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SMTA International 2019

TYPE - CONFERENCE SESSION, APT TRACK • SEPTEMBER 24 • TUESDAY

C Conference Session

SEPTEMBER 24 • TUESDAY

11:00am – 12:30pm C **APT1: Advanced Packaging** Room 48

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

>>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

>>Packaging Technologies for Advanced Automotive Applications
*Andrew Mawer, *Burton Carpenter, Ph.D., Mollie Benson, NXP Semiconductors

>>High Frequency Characteristics of Glass Interposer
Satoru Kuramochi, P.E., Masaya Tanaka, Miyuki Akazawa, Syohei Yamada, Dai Nippon Printing Co., Ltd.

2:00pm – 3:30pm C **APT2: Package Warpage Implications during Board Assembly** Room 48

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

>>Evaluation of Warpage Behavior of SMD-Packages and Boards During Soldering
Karsten Meier, Ph.D., Heinz Wohlrabe, Oliver Albrecht, Technische Universität Dresden; *Jörg Trodler, Dipl. -Ing,. Heraeus Electronics

>>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 Wohlrabe, Oliver Albrecht, Technische Universität Dresden

>>High Temperature Component Warpage as a Function of Moisture Sensitivity (MSL) Rating
*Neil Hubble, Akrometrix LLC

SEPTEMBER 25 • WEDNESDAY

8:00am – 10:00am C **APT3: Solder Joint Voiding** Room 48

Chair: Andy Behr, Panasonic
Co-Chair: Michael Jansen, Raytheon Company

>>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

>>Real Time X-Ray Analysis of Void Formation and Dynamics in QFN Devices During Reflow
Evstatin Krastev, Sandeep Kullar, Christopher Rand, Nordson Dage

>>Identifying Voids on BTC Assemblies with X-ray Analysis
*Bill Cardoso, Ph.D., Creative Electron, Inc.

>>New X-Ray Technologies for Enhanced Void Investigation
*Ragnar Vaga, YXLON International GmbH

11:00am – 12:30pm C **APT4: Wafer Level Packaging** Room 48

Chair: *Charles Woychik, Ph.D., i3 Microsystems, Inc.
Co-Chair: *Jim Wilcox, Universal Instrument

>>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

>>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

>>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

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1:30pm – 3:00pm C **APT5: Reliability I** Room 48

Chair: *Roy Starks, Libra Industries
Co-Chair: *Reza Ghaffarian, Ph.D., NASA JPL

>>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

>>Solder Joint Integrity Evaluation of Bottom Terminated Component (BTC) Subjected to Thermal Cycling
Tim Pearson, Collins Aerospace

>>An Investigation on the Influence of Copper and Nickel Solderable Surfaces on Solder Joint Degradation due to Gold Embrittlement
Daphne Gates, Collins Aerospace

SEPTEMBER 26 • THURSDAY

8:00am – 10:00am C **APT6:Thermal** Room 48

Chair: *Pradeep Lall, Ph.D., Auburn University
Co-Chair: *Marc Benowitz, iNEMI

>>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

>>Mechanical Failure of Thermal Interface Materials Due to Thermal Aging and Impact on Performance of Electronic Package
Tushar Chauhan, ASM Raufur Chowdhury, Abel Misrak, Rabin Bhandari, Pavan Rajmane, Krishna Bhavana Sivaraju, Milad Abdulhasansari, Dereje Agonafer, The University of Texas at Arlington

>>Modification and Application of Organic Phase Change Materials for Thermal Peak Management
*Mathias Nowottnick, Ph.D., Jacob Maxa, Andrej Novikov, University of Rostock

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10:30am – 12:00pm C **APT7: Reliablity II** Room 48

Chair: *Brian Roggeman, Qualcomm Technologies Inc.
Co-Chair: Arvind Srinivasan Karthikeyan, Auburn University

>>Investigating BTC Design Parameters for Robust Electrochemical Reliability on a Printed Circuit Board
*Mark McMeen, *Mike Bixenman, MBA, DBA, Magnalytix, LLC

