

NETgain

THE LATEST THE INTERNET HAS TO OFFER



Web Sites Worth Mentioning

www.transitionautomation.com Transition Automation, an electronics assembly manufacturer, has introduced a new electronic newsletter. The newsletter will feature technology to improve stencil printing quality and production yield. Visit their Web site to register for the next issue.

www.flexlink.com FlexLink Systems has expanded its E-services interactive information resource. The service now gives users all the information that they need to plan, configure, buy and install conveyors and automated solutions for assembly and manufacturing processes. E-services gives users the ability to configure conveyors online and order them based on their applications and manufacturing requirements.

www.IDofEA.org The Independent Distributors of Electronics Association (IDEA) has redesigned its Web site to provide added ease in navigation. The site now features a password-protected member area that serves as a database of important documents, such as the Electronic Components Inspection Manual, and also features a discussion board. It also includes an expanded newsroom section where visitors can view the most recent press materials created and distributed on behalf of IDEA.



Industry Resources

www.pcbupdate.com PCB Update is a bi-monthly newsletter published by UP Media Group. The newsletter's goal is to share the editorial content and expertise of UPMG's magazines and staff with e-newsletter subscribers.

www.pcdandm.com/pcdman/resource/pcb_basics.shtml The fourth edition of *Printed Circuit Board Basics* is now available. This edition contains an updated primer on single-, double-sided and multilayer PCB manufacturing processes; a review of new technologies; updated PCB specifications; a history of the industry; and an updated glossary of terms and definitions.

www.ascouncil.org/meetings Presentations and papers from Adhesive and Sealant Council (ASC) conventions past, including the 2004 Spring Convention & Expo, are available in ASC's library of resources. The library of papers includes spring and fall conventions dating to 1995, as well as short courses on waterborne adhesives, reactives, urethanes, hot melts, pressure sensitive adhesives, caulks and sealants and wood adhesion. It also includes seminar presentations on topics including adhesives in automotive interior applications, adhesives from natural sources and adhesives for product assembly.



Surveys and Guides

www.circuitsassembly.com/online/0404/0404salary.shtml The results of our 2004 salary survey are now available online.

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• Process Defect Clinic
Bob Willis, EPS

Would you like to contribute to NET gain?
Contact Robin Norvell at rnorvell@upmediagroup.com

Nortel Networks to Transfer Supply Chain Operations to Flextronics

Electronics manufacturing services (EMS) provider Flextronics (Singapore, www.flextronics.com) has signed an agreement with Nortel Networks (Brampton, Ontario, Canada, www.nortelnetworks.com) whereby Nortel will divest certain optical, wireless and enterprise manufacturing operations and optical design operations to Flextronics.

Subject to closing the four-year manufacturing agreement, Flextronics will assume most of Nortel Networks' systems integration activities, final assembly, testing and repair operations, along with the management of the related supply chain and suppliers. Over time, Flextronics expects to consolidate and internally source its vertically integrated supply chain solutions, which include the fabrication and assembly of printed circuit boards and enclosures, as well as logistics and repair services.

Through an optical design services agreement, Flextronics will acquire a group of engineers with expertise in end-to-end, carrier grade optical network products. The design and engineering skills to be transferred to Flextronics include hardware development, software development and project management.

As part of the transaction, approximately 2,500 employees will transfer to Flextronics. The business transfer to Flextronics is expected to begin in November 2004 and will take approximately six months to complete. During this time, Flextronics' revenues from Nortel will increase each quarter and should reach an annual revenue rate of approximately \$2.5 billion.

Cookson EAM Adopts Six Sigma System

Cookson Electronics Assembly Materials (Jersey City, NJ, www.alphametals.com) is joining fellow Cookson Electronics companies Polyclad and Enthone in adopting the Six Sigma system to improve the effectiveness and efficiency of its business processes. The goal will be to enhance customer satisfaction, improve profitability and train employees to understand and effectively employ the Six Sigma philosophy throughout the organization.

"Six Sigma is not another 'TQM' program," said David Zerfoss, president of Cookson EAM. "It involves a sustainable, measurable culture shift for the companies that embrace it, and our company is doing just that. In fact, we have over 35 assembly materials employees either in or about to begin black belt training globally. Our black belt candidates have been carefully selected, and, upon graduation, they will have developed the skills required to lead Six Sigma projects for us."

