

# RoHS and WEEE

## not just Lead-Free

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ESConnectivity 04

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## Background

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Two European Directives come into force in 2005/6 which effect the supply of electronics into the EU.

RoHS - (Restriction on use of Hazardous Substances)

WEEE - Waste Electrical and Electronic Equipment

# RoHS

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## Prohibits the use of 6 substances

- Lead
- Mercury
- Cadmium
- Hexavalent Chromium
- Polybrominated biphenols
- Polybrominated diphenol ethers

Enforcement date 1 July 2006 for any product  
“put on the market” from that date within the EU.

## WEEE

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Specifies a definitive percentage of products by weight that must be recycled

Producers (or importers) are responsible for end of life costs for recycling and disposal - including packaging

Comes into force 13 August 2005

## WEEE

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Most Kiwi companies exporting to the EU will be going through a distributor

The distributor is the “responsible party”

However the manufacturer is responsible for:

- A crossed out wheely bin label on the product
- Supplying the required recycling information
- This can be web based
- Annex II of the WEEE directive details what must be included.

# The Banned Substances Lead

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Solder

Electronic Components

Cables

- Stabilizer, pigment

Plastics

- Stabilizer, pigment

# The Banned Substances

## Cadmium

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### Plastics

- Stabilizer, pigment

### Metal finishing

- Plating
- Electrical contacts (Exempt)

### Alloys

- Brazing and soldering

# The Banned Substances

## Hexavalent Chromium

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### Metal finishing

- Zinc Chromate finish

### Pigments

- Lead Chromate (Yellow)

# The Banned Substances

## Mercury

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### Switches and relays

- Mercury whetted contacts

### Fluorescent lamps

- Just about all if not all applications are exempt from RoHS
- WEEE requires that the lamps are able to be removed and recycled separately

PBB  
Polybrominated Biphenols

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Printed Circuit Boards

Plastics

These have been phased out in most of the world  
since the mid 1990s

PBDE

Polybrominated diphenol ethers

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Printed Circuit Boards

Plastic Housings

Connectors

Resins

Cables

Transformers

PBDE

Polybrominated diphenol ethers

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There are 6 types of brominated flame retardants  
in common use

- |                  |                       |
|------------------|-----------------------|
| 1. PBB           | Banned                |
| 2. TBBPA         | Not Banned            |
| 3. HBCD          | Not Banned            |
| 4. Deca BDE      | Exemption very likely |
| 5. Octa BDE      | Banned                |
| 6. Penta BDE     | Banned                |
| 7. Any other BDE | Banned                |

PBDE

Polybrominated diphenol ethers

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Octa and Penta BDE were banned from ALL products in the EU (not just electrical and electronic equipment) in August 2004 by Directive 2003/11/EC

# Flame Retardants Engineering considerations

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Full testing of alternatives may be needed

Form/fit/function

Reliability

Flammability

Flexibility, curve radius

## Resource focus

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Lead Free is intensive in manufacturing process engineering

All other banned substances, especially flame retardants are engineering intensive.

- Compliance Verification- EMC, ESD, Electrical Safety, flamability etc
- Reliability testing- vibration, HALT/HASS

The workload and cost for validation of changed parts due to RoHS should not be underestimated.

## Exemptions

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### Medical devices - RoHS

- Pending confirmation or otherwise 12 Feb 2005

### Medical Devices - WEEE

- Effectively exempt from recycling until DEC 31 2008  
BUT need to comply with all other aspects

## Exemptions

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For RoHS there are a number of very specific applications exempt including:

- Lead as an alloying element in steel, brass and aluminium to specified amounts
- Mercury in bulbs
- High temperature solder in die bonding applications
- Cadmium in electrical contacts
- Batteries (covered by a separate directive)
- Lead in glass of CRTs
- Lead in solder for servers and network infrastructure
- Lead in solder for EEE for 100% military applications
- There are a total of about 25 current exemptions

## Other countries

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China intend to impose a virtual blueprint of RoHS in the same timeframe but potentially only on computers and cellphones initially - however they are not telling - yet. A draft legislation has been published and leaked copies are floating about on the web.

