

Stellar Technical Products – Gardena, CA – June 13, 2005

LEAD-FREE SOLDER IMPLEMENTATION for ELECTRONIC MANUFACTURERS

The deadline is fast approaching to meet the new guidelines (see below) and by now you should already have a timetable in place for implementation. For most PCB assemblers the major item needed is a new or 2nd wave solder machine. At the end of this article we list the solder alloys that have become the most accepted for the new lead-free processing. Samples of wire and paste are available for evaluation as well as a “dummy” PCB lead-free validation kit.

WHAT EXACTLY IS THE NEW LEGISLATION?

The European Union countries (EU) issued in 2003 a “Directive on the Restriction of Use of Certain Hazardous Substances” (ROHS) which takes effect on July 1, 2006. The ROHS Directive restricts the use of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB’s) and polybrominated diphenyl ethers (PBDE’s) to a maximum concentration value of 0.1% by weight and 0.01% for cadmium.

The ROHS Directive covers electrical and electronic equipment such as printed circuit boards, power supplies, motors and drives, electronic components, displays, switches, sockets and connectors.

The following products are exempt from the requirements:

- >Lead in solders for servers, storage and storage array systems.
- >Lead in solders for network infrastructure equipment, critical life support
 - >medical and monitoring equipment, aerospace and military products.

ROHS Legislation aims to reduce environment impacts of waste and improve recyclability.

In January 2003 the EU Council also adopted the “Directive of Waste Electrical and Electronic Equipment” (WEEE). This directive requires producers of electrical and electronic equipment to finance the collection and disposal of their products at the end-of-life. WEEE has specific target dates for recycling and recovery, with the first target being August 13, 2005.

WEEE Legislation aims to conserve landfills and boost recycling.

HOW DOES IT AFFECT YOU AND YOUR CUSTOMERS?

If you or your customers sell or ship any of the covered electronic components, sub-assemblies or finished products directly to any of the European Union countries it will be you or their responsibility to ensure that compliance is met for all covered products made for or shipped into the EU market. Also, if you supply components (i.e. circuit assemblies) or equipment to a U.S. OEM selling into the EU market, you will be required by those OEM customers to prove your ROHS compliance or you risk being removed from their supplier lists.

PLANNING for IMPLEMENTATION – ACTIONS THAT YOU NEED TO TAKE

Bill of Materials: You will need to change / convert all parts and part numbers for components to new part numbers that are free of lead, cadmium, PBB's, etc. This includes bare PCB's, all components and sub-assemblies.

Equipment Change Considerations: The wave solder machine will need a new or re-coated solder pot. The lead-free alloys corrode the solder pot and pump housings. You will need a new specially coated solder pot to prevent this.

You may also need a longer SMT reflow oven or one with more heated zones. The lead-free solder paste has a peak reflow temperature of 240C, compared to the 215C peak temperature used with processing 63/37. An 8 – 12 zone oven is usually the minimum size required for good results on multi-layer PCB's.

Process Changes: Wetting (solder flow) times will decrease, solder joints may appear grainier and more dull, requiring re-training of hand-soldering operators. New SMT reflow profiles will be needed, as will wave solder machine settings.

Lead-Free Validation Kit: We recommend building sample / test Lead-Free PCB assemblies using dummy components, dummy boards and Pb-Free paste, wire and stencils. These materials are available from us in a kit. This will give your staff and line workers some advance practice with the new materials. We also offer from Cookson Electronics Analytical Labs – Test Levels 1 – 2 – 3 of your assembled “dummy” boards. The testing

provides non-destructive inspection, photo-microscopic cross-sectioning and certification of your Pb-Free process. CALL US FOR PRICING ON THESE SERVICES.

STELLAR TECHNICAL PRODUCTS

Gardena, CA 310-660-0140

Following is a listing of our new Alpha Metals **Lead-Free** soldering products now commercially available for printed circuit board assembly:

LEAD-FREE ELECTRONIC SOLDER PRODUCTS

LEAD-FREE WAVE SOLDER BAR PRODUCTS

<u>Part #</u>	<u>Alloy Name</u>	<u>Sn (Tin)</u>	<u>Ag (Silver)</u>	<u>Cu (Copper)</u>
96-307-10	SAC0307	99.0%	0.3%	0.7%
96-305-10	SAC305	96.5%	3.0%	0.5%
96-305-11	SAC300	97.0%	3.0%	----

[The SAC0307 Alloy yields smoother looking solder joints than the SAC305 Alloy and is about \$3.00 /lb less expensive. The downside is that the SAC0307 wets more slowly than the SAC305, but this is less of a problem in wave-soldering than in hand-soldering applications. SAC300 is used only as a pot sweetener to maintain the SAC305 Alloy tin-silver levels.]

LEAD-FREE SOLDER WIRE PRODUCTS

96-320-42	SAC305	Purecore (Water-Sol.)	.020" diameter
96-325-42	SAC305	Purecore (Water-Sol.)	.025" diameter
96-332-42	SAC305	Purecore (Water-Sol.)	.032" diameter
96-320-51	SAC305	TeleCore (No-Clean)	.020" diameter
96-332-51	SAC305	TeleCore (No-Clean)	.032" diameter

LEAD-FREE SMT SOLDER PASTE

03-338-50	SAC305	OM-338 (Omnix No-Clean)	500 gram Jar
03-619-50	SAC305	WS-619 (Water-Soluble)	500 gram Jar

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Quality Soldering Materials & Equipment

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