

Sessions at a Glance: Monday, September 23rd
**Designates Distinguished Speaker*

7:00 AM			
Registration Opens			
Harsh Environments Symposium	Inspection Technologies	Women's Leadership Program	Microvia Reliability
Session HE1 - Understanding PCBA Ionic Contamination and Corrosive Mitigation Practices for Increased Survivability in Corrosive Environments Chair: *Sa'd Hamasha, Ph.D., Auburn University Co-Chair: *Dwight Howard, APTIV	Session INS1 - New Inspection Technologies Towards Industry 4.0 Chair: *Bill Cardoso, Ph.D., Creative Electron, Inc. Co-Chair: *Debbie Carboni, KYZEN Corporation		
8:30 AM PCBA Cleanliness as a Means to Improve Humidity Robustness of Electronics *Rajan Ambat, Ph.D., Kamila Piotrowska, Ph.D., Technical University of Denmark	How X-Ray Technology is Improving the Electronics Assembly Process Carlos Valenzuela, Creative Electron, Inc.		
9:00 AM Origin of Ionic Contamination in Automotive Electronics Case Study *Maurice Dore, Valeo	The Impact of Smart Factory Solutions on PCB Manufacturing Nicholas Fieldhouse, Omron		
9:30 AM Elimination of "Nickel Corrosion" in ENIG and ENEPIG by using "Reduction Assisted Immersion Gold" in place of "Standard Immersion Gold" *George Milad, Jon Bengston and Albin Gruenwald, Uyemura International Corporation	Smart Inspection Methods in the Electronics Industry *Ragnar Vaga, YXLON International GmbH		
10:00 AM Ultrathin and High Temperature Conformal Coatings for Corrosive Resistance of Electronics *Rakesh Kumar, Ph.D., Specialty Coating Systems, Inc.	A Test Methodology & Metrics for Force Sensing Resistors Edward Collins, Jabil (MT&I) Manufacturing Technology & Innovation Group		
10:30 AM Refreshment Break			
Session HE2 - Reliability Concerns for Automotive Applications Chair: *Babak Arfaei, Ph.D., Ford Motor Company Co-Chair: *Keith Sweatman, P.E., Nihon Superior Company, Ltd.	Session INS2 - Inspection for Manufacturing Performance Improvement Chair: *Rob Boguski, Datest Corporation Co-Chair: *Glen Thomas, Ph.D., Creative Electron, Inc.		Microvia Reliability Learning Lab Chair: Marc Carter, Aeromarc, LLC
11:00 AM Solder-joint Reliability of a 0.65mm Pitch Molded Array Package for Automotive Applications *Burton Carpenter, Mollie Benson, A. R. Nazmus Sakib, *Andrew Mawer, Paul Galles, Abdullah Fahim, NXP Semiconductors	Micro-Computed Tomography Analysis for Failure Analysis in Electronics Claire Brennan, Ph.D., Collins Aerospace		OEM/User Updates Lockheed Martin (Baccam) Motorola (Magera)
11:30 AM Challenges of Automotive Electronics Miniaturization *Maurice Dore, Valeo	Improve AOI Performance Through Smart Visual Insight Solutions Collaboration Wayne Zhang, Ph.D., Ziv Zhao, Ben Wu, Peng Tang, Yan Wang, Marie Cole, Li Qin Shen, Andrew Vogel, IBM China Procurement Company		Supplier Updates Atotech (Johal) Uyemura (Gudeczeskas/Valentine) RBP (Carano)
12:00 PM Automotive Harsh Environments and Implications for ADAS and AD Sensors *Dwight Howard, APTIV	An Interesting Approach to Yield Improvement *Keith Bryant, Keith Bryant Consultancy		Consortia Test Programs IMEC/European Space Agency (Martin Cauwe) SAIC/DoD "DOTC" Study (Carter)
12:30 PM Lunch Break			
Session HE3 - Improving the Reliability of Lead-free Solder Joints Chair: *Robert Kinyanjui, Ph.D., John Deere Electronic Solutions, Inc. Co-Chair: *André Delhaise, Ph.D., Celestica, Inc.	Session INS3 - New Techniques to Combat Counterfeit Electronics Chair: *Terry Kocour, BAE Systems, Electronic Systems Co-Chair: Marc Carter, Aeromarc, LLC	Women's Leadership Program Chair: *Priyanka Dobriyal Ph.D., Intel Corporation Co-Chair: *Jason Keeping, P. Eng., Celestica, Inc.	
1:30 PM Analysis of the Root Cause for Solder Joint Cracking Chaohui Hu, Weiming Li, P.E., Jianghua Shen, P.E., China CEPREI Laboratory	Can AI Help Us in the Fight Against Counterfeit Components? *Glen Thomas, Ph.D., Creative Electron, Inc.	Exciting Times in Packaging Simanti Lahiri, Intel Corporation	