Motorola first made Six Sigma popular in the 1980s. Allied Signal employed it in the 1990s, and General Electric has made it arguably the most popular management philosophy in history. Polyclad and Enthone both launched their Six Sigma programs three years ago.

Cookson EAM develops, manufactures and sells materials used in electronic assembly processes, including: solder paste, stencils, squeegee blades, stencil and printed circuit board cleaners, bar solder, cored wire solder, wave soldering fluxes and surface-mount device adhesives.

Tecnomatix Launches PCB Production Management System

Tecnomatix Technologies Ltd. (Herzlia, Israel, www.tecnomatix.com), a provider of manufacturing process management (MPM) software, has introduced eM-Execution, the latest solution in the company's eMPower for electronics offerings. The Web-based software solution was created specifically to meet the production management and analytical needs of electronics circuit board manufacturers and their supply chain partners.

The system helps electronics manufacturers act on critical production data to better serve their customers and meet regulatory demands by masking the complexity of gathering and managing critical manufacturing information. It creates customizable information and status reports targeted to multiple audiences, from the shop floor to the executive suite.

Electronics manufacturers can configure the solution to meet their specific needs and business objectives. Some of the key functionalities available include: traceability; electronic records and signatures; material management; process verification; repair; production analytics; and quality management.

NEMI Issues Recommendations for Lead-Free Part Identification

The National Electronics Manufacturing Initiative's (NEMI, Herndon, VA, www.nemi.org) Component and Board Marking Project has made recommendations for the identification of electronic components and board assemblies that have been modified for use in lead-free assembly processes. The team has also identified standard vocabulary terms to create a common terminology related to lead-free processing.

The conversion to lead-free products poses challenges as companies deal with the logistics of handling leaded and lead-free products for manufacturing, rework and field returns. Lead-free processing requires higher temperatures and tighter process windows, which necessitates segregation of leaded and lead-free parts. For the immediate future, manufacturing facilities will be running both leaded and lead-free processes, and rework facilities will be running both processes for an even longer time. Manufacturers must identify lead-free parts and keep them segregated to ensure legislative compliance.

The NEMI team provided input and supported the development of JEDEC standard JESD97: *Marking, Symbols and Labels for Identification of Lead-Free Assemblies, Components and Devices*, which was released in May of this year. NEMI considers the identification model in this standard comprehensive enough to meet the needs of manufacturing.

In addition to the guidelines in the JEDEC standard, NEMI is recommending the use of unique part numbers for lead-free materials, components and boards to distinguish them from tin-lead versions.

NEMI has also developed three standard vocabulary terms in an effort to establish a common language for communication of lead-free transition status. The terms defined by NEMI are: *lead-free second level interconnect*, *lead free* and *RoHS compliant*. However, the project team decided not to develop a guideline for identification of RoHS compliance or the various phases of lead-free implementation.

The recommendations are available at: www.nemi.org/projects/ese/Component_BoardMarking.html.

Elcoteq Adds Lines in Mexico, Expands to India

Elcoteq Network Corp. (Espoo, Finland, www.elcoteq.com), an electronics manufacturing services (EMS) provider for the communications technology industry, has added three surface-mount manufacturing production lines at Elcoteq America's facility in Monterrey, Mexico. The addition is a result of increased orders to manufacture mobile phones and similar wireless communications products. The addition brings the number of lines to 10 and increases capacity by 43%. Elcoteq will be expanding its work force by 200 employees.

The majority of the new equipment will be purchased from Siemens and Panasonic in keeping with Elcoteq's strategy to equip all its manufacturing plants with similar equipment so process transfer and supply chain management are optimized. Its plants are located in Europe, Asia, Mexico and the U.S.

The Monterrey plant was established in 1999 and has a production area of 18,300 m² and approximately 1,200 employees who manufacture electronic and electromechanical assemblies.

The company also announced that it will expand its operations to Bangalore, India, during 2004. The company claims to be the first EMS company offering manufacturing services to infrastructure and handset original equipment manufacturers (OEMs) in India.

Elcoteq will establish operations in Bangalore, initially operating in rented manufacturing space. The plant is expected to be operational within six to nine months. When fully operational, the plant will employ approximately 1,000 people.

