

GreenALabs

RoHS – WEEE – REACH
Has this world gone crazy?



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What is RoHS?

RoHS = Restriction on Hazardous Substances

**It limits hazardous materials
in electronic products**

- | | |
|---|-------|
| • Cadmium (Cd) | 0.01% |
| • Lead (Pb) | 0.1% |
| • Mercury (Hg) | 0.1% |
| • Hexavalent chromium (Cr 6+) | 0.1% |
| • Polybrominated biphenyls (PBB's) | 0.1% |
| • Polybrominated diphenyl ethers (PBDE's) | 0.1% |



RoHS Labels

Be creative



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Who is RoHS Ready?



Austria



Belgium



Cyprus



Czech Republic



Denmark



Estonia



Finland



France



Germany



Greece



Hungary



Ireland



Italy



Latvia



Lithuania



Luxembourg



Malta



Poland



Portugal



Slovakia



Slovenia



Spain



Sweden



Netherlands



UK



Substance Toxicity

PBB

Liver tumors

PBDE

Thyroid function

Cr⁶⁺

Lung cancer

Hg

Psychological disorders

Pb

Blindness

Cd

Cancer





Substance Use

PBB

Flame retardants

PBDE

Flame retardants

Cr⁶⁺

Anti Corrosion

Hg

Paints

Pb

Soldering paste

Cd

Ceramics





RoHS Directive

A maximum concentration value of 0.1% by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0.01% weight in homogeneous materials for cadmium shall be tolerated.

Homogeneous material means a unit that can not be mechanically disjointed in single materials

Myth

I can grind up my product, shake the powder and test my homogeneous compound for RoHS compliance. Fast and cheap!

Fact

Every component has to be checked. The easiest way to test components is by XRF. This allows you to test without really trying to mechanically separate the materials of it.





RoHS Compliance Tests

General Cd, Pb, Cr, Hg and Br test

Test each component with XRF

Spot checking is easy with XRF

Selective PBB/PBDE test

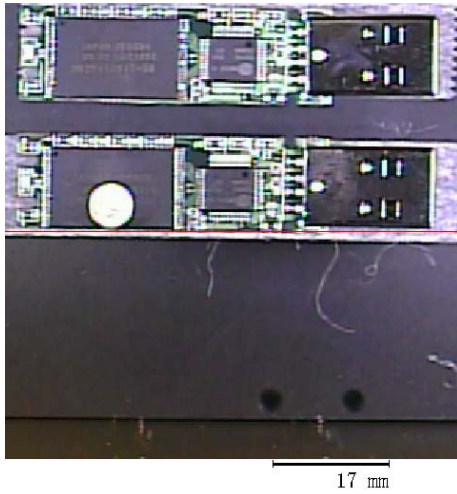
Re-test the components with GC/MS or HPLC



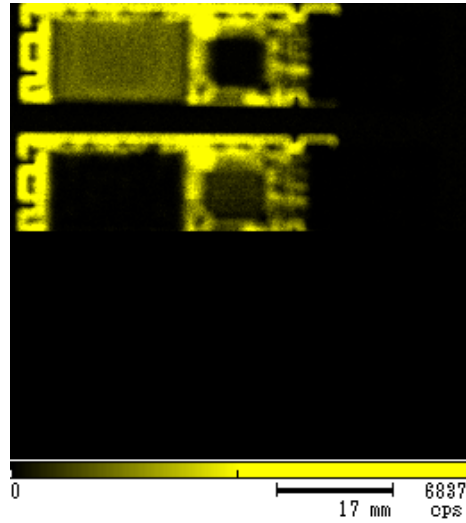
Selective Cr6+ test

Re-test the unit/components with UV spectrography

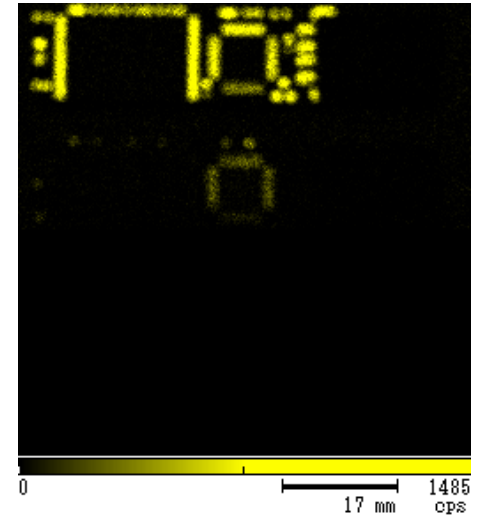
Image



Bromines



Lead



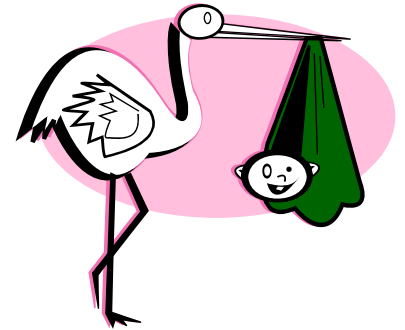
Life without Lead?

