

## Welcome to our newsletter

Structural failure in ships, water and gas distribution pipe lines, a diary event on smarter energy usage powered by developments in electronics & power electronics - is this really a SMART Group newsletter? Yes it is and it confirms that the expertise within the Group is wide and diverse.

We are pleased to inform you of the EU projects that we are involved in and any feedback is always welcome.

The first exhibition in the calendar, the Southern Manufacturing and Electronics Show, announced that visitor numbers were up 20% on last year at 2,500 and seminar bookings were up 28%. Certainly the show was busy, especially on the first day and the exhibitors I spoke to were pleased with the quality of enquiries received. Let's hope that this is a sign of recovery and that things are looking brighter in our industry.

SMART Group has announced a two day conference to be held on 6<sup>th</sup> and 7<sup>th</sup> October that will conclude our 25<sup>th</sup> Anniversary year. Please keep the date clear in your diary. As always we appreciate the support of all our members and look forward to seeing you at one of the many events held throughout the year.

Mike Judd

### Three New Training Products from SMART Group

SMART Group provides all types of training medium to assist the electronics industry and to support its regular seminars and workshops. In these difficult times the use of traditional and multimedia methods are essential to ensure engineers are trained to an acceptable standard. As well as a packed diary of seminars and workshops, SMART Group also offers in-house training at your site facility.

SMART Group is therefore delighted to release three new training products: two CD-ROMs and a Poster Guide. All cover Conformal Coating.

#### *Conformal Coating Inspection and Defect Guide - Price £99 plus VAT*

The CD-ROM provides a simple guide to the use of coatings, their application and process, product benefits, inspection and quality control. A unique feature of the CD is a number of engineers answering questions on coating processes, process defects and quality control in manufacture.



#### *Conformal Coating Inspection and Defect Guide Posters - Price £45 plus VAT*

A 24 page colour poster guide is ideal as a reference source. The photographic guide is ideal as a reference source for operators, inspection and training departments and is provided as an Acrobat pdf file. The individual sheets can be printed as A4 for bench top reference or as A3 colour posters for reference in manufacture.



#### *Conformal Coating Photo Album - Price £99 plus VAT*

A photo CD-ROM album featuring over 290 colour images available to allow engineers to create their own training material, PowerPoint files, process documents and standards.



The complete listing of SMART Group Training Products, can be found on our website [www.smartgroup.org](http://www.smartgroup.org)



# SMART Group and EU Projects



Peter Grundy



Nigel Burt



Bob Willis

SMART Group is involved with a number of EU Projects which are supported by members of the SMART Group Technical Committee. The projects span a wide range of engineering disciplines where members of SMART have experience and are able to provide support and disseminate technical information to the industry.

### Ship Inspectors

Structural failure is a major cause of the wreckage of ships or sea-going vessels. Wrecked ships or vessels contribute significantly to loss of life and pollution worldwide. There has been tremendous growth in the shipment of oil and oil-based products during the last decade and 90% of the EU's oil needs arrive by sea. Clearly, there is a need to monitor shipping effectively and cheaply so that tragic losses are minimised. Not only are about 1000 deaths attributable to structural failure each year but the clean-up costs are enormous.

The EU decided to fund a project to develop new or novel ways of using phased array ultrasonic emissions so that safety critical areas of a ship can be monitored without the need to place the ship or vessel in dry-dock. This allows constant monitoring of the vessel's condition in order that visits to a dock or repair centre only occur when suspicious signals arise. This is more cost-effective than before and is also intended to reduce deaths and injuries to dock workers and inspectors who suffer a high accident rate.

In common with other EU-funded projects, various organisations within the EU are set up as technical developers who work on the technology, disseminators who circulate the information gained from the developments to all interested parties, and groups or organisations who act in an advisory capacity. The project has been live since May 2009 and it is hoped that the first set of research and development data will be ready for dissemination by September 2010. Technical Committee member responsible for this project is Peter Grundy, for further technical information contact [peter.grundy2@btinternet.com](mailto:peter.grundy2@btinternet.com)

### Micro Ball Grid Array ( $\mu$ BGA) Spheres

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 miniaturization, 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. Technical Committee member responsible for this project is Bob Willis, for further technical information contact [technical@smartgroup.org](mailto:technical@smartgroup.org)

