

## SMART Group LEAD-FREE DEFECT GUIDE 2

It's free, pick up your copy at the **NEW SHOW**

Register for the show NOW, see below

### SMART Group Booth H29

The SMART Group has been at the heart of disseminating information regarding the diverse research and development needed to implement the change to lead-free soldering. Due to the knowledge and feedback we have built up through seminars, the European LEADOUT project and correspondence on our unique email forum *smart-e-link*, we have been able to confidently put this defect guide together.

As we in the industry have seen, the defects encountered during and after implementation of lead-free soldering have brought us a variety of new (and in some cases old) challenges. This lead-free guide is a compilation of defects designed to help managers, designers, engineers and operatives to solve these everyday problems and to let them troubleshoot effectively and efficiently. We hope you find this a useful guide and that it helps you achieve your objective.



### Visit SMART Group at National Electronics Week

Earls Court 2, London, 17-19 June 2008



SMART Group will be launching its free 'Lead-Free Defect Guide 2,' on its booth H29, come along and pick up YOUR copy.

manufacturing through to distribution will be showcasing new and proven products and services.

Over 300 companies spanning design, components,

SMART welcomes members to visit us at the show and you can register online at [www.nationalelectronicsweek.co.uk](http://www.nationalelectronicsweek.co.uk)

**STOP PRESS : SMART Group Launch On-Site Training see page five**

# South Africa Focus



## CHAIRMAN'S REPORT SMART Group SA

*Manufacturing Process Improvement & Optimisation Seminars 21st – 24th April CEO Summit 25th April*

Wow! As each event takes place and the numbers grow, I am encouraged by the quest and thirst for knowledge that our industry has. As always with an event like this the work that happens beforehand is a magnitude or two greater than the event itself, this is undoubtedly true again, I can only say an honest and sincere thank you to ALL those that made a contribution, the many compliments and messages I received go to you, there are too many to mention, but you know who you are.

The number of delegates grew from 120 last October to almost 200 this time, the sponsors grew from 4 to between 9 and 12 depending on the location, many of these were from overseas, and their support of our local electronics manufacturing industry is one that we should be taking notice of. The confidence that they show, I think is greater sometimes than we believe ourselves, we have a growing industry, that is placing itself on the world map, maybe not for vast quantities, but certainly in specialised or niche markets.

The inclusion of Durban on this tour was in my view an extremely worthwhile addition, it must be said it was not the case that you were forgotten last time, it was more logistics than neglect, but your comments were noted and we had a strong turn out to back this up.

The feedback from all the locations was positive and 97% of feedback sheets scored the speakers and content as Good or V. Good, a job well done, thanks again, Richard, Keith, Phil, Chris and Nick. It's going to be another tough act to follow, but the plan is for the next tour to be in October, with a heading of the 'A – Z of Soldering'.

It has been shown by the amount of interest over the past year or two that the need for SMART Group SA is real, and as we go forward with technology, there is also a very real need for us as an industry to meet the ever growing challenge, it is imperative that we maintain and in some areas catch up with current world trends and capabilities, with regard to technology and manufacturing. With everyone's support and participation,

we will do everything we can to bring more technology and understanding to our shores.

This brings me to the final event of the week, which was the CEO Summit, held on Friday afternoon and evening, many of the leading players in the South Africa electronics manufacturing industry supported this initiative, and to those I say thank you, we have a responsibility to go forward and plan the road ahead for our various companies, as well as for the overall industry. The input from Phil and Keith was most valuable, it did not give us any great answers, but the plan was to try and get everyone present to start thinking about the problems and how we are going to face them, we have a plan to address some of the questions and concerns raised at another meeting in July, most likely in Johannesburg.

Again, a very big thank you to all those that made it happen and to those that attended, your support is what makes it all worthwhile, Thanks!

**Stephen Eglinton**  
Chairman – SMART Group SA, May 2008

## Electronics Manufacturing in South Africa Summit

*report by Keith Bryant*

Having spent a lot of time here over the last few years and much of the rest of the time within the major electronics centres within Europe and beyond, I felt there was a need to get the key figures in SA Electronics into the same room and give them some hard facts on their future. I believe this country is sitting at a crossroads and key people have to decide the way forward, or electronics manufacturing here will follow the model of Western Europe.

I have seen manufacturing in my own country almost die or at least shrink to a level where it no longer features as a real 'profit centre' for the country's economy and employs a fraction of the people it did, even 10 years ago.

We were insular and thought a changing world went on around our shores and didn't affect us. Instead of changing our business practices to compete we carried on walking towards the edge of the precipice always assuming we would be alright in the end - we were not. Our electronics manufacturing moved very quickly to Eastern Europe and Asia; by the time we realised the problem it was too late. In all honesty much would have gone anyway, but a lot could have been kept if we had prepared for the fight by becoming more efficient and improving our knowledge.

