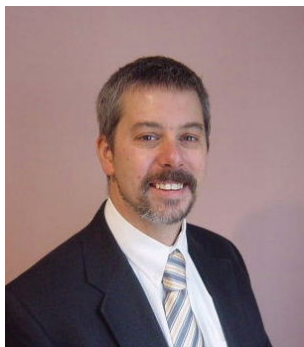


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Editorial

Welcome to the 6th NZTE/Electronics South/ RoHS and WEEE Specialists news letter. I trust everyone has recovered from the seasonal festivities and checked out the crossed out wheelie bin symbol on their new X-boxes and playstations!

There has been a lot of activity with China RoHS with analysis of their 2nd draft and an excellent interview published by Gina Roos of Green Supply Line with Jianzhong Huang of MII. The report from that interview is reprinted in this newsletter.

The DTI in the UK released their final RoHS guidance document in November. There is no substantial changes from the previous editions except for the updating of the exemptions sections. A copy can be found on www.electronicssouth.com on the legislation page of RoHS.

It has been notable that a growing area of concern for companies is material testing. I have fielded numerous enquiries in the last few months on this subject. There is a RoHS testing standard albeit at draft level being developed by the IEC. It encompasses not only the EU RoHS but also China RoHS and is intended to be a generic testing standard for environmental compliance for the electrical and electronics industry. There is an article on material composition testing and the IEC standard later on in this newsletter.

Leading on from this is an area that I am currently investigating which is purity of steel, both mild and stainless. Whilst I can

understand that for newly smelted ore you may not need to test for all 4 RoHS banned metals but surely for metals from recycled sources you would need to test? I have reprinted part of an article from Electronics weekly on this. Any opinion or input from readers would be much appreciated. The same issue would apply to recycled plastics as well and I would appreciate input here as well.

For those of you interested in the lead-free soldering aspects of compliance we have an overview of Bob Willis' Smart Group "Lead-free experience 2005" report which contains everything you ever wanted to know about lead free soldering.

We also have a definitive answer from the UK on whether 19" rack mounted equipment is classified as fixed installation. I wonder where the other 24 countries sit on this?

The Electrical and Electronics industries have good support for RoHS but what about the plastics and metal supply industries who keep getting bombarded with curly questions with undecipherable acronyms from one part of their customer base? To support this crucial part of the supply chain RoHS and WEEE Specialists are developing a course "RoHS for Suppliers and Mechanical Engineers" which will run in Christchurch on 15th February and Auckland on 22nd February

Also on the training front we will be running one day RoHS and one day WEEE courses again in Sydney and Melbourne in the second week of March. The Australian courses in November were very well received with many participants wondering where their competitors and suppliers were. Virtually all attendees indicated the need to modify their compliance plans based on what they learned.

Registration forms are available from www.raws.co.nz - upcoming events.

Roland Sommer
Editor

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An Electronics Weekly Farnell InOne roundtable to debate the problems of RoHS and WEEE compliance discussed the contaminants in components, how to test for them and the best way to get rid of them

Steve Bush
Monday 5 December 2005

Where can you find contamination and how do you tell if a component going into a product is compliant?

This was a major topic of conversation when a group of industry experts was pulled together by Farnell InOne and Electronics Weekly to exchange ideas and interpretations of the RoHS and WEEE Directives.

Aside from the actual components and PCBs, plastics and metalwork can be a minefield. "There is cadmium and mercury in steels," says Mark Shayler of environmental consultancy Eco3. "We are finding more and more."

According to Shayler, 60 per cent of steel is recycled. Mercury added to soften a steel product years ago, or cadmium added for wear resistance, could be in the steel parts you are incorporating. "We are still finding many cases above the [RoHS] threshold," he says.

Testing for these contaminants is hard without resorting to time-consuming wet chemistry, but it is possible. There are two main options: electron microscope-based EDX and X-ray-based XRF. "XRF is much more reliable," says Shayler. "There is room for operator misinterpretation with EDX."

