



# SMARTER

KEEPING YOU INFORMED OF DEVELOPMENTS IN THE ELECTRONICS INDUSTRY

SEPTEMBER 2010

28

## Addressing the issues facing your industry today

COME & JOIN US!

## Book your place today...

to attend our two day seminar and exhibition event of the year.

Take advantage of 10% early booking discount NOW!



SMART Group's 26th Anniversary Conference on 6th & 7th October, is a unique opportunity to obtain the latest news and views from world class speakers on the wide range of issues facing the electronics industry today.

### Day 1

*Has the supplier chain broken down?*

Exclusive keynote interview with Robert Gregory, Rolls Royce, Chairman of the IAG for Pb-Free Electronics Risk Management

*Reliability issues with lead-free – what is happening in science research?*

Dr Chris Hunt, National Physical Laboratory

*Impact of handling PCBs & the correlation of cleanliness & SIR results*

Doug Pauls, Rockwell Collins, USA

*Voiding in BGA & the potential impact on reliability*

Dave Hillman, Rockwell Collins, USA

*RoHS and REACH – are they killing the industry in Europe?*

Nigel Burtt, Enjaybee Associates

### Day 2

*New cleaning and cleanliness specifications for PCBs & assemblies*

Keynote presentation by Doug Pauls and Dave Hillman from Rockwell Collins USA

*Why do we clean when we have a no-clean process?*

Dr Ralph Hoeckle, Dr OK Wack Chemie

*Mitigation of whisker growths associated with high reliability electronics and spacecraft hardware*

Barry Dunn, ESA

*Silver v sulphur, can conformal coatings help?*

Phil Kinner & Marie Kaing, HumiSeal

*Designing products protection to meet harsh working environments*

Marion Quarrington, Cooper Industries

*Component re-finishing/re-tinning – good practice and reliable?*

Joe Tumilty, Retronix



- Question & answer session at the conclusion of each day's presentations
- Meet key suppliers at the exhibition areas
- Network with your industry peers
- Join us in celebrating SMART Group's 26th Anniversary

Venue: Oxfordshire GC Conference Centre, Thame (easy access from M40)  
Date: 6th and 7th October

ALL WELCOME – YOU DON'T HAVE TO BE A SMART GROUP MEMBER TO ATTEND

Places are limited. For full details and to reserve your place, please click here or call Tony Gordon on +44 (0)1494 465217

www.smartgroup.org

# SMART offer...

## and request for input to smart-e-webinar program

**SMART Group is offering a range of smart-e-webinars to complement its existing training, workshop and seminar programmes.**

The Group continues to be innovative and eager to provide different types of education opportunities for our valued members.

SMART Group has recently launched a new program to allow us to provide short seminars to the engineer without the need for them to leave the office.

Soon to be confirmed for November/December will be *smart-e-webinars* on 'Counterfeit Components' and 'Tin Whiskers'.

In order to make this program relevant to you - we would like your help in deciding on the topics for future *smart-e-webinars*. The good news is that if we use your idea - you will get a free registration to that webinar when it runs.

*smart-e-webinars* generally run for between 60 - 90 minutes, so we are looking for concise and relevant technical subjects that we can cover in this kind of time frame.

Thanks in advance for your suggestions.

**Sue Knight, Technical Committee Chairman**

### Chip Check combats Counterfeiting

There has been much concern in the industry over the last few years with counterfeit components and potential for product failure. SMART has been running workshops on counterfeits for the last few years and is delighted to announce their participation in a new EU project called Chip Check. The project's aim is to produce an automated system for checking components in their packaging for automated assembly. The first partner meeting is taking place October.