Pb/Sn/Bi alloys can no longer be used!
Melting point 98C (209F)



The new alloy of preference is SAC

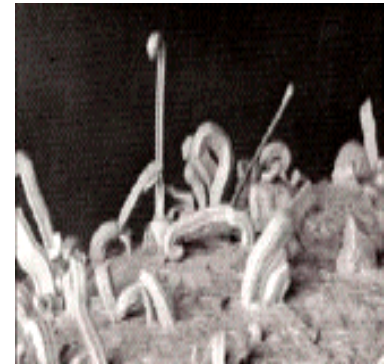
Sn 96.5% (Tin), Ag 3% (Silver), Cu .5%
(Copper) – Melting point 138C (280F)



Tin Whiskers Risks

Tin whiskers are electrically conductive, crystalline structures of tin (Sn) that sometimes grow from surfaces where tin is used as a final finish.

Many electronic system failures have been diagnosed to short circuits created by tin whiskers that bridge closely-spaced circuit elements that have different electrical potentials.



Tin whiskers have been observed to grow to lengths of several millimeters (mm).



RoHS risks

This risk involves ensuring that the manufacturer's **Bill Of Materials (BOM)** is entirely compliant with the Restriction of Hazardous Substances (RoHS) regulations.

If **ONE** component, out of hundreds is out of compliance, then the entire product is out of compliance.





RoHS Compliance List

All consumer electronic and electrical appliances/devices except...

- Batteries
- Military equipment (exclusive)
- Aviation
- Some Mobile phones
- Car Radios
- Medical Equipment
- Spare parts





RoHS Exceptions

- 1 Mercury (Hg) in compact fluorescent lamps
- 2 Mercury in straight fluorescent lamps
- 3 Mercury in scanners and back-lights
- 4 Mercury in special fluorescent lamps (projectors)
- 5 Lead in CRT tubes
- 6 Lead in alloys like steel, aluminum, copper



RoHS Exceptions (cont)

- 7 Lead high-temperature solder and servers
- 8 Cadmium in electrical contacts
- 9 Cr ⁶⁺ as anticorrosion in refrigerators
- 10 Lead used in compliant pin connectors
- 11 Lead as coating for thermal c-rings
- 12 Lead and Cadmium in optical and filter glass

What if not RoHS compliant?



- Mandatory test by a governmental assigned test lab
 - at least 5,000 EURO (\$6,500)
- Possible penalty of 50,000 EURO (Germany)
- 3 months to 2 years in jail (NEW! - UK)
- Your product is banned from entry in the EU until you can prove that it is compliant





How to avoid trouble?

- Check if the RoHS certificates are real
- Only use certificates of ISO certified labs
- Check if a RoHS certificate represents your component
- Have a component replacement plan
- Re-test by an independent lab (**like GreenALabs**)



Conclusion

It is good for the planet

Non-compliance could be expensive (maybe jail)

Everyone has to be RoHS compliant

Customers want RoHS proof now

GreenAnalysis Labs can help!





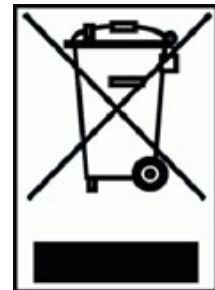
WEEE – What/When?

WEEE = Waste Electrical and Electronic Equipment

WEEE compliance started on Aug 13, 2005

Germany started enforcement on March 24, 2006

UK registration will start on Jan 1, 2007



Who is WEEE ready?



Austria



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Czech Republic



Denmark



Estonia



Finland



France



Germany



Greece



Hungary



Ireland



Italy



Latvia



Lithuania



Luxembourg



Malta



Poland



Portugal



Slovakia



Slovenia



Spain



Sweden



Netherlands



UK

What is WEEE?

