

Lead-free electronics – virtual panel discussion

In the May 2005 ELEKTRON published the article 'Life without lead' by Brian Smith, Celestica, UK. The case was made for lead-free components, according to the European Union's directive to restrict the use of certain hazardous substances in electrical and electronic equipment from July 2006. ELEKTRON approached various local companies for their comments on the relevance of this directive for South Africa.



Gregg Patterson, EBV
Electrolink



Brian Andrew, RS
Components



Frank Schoombie,
SAMES



André Schwager, UEC

Q Is there any legislation in this regard in South Africa and what are likely consequences for South Africa?

Gregg Patterson, EBV Electrolink

I do not know of any legislation. However the volume manufacturers in our industry service the markets where the legislation applies and need to take the correct action now to continue supplying into these markets post-July 2006. Even though some industries are exempt from the lead-free directives, the larger companies within these industries are environmentally aware and will drive the implementation of lead-free electronics in their end product. Component suppliers and manufacturers are moving in the direction of lead-free component inventory already, to avoid scrap when the laws come into effect. Fortunately the bulk of lead-free components in our portfolio are backwards compatible with leaded processes. The notable exception being BGA packages as the lead-free solder balls have a higher melting point than the conventional solder balls and as a result they do not solder correctly in a conventional process. An added complexity is that it is likely that certain BGA packaged parts will not be available with low temperature solder balls in the future. For these reasons manufacturers need to invest in their process technology should they wish to export into a lead-free market or use BGA packs.

Brian Andrew, RS Components

There is no current legislation for RoHS in South Africa, however the RoHS Directive is fast becoming a de facto world standard. The USA, Asia and Europe comprise the three main markets for consumer electronics and thus manufacturers exporting into these significant territories are hastily changing their processes to ensure continued sales.

The RoHS legislation will also have the following impacts:

- Mainstream component manufacturers consider consumer electronics to be their primary market and are thus making their ranges compliant. This has the impact of forcing other users of these components to adapt to these changes.
- Increased environmental legislation across the globe, including RoHS, is forcing countries currently taking a low key stance in this regard to consider the implementation of similar laws. Furthermore many manufacturers, irrespective of the legal requirement thereof, are making the progression to "lead free" to support their environmental standing.
- Current component and product exemptions from RoHS will all be subject to review in the coming years.

Within South Africa the effects of this legislation will be both outbound and inbound, as electrical

products are locally manufactured for export and equally so the ability to source non-compliant components will slowly dwindle.

Frank Schoombie, SAMES

As far as I know there is no similar legislation in SA. There is however legislation regarding the allowed level of lead vapours present at workstations and the safe disposal of lead. The latter is subcontracted to waste disposal companies and not under the control of the component or system manufacturer.

André Schwager, UEC

I am not aware of any South African legislation in place that prohibits the use of lead (Pb) in the solders used to attach electronic components to a printed wire board. Products sold in South Africa can be produced by using the standard SN62 or similar solders. If a South African manufacturer decides to export to Europe they would need to conform to European standards and comply by producing products without lead, e.g. SnAgCu.

Q What compliance problems have surfaced in the industry, what solutions have been found and what solutions are still being sought?

Gregg Patterson, EBV Electrolink

I expect the full impact of this will only be felt after July 2006. We offer lead-free versions

of nearly all components and if not already available our principals have clear roadmaps.

Brian Andrew, RS Components

Many of the practical issues surrounding working with lead-free solder, tin whiskers, product reliability, etc. have been addressed.

It is however important to recognise that besides technical and manufacturing implications, RoHS also has consequences to supply and value chains. Issues that still require addressing by many companies include the availability of compliant components and the management of change within their existing business processes, for example stock management, purchasing systems, bills of material, design and documentation, quality assurance, etc.

A further question that has been proposed is whether RoHS compliant products should be given new product numbers. To date there is no industry consensus on this issue and opinions remain divided. The argument made by certain component manufacturers is that this would be the only way to ensure compliance whereas others are stating that responsible and effective stock management, such as FIFO, could also address these issues effectively.

Frank Schoombie, SAMES

It is still very early days, but one issue that has surfaced is the question of proof of compliance. It would seem that the one route to take would be to obtain third party test reports. This can however be costly.

André Schwager, UEC

Problems regarding compliance are relevant and cover a wide range of issues.

- Older generation soldering equipment was manufactured with metals that cannot withstand the higher soldering temperatures and the very aggressive nature of tin (Sn). This machinery would need to be replaced, resulting in financial issues for the manufacturer.
- The identification of lead-free components is of great importance, as contamination of the lead-free solder with lead will result in field failures. The industry has not changed all the part numbers to new numbers, but opted to simply mark the components with dots or similar markings. Easy, on-the-floor identification is therefore not clear.
- The lead-free drive has placed the industry in a quandary as it has very little information on the long term effects of using lead-free solders.

Q What compliance issues have our exporters encountered?

Gregg Patterson, EBV Electrolink

No comment – we do not export.

Brian Andrew, RS Components

A number of local manufacturers who export their products have discussed the ability of RS Components South Africa to supply them with RoHS compliant components. These discussions have been entered into based on exporters:

- been approached by their customers to ensure that the products that they purchase are compliant, or
- are already taking cognisance of the implications of the legislation and are preparing to ensure their compliance.

Frank Schoombie, SAMES

See response to previous question.

André Schwager, UEC

No comment.

Q Is compliance being monitored/enforced in South Africa, USA, Europe and Asia?

Gregg Patterson, EBV Electrolink

There are no laws in place yet – the EU RoHS Act will come into effect in July 2006.