Whereas mercury and cadmium are banned completely, bromine and chromium give subtler problems as hexavalent chromium and two families of brominated fire-retardants are banned, leaving trivalent chromium and numerous bromine

compounds perfectly legal. "You will see if you have got chromium or bromine, but you need several rounds of tests to see if it is banned chromium or bromine," says Shayler.

Donal Horgan, a materials specialist at Molex, agrees. "To my knowledge, it is down to pretty fine instrumentation to do it," he says.

Horgan has been looking into brominated fire-retardants which are found in high-temperature plastics. "Brominated compounds are quite a challenge," he says. "You need to do a mass spectrum on it and at the end of the day, it is down to a highly specialised person to interpret it."

Difficulties in identifying bromine compounds and safety concerns about several more bromine-based fire retardants - some of the more toxic ones have been banned for years - mean bromine is under the spotlight. "There is a lot of debate in industry. There are a lot of challenges and a lot of the main players are focused on this," says Horgan.

Sweden, for example, has side-stepped determining which bromine compound is which by banning the lot. If you are exporting to Sweden, do not use any brominated fire-retardants.

Plastics makers may not even add banned compounds, but Horgan warns they can be produced inside plastic components by chemical reactions between legal compounds during manufacture - which is why some big players are looking to remove all bromine from their plastics.

And bromine is not the only issue with plastics. Cadmium was used in plastics and: "Every piece of PVC that was manufactured more than five years ago had lead in it," says Horgan. "It was pretty much right across the market." His advice is choose your plastics supplier with care. "Sourcing from the Far East is pretty risky," he says.

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It emerges that lead can accidentally find its way into purportedly lead-free components. "We were analysing a gold-plated connector and we found lead," says Leigh Holloway, of Eco3. It did not show up under EDAX, indicating the lead was not in the gold plating but under it. "The only way to find the lead was to dissolve the component leg," says Holloway.

Molex's Horgan - which did not make the connector in question - says: "Nickel sulphamate is almost an industry standard for plating, and there is no lead in it at all," he says. "And lead at more than 5ppm is a poison in gold." Horgan's best guess was that the lead was in or on the brass core of the contacts.

Running lead-inclusive and lead-free materials through the same machinery can result in cross-contamination, says Molex's Matt Wilhite. "The best way to [make lead-free components] is to get lead out of the factory completely."

Distributor Farnell InOne has been testing for banned substances in supposedly compliant components. "Random testing has shown up quite a few," says head of RoHS and WEEE Gary Nevison. To get control of the mavericks, the firm has now expanded its testing programme.

Nevison also warns component buyers not to get hoodwinked by marketing - a lead-free logo does not always mean RoHS compliance.

Reprinted from Electronics Weekly.com

Material Composition Testing

By Roland Sommer RoHS and WEEE (International) Ltd

Many companies are resorting to material composition testing either where they cannot get a material declaration or where they do not have reasonable grounds to believe the

one that they have been given. There is draft specification being developed by the IEC under project PR62321, and it would be legally prudent to ensure any testing conforms to this specification. There are many different test methods available, each with their own limitations.

XRF (X Ray Fluorescence Spectrometry) is the most popular screening method as it is within the reach of many companies to purchase equipment and use in-house. The limitations are that it can only scan the surface and that it can only show total Bromine and total Chromium. If Bromine or Chromium are present then additional laboratory based testing is needed. It is however very suitable for testing whether components leads are coated with lead-free solder or non lead-free solder.

ICP-AAS (ICP-AES Inductively Coupled Plasma - Atomic Emission Spectrometry) is a popular choice for laboratory based metals testing, however again it will not show valence of Chromium. ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) or a chemical wet test using diphenolcarbazine is needed to test for valency.

GC/MS (Gas Chromatography Mass Spectrometry) is used for testing the organics PBB and PBDE.