>>Reliability Assessment of BGA Solder Joints - Megtron 6 VS FR4 Printed Circuit Boards
ASM Raufur Chowdhury, The University of Texas at Arlington

>>Automotive Pb-Free BGA Packages Solder-Joint Reliability
*Burton Carpenter, *Andrew Mawer, Mollie Benson, John Arthur, Betty Yeung, NXP Semiconductors

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SMTA International 2019

TYPE - CONFERENCE SESSION, FSA TACK • SEPTEMBER 24 • TUESDAY

C Conference Session

SEPTEMBER 24 • TUESDAY

11:00am – 12:30pm C **FSA1: Low Melting Alloys Mixing with SAC Alloys** Room 49

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

>>Properties of Mixing SAC Solder Alloys with Bismuth-Containing Solder Alloys for a Low Reflow Temperature Process
Tayler Swanson, Rochester Institute of Technology

>>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

>>Root Cause and Solution to Mitigate the Hot Tear Defect Mode in Hybrid SAC-Low Temp Solder Joints
Todd Harris, Kevin Byrd, Nilesh Badwe, Intel Corporation

2:00pm – 3:30pm C **FSA2: Low Melting Alloy and Reliability** Room 49

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

>>Optimising Solder Alloy Composition for Low Temperature Assembly
*Keith Sweatman, P.E., Tetsuro Nishimura, Tetsuya Akaiwa, Pavithiran Naraynanan, Nihon Superior Company, Ltd.

>>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

>>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

SEPTEMBER 25 • WEDNESDAY

8:00am – 10:00am C **FSA3: Flux Performances** Room 49

Chair: *Jeff Jennings, Ph.D., Harris Corporation
Co-Chair: Fred Dimock, BTU

>>Fluxes Designed for Suppressing Non-Wet-Open at BGA Assembly
*Ning-Cheng Lee, Ph.D., Fengying Zhou, Fen Chen, Indium Corporation

>>Effect of No Clean Residue on Signal Integrity at High Frequency
Jennifer Nguyen, Flextronics

>>Novel Fluxes with Decreased Viscosity After Reflow for Flip Chip and SIP Assembly
*Ning-Cheng Lee, Ph.D., Runsheng Mao, Fen Chen, Indium Corporation

11:00am – 12:30pm C **FSA4: Reliability Enhancement Through Bonding** Room 49

Chair: Chad Showalter, Humiseal
Co-Chair:*Dock Brown, ANSYS

>>NImproved IC Package Reliability via Epoxy Flux Reinforcement
Shigeru Yamatsu, Atsushi Yamaguchi, Andy Behr, Koso Matsuno, Yasuhiro Suzuki, Panasonic Corporation

>>Novel Application Methods of Solder Joint Encapsulant Materials for SnAgCu FCBGA Solder Joints
Alex Huettis, Barath Palanisamy, and Raiyo Aspandiar, Ph.D., Intel Corporation

>>Synthesis and Properties of Several Functional Dimeric Epoxy Resins Containing Naphthalene Units
Mark Edwards, Kunihiro Morinaga, Koji Hayashi, Yoshiyuki Takahashi, Sun Chemical

TYPE - CONFERENCE SESSION, HE TRACK • SEPTEMBER 23 • MONDAY

C Conference Session

SEPTEMBER 23 • MONDAY

8:30am – 10:30am C **HE1: Understanding PCBA Ionic Contamination and Corrosive Mitigation Practices for Increased Survivability in Corrosive Environments** Room 47/49

Chair: *Sa'd Hamasha, Ph.D., Auburn University
Co-Chair: *Dwight Howard, APTIV

>>PCBA Cleanliness as a Means to Improve Humidity Robustness of Electronics
*Rajan Ambat, Ph.D., Kamila Piotrowska, Ph.D.,Technical University of Denmark

>>Origin of Ionic Contamination in Automotive Electronics Case Study
*Maurice Dore, Valeo

>>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

>>Ultrathin and High Temperature Conformal Coatings for Corrosive Resistance of Electronics
*Rakesh Kumar, Ph.D., Specialty Coating Systems, Inc

11:00am – 12:30pm C **HE2: Reliability Concerns for Automotive Applications** Room 47/49

Chair: *Babak Arfaei, Ph.D., Ford Motor Company
Co-Chair: *Keith Sweatman, Nihon Superior Company, Ltd.