## Micro Ball Grid Array (μBGA) Project

**SMART is involved in a number of EU Projects to support the industry and our members. The latest project covers the production of solder spheres and called μBGA. As we are all aware there is relentless consumer demand for electronics equipment offering miniaturisation with higher functionality (e.g. cell phones playing music and movies whilst also offering email/SMS/camera functions). The industry is therefore continuously aiming for increases in integrated circuit miniaturisation, processor speeds and circuit densities. The resultant increasing numbers of ever finer features on the silicon chip, and the need to electrically connect to them has stretched conventional wired or leaded electronics interconnect technology to its limits.**

Ball Grid Arrays (BGAs) is a key technology that simultaneously addresses the requirements for high density fine feature electrical interconnect and physical attachment of silicon chip devices. BGA is a 2-D array of miniature solder alloy spheres under the silicon chip that provides both electrical connection and mechanical attachment to a mounting socket or circuit board. The small diameter of the solder alloy spheres helps to preserve electrical signal integrity. BGA technology facilitates a reduction in the silicon chip package size, better heat dissipation, and greater module (circuit) densities.

The aim of the project is to produce micro spheres with different alloys, manufacture area array devices and assemble the parts. The production experience and documentation should be very useful for companies in the implementation or use of μBGAs in the future. The Technical Committee member responsible for this project is Bob Willis, for further technical information contact [technical@smartgroup.org](mailto:technical@smartgroup.org).



# 'Improving End of Line Yields - Inspection'

Thursday 9th September, 2010

**With parts becoming smaller and tighter packing densities, having the right inspection medium(s) is becoming even more critical. There are a wide variety of optical aids but which best suits your application and inspection needs?**

Session 1 Sue Knight presented an excellent unbiased paper on behalf of her company STI entitled 'The Inspection Dilemma - Triggers for upgrading on AOI System'. STI's requirements as a CEM were explained - as they differ from an OEM or high volume CEM. Criteria generated from evaluating 12 systems of interest after 30 systems were originally identified. With testing completed, good and bad points reduced the contenders down to 10 systems, then six for further investigation/on-site trials. Sue commented that sales techniques varied. Only one supplier took seriously about how much STI needed to be able to program from Gerber data. The reasons for a lengthy investigation were explained and the solution has proved good for STI's business.

Session 2 covered SPI (Solder Paste Inspection) by Jeremy Saise of Saise Ltd. With over 60% of end of line defects coming from the print process, SPI is becoming one of the most important inspection tools. There are many solutions, off line, in printer, inline, 1D, 2D, 3D & 5D, measuring either area or volume or a combination of both. An explanation was given to understand the different principles and the use of different cameras, lighting and lasers and the Moiré Fringe effect with optical triangulation and laser triangulation principles plus the advantages of using the SPC data for line optimisation.



Session 3 delegates enjoyed Peter Marshall of GEN 3 Systems Ltd covering Manual Inspection/First Off Checking, Prototype build, NPI and inspecting Specialized components. The paper explored the move from magnifiers and microscopes to the capabilities of the latest generation stereo inspection centres, analogue and digital hand held cameras plus the trend towards HD imaging and the visual inspection of BGA and QFN joints. A case study was given on a French company's introduction of a professional line scanner to cut first off inspection times to improve process yields.

Session 4 concluded the presentations 'AOI Automatic Optical Inspection', Shoich Rashed, Marantz Europe explained the principles behind the various AOI systems, Comparators, Correlation, Vector Imaging, Synthetic Imaging and the algorithms that support each. With a machine connected to an overhead projector delegates saw the effects of lens and camera technologies plus lighting options and the differences between OCR v OCV. A demonstration was given on histogram image profiling and the utilisation of 24 bit colour pixels compared 8 or 16 bit grey scale followed by guidelines on cutting down on false calls.

The day concluded with 'Question Time'

Exhibitors included: GEN3 Systems, Saise Ltd, Marantz Europe, Blundell Production Equipment, Altus Group, Anglo Production Processes, Viking Test Services, Goepel Electronics. Bench top displays covering all of the inspections systems were available for delegates to get a hands on feel.





