RoHS in China

- Measures for the Administration of the Control of Pollution (caused) by Electronic Information Products... “China RoHS”
- Deadline: Products manufactured from 1st March 2007
- Applies to products imported into China for sale in China and –
  - Products manufactured in China and sold in China but excludes:
    - Imported into China for re-export or manufacturing of products for export

- China RoHS has some provisions not found in EU RoHS
  - Wider product scope
  - Priority products catalogue
  - Variable enforcement dates by product
  - Labelling
  - Compulsory testing and certification for catalogue products

China RoHS – Stage 1: Declaration

- All “Electronic Information Products” (EIP)
  - Over 1800 listed
- “Put On The Market”: All products manufactured on, or after 1st March 2007:
  - 6 restricted substances are still permitted at this stage
  - Must be labelled with “Pollution (recycling) Control Symbols”
    - Symbol 1. No restricted substances symbol (above permitted levels)
  - Symbol 2. Restricted substances symbol (above permitted levels) plus other information:
    - Environmentally Friendly (safe use) Period (number of years)
    - Disclosure table highlighting toxic and hazardous substances and their location (aids recycling)
    - Marking on packaging required in both cases

China RoHS – Stage 2: Restriction

- Products included in “The China RoHS Catalogue”
  - The Catalogue (reviewed annually) will define:
    - Substance restrictions (some, all, or even more than the 6 EU restricted substances)
    - Define exemptions by product
    - Determine when each category has to comply allowing time for:
      - Testing via an authorised Chinese lab
      - Accreditation of China Compulsory Certificate (CCC)
- If product is not specifically listed in catalogue
  - No testing or certificate required
  - No substance restrictions
  - Not known, at this stage, which products will be included in The Catalogue
Scope

- 10 Categories:
  1. **Electronic radar products** – includes airborne and shipborne radar
  2. **Electronic communication products** – e.g. transmitters, navigation, telephones, base stations
  3. **Broadcast television equipment industry products** – transmitters, camcorders, antennas
  4. **Computer products** – all types of computers, network equipment, printers, power supplies, CDs, toner cartridges, etc.
  5. **Household electronic products** – TV, DVD, video tapes, CDs, etc
  6. **Electronic measuring instrument products** – test equipment, meters, etc.
  7. **Electronic industry professional equipment products** – includes production equipment for EIPs, soldering tools, electric and air tools
  8. **Electronic component products** – passives, PCBs, sensors, connectors, switches, loudspeakers, etc.
  8a. **Electronic device industry** – vacuum tubes, diodes, semiconductors, ICs, electronic circuits, wire and cables, lamps and batteries
  9. **Electronic application products** – household equipment (games, microwave ovens), medical devices
  10. **Electronic professional use material products** – materials used in components, solder, laminates, etc.

*Blue text indicates products not currently within scope of EU RoHS

Substance use restriction

- All EIPs – marking requirements apply to:
  - Lead
  - Cadmium
  - Mercury
  - Hexavalent chromium
  - Polybrominated biphenyls (PBB)
  - Polybrominated diphenyl ethers (PBDE) but not Deca-BDE

- Equipment listed in catalogue – substance restrictions will include some or all of the above six, this will be specified – plus
  - Possible other substances to be announced by State

Classification of materials/maximum permitted values

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIP – A</td>
<td>Each homogeneous material in EIPs – All 0.1% by weight except cadmium at 0.01% (as EU RoHS)</td>
</tr>
<tr>
<td>EIP – B</td>
<td>Metal plated materials in each part of EIPs – The restricted substances shall not be added intentionally</td>
</tr>
<tr>
<td>EIP – C</td>
<td>Small components that cannot be separated (standard states &lt;4mm²) – All 0.1% except cadmium at 0.01%</td>
</tr>
</tbody>
</table>

- Very similar to EU RoHS – split into 3 to recognise some of the difficulties in analysing metal coatings (B) and very small parts such as Passive components (C)
Marking/recycling requirements

- Pollution control symbols

Symbol 1 – use if none of the restricted substances are present above permitted levels
  - Compulsory label

Symbol 2 – use if any restricted substances are present above permitted levels
  - Must also provide a table of hazardous materials indicating location in product (recycling aid) and an environmentally friendly (safe use) period (in years)

Pollution control symbols

- Must be on product if regular 5000mm² space available.
  - If insufficient space, or irregular shape, or the function prevents this then print in user manual

- Clear, visible, hard to fade or remove
  - In a prominent location

- Colour
  - Symbol 1 – green preferred, symbol 2 – orange preferred
  - But any prominent (bright) colour if not green / orange
  - Marking may be moulded on to the EIP