>>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

>>Challenges of Automotive Electronics Miniaturization
*Maurice Dore, Valeo

>> Automotive Harsh Environments and Implications for ADAS and AD Sensors
*Dwight Howard, APTIV

1:30pm – 3:00pm C **HE3: Improving the Reliability of Lead-free Solder Joints** Room 47/49

Chair: *Robert Kinyanjui, Ph.D., John Deere Electronic Solutions, Inc.
Co-Chair: *André Delhaise, Ph.D., Celestica, Inc.

>>Analysis of the Root Cause for Solder Joint Cracking
Chaohui Hu, Weiming Li, P.E., Jianghua Shen, P.E., China CEPREI Laboratory

>>Qualification of High Density Connector Solutions for Military and Avionic Environments
Kimera Cho, Tim Pearson, David Hillman, Ross Wilcoxon, Collins Aerospace

>> 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

3:30pm – 5:30pm C **HE4: Progress in Lead-free Solders for Harsh Environment Applications** Room 47/49

Chair: *Babak Arfaei, Ph.D., Ford Motor Company
Co-Chair: *Burton Carpenter, Ph.D., NXP Semiconductors

>>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

>>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.

>>Influence of a New Abnormal $(CuNi)_6Sn_5$ / $(NiCu)_3Sn_4$ 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 Nowottnick, Ph.D., University of Rostock

>>Development of Low Temperature Sn-Bi Based Pb-Free Solder Alloys
*Mehran Maalekian, Ph.D., Aranav Das, Ludo Krassenburg, Co van Veen, Ph.D., Alexander Kodentsov, Ph.D., Mo Biglari, Ph.D., Mat- Tech

TYPE - CONFERENCE SESSION, INS TRACK • SEPTEMBER 23 • MONDAY

C Conference Session

SEPTEMBER 23 • MONDAY

8:30am – 9:30am C **INS1:New Inspection Technologies Towards Industry 4.0** Room 48

Chair: *Bill Cardoso, Ph.D., Creative Electron
Co-Chair: *Debbie Carboni, KYZEN Corporation

>>How X-Ray Technology is Improving the Electronics Assembly Process
Carlos Valenzuela, Creative Electron, Inc.

>>The Impact of Smart Factory Solutions on PCB Manufacturing
Nicholas Fieldhouse, Omron

>>Smart Inspection Methods in the Electronics Industry
*Ragnar Vaga, YXLON International GmbH

>>Test Methodology for Printed FSR's
Edward Collins, Jabil (MT&I) Manufacturing Technology & Innovation Group

10:30am – 12:00pm C **INS2: Inspection for Manufacturing Performance Improvement** Room 48

Chair: *Rob Bougski, Datest Corporation
Co-Chair: *Glen Thomas, Ph.D., Creative Electron, Inc.

>>Micro-Computed Tomography Analysis for Failure Analysis in Electronics
Claire Brennan, Ph.D., Collins Aerospace

>>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

>>An Interesting Approach to Yield Improvement
*Keith Bryant, Keith Bryant Consultancy

1:30pm – 3:00pm C **INS3: New Techniques to Combat Counterfeit Electronics** Room 48

Chair: *Terry Kocour,
Co-Chair: Marc Carter

>>Can AI Help Us in the Fight Against Counterfeit Components?
*Glen Thomas, Ph.D., Creative Electron, Inc.

