications \(AMAA\),](#)

[Berlin, Germany, 25 - 27 April 2006](#)

[Workshop on "Wafer Bonding for MEMS Technologies"](#)

[List of Events](#)

Other DfMM-related News

**EFABT Access MEMS Design Competition- 3-D MEMS and microdevices
A thesis "Model Oder Reduction for Electro-Thermal MEMS" has been
released**

**New book "Dimension Reduction of Large-Scale Systems, Lecture Notes
in Computational Science and Engineering"**

News from the NoE Patent-DfMM

Final Results and publications are now being received by the PATENT-DfMM management team on activities funded within the last 18 months. Access to summary reports are now being compiled. Here we feature 2 specific activities– more will be available in upcoming issues of DfMM News.

Andrew Richardson, PATENT-DfMM Coordinator, University of Lancaster

Support Project to SME Sandvik Osprey in use of Controlled Expansion Silicon / Aluminium Alloys for MEMS packaging

This work has been carried out by Lancaster University's Product Development Unit with a specific objective of assisting Sandvik Osprey enter the MEMS packaging market. Computational models capable of predicting the stresses involved in producing multiple layer assemblies from CE (Controlled expansion) Aluminium/Silicon alloys have been realised.

CE alloys are a product of Sandvik Osprey, and are manufactured by rapid solidification spray forming of Aluminium and Silicon. The effort required to produce these materials is considerable, however the properties of light weight, low Coefficient of Thermal Expansion (CTE) and good thermal conductivity are ideal for packaging of a range of high power electronics and MEMS technologies where heat dissipation and low expansion are required to protect components. However the brittleness and low CTE of the CE alloys becomes a problem when it is a requirement that they be joined to other materials. Although at present steps have been taken, and progress has been made the analysis models produce results that conflict with the result of physical prototype manufacture. Before the extent of the disparity can be ascertained it will be necessary to compare the material properties used with a more complete set of values from the manufacturer. All the tools developed to date are equally applicable to the new models that are needed. As a result progress can be made without time being spent reproducing existing work. Further progress will now rely heavily on the ability to characterise the as yet undefined, non linear, material properties such as thermal creep.

Contact: Dr Alan Rennie, University of Lancaster, UK, E-mail: A.Rennie@Lancaster.ac.uk

Electrical only testing of MNT based systems

MNT based systems contain in most cases a transducer that interacts with a non-electrical quantity such as pressure, chemical, temperature, motion and electronics for processing. Testing of these devices hence requires the application of this "physical quantity" that is normally expensive and slow hence not practical for mass produced low cost devices. This project is investigating the potential for testing these devices using electrical only stimuli applied by either superimposing test stimuli onto the bias signal or modulating the biasing of the device. The work is being carried out by Lancaster University, LIRMM, Montpellier and Qinetiq. To date the technique has been applied to an electro-chemical sensor, a silicon accelerometer and a magnetosensor for embedded compass applications.

The initial phase of this work has now been published at European Test Symposium 2005, International Mixed Signal Test Workshop 2005. The next phase of the work will focus on accelerometers in collaboration with ST Microelectronics.

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Dr John Bunyan, QinetiQ Ltd., UK, E-mail: rjtb@qinetiq.com

Call for Participation:

PATENT-DfMM – AMICOM – ESREF Joint Workshop on MEMS Reliability, 10 Oct 2005, Bordeaux, France

The aim of this workshop is to enable the members from two European Network of Excellence, PATENT and AMICOM, and the participants of the ESREF Conference to share experience and work on MEMS Reliability. The workshop studies all aspects of MEMS Reliability - theory, research & development, and applications. Topics include but are not limited to: characterization methods, failure mechanisms, failure analysis, testing techniques and test structures, reliability techniques, and design rules.

Authors will submit electronically a short abstract (1 or 2 pages) in English, including title and authors' affiliation, address and email. The abstract should reflect the significance of the contribution. Authors of accepted abstracts are willing to attend the workshop and perform a 15 minute oral presentation, no final paper will be requested.

Please submit before 15th September to:

Claude Pellet (pellet@ixl.fr) or Ingrid de Wolf (dewolfi@imec.be)

Common RF MEMS Lab THALES/LETI - PATENT-DfMM work transferred to CEA-LETI

THALES and the French Atomic Energy Commission (CEA) have created last year a common research laboratory in the field of RF-MEMS. The objective of this co-operation is to achieve more critical mass through the merging of so far parallel efforts on this particular subject. Another objective is to optimise the use of expensive clean-room facilities required for this application field. CEA LETI presents an excellent partnership opportunity for THALES, in particular through the MINATEC technology platform in Grenoble which gathers more than 3000 people in the fields of micro-electronics, microsystems and nanotechnologies. The MINATEC program includes facilitating technology transfers to industry through various channels such as joint laboratories. The Common Lab research staff is now entirely located at the CEA-Grenoble. For this reason, the Thales participation to the PATENT-DfMM project has been transferred to CEA-LETI. The main contact person for PATENT is now Didier Bloch, head of the MEMS Reliability Laboratory within LETI. Jean-Philippe Polizzi, previous representative for THALES and now personal of the common lab in Grenoble will remain active in the project.