Our aim for the Summit was, in only a few hours, to make the audience aware of this fact,

start them thinking about the need to change and give them some pointers as to the way forward and some key information to help them justify the cost of change. Phil Zarrow has a very good 'WorldView' of our industry and his insights were invaluable, his example of a company with 'best practice' caused some eyebrows to raise, these guys have an annual stock turn of 22, a set up/change over average time of 13 minutes and a first time pass rate and on time delivery of better than 99%. Of course, this is way above most other companies, but for a business specialising in producing many small to mid volume batches it is an aggressive target. Surprising for some in the

audience, this is a US company, not an Asian one, so it illustrates that low cost of labour is only part of the equation. Their goal was to dominate a niche market where they could make good margins and that is exactly what they have done. Not everyone has to chase the Holy Grail of huge volume, very low margin manufacture; there are plenty of strong niche markets out there.

I am very aware that our 'shot gun' approach pleased most of the people most of the time and frankly that was as good as we were going to get it to be, so from our side it 'did what it said on the tin' to get what we did

into the time frame was a real challenge, more was simply not possible.

However, during question time it became obvious that there was a desire for a more direct or dare I say blunt approach at future events and also a desire to form an alliance within the CEM industry to promote themselves aggressively and search for business beyond these shores. A need for more benchmarking information was also registered, so plenty of things for future events.

To get these key people in one room was an achievement, to have them networking with

each other was a bigger one, having them respond in such a positive way was tremendous. If SMART Group SA can build on this foundation and get the few who were not present to 'buy in' then this will shape a very successful future for Electronics Manufacturing in South Africa.

This is where I came in so I would just like to finish by offering my personal thanks to everyone who attended and to those who made it happen. The next Summit is already on the drawing board; it will address the points raised and happen in July close to the airport in Johannesburg.

## SMART Group SA, Manufacturing Process Improvement & Optimisation Seminars a speaker's view

by Keith Bryant

All the venues were well attended and the audiences were very happy with the content, the table tops were also busy, there were even six tables taken directly by major European companies, a sure sign that SMART Group SA is delivering what the industry needs and is also developing a serious profile on the world stage.

I am certain a panel of such technical experts with vast experience, ranging from soldering to pick and place and AOI has not been assembled together in South Africa before.

After Capetown it was time to pack up and move on to Midrand for days two and three. Again, plenty of interesting questions, a sign that the audience understood and appreciated the content of the talks, the other good news was that Phil Zarrow had made it into the country, he had problems with the US passport authorities and missed his original flight arriving in SA without his luggage! I have to say a big thank you to Nick Redgrave-Plumb and Chris Pallin who came to support the event as table top exhibitors who stepped in as speakers at the first locations.

This event drew some of the best questions of the week and we now had over 180 years of experience to draw on for the answers.

As Durban, (day four) is a key centre for the Automotive Electronics industry, fitting in the



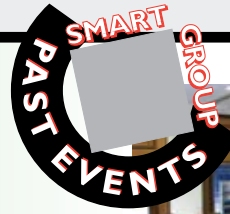
presentations on Conformal Coating and Contamination Detection and Control by Nick and Chris, would be of real benefit, so we squeezed them in too. Copies of all the presentations are available to attendees and members on the SMART Group SA web site. In summary, this series of events has added to the information given by those before it and educated the engineers of today and thanks to the great idea of offering free places to students, it has helped educate and inspire

the future of Electronics Manufacturing in SA. The program will continue, with the next major event happening in October, entitled 'The A to Z of Soldering', it will draw some of the best speakers from overseas who will also share their knowledge and experience with those attending. Don't miss it, if you have not attended yet, all I can say is, "for the sake of your future, please don't miss it".

Keith Bryant

## Past Event

### Joint Event with



## POP Package on Package Seminar & Demonstrations

Ball Grid Array BGAs and Chip Scale Packages CSP are widely used in a vast range of products including consumer, telecommunications, medical and military markets. An area array device provides high packing density with a relatively easy introduction. Over the last couple of years engineers have started to experiment and in some cases implement package stacking, also referred to as Package on Package (POP). As real estate is at a premium for memory the only way to go is up and up. Stacking fully tested memory and logic packages overcomes concerns of non tested silicon. SMART Group was pleased to have the support of iMAPS UK in this jointly organised event held at one of the Group's regular venues. The workshop was well attended with engineers eager to learn the positives and negatives of this design assembly solution.

Sessions at the workshop featured:

#### **Peter Grundy**

Packaging Styles and Trends

#### **Steve Dowds**

Materials for POP Assembly and Reliability

#### **Dave Bernard**

X-ray and CT Inspection  
Challenges of POP Assemblies

#### **Peter Moran**

Alternative STACK Packaging Concepts

#### **Bob Willis**

Guide to the POP Assembly Process  
Steps and Challenges

In simple terms POP represents the stacking of components one on top of the other during original manufacture or during printed board assembly. POP packaging systems may include direct

soldering, wire bonding or conductive adhesives for device-to-device interconnection.

The package-to-package interconnection is conducted using reflow technology with a dip flux or dip paste specifically formulated for the technology.