2:00 PM Qualification of High Density Connector Solutions for Military and Avionic Environments Kimera Cho, Tim Pearson, David Hillman, Ross Wilcoxon, Collins Aerospace	Using Standards to Increase Productivity While Fighting Counterfeits *Cameron Shearon, Raytheon Company	Planning for the Future *Brian Toleno, Ph.D., Microsoft Corporation	
2:30 PM Effect of Creep and Fatigue on Individual SAC305 Solder Joint Reliability in Iso-thermal Cycling Mohammed Abueed, Ph.D., Raed Alathamneh, Sa'd Hamasha, Ph.D., Jeff Suhling, Ph.D., Pradeep Lall, Ph.D., Auburn University	Challenges in Detection of Assembly Level Counterfeits *Diganta Das, Ph.D., CALCE/University of Maryland	Women Enabling Technologies Jennifer Bly, Intel Corporation	
3:00 PM Refreshment Break			
Session HE4 - Progress in Lead-free Solders for Harsh Environment Applications Chair: *Babak Arfaei, Ph.D., Ford Motor Company Co-Chair: *Burton Carpenter, Ph.D., NXP Semiconductors	Session INS4 - Inspection Methods for Long Term Assembly Reliability Chair: *Keith Bryant, Keith Bryant Consultancy Co-Chair: *Diganta Das, Ph.D., CALCE/University of Maryland	Women's Leadership Program - Speed Mentoring Chair: *Marie Cole, IBM Corporation Co-Chair: Michelle Ogihara, Seika Machinery, Inc.	
3:30 PM Thermal Cycling Reliability of Newly Developed Lead-Free Solders for Harsh Environments *Sa'd Hamasha, Ph.D., Francy John Akkara, Cong Zhao, Sudan Ahmed, Mohammed Abueed, Sinan Su, Jeffrey Suhling, *Pradeep Lall, Ph.D., Auburn University	Corrosion Induced Failure Mechanism of Hearing Aids Electronic Circuitry and Battery Contacts Abhijeet, Yadav, Ph.D., Widex, A/S; Rajan Ambat, Ph.D., Technical University of Denmark	Seeking University Graduate Talent and Collaborators for Industrial Research Hosted by: *Martin Anselm, Ph.D., Rochester Institute of Technology (RIT)	
4:00 PM Evaluation of Tin Whisker Formation on SOT and Discrete Components Assembled with Bismuth-Containing Lead-Free Solder Alloys after High Temperature, High Humidity Storage *André Delhaise, Ph.D., Celestica, Inc.	Impact of 10-year Room Temperature Aging on SAC105 Deng Yun Chen, Subramani Manoharan, Patrick McClusky, Michael Osterman, CALCE/University of Maryland	Introverts vs Extroverts Hosted by: Jennifer Bly, Intel Corporation	
4:30 PM Influence of a New Abnormal (CuNi)6Sn5 / (NiCu)3Sn4 Layer Growth at Temperatures Above 175°C in Tin Silver Based Lead-Free Solder Joints Timo Herberholz, Robert Bosch GmbH; Andrey Prihodovsky, Ph.D., Deggendorf Institute of Technology; *Mathias Nowotnick, Ph.D., University of Rostock	Mechanical Properties of SAC-BI Solder Alloys With Aging *Sa'd Hamasha, Ph.D., Mohamed El Amine Belhadi, Raed Al Athamneh, Auburn University; Luke Wentlent, Ph.D., Universal Instruments Corporation	Technical vs Management Path Hosted by: *Srinivas Chada, Ph.D., Stryker	
		Work Life Balance in a "Just in Time World" Hosted by: *Debbie Carboni, KYZEN Corporation	
		How Do You Inspire New Comers to the Industry, Their Retention and Their Strive to Achieve Higher Success Hosted by: Simanti Lahiri, Intel Corporation	
		Accelerating Your Career Path Hosted by: *Chrys Shea, Shea Engineering Services	
		Planning for the Future, People and Technology Hosted by: *Brian Toleno, Ph.D., Microsoft Corporation	
5:00 PM Development of Low Temperature Sn-Bi Based Pb-Free Solder Alloys *Mehran Maalekian, Ph.D., Arnav Das, Ludo Krassenburg, Co van Veen, Ph.D., Alexander Kodentsov, Ph.D., Mo Biglari, Ph.D., Mat-Tech	Women's Leadership Program Connection Reception (5:00 PM - 6:00 PM) Hosted By: Michelle Ogihara, Seika Machinery, Inc. & Sherry Stepp, KYZEN Corporation		
5:30 PM Day One Concludes			