The 9-member team of the Reliability Lab assist the specialists in design, process development, and packaging in order to develop reliable components. Electrical, Magnetic, and Surface Analysis specific test benches are designed and developed. Tests are performed by the experts of the lab, which allow determining the origin of the failure mechanisms in Microsystems (RF switches, FBARs, memories, magnetic MEMS...); and propose reliability models.

The complete press release is available at www.leti.cea.fr.

Contact: Didier Bloch, CEA-Leti, France, E-mail: BLOCHD@chartreuse.cea.fr

Event Announcements

NIST Metrology Workshop: Metrology Needs for Micro Nano Systems Technologies, 22 Sep 05, Pittsburgh, PA, USA

Developers of Micro Nano Technologies (MNT) still struggle in fabricating highly accurate and reliable products because of a lack of adequate metrology. Some of these issues include the need for improvements in static and dynamic performance testing, and the development of reliability and compatibility test methods for the thin-film materials. Definition of US Measurement System needs will start with drawing on results of previous workshops followed by networking with partners in industry, industry groups, universities, and other government labs to develop a draft report.

More information and registration:

http://www.memsiindustrygroup.org/METRIC2005/NIST_Metrology.asp

Contact: *Monica Takacs, MEMS Industry Group, USA, E-mail:*
mtakacs@memsiindustrygroup.org

MICRO SYSTEM Technologies, Munich, Germany, 5 - 6 Oct 2005

The Conference MICRO SYSTEM Technologies offers more than 70 oral and 20 poster presentations held by international speakers:

<http://www.mesago.de/00145/media/download/mstkp05.pdf>

Science and industries present their results on development, realization and application of microsystem technologies, MEMS, MOEMS, Micro/Nano-Integration, Nano-Interconnects and Microfluidics during the event. Each time the event is held, a special focus is selected to satisfy the information needs of companies and institutes worldwide. This year's focus is "microsystem packaging and fabrication".

Organised by Mesago Messe Frankfurt GmbH and Fraunhofer Institut für Zuverlässigkeit und Mikrointegration

For further information and registration see: <http://www.mesago.de/mst>

Abstract deadlines for conferences

Advanced Microsystems for Automotive Applications (AMAA), Berlin, Germany, 25 - 27 April 2006 Call for Papers, Deadline: 15 Oct 2005

AMAA is an international platform for representatives of car manufacturers and suppliers of electronics and MST/MEMS components. Suggested topics of AMAA 2006 are:

- Safety; All aspects of preventive and protective safety (e.g. accident avoidance, pre- and after-crash actions)
- Powertrain; Online measurement and control of engine and transmission subsystems (e.g. motor management, fuel economy, traction control)
- Comfort and HMI; Systems to enhance the comfort of passengers and human machine interface issues (e.g. seat, climate control, driver assistance, new forms of communicating to the driver)
- Networked Vehicle; All aspects of intra-car systems and ambient communication (e.g. internal networks, system architecture, spontaneous networks)

If you are interested in presenting a paper, please send a one-page-abstract in English by October 15, 2005 to the AMAA conference office.

Contact: Dr. J. Valldorf, VDI/VDE Innovation + Technik GmbH, Germany, E-mail: valldorf@amaa.de, <http://www.amaa.de>

Workshop on "Wafer Bonding for MEMS Technologies", Call for Papers, Deadline: 6 January 2006

The 2nd International workshop on »Wafer Bonding for MEMS Technologies« will be held on April 9-11, 2006 in Halle, Germany. More information and the abstract template can be found at www.microtesting.de .