New Mergers and Acquisition Firm Focused on PCB Companies

Two long-term industry experts have founded a merger and acquisition business focused on the buying and selling of printed circuit board (PCB) fabricators.

Paul Emello, with over 20 years of PCB industry experience—including a role as president and chief executive officer of Capitol Circuits—and Dan Beaulieu, co-founder of D.B. Management Group, a sales and marketing consulting firm, have joined forces in a new company, Capitol Technologies LLC (www.cappcb.com). The Boston, MA-based company will specialize in helping smaller (under \$20 million dollars) PCB shops who want to sell or buy board shops.

"We feel that there is real need out there for a company who is willing to work with the smaller board shops, the shops that the big investment companies are not really interested in," said Emello.

Beaulieu added, "With our years of expertise and our strong industry connections, we can offer our clients a very focused and strategic merger plan. Chances are, if you have a board shop to sell, we know the right company to buy it."

For more information, contact Paul Emello: (617) 254-2588; paul@cappcb.com.

Free Online Database Aids Component Search

Why is a Rochester, NY, distributor of electronic design automation (EDA) software suddenly making noise in the assembly arena? Because EMA Design Automation (ema-eda.com) convinced Cadence, whose software it resells, to update and reintroduce its online component database, allowing designers and procurement personnel to pick or substitute parts at the click of a button.

The ActiveParts database features online access to over 2 million parts, 100,000 of which are new parts and just added. Moreover, many contain links to the manufacturers' datasheets and parametric data for complex searches.

For users, the link means a faster path to board layout. Users will now be able to search online, versus being limited to a local database.

EMA currently does not charge existing customers to access the database, choosing instead to offer it as an add-on to its Capture CIS tool, the environment in which it works. OrCAD Capture CIS is a schematic capture tool and front-end for a number of design flows. The move aids hundreds of EMS firms and original equipment manufacturers (OEMs) that have OrCAD seats.

EMA president Manny Marcano sees this as an opportunity to extend EMA to a new group of potential customers, including IS and manufacturing personnel, which he believes will complement the company's main customer base—some 6,000 users of Cadence's OrCAD line.

—Mike Buetow, Editor-in-Chief, *Printed Circuit Design & Manufacture*

EMS Forum Releases RoHS Compliant Component Guidelines

Guidelines for Suppliers Transitioning to RoHS Compliant Components (Rev. 1.1)

Background

- This document is intended to provide guidelines to suppliers transitioning to lead-free/RoHS [Restriction of Hazardous Substances in Electrical and Electronic Equipment] compliance.
- RoHS compliance includes materials compliance as well as the process and reliability requirements for lead-free soldering.

Logistics

- As per JESD46-B, all changes from existing parts to lead-free/RoHS compliance should be documented by a PCN [product change notification] issued by the manufacturer. Any component changes related to lead-free/RoHS compliance should be considered major changes.
- Any product discontinuances of existing parts should be published to the customers as per the standard JESD48-A.
- All manufacturers who provide notification that they will be producing lead-free/RoHS-compliant products should provide a product roadmap to their customers indicating the planned changes and implementation timetable. Availability and life cycle information for both current and lead-free/RoHS-compliant products should be specified.
- Sample devices and qualification data should be available to customers prior to the release of the PCN or introduction of the new product.

Compatibility & Testing

- A qualification package for lead-free components should be provided that includes the following tests:
 1. Handling, packing, shipping and use (per IPC J-STD-033A)
 2. Solderability testing (per IPC/EIA J-STD-002, current revision)
 - a) Both no-clean and aqueous clean solder paste and wave solder flux should be included.
 3. Solder joint reliability testing (per IPC-A-9701)
 4. Mechanical shock and vibration (per AEC-Q100-Rev E/Mil-Std 883)
 5. High temperature storage (per AEC-Q100-Rev E/JESD22-A103-A)
 6. Tin whisker growth (Reference document: *NEMI Tin Whiskers Growth Tests, Rev. 4.5*, until applicable industry standards become available)
 7. Moisture sensitivity level (MSL) testing
 - a) Component MSL should not exceed the current levels. Wherever possible, testing should include old vs. new part comparisons. MSL testing should follow IPC/JEDEC J-STD-020 (current revision), with the exception that six heat cycles for area array packages and four heat cycles for other components should be included in preconditioning. *(The six-heat cycle requirement reflects the maximum heat cycle an area array package can be expected to be exposed to, including: two reflows, wave soldering, component removal, reballing and re-attachment).*
- The qualification data should include:
 1. Solder alloy(s) used