Environmentally Friendly Use Period (EFUP)

- Period of time that it is safe to use the equipment before hazardous substances could leak out into the environment
  - Normally be determined by manufacturers
    - Print date of manufacture on product or packaging will indicate EFUP start date
  - Labels are every year up to 10 years, then multiple of 5 to 95
  - Draft standards published:
    Some examples of the methods:
    - Experimental method
    - Based on accelerated aging tests
    - Safe use period method
    - If the product has a published safe use period
  - Techno-life method
    - Projected service life + time between production and putting into service + additional time if repairs and refurbishment are possible
  - (Two) comparative methods
    - One is the comparison with similar products and technologies and the other simply adopting defined EFUPs given in Annex A of the standard
      - Mobile phone = 10 years, Notebook PC = 8 years etc (from 3rd draft)
  - Several substances present
    - shortest EFUP will prevail
    - Excludes short lived consumables used as part of normal maintenance
Table listing restricted substances – example

<table>
<thead>
<tr>
<th>Part name</th>
<th>Toxic and hazardous substances and elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb</td>
<td>Hg</td>
</tr>
<tr>
<td>PCB</td>
<td>X</td>
</tr>
<tr>
<td>Enclosure</td>
<td>X</td>
</tr>
<tr>
<td>Cable</td>
<td>X</td>
</tr>
</tbody>
</table>

- Must be **X (yes)** or **O (no)** in every box (Unlike EU RoHS there are no exemptions)
- Informs recycler which substances are present, and where
- Must be in paper form with product, ideally located in instruction manual, or on a CD (can be on web providing **all** users have URL to internet)
- **Table must be in Chinese**, and explain meaning of “X” and “O”
- “Part” means PCB’s, sub assemblies etc
- Self declaration – no obligation to analyse

Packaging labels

- Applies to, and must specify:
  - Plastics
  - Paper
  - Metals
  - Aluminium
  - Glass
  - Wood

- Reusable
- Recyclable
- Includes Recyclable Materials
- Apply label to packaging unless insufficient space (then in instruction manual)
  - Should include Chinese letters plus codes for “major materials”

Summary

- “China RoHS” applies from 1st March 2007 and covers a wide variety of products
- Initially it requires marking of products (EIPs) only
  - Symbol 1: No restricted substances
  - Symbol 2: Restricted substances
    - + EFUP
    - + Disclosure of substances
- Packaging information in both cases
- Initially end 2008 – Some specific products will be listed in the “Catalogue”
  - Substance restrictions will apply (some, or all, of 6 EU substances)
  - Other substances maybe defined
  - Exemptions
  - Testing required
  - CCC required
A meeting was held in Beijing on December 19th 2007 driven by the China Quality Management Association for Electronics Industry (CQAE). The main topic was to discuss the future development of the so called China RoHS “catalogue”. Ahead of its release, initial proposals and comments were sought from industry associations, authorities and business. An “expert panel” will make an assessment based on technical and economic factors. From this, a report will be published and released for public comment.

The subsequent conclusions will be submitted for government approval.

While there is no firm date for the publication of the full catalogue it was announced at the meeting that an initial, “symbolic”, catalogue, containing a few products will be made available by December 2008. Some of the issues faced ahead of the proposed development include:

- Expert panel to be established by installing product teams
- Research on issues such as:
  - Which products should feature in the catalogue as a matter of priority, for example, the entire product, components or materials?
  - Implementation of the CCC model for RoHS
  - Certifying test houses
  - The role of the supervisory authority

Catalogue development is not expected to make significant progress until these conditions are basically met or mostly decided.

