

## 4th International Symposium on Tin Whiskers

June 23-24, 2010  
University of Maryland  
College Park, MD, USA

### List of Presentations

***Dynamic Recrystallization (DRX) as the Mechanism for Sn Whisker Development: Model and Experiments***

P.T. Vianco and J.A. Rejent, Sandia National Laboratories

***Interface Flow Mechanism to Explain Tin Whisker Growth Using FIB Technology***

Jing Cheng and James Li, University of Rochester  
P.T. Vianco, Sandia National Laboratories

***Real-time Studies of Whisker Growth : Trying to Understand the Stress, IMC and Whisker Connection***

Prof. Eric Chason, Nitin Jadhav, Eric Buchovecky, Allan Bower and Sharvan Kumar  
Brown University

***Stress and IMC growth in annealed and reflowed Sn-Cu bilayers and their relation to whisker kinetics***

Nitin Jadhav and Eric Chason - Brown University  
Gordon Barr-EMC Corporation

***A Synchrotron Micro-Diffraction Investigation of Crystallographic Texture of pure Sn, Sn-Cu, and Sn-Cu-Pb Films and its Effects on Whisker Growth***

Pylin Sarobol, Aaron Pedigo, John Blendell, Carol Handwerker-Purdue University; Peng Su -Cisco

***Indentation induced whisker formation***

Michael Osterman, Danny Birndt, Alex Heronime, Sungwon Han and Lyudmyla Panashchenko  
University of Maryland

***Status whisker research efforts with JEITA***

Prof. Katsuaki Sukanuma  
Osaka University

***Tin Whisker Growth and the Structure Zone Model for Electroplated Tin***

Aaron Pedigo, Pylin Sarobol, John Blendell, and Carol Handwerker - Purdue University

***SEM Observation and EBSD Analysis of Straight and Kinked Sn Whiskers***

Donald Susan, Joe Michael, Edward Webb III, Dick Grant, Bonnie McKenzie and Graham Yelton  
Sandia National Laboratories

***Effect of Soldering Method, Temperature, and Humidity on Whisker Growth on Lead-free Solders in the Presence of Flux Residue***

Keith Sweatman, K. Howell, J. Masuda, T. Nozu, M. Koshi and T. Nishimura -Nihon Superior

***Effects of Reflow Atmosphere and Flux on Sn Whisker Growth of Sn-Ag-Cu solder***

Minoru UESHIMA -Senju Metal Industry Co.,Ltd.  
Alongheng Baated, Keun-Soo Kim, and Katsuaki Sukanuma, Institute of Scientific and Industrial Research,  
Osaka University  
Sharon Huang, Benjamin Jurcik, and Shigeyoshi Nozawa  
Air Liquide Laboratoires

***Minimization of Tin Whisker Growth for Ultra-Low Tin Whisker Applications***

Bill Sepp and Rob Schetty - Technic Inc

## 4th International Symposium on Tin Whiskers

June 23-24, 2010  
University of Maryland  
College Park, MD, USA

### List of Presentations

***Tin Reflow for Tin Whisker Mitigation***

George J.S. Chou\* and Robert D. Hilty  
Tyco Electronics Corporation

***Tin Whisker Test Results for PCB Test Coupons with Immersion Tin Surface Finish***

Dr. Martin Huehne , Natcharee Nitisantawakool and Pakamas Ngamson - Celestica (Thailand) Limited

***Application-Specific Tin Whisker Risk Assessment Algorithm- Update 2010***

David Pinsky - Raytheon

***A Case Study of Bismuth Whiskers in a Crystal Oscillator***

Dr. Debasis Basak, L. H. Ponce and D.El. Boyarsky - Orbital Sciences Corporation

***Tin Whiskers: A Test Method at the Electronic Board Level***

JP. Michelet, Jannick Guinet and Carlos Perez - Schneider Electric

***Whisker Bridging Risk Spacing Analysis of the back side of Quad Flat Packs***

Dr. Stephan Meschter -BAE Systems

***Risk of Whisker Induced Metal Vapor Arcs***

Dr. Henning Liedecker - NASA

***Effectiveness of Conformal Coating in Mitigating Tin Whisker Induced Failures***

Sungwon Han and Michael Osterman  
University of Maryland

***Measuring the mitigation capability of Conformal Coatings: Part 2***

Dr. Chris Hunt and Martin Wickham - NPL

***Tin Whisker Mitigated by Photonic Sintering for Sn-based Surface Finishes***

Dr. Jamie Novak, Mohshi Yang, David Jiang-Applied Nanotech  
Ahmed Amin and Michael Osterman – University of Maryland

***Results of Mitigation Effectiveness Survey and Plans for GEIA-STD-0005-2 Revision***

Dr. Anduin Touw - Boeing

***Lead-Free Manhattan Project- Tin Whiskers Gap Analysis and Research Roadmap***

David Pinsky - Raytheon

## 4th International Symposium on Tin Whiskers

June 23-24, 2010  
University of Maryland  
College Park, MD, USA

### Scope

The Center of Advanced Life Cycle Engineering at the University of Maryland in collaboration with The Institute of Scientific and Industrial Research (ISIR) at Osaka University is pleased to announce the call for participation for the Fourth International Symposium on Tin Whiskers. Tin whiskers present a unique challenge to the electronics industry. There have been numbers of electronics failures in the market caused by tin whiskers since 1940s. After 2000, as a result of the global transition to lead-free electronics, the majority of the electronic component manufacturers are now using pure tin or tin-rich alloys for terminal and lead finishes. The increased used of tin based lead-free finishes and materials, focused concern and research on tin whiskers particular for long life and mission critical applications, such as space, aviation, and implantable medical devices.

A tin whisker is a conductive tin crystal, which can spontaneously grow from tin based lead-free finished surfaces even at room temperature, often in a needle-like form. Oxidation in humid atmosphere, corrosion, intermetallic formation, stress under thermal cycling, external pressure in fine pitch connectors and electromigration have been shown to promote whisker formation. However, acceleration models for whisker growth are very limited or not existent.

Listing of proceeding of prior International Symposia on Tin Whiskers can be found at

<http://www.calce.umd.edu/tin-whiskers/symposia.htm>

This symposium presentation can cover case histories, theories of tin whisker growth experiments and results, risk evaluation methods and risk mitigation strategies. Participants are provided free admission to the symposium. Important dates:

Registration opens April 5th  
Symposium is June 23<sup>rd</sup> and June 24<sup>th</sup>

An extra day may be added depending on number of submitted abstracts  
*Registration will open April 5<sup>th</sup>, Cost will be \$500 for the two day event.*

### Organized by

Center for Advanced Life Cycle Engineering (CALCE)  
The Institute of Scientific and Industrial Research (ISIR), Osaka University

### Contact

Dr. Michael Osterman, CALCE, University of Maryland, [osterman@calce.umd.edu](mailto:osterman@calce.umd.edu)  
Prof. Michael Pecht, CALCE, University of Maryland, [pecht@calce.umd.edu](mailto:pecht@calce.umd.edu)  
Dr. Katsuaki Suganuma, ISIR Osaka University, Japan, [suganuma@sanken.osaka-u.ac.jp](mailto:suganuma@sanken.osaka-u.ac.jp)