2. Termination metallurgy and thickness
3. Forward compatibility (ability to solder the components using lead-free solders and the appropriate higher temperature profiles) and backward compatibility (ability to solder the components using existing tin-lead solder and profiles), with the exception of area array packages with lead-free balls, which may not be backward compatible. (The incompatibilities of bismuth-containing termination with tin-lead solder, and bismuth- or lead-containing termination with lead-free solder for through-hole components for wave soldering, are also of particular concern.)
4. First-level interconnect compatibility
 - a) It is the supplier's responsibility to ensure that the first-level interconnect (i.e. within the component package) is compatible with the second-level (i.e. board level) soldering processes (as defined by IPC/JEDEC J-STD-020, current revision).

Part Identification

- All components should have the outer packaging boxes and inner package material (tray, tube, reel) marked with some form of traceable information indicating that the components are lead-free/RoHS compliant. This marking should also appear on the component package where there is room for such a marking.
- All lead-free/RoHS-compliant components should have new supplier P/Ns [part numbers] assigned. Suffix or prefix additions to existing P/N structures are acceptable.
- Device datasheets should clearly indicate the termination solder composition, maximum component temperature rating, recommended and absolute reflow profile limits, and the moisture sensitivity rating. If this information is not present on the datasheet, there should be a clear reference as to where it can be located.

- We encourage industry associations and consortia to come up with globally accepted labels or marking for easy identification of lead-free/RoHS-compliant products. At this time, we endorse JEDEC JESD97: *Marking, Symbols, and Labels for Identification of Lead (Pb) Free Assemblies, Components, and Devices (May 2004)*.

Compliance

- A master "Certificate of RoHS Compliance" should be generated and submitted, prior to any RoHS-compliant component shipment, to document verification methodology and results.
 - A "Certificate of RoHS Compliance" with lot-specific data should be submitted with every lot of shipment of RoHS-compliant components.
 - The certification should follow the guidelines of the "Material Composition Declaration Guide" by EIA, EICTA and JGPSSI, when finalized and released. "Level A" materials and substances (Annex A) are required for this certification; others are optional.

EMSF Steering Committee

Celestica:	Matthew Kelly, Thilo Sack
Flextronics:	Dongkai Shangguan, Sammy Yi
Jabil:	Quyen Chu, Tom Ciplewski
Plexus:	Denis Jean, Kirk Van Dreal
Sanmina-SCI:	Frank Grano, Eamon O'Keeffe

The EMS Forum on Lead-Free PCB Assembly provided Circuits Assembly with its recent publication: Guidelines for Suppliers Transitioning to RoHS Compliant Components (Rev. 1.1). To help the electronics industry prepare for the volume production of lead-free printed circuit board (PCB) assembly, the forum is comprised of five electronics manufacturing services (EMS) providers: Celestica, Flextronics, Jabil, Plexus and Sanmina-SCI. The mission of the EMSF is to discuss and address the issues that will affect the EMS industry as a whole as the transition is made to lead-free PCB assembly. The group will work with other industry consortia and standards organizations. For more information, contact Dr. Dongkai Shangguan, EMSF coordinator and director—advanced process technology, Flextronics, email: Dongkai.Shangguan@Flextronics.com.



Georgia Tech Packaging Research Center: Leading the SOP Paradigm

The Packaging Research Center (PRC) at the Georgia Institute of Technology (Georgia Tech, Atlanta, GA) has a mission it believes will revolutionize the convergent and microminiaturized systems of tomorrow. At their June 16 open house, several center directors, professors and graduate students spent a full day educating attendees on the vision that is *system-on-a-package* (SOP) through tours and breakout sessions.

As explained by Professor Rao Tummala, PRC Director, the center's research mission revolves around exploring, developing and demonstrating the SOP concept. Simply put, with SOP, the package is the system. Instead of the bulky "system" boxes of the past that may have housed hundreds of components performing just one task, an SOP system performs computing, communication, consumer and other functions in a small, single system package.