Other work in progress includes a review of the EIP classifications, China WEEE, which will be gradually implemented following an initial pilot scheme, and guidelines on energy saving and the reduction of emissions within the electronics industry are in draft form and will be published later this year.
EU RoHS and China RoHS legislation have a number of similarities and differences. These are summarised in the following table:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>EU RoHS</th>
<th>China RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation adopted</td>
<td>13th February 2003</td>
<td>26th February 2006</td>
</tr>
<tr>
<td>Entry into force</td>
<td>1st July 2006</td>
<td>1st March 2007</td>
</tr>
<tr>
<td>Scope</td>
<td>Eight broad categories of finished products. Individual product types are not specified and legislation leaves interpretation to producer</td>
<td>All Electronic Information Products (EIP). Extensive list published which includes many products not covered by EU RoHS such as radar attached to aircraft or ships, medical equipment, measurement instruments, some production equipment, batteries and most types of components</td>
</tr>
<tr>
<td>Main requirements</td>
<td>Six RoHS substances must not be present in homogeneous materials, at above the maximum concentration values, unless covered by an exemption</td>
<td>Two levels of requirements: All EIPs must be marked to indicate whether any of the six substances are present. Products that will be listed in a catalogue – substance restrictions will be specified and these may be some or all of the six EU-RoHS substances and possibly others</td>
</tr>
<tr>
<td>Restricted substances</td>
<td>Lead, cadmium, mercury, hexavalent chromium, PBB and PBDE</td>
<td>As for EU RoHS, with the possibility of others being added</td>
</tr>
<tr>
<td>Marking requirements</td>
<td>None. Related WEEE Directive requires use of the crossed wheelie bin symbol to indicate to users that product should be correctly recycled at end of life.</td>
<td>Pollution control mark. If no RoHS substances present above permitted levels (same six as EU RoHS except Deca-BDE), use:</td>
</tr>
<tr>
<td>Maximum concentration values</td>
<td>Products in scope must contain less than: 0.1% for all except Cd which is 0.01%. All are by weight in homogeneous materials (unless covered by exemptions)</td>
<td>Marking with a table and the orange logo if concentrations of Pb, Hg, Cr(6), PBB or PBDE are &gt;0.1 % or &gt;0.01 % of Cd by weight in homogeneous materials, except for metal coatings where RoHS substances must not be intentionally added and parts of 4 mm³ or less regarded as single homogeneous materials</td>
</tr>
<tr>
<td>Exemptions</td>
<td>29 so far (under review at present)</td>
<td>Will be specified in catalogue of products with substance restrictions</td>
</tr>
<tr>
<td>Approach to compliance</td>
<td>Self declaration, third party testing not required</td>
<td>Self declaration for marking of all EIPs Testing by authorised laboratories in China of catalogue listed products</td>
</tr>
<tr>
<td>Packaging</td>
<td>Not included as covered by the Packaging Directive</td>
<td>Must be marked to show materials content, not contain toxic substances and be recyclable</td>
</tr>
<tr>
<td>Batteries</td>
<td>Not included as covered by Batteries and Accumulators Directive</td>
<td>Included as these are EIPs</td>
</tr>
<tr>
<td>Non-electrical products</td>
<td>Excluded if the finished product sold to user does not depend on electricity for its main function</td>
<td>Included if listed as EIPs. Includes CDs and DVDs</td>
</tr>
<tr>
<td>Military and national security use only</td>
<td>Excluded from scope</td>
<td>Excluded from scope</td>
</tr>
<tr>
<td>“Put onto the market”</td>
<td>Products must be fully compliant from 1 July 2006</td>
<td>Applies to production on or after 1 March 2007.</td>
</tr>
</tbody>
</table>
Q 1. Which products are in scope of China-RoHS?
Answer: The scope of China-RoHS is much broader than EU-RoHS and includes all “Electronic Information Products” (EIPs). These include radar equipment, IT, telecom, production equipment used for making EIPs, some types of test instruments, medical devices, electronic components such as resistors and ICs, batteries, PCBs, materials and certain household appliances. The Chinese government has published guidance which lists well over 1800 EIPs.

Q 2. What substance restrictions apply?
Answer: At present there are no substance restrictions. However there will be restrictions for certain specified products that will be listed in a catalogue that is expected to be published in late 2008. It is likely that the six EU-RoHS substances -- lead, cadmium, mercury, hexavalent chromium, PBB and PBDE will be restricted although the legislation states that other, additional, substances may also be included in the catalogue.

Q 3. What are the maximum concentration values for China-RoHS?
Answer: The Chinese Government has published a standard that defines the maximum concentration values (MCV). These are essentially the same as EU-RoHS but with subtle differences. For most parts, the limits are 0.1% of Pb, Hg, Cr(6), PBB and PBDE (except Deca-BDE) and 0.01% Cd in homogeneous materials. Metal plating is different however and hazardous substances should not be deliberately added. However, if the substance can be detected by analysis, it will be presumed to have been added intentionally. Very small parts of <4 mm³ are regarded as single homogeneous materials with the same concentration limits as individual homogeneous materials in larger parts.

Q 4. My products are EU-RoHS compliant, so will they comply with China-RoHS?
Answer: To be compliant with China-RoHS all EIPs must be marked. At present no substance restrictions apply but if RoHS substances are present this must be indicated by the relevant symbols. One difference between EU and China RoHS is that the China-RoHS marking requirements do not have exemptions; the substance is either present or not and so if a product is EU-RoHS compliant by exemption, RoHS substances may be present at levels above the MCV, and therefore not China-RoHS compliant.