Canada and Brazil and certain states in the USA are also considering similar legislation

Local Support  
Co-ordinated Web based

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## 3 Websites

[www.electronicssouth.com](http://www.electronicssouth.com)

- Main place for practical RoHS and WEEE support (Due to be up and running December 04)

[www.dynamic-controls.co.nz](http://www.dynamic-controls.co.nz)

- Main place for Lead Free soldering

[www.sommerconsulting.co.nz](http://www.sommerconsulting.co.nz)

- Main place for environmental argument and lobbying

## Local support

### Electronics South/ Canterbury Electronic Group website - sponsored by NZTE

- Email forum
- Practical support
- Tools-
  - Supplier surveys
  - Example road maps
- Summaries of key documents
- Legislative interpretation
- Links to supporting material

This is due to be up and running Dec 04

Local Support  
University of Canterbury

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Department of Mechanical Engineering

Materials testing

- Able to test for element composition
- Resolution of approximately 0.1% depending on the element
- Method is Scanning Electron Microscope/Energy Dispersive X ray Spectroscopy. (SEM/EDS)

### Materials testing cost (indicative)

- Qty 1                      \$180 per item
- Qty 2                      \$100 per item
- Qty 3                      \$75 per item
- Qty 4                      \$60 per item
- Qty 5- 10                \$50 per item
- Qty 10+                 \$45 per item

Costs are indicative only, the UOC reserves the right to quote on a per piece basis

Contact: [milo.kral@canterbury.ac.nz](mailto:milo.kral@canterbury.ac.nz)

Local Support  
Parkside laboratories

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One stop shop for product reliability testing and type approval validation

- EMC
- ESD
- EMI
- Vibration
- Flammability
- Electrical safety
- HALT/HASS

# RoHS: Practical Advice

## The very basics

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Find out the facts

Develop a compliance strategy

- Will you create a variant just for the EU?
- Will you endeavour to prove 100% compliance or will you self insure to some level?

Conduct a supplier survey

- Find out what restricted substances are contained in your components

Split the project between “Lead -Free assembly” (operations) and “the rest” (engineering)

WEEE

Implications – worst case

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Provide financial guarantee for disposal of historical waste

Register with a recycling scheme in each EU state that we sell into

Register as a producer with each state that we sell into

Pay an annual fee into each of the recycling schemes based upon the weight of product sold in that EU state

WEEE

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Implications – worst case (cont)

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Ensure that XX percent by weight is reused, recycled or recovered per year

Produce disassembly documentation for each family of products – very detailed requirements in the Directive – Annex II

Label products with a crossed out “wheelie bin” label – specified in the directive

All by 12 August 2005

WEEE

A level of uncertainty

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There is a debate currently as to the terms  
“Product” and “Equipment”

The directive’s intent was to target Equipment –  
which was intended to be scoped as products  
that are a finished article.

Product infers an article that is sold – be it a  
subassembly or a product that forms part of a  
larger product

WEEE

A level of uncertainty

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The UK have issued guidance that in their view

“Equipment which is part of another type of equipment or system is considered to be outside the scope of the regulations where it does not have a direct function outside the other item of equipment”

This is also reflected in the view of Orgalime which is the main electrical and electronic industry voice in Europe.

WEEE

A level of uncertainty

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There is no official view from the EU, however the following is from Harvey Stone, GM of the GoodBye Chain – the main RoHS and WEEE consultancy in the USA

“I just talked with one of my lawyer contacts in New York. He confirmed that it is “finished product” not components. While there is no official documentation, it is assumed in the Directive, he says.”

# WEEE: Practical Advice

## The very basics

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### Find out the facts

- Are YOU the responsible party or not?

### Determine what needs to be done

- Labeling- crossed out wheeled bin
- On line or hard copy recycling documentation
- Filing system to retain records for 4 years
- If responsible party- subscription to a recycling scheme in each of the 25 Member States
- Registration with each of the 25 member states

## Are these guys serious

October 2003 – Dutch government halted shipments of Sony Play Station due to excess cadmium in its cables

Shipments resumed in mid December

Cost to Sony:

- EUR 110Million on sales
- EUR 52Million on operating profit

Root cause – supplier supplying cables out of spec

Source: Sony press release

Questions?

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