



NEPCON ON THE MOVE...

I just heard Alan Titchmarsh embarrassed to say that he'd covered the Chelsea Flower Show for 37 years! Well, I sadly have to admit that I participated in the first National Electronics Packaging CONFERENCE (then called InterNepcon) held in Brighton in October 1968.

The unofficial Nepcon historian, my good friend Brian Way (now retired from Astro Technology), lists many landmarks including 1979 when hurricane winds and torrential rain resulted in substantial damage to Brighton's historic West Pier. The bombing of the Grand Hotel in October 1984 was on the very weekend that the Nepcon show began build-up, security of course was very tight.

The show moved to the Birmingham NEC in 1986, there followed years of a buoyant industry and large booths competing with each other. In 2003 Nepcon returned to the quaint ambience of Brighton, for many of us it was like coming home!

Nepcon, organised by Reed Exhibitions, has always changed with the market, so with the industry in slightly better shape, after a successful show in Brighton this year, the exhibition returns to the NEC Birmingham in 2006. This issue of our newsletter concentrates on our participation May 11-12 with the Lead-Free Experience3 and the Process Technology Seminars.

Mike Judd

REED ANNOUNCES BEST ATTENDED NEPCON IN RECENT YEARS, AND CONFIRMS DEVELOPMENT PLANS FOR 2006

Reed Exhibitions is celebrating a 30%+ increase in attendance at Nepcon, with visitors travelling from all reaches of the UK with real enquiries and real budgets. Exhibitor numbers were also higher this year, confirming the value of the exhibition to Europe's increasingly optimistic electronic manufacturing sector.

"Nepcon 2005 added powerful new content, while retaining the fundamentally successful format of previous years. I believe this has driven the significant increases in exhibitor and visitor numbers as well as generally higher satisfaction levels among those attending," said Chris James, Nepcon Marketing Manager. "There was valuable knowledge available, for example in the SMART Group Lead-Free seminars, as well as important new product information and plenty of networking opportunities. Clearly, many people from all reaches of the UK invested their time, and received the reward of making significant progress toward realising their business goals."

In all, there were 173 exhibitors at Nepcon 2005, and confirmed exhibitor numbers for 2006 have already reached 96 just three working days after the event closed. Post-show reaction from exhibitors indicates high satisfaction levels, with some exhibitors taking important, unexpected orders. Many have met potential new customers with significant and real requirements that should lead to confirmed orders within the near future. "We became aware of large projects previously unknown to us," confirmed one exhibitor, Andy Kellard of Speedprint/Europlacer. Automatic optical Inspection equipment expert Cupio also announced that it received an order for its ScanSpection AOI system during Nepcon 2005. The customer, Altrincham-based manufacturing services company Assembly Contracts Ltd, will use ScanSpection to enhance its services for contracts ranging from high-quality medical instruments through to Intrinsically Safe products for hazardous environments.

Following the success of the new Nepcon formula, the exhibition now moves on to focus on its move to the NEC at Birmingham for 2006. "Brighton, as the original Nepcon's first home, will always have special significance, but the indicators going forward are that we will need the extra facilities the NEC has to offer," said Ian Crawford, Exhibition Director for Reed Exhibitions. "As an added benefit, Birmingham is nearer to those visitors who must travel a long way to reach Brighton, while also being served by Birmingham International Airport for visitors flying from Scotland, Ireland or further afield."



3 YEARS ON...

LEAD-FREE EXPERIENCE IS STILL GOING STRONG IN BRIGHTON

As in previous years delegates were able to see and use production equipment, utilising lead-free alternative alloys on board designs featuring ball grid array, surface mount, 0201 & 01005 chips and through-hole reflow terminations.

They were able to witness and discuss many of the issues raised by one of the most significant industry changes in many years. Delegates could also bring board designs and process issues and have all their questions answered by members of the SMART Group Technical Committee.

The SMART Group Lead-Free Hands On Experience3 ran both days of the exhibition, this provided delegates with the opportunity to visit the Nepcon exhibition and be first with lead-free process solutions. It also gave the opportunity for engineers to find out about LEADOUT, one of Europe's biggest collaborative projects on lead-free technology.

