



Bob Willis General Experience Profile & Lead-Free Specific

Bob Willis currently operates a training and consultancy business based in England. Bob is the Technical Manager of the SMART Group and a member of the technical committee. Although a specialist for companies implementing Surface Mount Technology Mr Willis provides training and consultancy in most areas of electronic manufacture. In the last 10 years focusing on lead-free manufacture which has eared him the ***SOLDERTEC/Tin Technology Global Lead-Free Award*** for his contribution to the industry He has worked with the GEC Technical Directorate as Surface Mount Co-Ordinator for both the Marconi and GEC group of companies and prior to that he was Senior Process Control Engineer with Marconi Communication Systems, where he had worked since his apprenticeship. Following his time with GEC he became Technical Director of an electronics contract manufacturing company where he formed a successful training and consultancy division.

As a process engineer, he was involved in all aspects of electronic production and assembly involved in setting up production processes and evaluating materials; this also involved obtaining company approval on a wide range of Marconi's processes and products including printed circuit board manufacture for MOD and British Telecom. During the period with Marconi, experience was gained in methods and equipment for environmental testing of components, printed boards and assemblies with an interest developed in many areas of failure and defect analysis. Over the last 20 years he has been involved in all aspects of surface mounted assembly, both at production and quality level and during that time has been involved in training staff and other engineers in many aspects of modern production.

Mr. Willis has travelled in the United States, Japan, China, New Zealand, Australia, South Africa and the Far East consulting and lecturing on electronic assembly. Mr. Willis was presented with the ***"Paul Eisler award by the IMF (Institute of Metal Finishing)"*** for the best technical paper during their technical programmes. He has conducted SMT Training programs for Texas Instruments and ran Reflow and Wave Soldering Workshops in Europe for one of the largest suppliers. Mr Willis is an IEE Registered Trainer and has been responsible for training courses run by the ICT and PCIF originally one of Europe's largest printed circuit associations. **SMTA, Surface Mount Technology Association** recently presented Bob with their ***2008 International Leadership Award*** for continued contribution to industry. Bob is also due to accept an ***IPC Committee Award*** for contribution to their standards.

Bob has conducted workshops and set up production lines, assembly features & his ***"Process Advice and Defect Clinic"*** with all the major organisations and exhibition organisers World Wide and is known for being an entertaining presenter and the only presenter to use unique process video clips during his workshops to demonstrate each point made.

Mr. Willis was Chairman of the SMART Group, European Surface Mount Trade Association from 1990-94 and has been elected Honorary President for life and currently holds the position of SMART Group Technical Manager, he also works on BSI Standards Working Parties. He is a Fellow of the Institute Circuit Technology, an NVQ Assessor, Member of the Institute of Quality Assurance and Society of Environmental Test Engineers. Bob Willis currently writes regular features for AMT Ireland, Asian Electronics Engineer and Circuits Assembly the US magazine. He was responsible for writing each of the SMART Group Charity Technology reports, which are sold in Europe and America by the SMTA to raise money for worthy causes. Bob Willis helped organise the SMART Group-Lead Free Mission to Japan to examine and report on the current state of lead-free research and implementation of lead-free processes. Bob ran the SMART Group PPM Monitoring Project in the United Kingdom supported by the Department of Trade and Industry and coordinator of the LEADOUT Project for the SMART Group.

Involvement in Lead-Free Process Development

Bob Willis has been involved with the introduction and implementation of lead-free process technology for the last 10 years. He recently received A ***SOLDERTEC/Tin Technology Global Lead-Free Award*** for his contribution to the industry, helping implementation of the technology. Bob has been a regular contributor to Global SMT magazine for the last five years. He was responsible for co-ordination and introduction of the first series of hands-on lead-free training workshops in Europe for ***Cookson Electronics during 1999-2001***. These events were run in France, Italy and the UK and involved lead-free theory, hands-on paste printing, reflow, wave and hand soldering exercises. Each non commercial event provided the first opportunity for engineers to get first hand experience in the use of lead-free production processes and money raised from the events was presented to local charity. More recently he co-ordinated the ***SMART Group Lead-Free Hands On Experience*** at Nepcon Electronics 2003. This gave the opportunity for over 150 engineers to process four different PCB solder finishes, with two different lead-free pastes through convection and vapour phase reflow. He also ran the ***Experience 2 & 3*** in 2004/2005. 2006 sees Nepcon back at Birmingham and Bob will again be organising the features.