Sessions at a Glance: Tuesday, September 24th
**Designates Distinguished Speaker*

7:00 AM

Registration Opens

8:00 AM

SMTA Annual Meeting (8:00 AM) & Keynote Presentation (9:00 AM)
The Right Kind of Crazy: A True Story of Teamwork, Leadership and High Stakes Innovation

Adam Steltzner, Team Leader & Chief Engineer EDL, NASA Mars Rover Curiosity & Author

10:00 AM

Refreshment Break

Advanced Packaging Technology Track
Manufacturing Excellence Track
Substrates/PCB Technology Track
Flux, Solder, Adhesives Track

Session APT1 - Advanced Packaging

 Chair: Tim Jensen, Indium Corporation
 Co-Chair: Ashok Pachamuthu, Maxim

Session MFX1 - Cleaning Technologies

 Chair: *David Raby, STI Electronics, Inc.
 Co-Chair: *Tom Borkes, Jefferson Project

Session SUB1 - Surface Finishes

 Chair: Mark Fulcher, Continental Automotive
 Co-Chair: Mei-Ming Khaw, Keysight Technologies

Session FSA1 - Low Melting Alloys Mixing with SAC Alloys

 Chair: Kunal Desai, Kester
 Co-Chair: Olivia Chen, Qualcomm Technologies Inc.

11:00 AM

High Performance RF Diplexer Module Using a Glass Interposer

*Charles Woychik, Ph.D., John Lauffer, Michael Gaige, William Wilson, James Carey and Matthew Neely, i3 Microsystems, Inc.; Scott Pollard, Corning Research & Development Corporation; Raj Parmar, Corning Precision Glass Solutions

pH Neutral Cleaning Agents: Technology and Performance

Terry Price, Ph.D., ZESTRON Americas; Axel Vargas, Lockheed Martin

IMC Study of Mid-Phosphorous and High-Phosphorous ENIG Finishes

Sandra Nelle, Thiago Pugliesi-Garcia, Britta Schafstetter, Gustavo Ramos, Atotech Deutschland GmbH

Properties of Mixing SAC Solder Alloys with Bismuth-Containing Solder Alloys for a Low Reflow Temperature Process

Tayler Swanson, Rochester Institute of Technology

11:30 AM

Packaging Technologies for Advanced Automotive Applications

*Andrew Mawer, *Burton Carpenter, Ph.D., Mollie Benson, NXP Semiconductors

Electrochemical Corrosion Measurements on Metal Alloys Exposed to EAC Cleaning Agents

David Lober, *Mike Bixenman, MBA, DBA, KYZEN Corporation

Wire Bonding Reliability of Electroless Ni/Pd/Au Plating Influence of Electroless Pd Deposition Reaction

*Yoshinori Ejiri, Ph.D., Takehisa Sakurai, Yoshinori Arayama, Yoshiaki Tsubomatsu, Kiyoshi Hasegawa, Hitachi Chemical Co., Ltd.

Evaluations on the Mixing of the Tin-Bismuth Paste with SnAgCu BGA Components in Terms of Peak Temperature, Time Over Melting and Paste Volume

*Jasbir Bath, *Shantanu Joshi, Roberto Segura, Koki Solder America

12:00 PM

High Frequency Characteristics of Glass Interposer

Satoru Kuramochi, P.E., Masaya Tanaka, Miyuki Akazawa, Syohei Yamada, Dai Nippon Printing Co., Ltd.

IPC's New Cleanliness Testing Standard is Now Active. What's New? What Stays the Same?

*Mike Konrad, Aqueous Technologies

Reliable Novel Nickel-Free Surface Finish Solution for High-Frequency PCB Applications

Kunal Shah, Ph.D., Ariel McFalls, Sam Rhodes, LiloTree

Root Cause and Solution to Mitigate the Hot Tear Defect Mode in Hybrid SAC-Low Temp Solder Joints

Todd Harris, Kevin Byrd, Niles Badwe, Intel Corporation

12:30 PM

Lunch Break

Session APT2 - Package Warpage Implications during Board Assembly

 Chair: *Raiyo Aspandiar, Ph.D., Intel Corporation
 Co-Chair: Jagadeesh Radhakrishnan, Intel Corporation

Session MFX2 - Reflow Challenges

Chair:

Co-Chair: *Chrys Shea, Shea Engineering Services

Session SUB2 - Surface Finish Effects

 Chair: *Lars Böttcher, Fraunhofer IZM Berlin
 Co-Chair: *Mathias Nowotnick, Ph.D., University of Rostock

Session FSA2 - Low Melting Alloy and Reliability

 Chair: Mike Buetow, Circuits Assembly
 Co-Chair: Niles Badwe, Ph.D., Intel Corporation

2:00 PM

Evaluation of Warpage Behavior of SMD-Packages and Printed Circuit Boards During Soldering

Karsten Meier, Ph.D., Heinz Wohlrahe, Oliver Albrecht, Technische Universität Dresden; *Jörg Trodler, Dipl.-Ing., Heraeus Electronics

Vacuum Reflow Processing of Ball Grid Array Packages for Reduced Solder Joint Voiding and Improved Attachment Reliability

*Richard Coyle, Ph.D., Charmaine Johnson, Richard Popowich, Nokia Bell Labs; Tim Pearson, Dave Hillman, Collins Aerospace; Michael Meilunas, Universal Instruments; Fred Dimock, Bob Bouchard, BTU International; Richard Parker, iNEMI; Keith Howell, Nihon Superior Co., Ltd.; *Jörg Trodler, Dipl.-Ing., Heraeus Electronics; Arvind Karthikeyan, Auburn University; Elizabeth Barr, Iowa State University

The Effects of Surface Finish on Solder Paste Performance - the Sequel

*Tony Lentz, FCT Assembly, Inc.

Optimizing Solder Alloy Composition for Low Temperature Assembly

*Keith Sweatman, P.E., Tetsuro Nishimura, Tetsuya Akaiwa, Pavithiran Narayanan, Nihon Superior Company, Ltd.

2:30 PM

Reliability of Electrical Devices Due to Warpage Behavior of SMD-Packages and Boards During Soldering

*Jörg Trodler, Dipl.-Ing., Heraeus Electronics; Karsten Meier, Ph.D., Heinz Wohlrahe, Oliver Albrecht, Technische Universität Dresden

Effect of Vacuum Reflow on Solder Joint Voiding in Bumped Components

Arvind Srinivasan Karthikeyan, *Sa'd Hamasha, Ph.D., Auburn University; Michael Meilunas, Universal Instruments Corporation; Fred Dimock, BTU International, Inc.

Component and Printed Wiring Board Finish Effects on QFN Solder Joint Formation

*Jeff Jennings, Ph.D., Carlyn Smith, Joe Kreuzpaintner, L3Harris Technologies, Inc.

Gold (Au) Embrittlement of Plastic Quad Flat(pack) No-Lead (PQFN) Solder Joints and Mitigation Strategies

*Paul Vianco, Ph.D., T. Garcia, C.E. Jaramillo, B.M. McKenzie, and J. Reese, Sandia National Laboratories

3:00 PM

High Temperature Component Warpage as a Function of Moisture Sensitivity (MSL) Rating

*Neil Hubble, Akrometrix LLC

Advanced PCB Lamination Material Development for High-Speed Networking Application

James Kenny, Panasonic Corporation

New High Reliability Lead Free Solder Alloy for Electronic Application in Extreme Environment

Shawn Xiang, Md Hasnine, Ph.D., Xiang Wei, Ph.D., Kester Inc, An ITW Company

3:30 PM

Visit the Expo in Hall F!