Exemptions maybe included in the “catalogue” when published.

Q 5. What Pollution Control symbols do I need?
Answer: If there are no RoHS substances in any of the homogeneous materials at concentrations above the maximum permitted values (MCV) within the EIP, then the green, environment friendly, “e” symbol is put on the product and no “disclosure” table is required. Green is preferred but any prominent colour may be used.

If there is at least one RoHS substance in a homogeneous material at a level above the MCV then the orange symbol with a number at the centre is attached to the product. A table of hazardous substances and their location will also need to be printed in the manual. The number is the Environmentally Friendly (safe use) Period or EFUP, denoting the number of years before any substance is likely to leak out into the environment. Orange is preferred but any prominent colour may be used.

Q 6. Do I need to label spare parts or components?
Answer: This is not yet clear. The Chinese standard states that the marking of components is not necessary if they are sold to OEMs for use in products that will be marked. However, information on any RoHS substances that are present will need to be provided to the OEM. Components including spare parts which are sold individually to end-users should however be marked as these are EIPs.

Q 7. How do I label the packaging?
Answer: The China-RoHS legislation states that a label with the “codes” for the main packaging materials will be compulsory for EIPs. The packaging of EIPs must be marked to indicate which materials are used. Apply a label to, or print on, the outside of the packaging the material codes from Chinese Standard GB 18455-2001 that indicate which materials are present.
**Q 8. How do I produce the table of hazardous substances and what format should be used?**

Answer: The first step is to determine which RoHS substances are present in each of the main parts of the equipment. Some will be known but for most it is best to ask the supplier. Remember that there are no exemptions and so EU-RoHS compliant products may contain China-RoHS substances above the MCV. The following example is for a hypothetical mobile phone (note this example is not a real modern mobile phone as most use plastic LCDs with no lead).

<table>
<thead>
<tr>
<th>Components identified with RoHS substances</th>
<th>LCD – lead in glass binder to bond layers</th>
<th>Chip resistor – lead in glass</th>
<th>MLCC – lead in ceramic</th>
<th>Plastic – PBDE</th>
<th>Lead in solder for battery connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD module</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chip resistor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Led in solder for battery connections</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Used in which part?</th>
<th>LCD module</th>
<th>PCB</th>
<th>PCB</th>
<th>Case</th>
<th>Battery pack</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD module</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chip resistor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic PBDE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead in solder for battery connections</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Once this information has been determined, print the table in the manual.

<table>
<thead>
<tr>
<th>Part</th>
<th>Lead</th>
<th>Cadmium</th>
<th>Mercury</th>
<th>Hexavalent chromium</th>
<th>PBB</th>
<th>PBDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Case</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>LCD module</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Battery pack</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The table must be in Chinese as shown in the standard and include definitions of the meanings of X and O.
**Q9.** How do I find out if a component contains a RoHS substance?

Answer: The easiest method is to ask the supplier. If you are told that the part is EU-RoHS compliant beware, as this does not necessarily mean that there are no RoHS substances present, as they may be used in exempt forms. It is increasingly important for electrical equipment manufacturers to know where hazardous substances are used, some examples are:

<table>
<thead>
<tr>
<th>RoHS Substance</th>
<th>Where used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Solder, termination coatings, inks, PVC, ceramics, some types of glass (e.g. chip resistor glaze), leaded brass, etc.</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Pigments, PVC, plating, switch contacts, thick film materials, NiCd batteries</td>
</tr>
<tr>
<td>Mercury</td>
<td>Various lamps, alkali button cells</td>
</tr>
<tr>
<td>Hexavalent chromium</td>
<td>Passivation coatings, bright yellow pigment (usually with lead)</td>
</tr>
<tr>
<td>PBB</td>
<td>Very unlikely. Possibly only in high voltage cables</td>
</tr>
<tr>
<td>PBDE</td>
<td>Common flame retardant in many plastics</td>
</tr>
</tbody>
</table>

**Q 10.** What will I need to do if my product is included in the catalogue?

Answer: Products specified in the catalogue cannot be imported into or sold in China after the specified date until an authorised Chinese laboratory has tested them for “China Compulsory Certification”. If it meets the requirements, the product can be labelled with the CCC mark and sold in China. It will be necessary to provide a test unit to the laboratory for destructive analysis although as yet, no guidance has been published which describes the procedure that the laboratory will use.

Please note:

The information contained in this document is of a general nature and is not intended to address the circumstances of any individual or entity. Although we endeavour to provide accurate and timely information, there is no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.