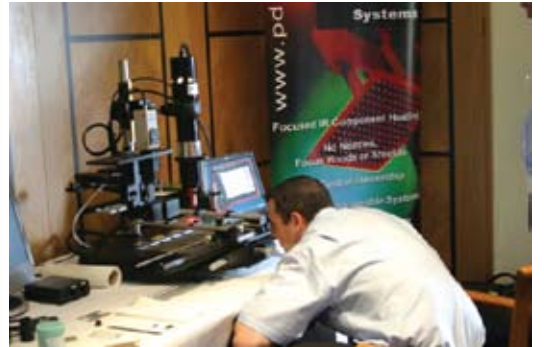
The workshop was well supported by tabletop exhibitions from ALMIT, Gen3 Systems, Parkheath and Intertronics who provided soldering materials, components, rework equipment and paste testing facilities. The Parkheath team provided some hands on demonstrations of POP assembly using a PDR rework system.

Topics covered during the workshop consisted of:

- Component packaging trends
- Stack silicon, SiP, POP & micro chips
- Why is stack packaging important?
- Who is using POP technology?
- Overview of the possible assembly steps
- Material sets for stack packaging
- Benefits of underfilling
- Drop testing performance
- Using flux or paste dipping process
- Placement system requirements - vision and placement force
- Reflow soldering and profiling packaged stacked devices
- PCB and package warping
- Reworking packages either the complete package or just one level
- Inspection of multilevel packages

The event was ideally suited to design, production and quality engineers looking at future technology and maintaining their company's technology roadmaps. It was also vital to subcontractors to be up-to-date with new technology and its possible implementation along with material and equipment requirements for their existing and future customers.

Bob Willis



## An Announcement from the Directors of SMART Group May 2008 SMART Group Launch On-Site Training

The SMART Group, (Surface Mount and Related Technologies Group), Europe's largest technical trade organisation proudly announces that it is launching a wide range of on-site one or two day training courses.

With its long term aim to promote the advancement of the electronics manufacturing industry through the education, training and networking of its members, the setting up of on-site training is a logical step. For nearly 25 years the group has organised leading edge technical seminars, conferences, meetings and offered training videos, CDs, technical reports, posters and free downloads to its members. It has long represented a valuable and dependable source of information and expert assistance among its members.

With the technical excellence of its active members, SMART Group is ideally placed to offer industry experts to provide outstanding, non commercial on-site training on a wide range of subjects. As an example the recent and on-going challenges of lead-free soldering, our involvement in the EU LEADOUT Project and over 8 years of Lead-Free Conferences confirm our position to offer exceptional technical advice.

SMART Group courses will offer both theory and practical hands-on training for all technical,

managerial and support staff within the organisation. They can be tailored for each company requirement.

Each delegate will receive a certificate of course attendance, the company will receive two interactive CD-ROMS to allow continued support.

For more information and course content, availability and costs please contact:  
Tony Gordon, SMART Group Secretary,  
Tel: +44 (0)1494 465217  
Email: info@smartgroup.org

## DIARY 2008

### June 10th

A-Z of SMT & Conventional Assembly  
Hook, Hampshire

### June 17-19th

National Electronics Week Exhibition  
Earls Court, London (SMART Group Booth H29)

### July 2nd

Thermal Management –  
Thermal Interface Materials  
NPL, Teddington

### September 10th

Solving Counterfeit Components –  
The Problem, Identification & Testing  
St. Albans, Hertfordshire

### September 25th

Environmental Directives Update Seminar  
Galway, Ireland

### October 30th

PCB Design for Manufacture & Assembly  
Shannon, Ireland

### November

Special SMART Group Event  
Details to be announced

### December 4th

Logistics in Electronics Workshop  
Cork, Ireland

## Scotland Past Event Agilent Technologies, Scotland



There was again a varied menu on offer at Agilent Technologies at the 17th April 'Awareness Seminar' on the topic of 'Improving Product Reliability'. It was interesting to note from the feedback sheets that different people focused on different presentations, demonstrating the wide range of reliability topics that are of concern.

We were pleased to see delegates from Ireland and Northern England, and a number of new faces among our audience. As befits a reliability-centred seminar, all the presentations "did what it said on the tin", starting with Martin Tarr's review of the main causes of electronic failure. Ian Hood followed, with a paper that gave insights into the way in which the move to lead-free has impacted on board reliability. In the pre-lunch slot, we were delighted to welcome Graham Naisbitt, Vice-Chairman of SMART Group, who gave an interesting review of the relative merits of different technologies.

The afternoon presentations covered an even wider perspective, and three very different

presenters provided sufficient stimulation to keep us all hanging on every word until the final whistle. Stuart Lees gave an interesting case study on the way in which improvements in production management and employee attitudes could turn almost disaster to preferred supplier status. A new speaker for SMART Group Scotland, and one who will doubtless be tapped for his expertise by other parts of the Group.

Bob Page's presentation was an excellent demonstration of the benefits of using screening regimes that really tested out whether a product was likely to fail, with some excellent case studies. Finally, Stewart McCracken gave a lucid and well-illustrated explanation of the processes involved in 'Forensic Science for Electronics', with an up-to-the-minute example of a severe problem that had been first contained and then resolved by the use of appropriate failure analysis techniques.

Overall, a very stimulating day, although inevitably one that just scratched the surface of this diverse topic.