SMART Group is a key member of the project and all the data from the SMART Group Experience will form part of a technical review for LEADOUT member companies.

The key aspects of this years Experience are listed below, a full report is due in a couple of months so look out for the announcements on the web site www.smartgroup.org

- Components
- Printed Boards
- Component Placement
- Solder Paste Printing
- Reflow Soldering
- Wavesoldering
- Lead-Free Rework
- Inspection

Having run the SMART Group Lead-Free Experience for three years I must say its just great fun to experiment with different processes, materials and components and pass on the information to the industry. Its one of the most useful services SMART Group provides commented Bob Willis at the end of this years event.



Experience partners with Bob Willis and Peter Marshall, SMART Group Chairman

NEPCON ELECTRONICS PROCESS TECHNOLOGY SEMINARS

ANOTHER YEAR, ANOTHER BIG HIT!

Over 400 delegates pre-registered for this year's seminars sponsored by EM&T magazine and organised by SMART Group, in fact 724 turned up to attend.

Year on year this is the place to be and where to get up to date with the latest technology. Inevitably a high proportion of the content this year was on lead-free topics as the industry clambers for information and the latest test results. All the papers were well received and found by delegates to be practical and the advice provided easy to implement in manufacture. SMART Group's Technical Committee tries hard to pick the right topics to complement the latest technology focus at Nepecon Electronics. From the number of people that were standing in the aisles for each paper the Committee must be getting things right, or not supplying enough seats!

A copy of each of the papers listed below can be downloaded by members from the Events section of the SMART Group web site www.smartgroup.org

- Key Trends and Challenges in Automated Test: Virtual Instrumentation from Design to Manufacturing, Ian Bell NATIONAL INSTRUMENTS
- Moisture Sensitive Devices MSDs - A Real Production Issue, Chris Ward ALMIT

- Identification and Labelling for Lead-Free Products, Tom Perrett TIN TECHNOLOGY
- Impact of Lead on Lead-Free Joint Reliability, Chris Hunt NPL
- Measurement and Identification of Lead-Free Products, Sue Knight EADS ASTRIUM
- 0201 & 01005 Design and Assembly Issues, Peter Grundy, PG ENGINEERING
- How to Comply with the RoHS Directive, Dr. Paul Goodman & Dr. Chris Robertson ERA
- Making Pin In Hole Reflow Work in a Lead-Free Process, Jürgen Hahn-Barth PHOENIX CONTACT
- IPC610D - International Soldering Standard Update, Barry Morris, ART
- "LEADOUT" The Elimination of Lead in Manufacture, Simon Mason, TWI
- Small, Buried and Blind Via PCB Reliability, Dennis Price & Bob Willis, MERLIN CIRCUIT TECHNOLOGY
- Auditing Facilities for ESD Compliance, Jeremy Smallwood ELECTROSTATIC SOLUTIONS
- PCB Design and Layout Changes for Lead-Free Production, Bob Willis EPS

SMART Group would like to thank all our speakers.



Standing room only for most seminar sessions.

LEADOUT News

Simon Mason of TWI presented a paper on the EC funded LEADOUT project as part of the Process Technology Seminars at NEPCON.

The main aim of this project is to provide and disseminate technical support to European electronics assembly SMEs during their



implementation of lead-free soldering technology. It includes a PPM Benchmarking programme, similar to that run in the UK by the SMART Group, extended to a Europe-wide audience and taken through the changeover period so that companies can monitor and compare their manufacturing processes.

The project will also investigate the health & safety and environmental aspects of the switch to lead-free soldering. The SMART Group, who is also a project partner, will be supporting the project throughout its 3 year span by organising seminars, workshops, training sessions and giving technical support where needed. For further information, please contact Simon Mason at simon.mason@twi.co.uk

Visitors from LEADOUT visit Nepcon



Margarida Pinto & Rolim Carmo, Instituto de soldadura a qualidade and Joao Jose' C. Reis, Silgal, Portugal.



