

The Five Stages of Lead-Free

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“Life is pleasant. Death is peaceful. It’s the transition that’s troublesome”
- Isaac Asimov

Death and Lead-free have something in common. They are both inevitable. Unlike death, though, Lead-free is not necessarily terminal. In fact, its purported purpose was to eliminate a potential health hazard. Nevertheless, RoHS takes effect in July 2006 and if you market your products in the EU, any new inventory shipped and/or sold there will have to be lead-free. This also means that you had better have, at the very least, a Lead-free Roadmap in place by mid-2005. Don’t fight a fact, deal with it.

There is a lot of good information out there and your company’s road-map will be developed only after a lot of research and input from lots of sources. Be aware that there is still a bit of ambiguity about lead-free and RoHS. At present, a regulating organization to check compliance has not yet been selected. . The RoHS definition of “lead-free is of “0.1% by weight per homogeneous material for lead” with a homogenous material being “ a unit that cannot be mechanically disjointed into single materials”. This would bet he solder, the lead finish, the PCB finish, a cable tie, wire insulation, etc. . But, just how will compliance be checked? And by whom? These and other questions will be answered in time – perhaps not by July 2006 but rest assured they will be. And don’t get ideas about sneaking lead-bearing product in under the wire. Unlike the US, in Europe they have no reservations about putting CEOs and Directors in jail for corporate misdeeds.

In my lead-free implementation work with clients, I have noticed that different regions seem to have attained different levels of “attitude” towards lead-free. I was recently doing some lead-free work with clients in SE Asia and there is a very matter of fact “okay, we have to do it so let’s get on with it” attitude over there. Indeed, quite a number of firms are already producing lead-free products (and not only for Japanese clients). In North America, a vast number of firms are “in denial” regarding lead-free. I consider the later condition as being rather serious and perhaps some therapy may be in order here. So, taking a cue from Dr. Kubler-Ross¹, here are the *5 Stages of Lead-Free*.

DENIAL

¹ Kubler-Ross, On Death and Dying, Simon and Shuster

Surprisingly, having only recently learned of RoHS, this stage is common among North American electronic manufacturers. *“What’s a RoHS? Never heard of it. Lead-free what?”* followed by *“Well, it won’t affect us”* until they realize that a good portion of their market is the EU. *“Well, maybe it will be delayed beyond 2006”*. Thus, the first response is one that can best be described as shock. In most cases, North American manufacturers have become recently and suddenly aware of RoHS as their marketing people never gave them the “heads up” on it. Why that is the case is a bit of a mystery – they should have, marketing people are supposed to be aware of things that affect their companies. While RoHS is not exactly headline news nor does it rate a feature on CNN, it has been quite visibly in the making for the past 8 years and most Europeans were well aware of it. The shock resulting in Denial is usually a very temporary defense.

ANGER

When denial can no longer be maintained, it is replaced by anger, rage and resentment. *“Our industry consumes less than 1% of mined lead – why pick on us?”* *“There have been studies that show that lead-free will be more toxic to the environment than continuing with the use of lead bearing alloys.”* *“This reeks of exclusionary politics !”* Of course these are all valid points however they really don’t matter because RoHS has been enacted so it is a matter of “get with it or get out of the way”.

BARGAINING

This is an attempt to postpone the unavoidable. *“Maybe our product is exempt.”* *“How are we supposed to go lead-free if we can’t get lead-free components from our suppliers.”* *“There aren’t any workmanship standards that cover lead-free.”* First of all, there are quite a number of components that have been converted over to lead-free lead finishes already. What’s scary is that many (but not all) of the component manufacturers have not designated this radical change with their nomenclature (for example a suffix indicating lead-free status of the part). So, in fact many people may be using lead-free components and not even be aware of it. This doesn’t mean that eventually all parts will be available as lead-free. The trick is finding which suppliers and when and BoM review is one of the most challenging parts of lead-free implementation. Yes, there are products that will be exempt from lead-free – some for a limited period of time, some indefinitely. Most of these are medical and avionics related. However, the majority of products will have to comply unless, of course, you want to kiss off your European (EU) markets. As far as workmanship standards, the IPC is convening a committee to produce 610-“D” which will address lead-free. Of course, since these specifications are done by committee they resemble the gestation of an elephant², lead-free workmanship standards are forthcoming.

DEPRESSION

Rage and anger are eventually displaced by fear of the work ahead. *“Lead-free is a logistical nightmare. How will we ever going to make the conversion?”* *“We will have to maintain both leaded and lead-free processes during the transition period, how will we ever manage that?”* *“What if our competition is ahead of us and we look like followers playing catch-up?”* Be careful you don’t get any tears in your solder-pot. For most

² Done with a lot of grunting and roaring and takes 24 months to get any results.

firms, the task is, indeed, Herculean. But the sooner you face up to it, the quicker you can get in gear.

ACCEPTANCE

I have observed a number of assemblers, primarily in Asia as well as Europe, that never became depressed or angry, neither happy nor sad about lead-free, but somewhat void of feelings. As I mentioned, their “we have to do it so let’s get on with it” attitude have carried them through the initial stages of lead-free implementation, though they are still very much, like everyone else, in a learning mode. For the rest of the industry, it’s okay to have these feelings and to come to terms with them. This is a strong and very resilient industry. We have survived having our Freon-based cleaning solvents taken away, VOC restrictions and countless economic downturns. Even the evolution to SMT from PTH 20 years ago, at which time a number of practitioners, obviously in denial, said would be a passing fad. We will overcome the obstacles and adapt, where appropriate, to lead-free. And we will be all that much stronger for it. Remember, we’re all in this together.

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