Sessions at a Glance: Wednesday, September 25th

**Designates Distinguished Speaker*

	Advanced Packaging Technology Track	Manufacturing Excellence Track	Substrates/PCB Technology Track	Flux, Solder, Adhesives Track
	Session APT3 - Solder Joint Voiding Chair: Andy Behr, Panasonic Co-Chair: Fred Dimock, BTU	Session MFX3 - Stencils & Printing Chair: *Bill Capen, Honeywell FM&T Co-Chair: Adam Murling, Indium Corporation	Session SUB3 - Reliability Chair: *Lars Böttcher, Fraunhofer IZM Berlin Co-Chair: *Jörg Trodler, Dipl. -Ing., Heraeus Electronics	Session FSA3 - Flux Performances Chair: *Jeff Jennings, Ph.D., L3 HARRIS Co-Chair:
8:00 AM	X-ray Micro-Computed Tomography Based FE Models to Capture Realistic Manufacturing Variability in Cu-Al Wirebonds and Solder-Joints in QFNs *Pradeep Lall, Ph.D., Madhu Kasturi, Nakul Kothari, Auburn University; David Locker, US Army CCDC Aviation & Missile Center	Comparison of Aperture Designs, Solder Pastes, Nanocoatings and Print/Inspection Systems *Chrys Shea, Jennifer Fijalkowski, Shea Engineering Services; Raymond Whittier, BAE Systems; Michael Butler, Edward Nauss, ITWEAE/MPM; Dean Fiato, StenTech	Transient Solder Separation of BGA Solder Joint During Second Reflow Cycle Phase III – The Impact of Back Drill Steven Perng, Ph.D., Weidong Xie, Cisco Systems, Inc.	Fluxes Design for Suppressing Non-Wet-Open at BGA Assembly *Ning-Cheng Lee, Ph.D., Fengying Zhou, Fen Chen, Indium Corporation
8:30 AM	Real Time X-Ray Analysis of Void Formation and Dynamics in QFN Devices During Reflow Evstatin Krastev, Sandeep Kullar, Christopher Rand, Nordson Dage	Root Cause Stencil Design for SMT Component Thermal Lands *Greg Smith, BlueRing Stencils; *Tony Lentz, FCT Assembly	Impact of Thermal Aging on Thermomechanical Properties of Oil-Immersed Printed Circuit Boards Shrinath Ramdas, A S M Raufur R Chowdhury, Akshay Lakshminarayana, Rabin Bhandari, Tushar Chauhan, Abel Misrak, Dereje Agonafer, Ph.D., The University of Texas at Arlington	Effect of No Clean Residue on Signal Integrity at High Frequency Jennifer Nguyen, David Geiger, Dongkai Shangguan, Ph.D. Flextronics
9:00 AM	Identifying Voids on BTC Assemblies with X-Ray Analysis *Bill Cardoso, Ph.D., Creative Electron, Inc.	Robustness of High Tension, Standard Tension and Mesh Mount Solder Paste Stencils Prithvi Kotian, Plexus Corp.; Jeff Schake, ASM SMT Solutions; *Martin Anselm, Ph.D., Rochester Institute of Technology	Improved Printed Circuit Board Reliability Through Quantitative Control of Cleaning Processes Elizabeth Kidd, Brooke Campbell, R. Giles Dillingham, Ph.D., BTG Labs	Fluxes with Decreased Viscosity After Reflow for Flip Chip and SIP Assembly *Ning-Cheng Lee, Ph.D., Runsheng Mao, Fen Chen, Indium Corporation
9:30 AM	New X-Ray Technologies for Enhanced Void Investigation *Ragnar Vaga, YXLON International GmbH	Stencil Printing 008004/0201 Aperture Components Edward Nauss, Michael Butler, ITW EAE		
10:00 AM	Keynote Presentation & Refreshment Break To the Moon! Orion's Next Giant Leap into Deep Space W. Michael Hawes, DSc, Vice President Human Space Exploration & Orion Program Manager, Lockheed Martin Space			
	Session APT4 - Wafer Level Packaging Chair: *Charles Woychik, Ph.D., i3 Microsystems, Inc. Co-Chair: *Jim Wilcox, Universal Instruments Corporation	Session MFX4 - MFX Assembly Challenges Chair: *Chrys Shea, Shea Engineering Services Co-Chair: *Ray Whittier, BAE Sytems	Session SUB4 - Metallization Chair: *Julie Silk, Keysight Technologies Co-Chair: *Jasbir Bath, Bath Consultancy LLC	Session FSA4 - Reliability Enhancement Through Bonding Chair: Chad Showalter, Humiseal Co-Chair: *Dock Brown, ANSYS
