

## FAQ's

### **Q. What is Cemco Services?**

Cemco Services have been providing subcontract Solder Coating and Hot Air Leveling of Printed Circuit Boards to the industry for more than 23 years using state of the art equipment manufactured by CEMCO-FSL. Over the past 6 years Cemco Services have assisted CEMCO-FSL with the development of their LEAD FREE HASL systems and have co-operated in the development of LEAD FREE SOLDERING products for major Solder and Soldering Chemical suppliers around the world.

### **Q. What is your experience with LEAD FREE solders?**

Cemco Services and its associate company in Scotland, Quicksilver Services processed many of the samples in research programs conducted by groups including: Nortel Networks Joint Lead Free Collaborative Program, Celestica and INEMI.

The experience gained during processing both experimental and production quantities of panels for most of the major EMS companies and PCB fabricators around the world provides a unique resource for both evaluating Lead Free FUSED SOLDER COATINGS and for the re- processing of boards with 'ALTERNATIVE' surface protection coatings.

### **Q. Why would we choose fused LEAD FREE solder in preference to alternative surface coatings?**

#### ❖ Solderability

None of the 'non fused' surface protective coatings guarantee solderability. Some 'alternative' coatings that have proven reliability when using lead solder may not be reliable at the higher time/temperature cycles demanded by lead free assembly.

#### ❖ Shelf Life.

HASL has always provided a long shelf life, lead free hasl results thicker minimum deposits for a given pressure setting.

#### ❖ Wetting time.

Lead free solders do not wet to Copper, Nickel or other protective coatings as readily as Tin lead solders. Wetting solder to solder will always be faster and more reliable.

#### ❖ Spread and fillet angle.

Lead Free Solder paste will not spread beyond the printed area with most protective coatings. Pre wetted surfaces ensure complete coverage.

#### ❖ Reduced voiding.

Customers have reported that fused solder coatings have eliminated voids associated with organic coatings.

#### ❖ Cost and Reliability

HASL has always been the ultimate QA tool. The process highlights material and manufacturing defects on the bare board, as received, prior to assembly.

Demand for LEAD FREE HASL continues to increase as more and more assemblers recognise the advantage of assembling onto solder rather than a 'protected' copper surface.

### **Q. Can you replace an alternative Protective Surface Coating with LEAD FREE solder?**

YES. Cemco Services can remove most alternative finishes and replace them with a fused NoLead solder.

### **Q. Can you remove Conventional SnPb HASL and replace it with Lead Free?**

YES but only after chemical stripping. The proposed upper limit for lead in lead free solder is 0.1% by weight. Reprocessing circuits would rapidly contaminate the solder pot.

### **Q. Will LEAD FREE solder provide a more planar surface?**

YES. Our experience has shown that large surface areas (always the thinnest coating) are between 40% and 80% thicker and small areas (always the thickest coating) are between 40% and 80% thinner.

**Q. Can I use the same solder paste Stencils?**

YES. But because the solder will flow to the edge of pads a smaller aperture may be used to advantage. Stencils should also be designed to provide clearance over fiducials, test points and other features that may not have a component attached but that will receive a solder coating; to ensure the stencil will conform to the board surface and not 'leak' under the stencil.

**Q. Won't the solder paste slump on fused solder finishes?**

The flatter topography of lead free HASL reduces the slumping problems sometimes experienced with small features; but it may be necessary to change the aperture size and or shape to eliminate this problem on some pad/component designs. Speak with your stencil supplier or CEMCO Services for assistance.

**Q. Will holes clear?**

YES. Hole clearing is better with lead free solders.

**Q. Won't LF HASL leach too much copper?**

NO. All protective coatings demand micro etching prior to application. HASL generally requires less as the process confirms solderability. Electroless metal deposition is a conversion process, replacing copper 1-1 with Tin or Silver.

All soldering operations will dissolve copper proportional to time and temperature. Some alloys dissolve copper faster than others. In our experience the 3-4%Ag SAC alloys are the worst, dissolving approximately 1 micron after a six-second immersion at 275 C. The Ni stabilised SnCu alloys seem to be the best at around 0.5 Microns. Horizontal leveling results in a contact time of approximately 2 seconds, Vertical Leveling approximately 5 Seconds.

We have conducted controlled dissolution testing with 6 different alloys including SnPb. Results are available to interested parties.

**Q. Won't the higher temperatures result in too much thermal shock or Z-axis expansion damage?**

We have processed all types of circuit from phenolic paper to 6mm thick backplanes over the past 7 years and have had no reported damage or degradation resulting from the higher time temperature cycles used.

BUT HASL DOESN'T MEET MY ASSEMBLY PROCESS REQUIREMENTS...

Is it HASL that doesn't meet you requirements or is it the HASL quality you have experienced? Why not send us samples of you most problematic boards and see what can be done or visit by appointment or one of our open days.

## LEAD FREE LEVELING OPEN HOUSE

- Come and visit our Hampshire facility and talk through your lead-free levelling issues.
- Vertical QUICKSILVER and horizontal ALCHEMY soldering machines available to view.
- Bring samples and let us run comparison test with SnPb and LEAD FREE alloys.
- Talk to our sales team about converting your Quicksilver for LEAD FREE solder coating.

Call to reserve your place on 02392 241166 or email [cemco.services@cemco.com](mailto:cemco.services@cemco.com)