>>Using Standards to Increase Productivity While Fighting Counterfeits
*Cameron Shearon, Raytheon Company

>>Challenges in Detection of Assembly Level Counterfeits
*Diganta Das, Ph.D., CALCE/University of Maryland

3:30pm – 5:00pm C **INS4: Inspection Methods for Long Term Assembly Reliability** Room 48

Chair: *Keith Bryant, Keith Bryant Consultancy
Co-Chair: *Diganta Das, Ph.D., CALCE/University of Maryland

>>Impact of 10-year Room Temperature Aging on the Temperature Cycle Reliability of SAC105
Deng Yun Chen, Subramani Manoharan, Patrick McClusky, Michael Osterman, CALCE/University of Maryland

>>Microstructure and 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

TYPE - LEAD-FREE, LF TRACK • SEPTEMBER 26 • THURSDAY

SEPTEMBER 26 • THURSDAY

8:00am – 9:00am L **LF1: Lead-Free Reliability I** Room 49

Chair: *Andre Delhaise, Celestica
Co-Chair: *Lars Bruno M.Sc., Ericsson AB

>>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

>>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

>>Bottom Terminated Component (BTC) Void Concerns: Real and Imagine
*David Hillman, Ross Wilcoxon, Tim Pearson, Kim Cho, Collins Aerospace

>>Status of Pb-free Risk Mitigation for Aerospace and Defense – “An Attitude Adjustment” Perspective
*Anthony Rafanelli, Ph.D., P.E., Raytheon Company

10:30am – 12:00pm L **LF2: Microstructure, Structure, Properties** Room 49

Chair: *Keith Sweatman, P.E., Nihon Superior Company, Ltd.
Co-Chair: Tim Pearson, Collins Aerospace

>>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

>>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

>>Gold Embrittlement Effects on Bulk Mechanical Properties of SAC396
Rebecca Wheeling, Sandia National Laboratories

1:00pm – 2:30pm L **LF3:Low Temperature Solder** Room 49

Chair: *Srinivas Chada, Ph.D., Stryker
Co-Chair: *Julie Silk, Keysight Technologies

>>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

>>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.

>>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

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2:45pm – 3:00pm L **LF4: Lead-Free Reliability II** Room 49

Chair: Rebecca Wheeling, Ph.D., Sandia National Laboratories
Co-Chair: Charmaine Johnson, Nokia Bell Labs

>>Assessment of the Behavior of High Reliability Solder Alloys in Accelerated Thermal Testing
*Jim Wilcox, Universal Instruments

>>Study Electromigration in SnBiAg / SAC(305) Mixed Solder Alloy
Faramarz Hadian, Binghamton University

>>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

TYPE - CONFERENCE SESSION, MFX TRACK • SEPTEMBER 24 • TUESDAY

C Conference Session

SEPTEMBER 24 • TUESDAY

11:00am – 12:30pm C **MFX1: Cleaning Technologies** Room 44

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

>>pH Neutral Cleaning Agents: Technology and Performance
Terry Price, Ph.D., ZESTRON Americas; Axel Vargas, Lockheed Martin

>>Electrochemical Corrosion Measurements on Metal Alloys Exposed to EAC Cleaning Agents
David Lober, *Mike Bixenman, MBA, DBA, KYZEN Corporation

>>IPC's New Cleanliness Testing Standard is Now Active. What's New? What Stays the Same?
*Mike Konrad, Aqueous Technologies

2:00pm – 3:30pm C **MFX2: Reflow Challenges** Room 44

Chair:
Co-Chair:*Chrys Shea, Shea Engineering Services

>>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

>>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.

SEPTEMBER 25 • WEDNESDAY

8:00am – 10:00am C **MFX3: Stencils & Printing** Room 44

Chair: *Bill Capen, Honeywell
Co-Chair: Adam Murling, Indium Corporation

>>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

>>Root Cause Stencil Design for SMT Component Thermal Lands
*Greg Smith, BlueRing Stencils; *Tony Lentz, FCT Assembly

>>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

>>Stencil Printing 008004/0201 Aperture Components
Edward Nauss, Michael Butler, ITW EAE

11:00am – 12:30pm C **MFX4: MFX Assembly Challenges** Room 44

Chair: *Chrys Shea, Shea Engineering Services
Co-Chair:*Ray Whittier, BAE Systems

>>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

>>An Investigation Into the Development of Effective Printing Process for Package on Package (POP) Warpage and Head in Pillow Defect Reduction
Narayanan Manickam, MS, SMTC Corporation

>>Selective Solder Fine Pitch Components on High Thermal Mass Assembly
*Gerjan Diepstraten, Ing., Vitronics Soltec BV

1:30pm – 3:00pm C **MFX5: New and Unique Material Deposition** Room 44

Chair: *Martin Anselm, Ph.D., Rochester Institute of Technology (RIT)
Co-Chair:*Srinivas Chada, Ph.D., Stryker

>>High Density Micro-Dispensing Solder and Adhesives onto FHE and 3D Substrate Assemblies
Sam LeBlanc, nScrypt, Inc.