All these laboratory techniques are very sensitive, able to detect to parts per billion. The main margin for error lies in sample preparation. Creating a true homogeneous sample as per the EU definition can be very time consuming and difficult. For a piece of molded plastic there is no issue but to dissect an integrated circuit into the lead, lead coating, lead frame, bonding wires, substrate and encapsulating material with no cross contamination is a difficult and laborious process.

The normal method for testing a hybrid component (one that contains many homogeneous materials) is to crush one whole and test for the banned substances. If any are detected than the painstaking (and

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expensive) process of dissection is undertaken. This is all in accordance with IEC PR62321.

There are many other methods that can be employed including:

- CVAAS** - Cold Vapour Atomic Absorption Spectrometry
- ED-SEM** - Energy Dispersive Scanning Electron Microscope
- ED-XRF** - Energy Dispersive X Ray Fluorescence Spectrometry
- HPLC/UV** - High Pressure Liquid Chromatography - Ultraviolet Detection
- ICP-AAS** - Inductively Coupled Plasma - Atomic Absorption Spectrometry
- WD-XRF** - Wavelength Dispersive X Ray Fluorescence Spectrometry

However, testing on its' own may not be all that is needed. There is a growing list of exemptions for components, applications and applications of specific banned substances which means that if a component exceeds the maximum level for any substance then the component needs to be checked against existing (and arguably proposed) exemptions. Many laboratories advertise RoHS consulting capability but their main competency is in testing and they cannot be expected to have the same access to information as a Specialist RoHS and WEEE consultancy. Also as a result of the above a test lab cannot provide a material declaration - they can provide the lab analysis but cannot stipulate if the part is or is not RoHS compliant.

(RoHS and WEEE Specialists (International) working in conjunction with SGS Australia provide an accredited end to end RoHS material composition testing service. See www.raws.co.nz for details)

IEC 62321

By Roland Sommer RoHS and WEEE (International) Ltd

"IEC 62321, Ed.1: Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products"

In the introduction of the spec it defines it's purpose as "The purpose of this normative document is therefore to provide test procedures that will allow the electrotechnical industry to determine the levels of the regulated substances Pb, Hg, Cd, Cr VI, PBB, PBDE (EU RoHS, China, US, Japan, etc.) in electrotechnical products on a consistent global basis."

The project is headed up by Technical Committee 111. The overall project for TC111 covers 3 areas each with its own Working Group.

WG1- Material Declaration working with JIG, IPC1752 and JGPSSI format

WG2 - Environmentally conscious design

WG3 - Analytical testing for RoHS Compliance working with the Analytical testing section of IPC1065. Further details of the project and the team membership are available at

http://www.raws.co.nz/rohs_and_weee/material_composition.php

Bob Willis' Smart Group "Lead-free experience 2005" report

This is a very comprehensive report with heaps of data and photographs. It is based upon trials performed at Nepcon over the last 3 years. The report is available on our support website www.electronicssouth.com under lead-free soldering on the RoHS menu. Be aware that it is 8.5MB

EU TAC Update

The TAC has not convened since July 2005. As a result the legislation and interpretation have remained relatively static. However the TAC members have been busy, with the member for Belgium (Ortwin Meeuws) and

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the member for Poland (Magdalena Weglarz) visiting Australia and presenting seminars in Sydney, Adelaide and Melbourne.



Roland Sommer of RAWs, Keith Anderson MD of Adilam and Chairman of the AEEMA RoHS and WEEE Support Committee, Ortwin Meeuws (TAC member for Belgium) and Magdalena Weglarz (TAC Member for Poland) enjoy a meal in Melbourne Australia

Could you please tell me if the NWML would consider telecommunications equipment that is installed in 19" telecommunications cabinets that are in turn bolted to the floor as Fixed Installation.

I attach a graphic to illustrate the type of equipment.



Kind regards
 Roland Sommer

A Wonderful Endorsement

The National Weights and Measures Laboratory in the UK which is the UK RoHS enforcement agency has provided a link to our New Zealand Support website www.electronicssouth.com on their page of 13 useful links with the comment:

"This is a national coordination site for industry support in New Zealand. A view of RoHS and WEEE from the other side of the world. Good information."

