



Lead Free Applications Lab

Process Update

OK International is pleased to announce our new Lead-free Applications Lab. For many years, we have been recognized as a leader in hand soldering and rework technology. Our SmartHeat® technology offers significant productivity and process advantages in lead-free hand soldering. Our Applications Team is knowledgeable in lead-free soldering processes and is able to provide assistance and recommendations when converting to lead-free hand soldering and rework processes.

Lead-Free hand soldering requires tighter process control.

Solder Alloy	Melting Point	+ 40°C (72 F)
60 / 40 Tin Lead	183°C (361 F)	223°C (433 F)
Sn 3.8 Ag 0.7 Cu	217°C (423 F)	257°C (495 F)
Sn 0.7 Cu	227°C (441 F)	227°C (513 F)

IPC recommendations indicate that solder should be held at 40°C above its melting point for three to four seconds. Typically hand soldering times are shorter, however this means that lead-free soldering temperatures could be as high as 52°C above a traditional process. This puts the maximum temperatures dangerously near to the FR-4 pad delaminating temperatures and leaves only a small margin for error.

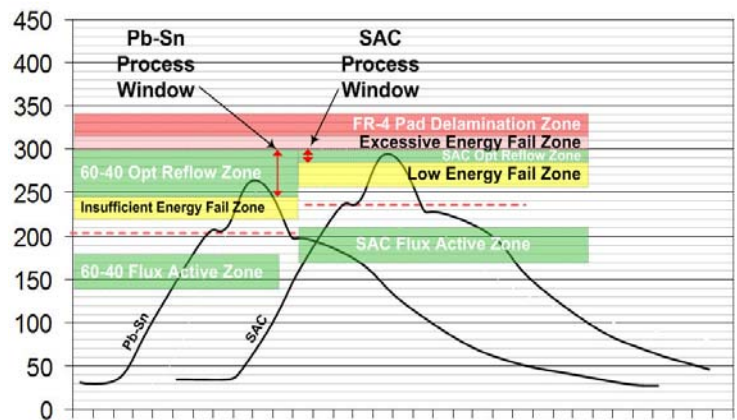


Figure shows the narrower process window for lead-free when compared to traditional eutectic hand soldering.

The best practice when evaluating lead-free hand soldering connections is to optimize the energy transfer to the joint before raising soldering temperatures.

For your Lead-Free process contact us for:

- Lead-free evaluation support
- Thermal requirement assessment & tip recommendations:
 - Send your PCB's and solder to us for tip & process recommendations
- Seminar information and training support.
- Your main rework issues: our experts work with the major solder and flux manufacturers for solutions.



Eutectic solder joint



Lead-free solder

Best Practices For Lead-Free Soldering

- Understand the thermal requirements of the joint.
- Select the correct tip geometry:
 - Use the largest contact area to pad.
 - Use the largest tip body to maximize energy transfer.
 - Use the shortest tip length to maximize energy transfer.
- Understand the board coatings and their wettability.
- Understand the flux and solder combinations.
- Keep iron tips tinned to prevent oxidation.
- Use preheat for rework where required.

Conclusion

Soldering at the lowest temperatures with good thermal transfer will provide the best results and safest process.

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