>>Ultra-Fine Solder Paste Dispensing for Heterogeneous Integration
Kenneth Thum, P.E., Sze Pei Lim, Indium Corporation; KC Tai, NSW Automation Sdn Bhd

>>Aerosol Jet Direct Writing Polymer-Thick-Film Resistors for Printed Electronics
James Feng, Ph.D., Anthony Loveland, Michael J. Renn, Optomec

SEPTEMBER 26 • THURSDAY

8:00am – 10:00am C **MFX6: Conformal Coating** TBA

Chair: *Rakesh Kumar, Specialty Coating Systems, Inc.
Co-Chair: *David Reitz, Inventec Performance Chemicals

>>Process Development Challenges and Design of Experiments for Conformal Coating Printed Circuit Board Assemblies
Roshan Muralidharan, WISE Binghamton University; Rajat Dhiman, SMART Modular Technologies

>>LED Curable Conformal Coatings with High Proptective Properties
Chris Brightwell, Danielle Bradley, Humiseal Europe

>>Optimizing Conformal Coating Coverage For Improved Environmental Corrosion Protection
*Chen Xu, Ph.D., Nokia Bell Labs

>>Atmospheric Plasma Treatment Prior to Selective Conformal Coating
Brian Stumm, Anda Technologies USA Inc.

10:30am – 12:00pm C **MFX7: Cleaning Challenges** Room 44

Chair: *Jason Keeping, P. Eng., Celestica, Inc.
Co-Chair: *Sal Sparacino, ZESTRON USA

>>Characterize and Understand Functional Performance of Cleaning QFN Packages on PCB Assemblies – iNEMI Cleanliness Research Study
*Mike Bixenman, MBA, DBA, KYZEN Corporation

>>Handling Technical Cleanliness in electronic Production
Michael Kövi, *Helmut Schweigart, Ph.D., ZESTRON Corporation

>>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

SMTA International 2019

TYPE - CONFERENCE SESSION, SUB TRACK • SEPTEMBER 24 • TUESDAY

C Conference Session

SEPTEMBER 24 • TUESDAY

11:00am – 12:30pm C **SUB1: Surface Finishes** Room 45

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

>>IMC Study of Mid-Phosphorous and High-Phosphorous ENIG Finishes
Sandra Nelle, Thiago Pugliesi-Garcia, Britta Schafsteller, Gustavo Ramos, Atotech Deutschland GmbH

>>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.

>>Reliable Novel Nickel-Free Surface Finish Solution for High-Frequency PCB Applications
Kunal Shah, Ph.D., Ariel McFalls, Sam Rhodes, LiloTree

2:00pm – 3:30pm C **SUB2: Surface Finish Effects** Room 45

Chair: *Lars Böttcher, Fraunhofer IZM Berlin
Co-Chair: *Mathias Nowottnick, University of Rostock

>>The Effects of Surface Finish on Solder Paste Performance - the Sequel
*Tony Lentz, Ph.D., FCT Assembly, Inc.

>>Component and Printed Wiring Board Finish Effects on QFN Solder Joint Formation
*Jeff Jennings, Ph.D., Harris Corporation

>>Advanced PCB Lamination Material Development for High-Speed Networking Application
James Kenny, Panasonic Corporation

SEPTEMBER 25 • WEDNESDAY

8:00am – 10:00am C **SUB3: Reliability** Room 45

Chair: *Lars Böttcher, Fraunhofer IZM Berlin
Co-Chair: *Jörg Trodler, Dipl. -Ing,. Heraeus Electronics

>>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.