The reply back was very concise.

"Such equipment is not considered fixed installation."

*Chris Smith
 Technical Manager RoHS Enforcement*

The advice contained in this e-mail is based on the best and most up to date information available to us at the time. However, it is not a definitive opinion as only the courts can interpret legislation with any authority."

Fixed installation definition update - the saga continues?

The following was sent to the National Weights and Measures Laboratory who are the enforcement agency for the UK.

So I guess it is the end of the road for now for the quest for a definitive opinion on the interpretation of Fixed Installation. It DOES NOT cover 19" rack mounted telecommunication equipment. I will be watching the EU Courts very closely from 1 July this year onwards.

Dear Sir/Madam

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Soft launch for China RoHS in July

By Bruce Rayner and Amy Wang
 Reprinted from Green Supply Line

Shanghai, China — China is making progress toward introduction of its version of the European Union's RoHS directive but the timeline for eliminating the use of hazardous materials will lag behind Europe's.

The final draft of China RoHS, officially known as "The Administration on the Control of Pollution Caused by Electronic Information Products", will be released in early January and is expected to be passed into law in July 2006, according to Huang Jianzhong, the director of China RoHS at the Economic Operations Bureau of China's Ministry of Information Industry (MII), Beijing.

However, the all-important companion catalog that will define exactly which electronics products are covered by the law and the reporting requirements will not be available at the time the law takes effect. In fact, there is no timeframe set for when the catalog will be made available, Huang said.

When China RoHS is passed into law the only formal requirement will be for companies to include a label of the hazardous substances contained in their products. Companies will not be required to remove hazardous materials from their products at that time. MII expected to draft the labeling standard in March and release it for industry review. How the standard is to be implemented will be specified in the final version of China RoHS and will be binding in July, Huang said.

But even the July date is not firm. "Ideally [China RoHS] will be effective July 1, but we may delay it," Huang said.

As for the catalog, it is in the preparation phase. "We have yet to set the final procedure," Huang said. "As for which

products will be in the catalog, it has not been addressed."

The Ministry of Information Industry plans to develop a draft of the catalog and send it out for comment to other government agencies and then send it out to industry for review, Huang said.

Huang has been heading up work on China RoHS since early 2002 and stresses that implementation of the law must follow international standards for review and adoption. "The process needs to be transparent," he said.

China RoHS will apply to electronics manufactured in China for sale domestically as well as goods imported into China. It does not apply to electronics made in China for export and it does not apply to military electronics.

The original timeline for China RoHS was to pass it into law in January 2005 and release the catalog in January 2006. This would have given industry six months to come into compliance by July 2006. The new timeline is effectively 18 months behind schedule, which puts the likely enforcement date in mid-2007.

China RoHS

By Roland Sommer RoHS and WEEE Specialists (International) Ltd

The second draft of China RoHS has much more detail and some marked differences from the original. Articles 15, 16 which covered the extended Producer responsibility (or WEEE) aspects have been dropped as has article 17, the requirement for the labeling of the country of origin for imported goods.

Also a point that many seem to have missed is that the so called catalogue will provide a list of products that have additional

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requirements over and above the basic requirements that are contained in the body of the draft legislation.

The basic requirements are quite clear. The scope is given in Article 3 and reads:

Article 3: “Electronic Information Products” refers to products and parts made with electronic information technology, which include electronic radar products, electronic communication products, broadcast and television products, computer products, household electronic products, electronic measurement and instrument products, electronic products for special use, electronic component products, electronic application products, electronic material products and software products, etc.

This is quite explicit.

The requirement that units covered in article 3 shall not contain the banned substances is also quite clear. **Article 16** states: “Sellers of electronic information products shall have strict procurement channels and shall not sell any electronic information products in which the contents of toxic and harmful substances do not comply with the industrial or national standards on prevention and control of pollution from electronic information products.”