11:00 AM	Solder Joint Reliability of BGA Packages on High Frequency Laminate PCBs Under Power Cycling Akshay Lakshminarayana, Mahesh Pallapothu, Mugdha Chaudhari, Unique Rahangdale, Abel Misrak, Dereje Agonafer, Ph.D., University of Texas Arlington	Low Temperature Solder Paste Transfer Efficiency Characterization and Area Ratio Limits Nilesh Badwe, Ph.D., Abhishek Prasad, Ph.D., Xiying Chen, and Kevin J Byrd, Intel Corporation	Periodic Pulse Plating of Mid-Aspect Ratio Printed Circuit Boards for Enhanced Productivity Carmichael Gugliotti, Rich Bellemare, Andy Oh, Ron Blake, MacDermid Alpha Electronics Solution	Study of Epoxy Flux to Improve Reliability of IC Packages for Automotive Applications Shigeru Yamatsu, Atsushi Yamaguchi, Andy Behr, Koso Matsuno, Yasuhiro Suzuki, Panasonic Corporation
11:30 AM	High Density RDL Technologies for Panel Level Packaging of Embedded Dies *Lars Böttcher, S. Kosmider R. Kahle and A. Ostmann Fraunhofer IZM Berlin; F. Schein, Technical University of Berlin	An Investigation Into the Development of Effective Printing Process for Package on Package (POP) Warpage and Head in Pillow Defect Reduction Narayanan Manickam, MS, SMT Corporation	New Developed Copper Electroplating Process for BMV Filling with the Special Feature of a Very Bright Cu Deposition on Flex and Flex-Rigid PCB Applications John Foley, Mustafa Özkök, Dipl. -Ing., Peter Haack, Ph.D., Vera Peldinski, Dipl. -Ing., Thomas Huelmann Dipl.-Ing., Ph.D., Grigory Vazhenin, Ph.D., Henning Hübner, Dipl.-Ing., Atotech Deutschland GmbH	Novel Application Methods of Solder Joint Encapsulant Materials for SnAgCu FCBGA Solder Joints Alex Huettis, Barath Palanisamy, and Raiyo Aspiandir, Intel Corporation
12:00 PM	Multi-Axis Loading Effect on Edgebond and Edgefilled WLCSP Thermal Cycling Performance *Tae-Kyu Lee, Ph.D., Andy Hsiao, Portland State University; Edward Ibe, Karl Loh, Zymet	Selective Solder Fine Pitch Components on High Thermal Mass Assembly *Gerjan Diepstraten, Ing., Vitronics Soltec BV	Evaluation of Direct Metallization Technology Plating Properties with Excellent Material Selectivity Takuya Komeda, P.E., Tetsuji Ishida, Hisamitsu Yamamoto, C. Uyemura & Co., Ltd.	Synthesis and Properties of Several Functional Dimeric Epoxy Resins Containing Naphthalene Units Mark Edwards, Kunihiro Morinaga, Koji Hayashi, Yoshiyuki Takahashi, Sun Chemical
12:30 PM	Lunch Break			
	Session APT5 - Reliability I Chair: *Roy Starks, Libra Industries Co-Chair: *Reza Ghaffarian, Ph.D., NASA JPL	Session MFX5 - New and Unique Material Deposition Chair: *Martin Anselm, Ph.D., Rochester Institute of Technology (RIT) Co-Chair: *Srinivas Chada, Ph.D., Stryker	Session SUB5 - How It is Made Chair: *Lenora Clark, MacDermid Alpha Electronics Solutions Co-Chair: Carmichael Gugliotti, MacDermid Alpha Electronics Solutions	
1:30 PM	Effect of Cure Conditions on the Interface Properties and Reliability of Potted Electronics in 25,000g Mechanical Shock *Pradeep Lall, Ph.D., Kalyan Dornala, Auburn University; Ryan Lowe, ARA Associates; John Deep, Air Force Research Laboratories	High Density Micro-Dispensing Solder and Adhesives onto FHE and 3D Substrate Assemblies Sam LeBlanc, nScript, Inc.	PCB Miniaturization: Lessons Learned and Best Practices *Todd MacFadden, BOSE Corporation	
2:00 PM	Solder Joint Integrity Evaluation of Bottom Terminated Component (BTC) Subjected to Thermal Cycling Tim Pearson, Collins Aerospace	Ultra-Fine Solder Paste Dispensing for Heterogeneous Integration Kenneth Thum, P.E., Sze Pei Lim, Indium Corporation; KC Tai, NSW Automation Sdn Bhd	For Optimal Performance of 77 GHz Radars, Material Properties and Fabrication Processing Needs to be Considered *John Coonrod, Rogers Corporation	
2:30 PM	An Investigation on the Influence of Copper and Nickel Solderable Surfaces on Solder Joint Degradation due to Gold Embrittlement Daphne Gates, Collins Aerospace	Aerosol Jet Direct Writing Polymer-Thick-Film Resistors for Printed Electronics James Feng, Ph.D., Anthony Loveland, Michael J. Renn, Optomec	How Advanced Safety Systems Change Automotive PCB Design and Build *Lenora Clark, MacDermid Alpha Electronics Solutions	
3:00 PM	Appreciation Reception on the Expo Floor - Hall F (3:00PM - 4:00PM)			
3:00 PM	Day 3 Concludes			