### TestPEP

The TestPEP Project addresses the needs of a large community of SME-AGs and SMEs in the huge global plastic pipeline distribution industry sector for gas and water and also the large potential market of civil nuclear power generation and reprocessing. The SME-AGs in the consortium represent a supply chain involving a number of NDE industry associations representing about 25% of the SME suppliers of equipment, sensors and inspection services throughout the EU for the pipeline inspection market Supply Chain

Most leaks in plastic pipe water and gas supply distribution pipe lines arise from improperly fused pipe welded joints. The best method of alleviating the risk of leaks and maintaining the quality of welded joints in plastic pipes is to inspect them prior to service. However, there is no accepted NDE method for the examination

of plastic pipes. This has caused a risk to both the public and the plastic pipe industry. Furthermore, the environmental risk, with leaks of effluent, gas and water are severe.

Plastics are relatively new structural materials and they provide significant challenges for NDE. In particular, these materials are very opaque both acoustically and thermally. Furthermore, the application of radiography in the field or in a town centre is totally unacceptable for safety reasons. This has restricted the use of welded plastic pipe systems for more demanding service applications such as in the nuclear industry, because of a lack of confidence in the long term reliability of these systems. But plastic pipe is now being used in the gas and water industries throughout the world. The current best practice for inspection of these steel welds uses ultrasonic phased array NDT.

From this evidence it is clear that the plastic pipe industry is out of step and lagging well behind the steel pipe industry. Technical Committee member responsible for this project is Bob Willis, for further technical information contact [technical@smartgroup.org](mailto:technical@smartgroup.org)

Currently there are two other projects which are still in the discussion stages. These will be considering Counterfeit Components Identification by X-Ray and Improving X-Ray Inspection Techniques. Technical Committee member responsible for this project is Nigel Burtt, for further technical information contact [njb@nigelburtt.co.uk](mailto:njb@nigelburtt.co.uk)

For further information on SMART Group and how members can benefit or participate in these projects contact Tony Gordon at [info@smartgroup.org](mailto:info@smartgroup.org) or call Tony on 01494 465217

## Moving on from lead-free to halogen free? Nigel Burtt

The original proposals for a revised RoHS Directive added no additional substances to be restricted. However, at the beginning of December 2009, the EU's Committee of the Regions expressed "...concern about the still widespread contamination by hazardous substances and materials used in EEE" and said that it "...regrets that no new items have been added to the list of prohibited substances...", mentioning in particular flame retardant HBCDD, and plasticizers DEHP, BBP and DBP, all of which were already on the first issue of the REACH SVHC candidate list.

Meanwhile, Jill Evans, Member of the European Parliament and rapporteur on its Environment Committee for the RoHS Directive, gave a speech on December 1st, 2009 saying that "...the recast is an important opportunity to move further forward..." and concluded "...We should take the opportunity, working together with industry, to make the next generation of electrical and electronic equipment free of PVC and halogenated flame retardants." Her draft report to the European Parliament published on 14th December proposes amendments to RoHS specifically adding the following to the list of restricted substances:

- Brominated flame retardants
- Chlorinated flame retardants
- PVC
- Chlorinated plasticizers
- DEHP
- BBP
- DBP

Given so many product safety standards which our industry has to comply with, such as UL certification, the removal of all such substances may present significant challenges – perhaps making the transition to lead-free solder seem simple by comparison. Fortunately, the plastics industry seems to be already well advanced in providing replacements. There is a useful primer for those of us whose education in chemistry stopped before our twenties at: [www.halogenfree-flameretardants.com/HFFR-72.pdf](http://www.halogenfree-flameretardants.com/HFFR-72.pdf)

(Note Of course, there are also many organisations lobbying against this and this is still just a proposal with further alterations possible prior to the next stage of consideration.)



### Caption Contest Update

The winner of our caption contest (from our last Newsletter) is Mike Inman, Technology & Transport Certification Manager at BSi. The winning caption was 'Grab the Global Market'. Mike will attend a future SMART Group event as our guest.

## SMART Group Announces New Process Control Test Methods Solder Paste Standard

SMART Group announces the release of its first Standard, "Control of Solder Paste used in Electronic Assembly Process" (Document reference: SG PCT01), that is intended to help electronics assemblers to determine the suitability of the solder paste prior to production. The tests show the actual useful life of the paste that will help to reduce waste and environmental impact.