Similarly the actual banned substances are clearly stated. **Article 3 (4)** reads: “Toxic and harmful substances or elements” refers to the following substances and elements contained in electronic information products

1. Lead
2. Mercury
3. Cadmium
4. Hexavalent chromium
5. Polybrominated biphenyls (PBB)
6. Polybrominated diphenyl ethers (PBDE)
7. Other toxic and harmful substances or elements provided by the State

From the above it is quite clear that the requirements of Article 3 (4) apply to the products listed in Article 3.

Where some confusion has arisen is in the mention of a catalogue of Key Products. However it is explicitly stated that the Catalogue will contain ADDITIONAL requirements for a subset of the list in Article 3.

(Article 20) The electronic information products listed in the Catalogue for Pollution Prevention and Control in Key Electronic Information Products shall satisfy the provisions in these measures on prevention and control of pollution caused by electronic information products and conform to the key requirements for prevention and control stated in the Catalogue.

Article 20 continues with “Those electronic information products not listed in the catalogue for Pollution Prevention and Control in Key Electronic Information Products shall satisfy the the provisions in these measures on prevention and control of pollution caused by electronic information products.

So in summary the 6 banned substances are banned from the products in Article 3 - watch out for the little “etc” at the end. It may well apply across the board. There may well be additional bans or labeling or reporting requirements for a subset of products that will be listed in the “Catalogue”.

There is a lot more to the China RoHS but the key points are:

1. For most provisions we do not need to wait for the Catalogue
2. There is no mention of any exemptions like EU RoHS
3. Annual review of substance ban
4. Compliance is by certification
5. There are labeling requirements
6. Customs is the enforcement body
7. Appears to cover all Electrical and Electronic products

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Having said all this there needs to be a caveat. The Chinese legislation may change significantly from what has been released as the second draft. There have been other interviews with Mr Huang where he has stated that household appliances may not be included which is direct contradiction with the present draft assuming a correct translation. So the caution is - proceed with caution but ensure there is money budgeted for compliance costs.

The above article is based upon the translation kindly posted by Design Chain Associates at www.designchainassociates.com.

A word of thanks to our Sponsors

This newsletter and the www.electronicssouth.com RoHS and WEEE website are made possible by an initiative and funding from New Zealand

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Note to Editors. Please contact Roland Sommer on rsommer@raws.co.nz for a MS Word file if you wish to reprint any article written by RoHS and WEEE Specialists (International) Ltd. There is no charge for reprinting.

Upcoming Events

RoHS and WEEE Training

Christchurch, New Zealand: 15 Feb 2006: RoHS for Suppliers and Engineers with Roland Sommer of RoHS and WEEE Specialists. www.raws.co.nz - upcoming events

Auckland, New Zealand: 22 February: RoHS for Suppliers and Engineers with Roland Sommer of RoHS and WEEE Specialists. www.raws.co.nz - upcoming events

Sydney, Australia: 6 March RoHS: With Roland Sommer of RoHS and WEEE Specialists Ltd and Harvey Stone of the Goodbye Chain Group. www.raws.co.nz - upcoming events

Sydney, Australia: 7 March WEEE: With Roland Sommer of RoHS and WEEE Specialists Ltd and Harvey Stone of the Goodbye Chain Group. www.raws.co.nz - upcoming events

Melbourne, Australia: 8 March RoHS: With Roland Sommer of RoHS and WEEE Specialists Ltd and Harvey Stone of the Goodbye Chain Group. www.raws.co.nz - upcoming events

Melbourne, Australia: 9 March WEEE: With Roland Sommer of RoHS and WEEE Specialists Ltd and Harvey Stone of the Goodbye Chain Group. www.raws.co.nz - upcoming events

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<u>The Commercial Page</u>	
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	<p>University of Canterbury</p> <ul style="list-style-type: none"> - Material composition analysis - Micro-sectioning <p>milo.kral@canterbury.ac.nz</p>
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