Sessions at a Glance: Thursday, September 26th
**Designates Distinguished Speaker*

7:00 AM Registration Opens				
	Advanced Packaging Technology Track	Manufacturing Excellence Track	Technical Innovations Symposium	Lead-Free Symposium
	Session APT6 - Thermal Chair: *Pradeep Lall, Ph.D., Auburn University Co-Chair: *Marc Benowitz, iNEMI	Session MFX6 - Conformal Coating Chair: *Rakesh Kumar, Ph.D., Specialty Coating Systems, Inc. Co-Chair: *David Reitz, Inventec Performance Chemicals	Session TI1 - Smart Factory Chair: Trevor Galbraith, Global SMT & Packaging Co-Chair: *Matt Kelly, P.Eng, MBA, IBM Corporation	Session LF1 - Lead-Free Reliability I Chair: *Andre Delhaise, Ph.D., Celestica Co-Chair: *Lars Bruno M.Sc., Ericsson AB
8:00 AM	High-Reliability Lead-Free Solder for Low-Cost Die Attach Applications *Ranjit Pandher, Ph.D., Niveditha Nagarajan, Sathish Kumar, Gyan Dutt, Carl Bilgrien, MacDermid Alpha Electronics Solution	Process Development Challenges and Design of Experiments for Conformal Coating Printed Circuit Board Assemblies Roshan Muralidharan, WISE Binghamton University; Rajat Dhiman, SMART Modular Technologies	Human Automation: Hands-Free Industry 4.0 *Michael Ford, Aegis Industrial Software	Thermal Cycling Reliability and Failure Mode of Two Ball Grid Array Packages with High Reliability Pb-Free Solder Alloys *Richard Coyle, Ph.D., Nokia Bell Labs; et al.
8:30 AM	Impact of Thermal Aging and Cycling on Reliability of Thermal Interface Materials Tushar Chauhan, ASM Raufur Chowdhury, Abel Misrak, Rabin Bhandari, Pavan Rajmane, Krishna Bhavana Sivaraju, Milad Abdulhasansari, Dereje Agonafer, The University of Texas at Arlington	LED Curable Conformal Coatings with High Protective Properties Qualities Chris Brightwell, Danielle Bradley, Humiseal Europe	Designing a Robust Industrial Augmented Reality Solution *Jay Gorajia, Nir Sagi, Eran Nadel, Siemens PLM; Shai Newman, Compedia	Attachment Quality and Thermal Fatigue Reliability of a Surface Mount Chip Resistor Assembled with a Low Temperature Solder Charmaine Johnson, *Richard Coyle, Ph.D., Richard Popowich, Chen Xu, Nokia Bell Labs; *Martin Anselm, Ph.D., Ajitesh Singh Parihar, Tayler Swanson, Rochester Institute of Technology; *Lenora Clark, *Jason Fullerton, MacDermid Alpha Electronic Solutions;
9:00 AM	Modification and Application of Organic Phase Change Materials for Thermal Peak Management *Mathias Nowotnick, Ph.D., Jacob Maxa, Andrej Novikov, University of Rostock	Optimizing Conformal Coating Coverage For Improved Environmental Corrosion Protection *Chen Xu, Ph.D., Nokia Bell Labs	Automating Detection of Pick & Place Nozzle Anomalies *Greg Vance, Rockwell Automation	Bottom Terminated Component (BTC) Void Concerns: Real and Imagined *David Hillman, Ross Wilcoxon, Tim Pearson, Kim Cho, Collins Aerospace
9:30 AM		Atmospheric Plasma Treatment Prior to Selective Conformal Coating Brian Stumm, Anda Technologies USA Inc.	A Defect Prediction Case Study for Printed Circuit Board Assemblies Containing Ball Grid Array Package Types Phillip M. LaCasse, LTC, Ph.D., Air Force Institute of Technology; Wilkistar Otieno, Ph.D., University of Wisconsin - Milwaukee; *Greg Vance, Francisco P. Maturana, Ph.D., Mikica Cvjetinovic, Rockwell Automation	Status of Pb-free Risk Mitigation for Aerospace and Defense – “An Attitude Adjustment” Perspective *Anthony Rafanelli, Ph.D., P.E., Raytheon Company
10:00 AM Refreshment Break				
	Session APT7 - Reliability II Chair: *Brian Roggeman, Qualcomm Technologies Inc. Co-Chair: Arvind Srinivasan Karthikeyan, Auburn University	Session MFX7 - Cleaning Challenges Chair: *Jason Keeping, P. Eng., Celestica, Inc. Co-Chair: *Sal Sparacino, ZESTRON USA	Session TI2 - Digital Strategy for Electronics Manufacturing Chair: *Marie Cole, IBM Corporation Co-Chair: *Greg Vance, Rockwell Automation	Session LF2 - Microstructure, Structure, Properties Chair: *Keith Sweatman, P.E., Nihon Superior Company, Ltd. Co-Chair: Tim Pearson, Collins Aerospace