He has also run training workshops with research groups like ***ITTF, SINTEF, NPL & IVF*** in Europe. Bob has organised and run three lead-free production lines at international exhibitions ***Productronica, Hanover Fair*** and ***Nepcon Electronics*** in Germany and England to provide an insight to the practical use of lead-free soldering on BGA Ball Grid Array, CSP Chip Scale Package, 0210 chip and through hole intrusive reflow connectors. This has resulted in technical papers being published in Germany, USA and the United Kingdom. Bob also defined the process and assisted with the set-up and running of the first

Simultaneous Double Sided Lead-Free Reflow process using tin/silver/copper for reflow of through hole and surface mount products. This year 2005, he will be running a Lead-Free Production and Seminar feature at Productonica in Munich Germany with Global SMT magazine.

Bob also had the pleasure of contributing a small section to the first Lead-Free Soldering text book ***"Environment - Friendly Electronics: Lead-Free Technology"*** written by ***Jennie Hwang*** in 2001. The section provided examples of the type of lead-free defects companies may experience in production. Further illustrations of lead-free joints have been featured in here most recent publication ***"Implementing Lead-Free Electronics"***. He has also contributed a small section to Joe Fjelstad's latest book on flexible circuits.

Mr Willis led the ***SMART Group Lead-Free Mission to Japan*** and with this team produced a report and organised several conference presentations on their findings. The mission was supported by the DTI and visited many companies in Japan as well as presenting a seminar in Tokyo at the British Embassy to over 60 technologists and senior managers of many of Japans leading producers.

Bob was responsible for the ***Lead-Free Assembly & Soldering "CookBook" CD-ROM*** concept in 1999, the world's first interactive training resource. He implemented the concept and produced the interactive CD in partnership with the ***National Physical Laboratory*** (NPL), drawing on the many resources available in the industry including valuable work from NPL and the DTI. This incorporated many interviews with leading engineers involved with lead-free research and process introduction; the CD-ROM is now in its 3rd edition.

Bob has recently produced three new lead-free interactive CD-ROMs with Soldertec Global/Tin Technology covering ***Hand, Wave and Reflow Soldering*** each CD introduced by Kay Nimmo world leading expert on lead-free and the WEEE and RoHS legislation.. These CDs complement the range of lead-free training CD-ROM offered by Bob who has just introduced a CD entitled ***PCB Design, Layout, Assembly and Lead-Free Defect Guide*** each of which are sold World Wide by IPC.

Recently Bob has produced one of the first set of ***Lead-Free Inspection Wall Charts*** covering reflow and wave solder joints using lead-free terminations and different alloys and PCB finishes. New sets recently introduced cover ***BGA X-Ray Inspection & BGA Optical Inspection***.

Although the problems associated with fillet lifting of through hole joints have been well documented by many researchers, it was Bob Willis who highlighted the same problem could exist with pin in paste/intrusive reflow and selective soldering processes. He demonstrated that the problem could occur with each of the common lead-free alternative alloys, but despite its poor appearance provided reliable joints even after 2000 thermal cycles. He has recently produced video simulations of fillet lifting to help understand the way fillet lifting occurs, similar to the work done in the US by NIST.

Bob has conducted workshops on lead-free production process for *IPC, APEX & Nepcon Exhibitions* in the USA as well as SMT Nuremberg and Productronica, Germany and *Nepcon Malaysia*. In addition Bob has coordinated the annual *SMART Group Lead-Free Update Seminars* with the SMART Group PR Director, Mike Judd for the last six years. He has also assisted with the launch of two *DTI Lead-Free Reports* written by representatives of Soldertec global and NPL at two Nepcon Exhibitions.

Currently Mr Willis is supporting the NPL *"Lead-Free Masterclasses"* workshops on design, manufacturing and rework which are being presented around the UK. These workshops are sponsored by EM&T magazine.

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