

Title: Mixing different Lead-Free alloys in PCB Assembly

Question

I am assembling PCB using Lead-Free processes; I have selected SAC305 for my reflow process and SACX™ for my wave process. I have not selected my rework alloy.

- Can I create any problems by using different alloys in Reflow and Wave?
- How do I rework my boards, can I use the same cored wire?

Can I create any problems by using different alloys in Reflow and Wave?

Generally the alloy used in reflow on the top side of the board will not come into physical contact with the wave solder alloy used on bottom side surface mount components and through hole components. Therefore the integrity of the joints on the boards is not affected by using different alloys – they retain their intrinsic long-term reliability properties.

Secondary reflow, where a solder joints on the top side of the board get to a temperature above the solidus temperature of the alloy during the wave solder process is a potential issue in any assembly undergoing both processes. The risk of this occurring when using SAC305 for reflow and SACX™ for wave is no more than if using the same alloy for both processes. The operating temperature of the wave solder alloy when using SACX™ compared to SAC305 is the same, therefore the same amount of heat is transferred to the board for any given conditions.

How do I rework my boards, can I use the same cored wire?

SAC305 and SACX™ are both Tin/Silver/Copper based alloys and therefore have the same basic ingredients. Through extensive reliability testing we have established that the performance of SAC305 and SACX™ solder joints using accelerated life testing are comparable. Therefore it is acceptable to rework SAC305 joints with SACX™ and vice versa, the small amount of alloy mixing that takes place is not deemed to be a significant risk to the reliability of the solder joint.