10:30 AM	Printed Circuit Board Design Can Impact Electrochemical Reliability *Mark McMeen, *Mike Bixenman, MBA, DBA, Magnalytix, LLC	Characterize and Understand Functional Performance of Cleaning QFN Packages on PCB Assemblies – iNEMI Cleanliness Research Study *Mike Bixenman, MBA, DBA, KYZEN Corporation; et al.	Electronics Production Planning - What You Need to do to Remain Competitive *Jay Gorajia, Siemens PLM	Precipitation of Bi and SbSn Phases in Next-Generation Pb-Free Solders Chris Gourlay, Ph.D., S.A. Belyakov, Imperial College London; K. Sweatman, T. Akaiwa, T. Nishimura, Nihon Superior Co., Ltd
11:00 AM	Reliability Assessment of BGA Solder Joints - Megtron 6 VS FR4 Printed Circuit Boards ASM Raufur Chowdhury, The University of Texas at Arlington	Handling Technical Cleanliness in Electronic Production Michael Kövi, *Helmut Schweigart, Ph.D., ZESTRON Corporation	The Secure Supply-Chain: 2019 Update *Michael Ford, Aegis Industrial Software	Phase Formation and Solid Solubility in High Reliability Pb-Free Solders Containing Bi, Sb or In Chris Gourlay, Ph.D., S.A. Belyakov, Imperial College London; B. Arfaei, Ford Motor Company; C. Johnson, R. Coyle, Nokia Bell Labs; K. Howell, Nihon Superior Co., Ltd
11:30 AM	Solder-joint Reliability of BGA Packages In Automotive Applications *Burton Carpenter, *Andrew Mawer, Mollie Benson, John Arthur, Betty Yeung, NXP Semiconductors	Risk Management of Class 3 Electronics as a Function of Cleanliness *William Capen, Jason Edgar, Honeywell FM&T; *Mark McMeen, *Mike Bixenman, MBA, DBA, Magnalytix LLC	Real Stories of Applied Advanced Analytics in the Electronics Manufacturing Smart Factory Jack France, Keysight Technologies Ltd.	Gold Embrittlement Effects on Bulk Mechanical Properties of SAC396 Rebecca Wheeling, Ph.D., Sandia National Laboratories
12:00 PM Lunch Break				
			Session TI3 - Additive Manufacturing in Electronics Panel Chair: *Gary Tanel, Libra Industries Co-Chair: *Jason Fullerton, MacDermid Alpha Assembly Solutions	Session LF3 - Low Temperature Solder Chair: *Srinivas Chada, Ph.D., Stryker Co-Chair: *Julie Silk, Keysight Technologies
1:00 PM				Tin-Bismuth Low Temperature Homogeneous Second Level Interconnect Solder Joint Microstructure, Reliability, and Failure Mechanism Nilesh Badwe, Ph.D., Kevin Byrd, Ou Jin, Pubudu Goonetilleke, Intel Corporation
1:30 PM			Moderator: *Trevor Galbraith, Global SMT & Packaging Panelists: Nano-Di MarkForged Daniel Braga, Accucode 3-D The 3D Printing Store *Pradeep Lall, Ph.D., Auburn University	Inemi Project on Process Development of BiSn-based Low Temperature Solder Pastes - Part VI: Mechanical Shock Results on Resin Reinforced Mixed SnAgCu-biSn Solder Joints of Fcbga Components Jagadeesh Radhakrishnan, Intel Corporation; et al.
2:00 PM				High Reliability Low Temperature Solder Alloys *Anna Lifton, Pritha Choudhury, Ph.D., *Morgana Ribas, Ph.D., Raghu Raj Rangaraju, Siuli Sarkar, Ph.D., MacDermid Alpha Electronics Solutions
2:30 PM Refreshment Break				
				Session LF4 - Lead-Free Reliability II Chair: Rebecca Wheeling, Ph.D., Sandia National Laboratories Co-Chair: Charmaine Johnson, Nokia Bell Labs
2:45 PM				Assessment of the Behavior of High Reliability Solder Alloys in Accelerated Thermal Testing *Jim Wilcox, Universal Instruments.
3:15 PM				Study Electromigration in SnBiAg / SAC(305) Mixed Solder Alloy Faramarz Hadian, Mohammed Genanu, Eric Cotts, Binghamton University
3:45 PM				Reliability of the Solder Joints: Is a Shear Force a Good Indicator *Anna Lifton, Westin Bent, Irina Lazovskaya, Paul Salerno, Frank Andres, MacDermid Alpha Electronics Solutions
4:15 PM	Conference Concludes			