SOP is about thin-film component integration by embedding actives and passives, and the benefits to this tiny single system package are many. According to Tummala, SOP overcomes the fundamental and integration shortcomings of system-on-chip (SOC) and system-in-package (SiP) technologies, which are limited by CMOS processing. Silicon technology has improved transistor density year after year, but it is not optimal for the integration of radio frequency (RF) and optical components, especially popular in the new age of wireless communication. With SOP, RF components—such as capacitors, filters and antennas—can be fabricated right on the package itself, rather than on the silicon.

Even though SOP promises to solve several computing and integration issues, it is not without its challenges. According to Tummala, one concern is signal interaction and noise management. In addition, the infrastructure of SOP presents a challenging question: Who will manufacture the new technology? Since integrated circuit (IC) companies make ICs and printed circuit board (PCB) fabricators make PCBs, SOP has yet to find a champion in either type of manu-

facturer. As one audience member commented, however, semiconductor companies are starting to see packaging—and not just silicon—as a value-add for customers.

The keen interest in SOP has produced several active members for the PRC, a National Science Foundation-funded National Engineering Research Center established in 1994. Supporting companies include IBM, HP, Nokia, Sony and Motorola, who are part of the larger network of 50 global companies who are involved in the center's research from SOP to flip chip to wafer-level packaging. "There have been dozens of technology transfers [from concept to production] since the PRC started," stated Tummala.

With an annual budget of about \$20 million, the center comprises five academic departments at Georgia Tech, with over 200 students and 30 faculty members all employed in SOP research. In addition, the PRC has prototyping facilities, fundamental research laboratories across the Georgia Tech campus and a class 1000 clean room to aid its research activity and technology transfers for PRC members.

—Lisa Hamburg Bastin, Editor-in-Chief

UK Contract Manufacturer Opts for Assembléon Platform

Contract manufacturer MRP Electronics plc (Bedford, UK, www.mrpplc.co.uk) has recently taken delivery of the first Assembléon (Eindhoven, The Netherlands, www.assembleon.com) A-series machine in the UK.

Assembléon has based its A-series platform on parallel placement technology, addressing manufacturers' needs for volume, technology and application flexibility. The platform comprises two chip/IC placers and a multifunctional placer to allow any application to run, at any volume, on the same footprint. Starting at a minimum 30k cph configuration, capacity can be added in increments to 100k cph.

MRP installed an AX-5 chip and IC placer in-line with an existing multifunctional placer in January 2004. The company's system is currently only partially populated, with three of the five robot banks delivering the required throughput. To achieve the required feeder count, MRP has installed three out of five feeder trolleys.

Machine Vision Products to Open European Headquarters

Machine Vision Products Inc. (MVP, Carlsbad, CA, www.mvpinc.com), a vision and process control technology provider, will open a new European headquarters in Ounferline, UK. The facility will house MVP's European sales, support, training and dynamic process control development.

MVP has enjoyed a long history in the region, originally commencing European interests in Scotland and increasing its reach throughout Scandinavia and Europe.

MVP's new building will offer a demo facility, training center and research and development hub. Customers and industry colleagues are encouraged to visit for tours and demos.

MEV to Distribute EAZIX ODM Products and Services in Europe

EAZIX Inc. (www.eazix.com), the original design manufacturing (ODM) arm of electronics manufacturing services (EMS) provider Integrated Micro-electronics Inc. (IMI, Laguna, Philippines, [\[imiphil.com\]\(http://imiphil.com\)\), announced its partner distribution program with MEV Elektronik Service GmbH \(Hilte, Germany, \[www.mev-elektronik.com\]\(http://www.mev-elektronik.com\)\). MEV is a distributor and stocking representative for electronic niche components.](http://www.</p></div><div data-bbox=)

MEV offers procurement of electronic components and logistics services to original equipment manufacturers (OEMs) and EMS companies in Central and Eastern Europe. With the value added reseller partnership with EAZIX, MEV will also be an authorized distributor of EAZIX's line of wireless connectivity ODM products.

MEV president Dieter Tappmeyer said, "We foresee high demand coming from European wireless OEMs for wireless ODM platforms that will require more complex levels of customization."

Research group iSuppli predicts that the number of embedded devices supporting WiFi technology will increase to 167.8 million units in 2008, up from \$436 million in 2003.

*Would you like to contribute to Europe WATCH?
Contact Robin Norvell at rnorvell@upmediagroup.com.*