CAPTION CONTEST

Please send your best caption to info@smartgroup.org
The prize is a free place at our November event in Wycombe.

DIARY 2005

1st June

Lead-Free Materials Workshop
Hemel Hempstead

15th September

Lead-Free Rework
Soldertec, St. Albans

20th September

RoHS Legislation & Compliance Seminar
& Table Top Exhibition
Dublin Ireland

1st November

ALL you ever wanted to know about Lead-Free
Wycombe FC Conference Centre

1st December

Manufacturing Process
'The Transition to Lead-Free'
Cork, Ireland

DIARY 2006

10th-11th May

Nepcon Electronics
NEC, Birmingham

SMART GROUP WOULD LIKE TO THANK ALL PARTICIPANTS IN THE LEAD-FREE EXPERIENCE3

A special presentation was made to those companies who have supported the SMART Group Lead-Free Experience for each of the last three years.



Sandra Dunham too busy working on her booth to attend the group shot!



L to R: Speedprint/Europlacer - Andy Kellard, Tecan - Tony Weldon, SMT Surface Mount Technology - Neil Everitt (Bob Willis - Organiser for SMART Group) A & D Automation - Fred Gregory, OK International - Craig Brown

GREAT SOUTHERN HOTEL SHANNON 19/5/05

SMART GROUP LEAD-FREE SEMINAR



Lead-free seminars are often focussed on a particular aspect of applying the technology and getting the best out of it. The emphasis in Shannon was on rework and test/inspection.

As a start to the proceedings, Peter Grundy of the Smart Group UK discussed the background and purpose behind the European Union's LeadOUT project and went on to describe the status of the project so far. It was agreed by all that the aims and activities of the project in promoting all aspects of Pb-free soldering to SME's is correct but it is a pity the project had not started 5 years earlier.

Rick Nuttall of OKI/Metcal reminded the audience that although the aim of all manufacturers must be to build perfect products all the time, they must be aware that rework is inevitable and that the process control for Pb-free rework is not difficult but needs the application of common sense and good housekeeping. Cleanliness and a thorough understanding of the narrower process window are vital.

Much has been researched, published and spoken recently about joint reliability with Pb-free joints and Pascal Jud of EMPA (the Swiss Federal Lab for materials training and research) spoke of the need to expand testing regimes to encompass a better definition of the mechanisms of creep failure. It is also important to evaluate the behaviour of relaxation times during cyclical loadings to check for the possibilities of materials not returning to their initial states properly. He described much of the work being carried out at EMPA to tackle these unknowns.

There followed two views on the use of AOI/AXI. One from Axel Eschenberg of Viscom and one from Dr Geraint Dermody of X-Tek. It has often been mentioned before that AOI and AXI machines do not have any strong aversion to Pb-free solders but some effort is required to set up new libraries to ensure that the images are evaluated correctly and this was

emphasised by Mr Eschenberg who also showed some good quality photographs of comparisons between Sn/Pb and SAC alloy joints and possible issues such as voids. Dr Dermody presented the technology of X-Ray emission and absorption in a very clear concise manner and then went on to explain from this technical background how Pb-free solder can offer a higher resolution to X-Ray systems since the density of SAC alloy is less than that of Sn/Pb

The focus shifted to test strategies and Bernard Sutton, the test consultant, presented a description of the various test possibilities and their likely fault coverage as a guide to the best strategy to give the best return on investment. All systems have merit but each can offer particular advantages depending on the product design and market. The concept of design-for-test was emphasised and it was noted that there are still not enough adherents. It is too common for test to be considered too late in the product life cycle.

The end of the seminar brought a discussion on Laser technology for initial assembly and rework from Ray Prasad of Beamworks. The higher soldering temperatures necessary for Pb-free soldering also cause major concerns with the use of plastic bodied connectors, electrolytic capacitors, flash memory and many other components. Lasers offer an alternative to heating up the entire assembly and can focus the soldering energy into the joint area only. Recent developments have improved the speed potential but they are still slower than conventional reflow systems. The armoury available to process engineers is expanding.

Peter Grundy, Technical Committee Chairman, Smart Group UK