Contact: Joerg Bagdahn, Fraunhofer IMM, Germany, E-mail: wbw@iwmh.fraunhofer.de

PATENT- AMICON – ESREF WORKSHOP "MEMS reliability"

10 October 2006

Bordeaux, France

Abstract Deadline: **15 September 2005**

Micro and Nanotechnology 2005 (MNT 2005)

12 - 14 December 2005

London, UK

Abstract Deadline: **15 September 2005**

<http://www.iom3.org/events/mnt2005.htm>

Photonics Europe 2006

3 - 7 April 2006

Strasbourg, France

Abstract Deadline: **19 September 2005**

<http://spie.org/conferences/calls/06/epe/>

EuroSimE 2006

23 - 26 April 2006

Milano, Italy

Abstract Deadline: **15 October 2006**

www.eurosime.org

AMAA 2006 - Advanced Microsystems for Automotive Applications

25 - 27 April 2006

Berlin, Germany

Abstract Deadline: **15 October 2006**

www.amaa.de

List of Events

11 - 14 September 2005

EUROSENSORS XIX (Euroensors Conference)

Hotel Alimara, Barcelona, Spain

www.euroensorsxix.com

11 - 14 September 2005

IMAPS Nordic Annual Conference

Quality Hotel, Tonsberg, Norway
www.imapsnordic.org

12 - 16 September 2005
ESSDERC-ESSCIRC 2005
Alpexpo, Grenoble, France
www.essderc2005.com

12 - 16 September 2005
Optical System Design 2005
University Jena, Germany
www.spie.org/conferences/calls/05/eod/

13 - 15 September 2005
Nanofair 2005
St.Gallen, Switzerland
www.nanofair.ch

21- 22 September 2005
METRIC 2005
Pittsburgh, PA, USA
www.memsindustrygroup.org/METRIC2005

21- 22 September 2005
NIST Metrology Workshop 2005
Pittsburgh, PA, USA
www.memsindustrygroup.org

23 - 24 September 2005
4M Workshop
Piran, Slovenia
www.4m-net.org

28 September - 1 October 2005
AMICOM Summer School
Sinaia, Romania
www.4m-net.org

30 September 2005
4M Workshop MNT and Multifunctional Materials for Life Quality and Industry
Sinaia, Romania
www.4m-net.org

3 - 5 October 2005
CAS 2005, International Semiconductor Conference
Sinaia, Romania
www.imt.ro/cas/

3 - 5 October 2005
ESA Round Table on Micro/Nano Technologies for Space
Noordwijk, The Netherlands
<http://www.congrex.nl/05c12/>

3 - 7 October 2005
European Microwave Week 2005
Paris, France
www.eumw2005.com

5 - 6 October 2005

MICRO SYSTEM Technologies 2005

Munich, Germany

www.mesago.de/mst

10 - 14 October 2005

ESREF 2005, European Symposium on Reliability of Electron Devices

Bordeaux, France

<http://www.ixl.fr/esref/welcome/index2.html>

Other DfMM-related News

EFABT Access MEMS Design Competition - 3-D MEMS and microdevices

This new MEMS design competition follows up on a MEMS Design Challenge held back in 2003. Details:

- The EFABT Access MEMS Design Competition is carried out by Microfabrica and MOSIS and is open to everyone
- Entries must be submitted to the escrow agent by November 11, 2005
- There is no limit to the number of entries per person or organization
- The top three designs will be awarded prototypes of their MEMS designs built through EFABT Access, a low-cost prototyping service developed jointly with MOSIS.
- The top three designs will also be awarded these MEMS-related items:
 - 1st prize - SegwayT i180
 - 2nd prize - SegwayT p133
 - 3rd prize - Toshiba TDP-T90U DPL Projector
- Top designs will be announced January 2006

Submissions will be judged by a panel comprised of independent industry experts. For more details and to get started visit: www.efabaccessdc.com, <<http://www.efabaccessdc.com>>.

Contact: Dan Feinberg, Microfabrica Inc., USA, E-Mail: DFeinberg@Microfabrica.com

A thesis "Model Oder Reduction for Electro-Thermal MEMS" has been released

The thesis is a good introduction to the background of mor4ansys which has been developed at IMTEK Freiburg, Germany. You can obtain a pdf by writing an E-mail to Tamara Bechtold, E-mail: bechtold@imtek.uni-freiburg.de

New book "Dimension Reduction of Large-Scale Systems, Lecture Notes in Computational Science and Engineering"

The contains an overview of modern model reduction as well as several model reduction benchmarks made with mor4ansys. The benchmarks by themselves are available from <http://www.imtek.uni-freiburg.de/simulation/benchmark/>
The book has been published by the Springer-Verlag, Berlin/Heidelberg, Germany, v. 45, 2005, please visit <http://www.springeronline.com/sgw/cda/frontpage/0,11855,1-40356-72-48577088-0,00.html> for more details.

Next issue: **3 November 2005** (deadline for contributions: **01 November 2005**)

Please feel free to send us any DfMM-related news that might be of interest for our readership.

This e-mail newsletter contains public information, only. Please feel free to distribute it to anyone who might be interested in the topics.

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