The test methods employed are adaptations of the methods employed by paste manufacturers found in IPC-TM-650, IPC J-STD004/5 and IEC 61189-5. They assess solder paste for Slump - Spread - Wetting - Tack - Balling. Gathered data also provides the "Open Time" that the selected paste can provide to the user.

Process Control tests have become essential to CEM's, ECM's and ODM's as they strive to enhance yields, improve product reliability and increase profits.

Good measurement practice, preferentially, requires only one variable - the item under test. However, this often requires far more sophisticated methodology than is practicable in a production environment - the demands in production are for something that is quick and easy to do, allowing a Go / No-Go answer rather than a definitive Pass / Fail.

This new Standard provides, for the first time, a user-friendly test procedure that may be conducted in less than one hour. Simple ceramic or copper clad FR4 type coupons are employed and the solder paste is applied using special stencils applicable to the test in question. To carry out the tests, the user will require some items that, whilst readily available, are not necessarily "in-house" items. They include: Force Gauge, Hot plate, Microscope x10 to x30, Camera, Stencils and Printer and Coupons (Ceramic and FR4 type)



There are, of course, commercially available systems that can be used to conduct all of these tests. Some of these are also able to provide image capture and comparison software that make the testing even easier and more useful.

SMART Group Vice-Chairman, Graham Naisbitt, who initiated this Standard, announced: "This document is an important new development to our membership and beyond. Process Control Tests are in high demand but have not been easy to implement because invariably it results in arguments between the user and the supplier.

"What we have set out to achieve is a careful balance of the needs of each and of enhancing the user / supplier relationship."

SMART Group Chairman, Keith Bryant, welcomed this Standard, explaining: "It is hoped that our members will find this work extremely useful and will raise issues requiring us to look at further Standards requirements".

Note: This new Standard, including images and diagrams of what type of defect is occurring and cost implications is available in the members area of SMART Group web site [www.smartgroup.org](http://www.smartgroup.org).

If members have any suggestions for future STANDARDS please don't hesitate to contact Tony Gordon [info@smartgroup.org](mailto:info@smartgroup.org).

## SMART GROUP EVENTS DIARY 2010

### 9th-10th March

NEW Exhibition and Conference,  
SA (Includes SMART Group Seminars)  
**Sandton, Johannesburg, South Africa**

### 18th March

Multilayer Builds  
**RSG - Scotland**

### 15th April

Inspection of Printed Circuit Boards  
**RSG - Scotland**

### 20th April

Practical ESD Control Workshop  
**Cooper MTL, Luton**

### 13th May

Practical Lead-Free Experience over  
4 Years, (The Full Story So Far)  
**Crowne Plaza Hotel, Dublin 9**

### 18th -19th May

National Electronics Week  
**NEC Birmingham**

### 20th May

Board Specifications  
**RSG - Scotland**

### 3rd June

Lead-Free Wave,  
Flux and Selective  
Soldering Workshop  
**The Oxfordshire, Thame**

### 16th June

Solar Technology Day  
**DEK Weymouth**

### 17th June

Main Cost Drivers of  
Printed Circuit Boards  
**RSG - Scotland**

### 13th July

Reliability Day  
**NPL Teddington**

### 15th July

Quality Standards and Printed Circuits  
**RSGAC - Scotland**

### 2nd September

Zero Defect Printing  
**The Oxfordshire, Thame**

### 16th September

Medical Electronics Seminar  
**Avocent, Shannon**

### 16th September

Lead-Free SMT, BGA  
& PoP Rework Workshop.  
**The Oxfordshire, Thame**

### 6th-7th October

Cleaning and Conformal Coating  
Conference (Major Event concludes  
our 25th Anniversary)  
**The Oxfordshire, Thame**

### 25th November

Supply Chain Management  
**Henkel, Dublin 24, Ireland**

To view any updates please visit the Diary Page on our website.

Note: SMART Group Scotland meetings are held at the Royal Scots  
Guards Association Club (opposite Haymarket Station), Edinburgh.

For location visit <http://tinyurl.com/rd4qzx>

Join us for our final event  
celebrating our 25th Anniversary.



The venue is the Oxfordshire Golf Club Conference Centre, overlooking this  
championship course. The date is 6th & 7th of October for a Cleaning and  
Conformal Coating Conference.

More details will be available soon.

To book an exhibition space contact Tony Gordon [info@smartgroup.org](mailto:info@smartgroup.org).

