



Quality and Reliability for Electronic Assembly Workshop (RelQual)

6th February 2020 at The Granta Centre, TWI, Gt Abington, Cambridge, CB21 6AL

This IMAPS-UK organised Quality and Reliability for Electronic Assembly Workshop explored many aspects of New Product Introduction and the challenges faced by the micro-electronics industry in satisfying more demanding customer needs. The event was sponsored by Nordson Dage, with each attendee receiving a copy of the book “A Practical Guide to X-Ray Inspection Criteria and Common Defect Analysis”.

Piers Tremlett of Microchip Inc introduced the event and presented an Overview of IMAPS-UK activities and described the other future events in the IMAPS-UK Calendar.

This workshop was attended by 31 people and covered a wide range of experiences in the field of quality and reliability for micro-electronics, including presentations on:

- New Product Introduction by Allan Proudfoot of ALP Consulting
- Design for Manufacturing by Bob Willis
- Reliability Tests Explained by Dave Phillips of TT Electronics
- Holistic Approach to Maximising Reliability by Martin Shaw of Reliability Solutions
- New Product Introduction De-Risking by Simulation by Borja Lazaro Toralles of MTC
- Component Technologies: Profitable Lifecycles by Ian Stothers of Ultra Electronics

The workshop was rounded off with an interactive session on identifying key quality and reliability issues and solutions.

Allan Proudfoot of ALP Consulting introduced the subject of **New Product Introduction (NPI)** based on his many years of experience in industry. He emphasised the need for detailed planning and a deep understanding of customer and supplier requirements throughout the product development, verification and validation phases. Differences in requirements between industrial sectors and geographical locations were also highlighted.

Bob Willis presented on a **Practical Approach to Design for Manufacturing**, where typical defects in surface assembly were described. Thorough documentation of all the process steps was recommended and using physical experiments to understand quality issues such as outgassing and de-wetting of solders could aid in minimising reliability concerns. This was backed up by video demonstration and Bob mentioned that several books on this subject are available.

Dave Phillips of TT Electronics (see below) explained the range of **Environmental Tests** that are normally carried out to test the integrity of electronic products. In addition combined environmental tests are often performed for particular customer requirements for example in corrosive atmospheres. The pros and cons of accelerated testing procedures were also explained.



Martin Shaw of Reliability Solutions presented an **Holistic Approach to Assessing Product Reliability** based on a scoring and weighting system to producing an overall score of the confidence that the product will be fit for purpose. The scoring system is based on assessment of design maturity, design for assembly, early life reliability testing and failure escapes, accelerated life tests failure prediction and DFMEA. This system is being widely used for high volume consumer products and could be applied to lower volume applications provided that failure data is available.

Borja Lazaro Toralles of MTC gave a talk on using **Simulation to De-risk NPI** by reducing the number of design iterations as well as optimising product performance and quality. This was illustrated through an example of an electronic assembly using a Thermo-electric cooler (TEC), where inputs of thermal conductivity, mass, density and heat capacity could be analysed to produce optimised temperature outputs, thereby minimising the number of practical experiments that would need to be carried out.

Ian Stothers of Ultra Electronics presented on **Component Technologies; Profitable Lifecycles**, with a focus on the challenges of the aerospace industry faced with an electronics market dominated by commercial products. The many pitfalls were described; in order to achieve profits, extensive planning needs to take place to cover the entire lifecycle of the products, which may be up to 40 years for an aerospace system.

Workshop Session

The delegates participated in an interactive workshop session to:

- What are your current main issues in quality and reliability for electronics assembly?
- What solutions are needed to address the main quality and reliability issues?

The main questions that arose and were discussed included:

- Are customer led specifications the solution to achieving quality products?
- Identifying latent product defects in boards that are not detected until the systems are in the field
- How to reduce qualification times
- Increasing quality demand from customers, without willingness to pay for it.

The attendees also had the chance to network with the Speakers during the refreshment and lunch breaks.

For further information on forthcoming events, please visit IMAPS-UK (www.imaps.org.uk)