## SMT Process Troubleshooting in Ireland

**Wednesday September 15th, 2010**

SMART Group Ireland held a workshop on 'Troubleshooting your Surface Mount Assembly Process In House or Offshore' at Avocent International, Shannon, Co. Clare, Ireland hosted by Tiernan Culloo of Avocent and Philip O'Rourke of SMART Group, Ireland.

During this workshop delegates were shown problems common in industry, what are the solutions or ways of investigating the root causes by Bob Willis. Engineers were shown how to use the free NPL online soldering defect databases to solve process problems 24/7 which is now supported by the IPC. The session also dealt with manufacturing offshore. The day was presented by Bob who will be back in Ireland for Design for Manufacture workshop in 2011.



## SMART Group Rework Workshop

**Thursday September 16th, 2010**

The annual rework workshop was held in September at the Oxfordshire G.C. Business Centre and was well attended for this practical hands-on day. The presentations covered traditional through hole and surface mount rework procedures as well as advanced rework for BGA, QFN and the latest Package on Package assembly.

The theory sessions were presented by Bob Willis, he and Jason O'Dell handled the practical sessions. Jason of O'Dell Rework did a great job on demonstrating the rework and repair of BGA, Package on Package and Bottom Mounted Packages during the afternoon session which you can see in the session photographs.



# Environmental Regulation and Legislation

## Europe's RoHS and WEEE Directives – UK Stakeholder meeting report summary

On August 3rd, the UK's Department for Business, Innovation and Skills (BIS) held a meeting to update interested parties on the recast of the RoHS and WEEE Directives.

It noted that progress on the negotiations over changes to the RoHS Directive had gathered pace since Belgium has taken over the EU Presidency at the beginning of July. The new Presidency has instigated regular "technical tri-ologue meetings" between representatives of the Commission, the Parliament and the Council of Ministers to help move towards agreeing a first reading text in October. The next meetings are due in September and the likelihood of agreement being reached will be clearer once these have taken place. Many member states, including the UK, have strong reservations about the "open scope" proposal, but the Presidency has suggested a compromise whereby this provision would only be enforced six years after the new law has been passed and only then after consideration of an impact assessment to be carried out within the first four years.

By contrast, progress on the WEEE recast has been poor, with the previous Spanish Presidency being unable to push forward on the detail, but the new Belgian Presidency is trying to improve the situation. It was reported that, as yet, no substantive discussions have taken place in the Council of Ministers, but the next Council Working Group meetings on WEEE were scheduled for September.

**Nigel Burrt**

## SMART Supplier Link List

SMART Group 'Industry Links' List is featured on the web site at [www.smartgroup.org](http://www.smartgroup.org) and provides direct links to material and equipment suppliers, service providers, PCB manufacturers and a whole lot more. If your company is not featured then let us know [technical@smartgroup.org](mailto:technical@smartgroup.org)

## SMART GROUP EVENTS DIARY 2010

### 6th-7th October

SMART Group 26th Birthday Conference  
'Addressing The Issues Facing Industry Today'  
The Oxfordshire, Thame

### 11th November

Counterfeit Component Webinar  
Webinar

### 25th November

Lean Management Workshop  
Henkel, Dublin 24, Ireland

### 6th December

Tin Whisker webinar  
Webinar

## SMART GROUP EVENTS DIARY 2011

### 15th February

µbGA, PoP & Fine Pitch Paste Printing Workshop  
The Oxfordshire, Thame

### 24th February

Design for Manufacture & Assembly Workshop  
Enterprise Ireland, Dublin

### 5th April

No Clean Materials & Process Reliability Workshop  
The Oxfordshire, Thame

### 12th May

Quality Workshop  
Antrim, Northern Ireland

### 22nd September

Green & Portable Energy Workshop  
Tyndall National Institute, Cork

**To view any amendments please check our Diary Page - [www.smartgroup.org/diary](http://www.smartgroup.org/diary).**

Note: SMART Group Scotland meetings are held at the Royal Scots Guards Association Club (opposite Haymarket Station), Edinburgh, (dates to be arranged). For location visit <http://tinyurl.com/rd4qxz>