

Teradyne Webinar March 3

Impact of Lead-Free Solder on PCB Test & Inspection

Questions have been combined to add clarity to the answers.

Is contact resistance build-up a concern for ICT?

Most of the high-performance in-circuit systems have techniques that can measure the contact resistance build up inside the fixture and on the probe. Yes, increased contact resistance affects low-value device measurement and can affect the guarding effectiveness on other devices being tested.

If the lead-free solder uses more aggressive fluxes, are no-clean processes still possible?

Yes, but more aggressive probes will be required, with an advanced cleaning and/or replacement cycle.

Please clarify the flying probe issues on repeatedly probing on the same pad or joint.

Repeated probing of the same lead-free joint may cause problems. The joint or filled via may crack. It would be better to either probe on test pads or use fixed probes for points that need to be repeatedly probed, such as ground and other power nodes. Design for test (DFT) tools may have to change to give a higher priority to test pads rather than to solder-based test points.

Will probe pressure drop from 8 oz to 4 oz for lead free solder joints?

The issue of board warping on test fixtures will have to be more aggressively addressed with lead-free solder because of the brittle nature of lead free and the risk of cracking lead-free joints that are not perfectly formed. Lower pressure probes make sense from a pressure point of view but at the same time may not provide the pressure needed to penetrate the aggressive lead-free fluxes.

What about using boundary scan as a technique to find shorts and opens introduced to adjacent devices after rework?

Boundary scan is ideally suited to testing and retesting lead-free parts as it is designed to find shorts and opens. With the move towards area array devices, we have more spare pins that can be used for boundary scan test and are seeing an increase in the use of this technique.

When will mil-aero and automotive companies move toward lead-free manufacturing?

Any company that uses contract manufacturers will have no choice about moving to lead-free because EMS companies won't maintain both lead and lead-free lines. And as stated in the presentation, the "low cost" option on parts will be lead free. Therefore mil-aero and automotive companies will transition to lead-free very soon after the mainstream transition.

What steps is Teradyne taking to address PB-free with the Optima AOI systems?

The Optima 7300 post reflow AOI system was part of the NPL evaluation and was proven to be capable of testing lead free joint because of its angled lights and cameras.

What probe styles are being recommended for lead-free boards?

I have asked a number of fixture manufacturers to respond to this in the next few week and will update this response ASAP.

Will capital equipment companies move towards lead free boards in their products?

To sell into Europe by 2006, these products need to be lead free. So the answer is yes.

Is 'tin plaque' a problem with components using 100% tin?

I don't know the answer to this but will find an answer ASAP.