Brian Andrew, RS Components

Enforcement authorities are being set up throughout Europe. In the UK the National Weights & Measures Laboratory was recently given the contract for RoHS enforcement. The regulators are taking a realistic view and are looking for manufacturers to demonstrate that they are moving as quickly as possible towards ensuring compliance. There appears to be the recognition that there will still be areas of non-compliance after the 1st of July 2006, however it is expected that this tolerance will be decreased by 2007 and enforcement will accordingly be stepped up.

At this moment in time there is no indication of compliance being monitored or enforced in South Africa via legislation.

Frank Schoombie, SAMES

South Africa - monitored/enforced - no. Required by exporters of equipment/systems from component manufactures - yes.

USA - Don't know. As they are the biggest manufacturer of lead they might not want to.

Europe - yes - required by equipment/systems manufacturers.

Asia - maybe - required by exporters of equipment/systems from component manufactures.

André Schwager, UEC

As the compliance of lead-free manufacturing is not yet mandatory in South Africa, the possibility of the South African government monitoring the progress is very unlikely. To date, the lead-free certification is a self-certification, whereby the

manufacturer states that his product is lead-free via a declaration. This is currently acceptable in Europe.

Q What penalties are being applied and by whom?

Gregg Patterson, EBV Electrolink

No laws yet so no penalties yet. I am not suitably qualified to know what action will be taken once the law is enforced.

Brian Andrew, RS Components

Penalties will vary by country and legislation of this nature has not yet been published across Europe. It is thought that the worst penalty is likely to be the instruction to remove the applicable product from sale throughout Europe. This has obvious financial implications which could be further amplified through potential bad publicity.

Frank Schoombie, SAMES

We have not encountered any and are unaware of any penalties applied. The obvious will be to source products/components from a supplier that can prove compliance.

André Schwager, UEC

No real penalties have been decided, but the UK government has suggested the following in the Phase II consultation document:

- Removal of the product from the market place.
- Possible imprisonment.
- Fines.

These penalties are purely suggestions.

Q Should we be following the European directive?

Gregg Patterson, EBV Electrolink

The South African electronics industry is very closely coupled to the European industry from both a component and market perspective. It would make sense to follow the EU directives.

Most component manufacturers operate on a global basis and will offer an end product suitable for all markets they serve. South Africa is a very small market and would be excluded from a lot of the industry if any special conditions were to be enforced.

The only sensible action would be to either not enforce any RoOHS type legislation in the domestic market or follow the European model. As the global industry swings to lead-free products we will be forced to follow in any event with or without legislation, as most raw material for the electronics industry is imported.

Brian Andrew, RS Components

Regardless of whether South Africa chooses to implement the directive locally we will feel the impacts of the legislation and international market pressures are already, and will continue to produce change.

The RoHS Directive should not be viewed in isolation, but rather as part of a series of environmental measures of which the two key elements affecting electrical products are RoHS [which limits the usage of hazardous content] and WEEE [which encourages the use of environmentally sound procedures for disposing of goods at the end of their lifecycle. This includes re-usage, reclaiming or recycling before crushing and burying].

Frank Schoombie, SAMES

If we want to continue to trade with Europe, we have no choice but to comply with the European directive. If we should enforce the same type of legislation in SA we should do it for the correct reasons. Lead is poison and the other forms of lead in old houses, pipes and dump sites should be addressed first before more demands are placed on our small and fragile local electronic industry.

André Schwager, UEC

If your company exports to lead-free countries, you will have no choice but to conform to European standards. From an environmental perspective lead (Pb) is a dangerous metal both for the human body and the environment. Therefore, elimination of lead is a better long-term objective.

Q Is the manufacturer bound by customer contracts to the content of the product, and what if both lead and lead-free versions of the same products are available?

Gregg Patterson, EBV Electrolink

No comment – we do not manufacture.

Brian Andrew, RS Components

Where a reseller or customer expects a manufacturer to supply compliant goods certain supply agreements may need renegotiation. Ultimately the directive itself will enforce the change over.

It is thought that for economic reasons including; market demand, the cost of producing two versions, the need to “clean” production equipment when moving between leaded and unleaded production, very few manufacturers will over the long term continue to produce both versions of a product. This will be exasperated by the belief that in most instances both versions of a component will only be available for a limited period of time to provide the transition period necessary for supply chains to dispose of the non-compliant stock.

Frank Schoombie, SAMES

Not necessarily in all cases, but as far as it is economically feasible we endeavour to accommodate the customer's requirements. Making components available in both lead and lead-free versions is not seen as a major problem and can be easily managed with the proper product identification and traceability systems.

André Schwager, UEC

The bill of materials requested by the customer needs to be adhered to, but if this product is deployed in a lead-free region, then the bill of materials would need to be amended accordingly.

Q Any other comments you wish to make?

Gregg Patterson, EBV Electrolink

As a distributor we are willing and able to provide our customers with the information and assistance they need for the transition to a lead-free process. We carry dual inventory on most items with the intention of having a lead-free inventory in the short term except for specific customer requirements. We act as a channel between the component manufacturer and the electronics equipment manufacturer but cannot take legal responsibility for compliance of the components we supply.

South African electronic equipment manufacturers need not move to a lead-free process in the short term for domestically-consumed products. However they need to order lead-free components that are backwards-compatible because lead-containing components are going to become very difficult if not impossible to procure from the major manufacturers and distributors in the near future.

Brian Andrew, RS Components

RS is leading the market in identifying component compliance. The RS web site displays full compliance information on all affected product, allowing customers to search for the correct components as well as make educated decisions.

Frank Schoombie, SAMES

The safe disposal of toxic substances is an area that needs serious attention in SA as per recent incidents reported in the media.

André Schwager, UEC

To have both lead and lead-free technologies running at the same time, in the same manufacturing factory, on a continuous basis is not ideal. The possibility of lead (Pb) contaminating the lead-free alloys is too great and risky. □

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