

Lead-Free Solder Joint Reliability Basics by Dr. Jean-Paul Clech

Join us for a webinar on Nov 16, 2016 at 8:30 am PST Cost \$300, Group discounts available!

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Given the proliferation of lead-free solder alloys, and the dearth of lead-free reliability data and modeling tools, taking care of the basics is of utmost importance to designers and product engineers having to build in long-term solder joint reliability. This 3-hour webinar, which costs \$300, reviews basic board, component and board assembly parameters that effect solder joint reliability regardless of solder composition, tin-lead or lead-free. Rules-of-thumb and design-for-reliability guidelines are presented that are of help to improve solder joint life under both thermal and mechanical loading conditions. Accelerated testing procedures and acceleration factors are also discussed briefly. This introductory webinar will be of interest to beginners as well as experienced technical staff needing a refresher on designing for solder joint reliability in electronic assemblies.

This webinar is introductory in nature with emphasis on board and component effect and generic guidelines that can be used to minimize the risk of solder joint failures in circuit board assemblies. While the webinar ends with an overview of lead-free solder joint reliability trends, solder alloy specifics are not covered. Numerous rules-of-thumb (do's and don'ts) are presented based on established industry practices and field failures encountered by the instructor. Main topics include:

- Why bother?
 - ✓ Customer-driven requirements
 - ✓ Solder joint reliability trends
 - ✓ Field failure examples
- Metallurgical issues: contamination; intermetallic; voids; impact of reflow profile.
- Thermal expansion problems:
 - ✓ CTE mismatches: global vs. local CTE mismatches; CTE measurements
 - ✓ Solder joint damage drivers: shear strains, stress/strain cycles
 - ✓ Component parameter effects: pitch and DNP effects; effective component CTE.
 - ✓ Board parameter effects: board material, thickness, in-plane CTEs.
 - ✓ Assembly parameters effects: joint height, pad design and pad size effects
- Mechanical loading problems:
 - ✓ Solder creep under constant load
 - ✓ Vibration loading: board support, stiffener effects; impact of component location.
- Accelerated testing procedures and life data analysis:
 - ✓ Test profiles
 - ✓ Effect of thermal cycling dwell times
 - ✓ Sample size, failure statistics
 - ✓ Acceleration factors
- Lead-free reliability overview:
 - ✓ Lead-free vs. SnPb reliability
 - ✓ Alloy composition effects

- ✓ Alloy proliferation issue and other challenges

WHO SHOULD ATTEND

Design, materials, manufacturing, quality or reliability professionals and managers, attorneys and others who are responsible for, or have to deal with solder joint reliability issues and the consequences of solder joint failures in the field.

PRE-REQUISITES: None other than basics physics and the business-drive to ensure that customer reliability requirements are met.

INSTRUCTOR

Jean-Paul Clech has 25+ years of practical experience in SMT design, soldering quality and reliability assurance. He maintains one of the largest databases of solder joint reliability data, material properties and life prediction models in the industry and is constantly challenged by problems brought about by new and emerging technologies.

Jean-Paul is the founder of EPSI Inc. in Montclair, NJ, where his responsibilities include technical consultation and problem solving for clients across the electronics industry, and the development of engineering tools and training programs to prevent or solve reliability problems in electronic packages and board assemblies. He has also served as an expert-witness in product litigations involving package and solder joint field failures.

Jean-Paul previously was a Member of the Technical Staff and then consultant at AT&T Bell Laboratories. He received the Diplôme d'Ingénieur from Ecole Centrale de Paris, France (Materials Science major), and the M.S. and Ph.D. degrees in Mechanical Engineering from Northwestern University, Evanston, IL. He is the author of over forty technical papers, a frequent speaker at technical conferences, and has been an invited lecturer and instructor at various corporate events and professional venues in Asia, Europe and North America. He is an active member of ASME, IEEE, IMAPS, TMS and SMTA. In 2003, Jean-Paul received the SMTA Member of Distinction award. In 2006, he was presented with the IPC's Distinguished Committee Service award in appreciation and recognition of his contribution to the development of IPC-9701A, Performance Test Methods and Qualification Requirements for Surface Mount Solder Attachments. In 2009, Jean-Paul and his co-authors from Hewlett-Packard received a best paper award at the SMTA International Conference.

Cost: \$300 per person - + 5 or more from same company \$270 each

Date: Wednesday, November 16, 2016

Time: 8:30 AM – 11:30 AM PST (California)

After registering, you will receive a confirmation email containing information about joining the webinar.

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