In Case You Missed It

As of January, CIRCUITS ASSEMBLY provides abstracts of papers from recent industry conferences and company white papers. With the amount of information increasing our goal is to provide an added opportunity for readers to keep abreast of technology and business trends.

Lead-Free Manufacturing

"Transitioning to Lead(Pb)-Free Manufacturing with Toshiba Semiconductor Products"

Author: Toshiba America Electronic Components, leadfree.toshiba.com.

Abstract: Describes Toshiba's manufacturing procedures for Pb-free manufacturing. Presents information on the transition initiative, along with technical information on Toshiba's lead-free products, transition schedule and inventory management procedures. Covers considerations for backward and forward compatibility, mounting temperatures, heat resistance for reflow soldering, whisker evaluation, solderability and joint reliability. (White paper)

PCB Finishes

"Study and Recommendations into Using Lead-Free PCB Finishes at Manufacturing In-Circuit Test Stage"

Author: Jon O'Connell, home.agilent.com/upload/cmc_upload/All/5989-1558EN.pdf

Abstract: How will the pursuit of a lead-free PCB affect ICT? This report details effects seen at ICT and the need to respond and understand these changes. It addresses lead-free PCB finish issues at the ICT stage and shows that successful testing of lead-free finishes also relies on a positive contribution from the PCB build process. (White paper)

Process Control

"AOI Process Improvement"

Author: Jeff Danner, jeff_danner@jabil.com.

Abstract: Addresses the need for a statistical approach to validating and optimizing an automated optical inspection process. The majority of the AOI process improvement effort will consist of identifying the optimal imaging and analysis criteria for each inspection requirement. However, changes made to the manufacturing process to make the assembly more compatible with current AOI technology would also be considered. This paper proposes statistical methodologies and metrics that could be applied to an AOI process or to individual AOI algorithms. The objective of implementing such methods is to reduce the levels of incorrect component condition verdicts made by the AOI process. The metrics outlined can be used to 1) provide a baseline of the current inspection process to track AOI improvements; 2) determine the nature of the AOI problem caused by the measured variation; and 3) predict levels of AOI accuracy based on measurement distributions. (SMTAI, September 2004)

"Integration of QFD and DoE Methodologies for New Product Introduction in the Electronics Manufacturing Arena"

Author: Kaustubh Nagarkar and Dr. K. Srihari, State University of New York – Binghamton, nkautubh@hotmail.com.

Abstract: Manufacturers follow various strategies to identify customer requirements and to correctly translate them to define product- or service-related features. The techniques to include these features are then researched and, finally, new or modified designs and related production processes are introduced. This paper focuses on the role of two concepts for product and process development: quality function deployment and design of experiments. The two philosophies are often used independently to achieve specific targets within various domains of interest. QFD is used to systematically identify and define key technical targets starting from the knowledge of the overall customer requirements/complaints. DoE is used to identify the effect of multiple factors on a specific product characteristic. Results are often used to find the best values of a combination of the different factors that affect the product characteristic. This paper presents a strategy of interfacing the two tools of QFD and DoE to:

- Quickly and accurately identify the key technical targets based on the requirements of the customers.
- Identify the factors in the design and manufacturing domains that are related to the technical targets.
- Translate the technical targets into actual production specifications. (SMTAI, September 2004)

Soldering

"Selective Soldering – An Overview of the Process, the Equipment and the Associated Board Design Requirements"

Author: Gary Dick

Abstract: This report concerns the process of selective soldering and the evaluation of related equipment. The evaluation was driven by a) the need to replace current (poorly performing) selective soldering processes and b) assembly designs that necessitated a unique method of processing. The evaluation included traveling to five manufacturers to review equipment and process test cards. Actual soldering results were key in the evaluation, as were cycle time, tooling requirements and operator intervention. One machine exhibited the preferred combination of features and performance. Limitations and requirements of the chosen piece of equipment are reviewed and discussed in conjunction with card design recommendations. (SMTAI, September 2004)