>>Impact of Oil Immersion on Thermo-mechanical Properties of PCB’s, its layers and Reliability of BGA Packages
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

>>Improved Printed Circuit Board Reliability Through Quantitative Control of Cleaning Processes
Elizabeth Kidd, Brooke Campbell, R. Giles Dillingham, Ph.D., BTG Labs

11:00am – 12:30pm C **SUB4: Metallization** Room 45

Chair: *Julie Silk, Keysight Technologies
Co-Chair: *Jasbir Bath, Koki Solder America

>>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

>>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, Mustaf Özkök, Dipl. -Ing., Peter Haack, Ph.D., Vera Peldinski, Dipl.-Ing., Thomas Huelsmann Dipl-Ing., Ph.D., Grigory Vazhenin, Ph.D., Henning Hübner, Dipl.-Ing., Atotech Deutschland GmbH

>>Evaluation of Direct Metallization Technology Plating Properties with Excellent Material Selectivity
Takuya Komeda, P.E., Tetsuji Ishida, Hisamitsu Yamamoto, C. Uyemura & Co., Ltd.

1:30pm – 3:00pm C **SUB5: How It is Made** Room 45

Chair: *Lenora Clark, MacDermid Alpha Electronics Solutions
Co-Chair: Carmichael Guggliotti, MacDermid Alpha Electronics Solutions

>>PCB Miniaturization: Lessons Learned and Best Practices
*Todd MacFadden, BOSE Corporation

>>For Optimal Performance of 77 GHz Radars, Material Properties and Fabrication Processing Needs to be Considered
*John Coonrod, Rogers Corporation

>>How Advanced Safety Systems Change Automotive PCB Design and Build
*Lenora Clark, MacDermid Alpha Electronics Solutions

SMTA International 2019

TYPE - TECHNICAL INNOVATIONS SYMPOSIUM, TI TRACK • SEPTEMBER 26 • THURSDAY

T Technical Innovations Symposium

SEPTEMBER 26 • THURSDAY

8:00am – 9:00am T **TI1: Smart Factory** Room 45

Chair: Trevor Galbraith, Global SMT & Packaging
Co-Chair: *Matt Kelly, P.Eng, MBA, IBM Corporation

>>Human Automation: Hands-Free Industry 4.0
*Michael Ford, Aegis Industrial Software

>>Designing a Robust Industrial Augmented Reality Solution
*Jay Gorajia, Nir Sagi, Eran Nadel, Siemens PLM; Shai Newman, Compedia

>>Automating Detection of Pick & Place Nozzle Anomalies
*Greg Vance, Rockwell Automation

>>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 Cvijetinovic, Rockwell Automation

10:30am – 12:00pm T **TI2: Digital Strategy for Electronics Manufacturing** Room 45

Chair: *Marie Cole, IBM Corporation
Co-Chair: *Greg Vance, Rockwell Automation

>>Electronics Production Planning - What You Need to do to Remain Competitive
*Jay Gorajia, Siemens PLM

>>The Secure Supply-Chain: 2019 Update
*Michael Ford, Aegis Industrial Software

>>Real Stories of Applied Advanced Analytics in the Electronics Manufacturing Smart Factory
Jack France, Keysight Technologies Ltd.

1:00pm – 2:30pm T **TI3: Additive Manufacturing in Electronics Panel** Room 45

Chair: *Gary Tanel, Libra Industries
Co-Chair: *Jason Fullerton, MacDermid Alpha Assembly Solutions
Moderator: *Trevor Galbraith, Global SMT & Packaging

Panelists:
Daniel Braga, Accucode 3-D
*Pradeep Lall, Ph.D., Auburn University
Ofer Maltiel, Nano-Di
Kevin Smith, MarkForged

ADDITIONAL PRESENTATIONS

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Kris Troxel

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T. Kosuga

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Qin Chen

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H. Zhang, F. Mutuku, N.-C. Lee

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D. Daily

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W. Tseng

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D. Geiger, H. Osgood, D. Shangguan

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