WEEE = Waste Electrical and Electronic Equipment

It **CONTROLS** the electronic/electrical **WASTE**
imported in Europe

B2B (Business to Business)

- You can do your own recycling
- You must have a recycling partner and recycling deliver address
- You must have proof of B2B deliveries



B2C (Business to Consumer)

- Your recycling activity is controlled by the governmental WEEE authorities

WEEE Steps to Compliance



Build Awareness (Funding, effort)

Assign a WEEE coordinator

Start tracking the weight shipped per country

Get your WEEE registration number for each country

Contract with a recycling agent

Deploy the WEEE rules (stickers – marking)

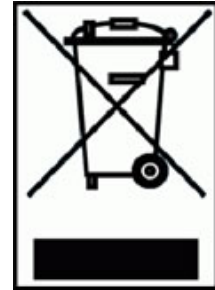


WEEE Markings

After you receive your WEEE registration number(s) :

Has be difficult to remove

13 x 10 mm min size



Allowed markings: (either one)

- Brand name of the manufacturer
- **WEEE number**
- Reference name (for multi-branded products) *

*** Has to be on the box!**



WEEE Groups

- 1 Large household appliances**
- 2 Small household appliances**
- 3 IT and telecommunications equipment**
- 4 Consumer equipment**
- 5 Lightning equipment**
- 6 Electrical and electronic tools (except large industrial)**
- 7 Toys, leisure and sports equipment**
- 8 Medical Products (except implants and infectious)**
- 9 Monitoring and control instruments**
- 10 Vending machines**



WEEE Registration

- Determine the product group that you belong to
- Register with a European Waste Management company
- Estimate the annual volume (Ton) per year
- Pay your basic WEEE registration fee (per country)
- Open a European bank account (any EC country)
- Get a European lawyer as trustee
- Prepare for the insolvency guarantee deposit
- Receive your WEEE number(s)
- Put a WEEE sticker on your products before you ship



WEEE On-Going

- Assign an administrator
- Track volumes shipped to the appropriate countries
- Verify your weight-volume via a computer system
- Report significant increases
- Pay differences on an annual base
- Consider a CRM tracking solution
- Use WEEE as a marketing tool

WEEE Costs

- 1 WEEE Registration fees (different per country)
- 2 Administrative expense/Monthly reporting
- 3 Insolvency deposit
- 4 Recycling costs (different per country and volume)





WEEE Registration fees* (EURO)

< 100	Cyprus	Luxembourg	
< 1000	Hungary	Finland	Slovakia
	Slovenia	Portugal	Austria
	Spain	Denmark	
< 5000	Ireland	Belgium	Czech Rep
	Poland	Netherlands	
> 5000	Germany		
Undecided	Greece	Estonia	Latvia
	Lithuania	Sweden	Italy
	France	Malta	UK

* Based on 04/01/2006 pricing



WEEE Waste fees*

1 Pallet = 300kg ~ 300 EURO ~ US\$390

B2B (average per kg)

Logistics Cost	0.50 EURO
Recycling Cost except CRT	0.25 EURO
Recycling Cost includes CRT	0.40 EURO
Management Cost	0.15 EURO

Between 0.80 - 1.05 EURO

B2C (average per kg)

Logistics Cost	0.60 EURO
Recycling Cost except CRT	0.30 EURO
Recycling Cost includes CRT	0.45 EURO
Management Cost	0.10 EURO

Between 0.85 - 1.15 EURO

* Based on 04/01/2006 pricing



How does it work?

- Every country WEEE registration authority has assigned 1000's of empty waste containers per waste group
- Each of the governmental approved waste management companies collect the waste for your group
- A computer algorithm assigns a container to you when it is ready to be recycled
- This assignment is based on the ratio of the total waste per country and your reported annual waste
- Your shipped volume has to be audited on an annual base (CPA) , to avoid cheating

Conclusions

- It might not be fair!
- What you ship and pay for is NOT what you will recycle
- Collective recycling with multiple companies will save costs
- You should consider an agent as otherwise you have to register in 25 countries and speak/write in 20 different languages
- It will be expensive if you ignore. Penalties are 50,000 EURO per item!





REACH

Registration, Evaluation and Authorization of Chemicals
Controls the IMPORT of toxic/suspicious CHEMICALS

Encourages the replacement of hazardous chemicals with safer ones

Enforcement planned in 2007

- **ONE Central Registration office (Helsinki)**
- **More that 1 ton/year**
- **30,000 Chemicals over 11 years**





We are **ISO17025:2005** certified!



Our Services

- **RoHS** compliance testing
- **RoHS** compliance consulting
- One step **WEEE** registration
- **WEEE** consulting



**Get your
FREE booklet
Here!**

