EU RoHS VS. CHINA RoHS

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ABSTRACT
Companies not only need to understand the reliability issues with environmental compliance, but also how to comply with the various regulations from the business end. China is the second jurisdiction with formalized legislation on the restriction of hazardous substances for electronic products.

KEYWORDS
China RoHS, Phase 1, Phase 2, eco-compliance, marking, disclosure, testing, certification, restriction on hazardous substances

BACKGROUND
When the European Union first released the Restriction on the use of certain Hazardous Substances directive (RoHS)[1], many companies began gathering datasheets and certificates of compliance (CoC) to show the products being produced met the RoHS directive. To date, there is no formal requirements for marking/disclosure of hazardous substances; or testing and certification for products entering the European market. Simply by placing the product on the EU market, it is presumed to comply with the RoHS directive.

In February 2006, China released the "Management Methods for Controlling Pollution Caused by Electronic Information Products" Ministry of Information Industry Order #39, commonly referred to as *China RoHS*.[2] The regulation covers a broad range of products; similar to the European Union, but more focused on the general electronic industry, not consumer-type articles. The framework of the regulation allows for a two-phased implementation of the regulation. *Phase One* covers marking and disclosure of electronic information products which contain the to-be-restricted substances at or above maximum concentration values; *Phase Two* will cover the removal of the hazardous substances and require pre-market testing and certification to show the product does not contain the restricted substances.
Though both China and the EU have passed and implemented RoHS-type directives to cover electronics, they are similar and very different in the same time period. This paper will focus on explaining China RoHS by contrasting with the European Union's RoHS directive.

CHINA RoHS AND EU RoHS
There is only one major similarity between the Chinese version and the European version of their respective RoHS regulations/directives. There are several differences between the regulations/directives. The following sections will outline the similarity and differences between the two legislations.

SIMILARITY*:* Restricted Substances and Concentration Values
The two legislations have implemented the same maximum concentration values of the same restricted substances. See Table 1 for these substances and values.

Table 1. Maximum Concentration values of restricted substances for both China and EU RoHS

Substance	**Maximum Concentration Value**
Lead – Pb	0.1% weight of homogeneous material
Mercury – Hg	0.1% weight of homogeneous material
Hexavalent Chromium – Cr_6	0.1% weight of homogeneous material
Polybrominated Biphenyls – PBB	0.1% weight of homogeneous material
Polybrominated biphenyl Ethers - PBDE	0.1% weight of homogeneous material
Cadmium - Cd	0.01% weight of homogeneous material

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DIFFERENCE: Covered products

The European Union RoHS directive covers ten broad categories of products.[3] The China RoHS regulation covers multiple broad categories under the heading of "Electronic Information Products (EIP)".[4]

Definition of EIP

The China RoHS regulation defines in Article 3-1 electronic information products as: "Electronic information products refers to products such as electronic radar products, electronic communications products, radio and television products, computer products, home electronic products, electronic instrument measuring products, specialized electronic products, electronic components and parts, electronic applications, electronic materials, and accessories."[5] Table 2 shows the major categories and examples from each. Table 2 is only partial list and is by no means all-inclusive.

Table 2. EIP Categories and examples within each category. Not an all-inclusive listing.

Category	Examples
Radar Equipment and Products	- Command Automation Systems - Ground Radar - Vehicle Borne Radar - Airborne Radar - Missile Radar - Shipboard Radar
Communications Equipment and Products	- Communications Transmission Equipment - Communications and Switch Equipment - Communications Terminal Device - Mobile Communications Device
Broadcast and Television Equipment Industry Products	- Programming, Transmitting, Transmission Equipment - Reception Equipment - Other Broadcast and Television Devices
Computer Industry Products	- Complete Set of Electronic Computers - Computer Network Facility Industry - Electronic Computer External Device
Household Electronics Products	- Television - Video Cassette Recorder - Laser Compact Disc Player - Television Receiver Set-Top Box
Electronic Measuring Instrument Products	- Electronic Measuring Instrument - Microwave Signal Generator - Power Signal Generator - Scan Signal Generator
Electronic Industry Dedicated Equipment and Products	- Semiconductor Device and Integrated Circuit Dedicated Equipment - Electronic Components Assembling Equipment - Electronic Industry Mold and Gear
Electronic Element Products	- Electronic Element and Component: capacitor, resistor, connector, etc. - Electronic Printed Circuit Board
Electronic Device Industry	- Vacuum Electron Device - Electron Beam Tube - Photoelectric Device and Other Electronic Device
Electronic Application Products	- Household Electrical and Electronic Products - Medical Electronic Device and Apparatus
Electronic Dedicated Material Products	- Electronic Element Material - Semiconductor Material

It should be noted that the listing of EIP is not considered an all-inclusive listing of products. One of the issues industry is having with China RoHS is in some cases products which were out of scope for the European directive are now in scope of the China regulation.

One example is a spare part, such as a resistor or memory module, sold to the end customer as a replacement part or upgrade. The part must meet the marking and labeling requirement of Phase One as these products are listed in the EIP document.

Other items outside the scope of EU RoHS, which are covered by the China regulation, include: Radar Systems, Medical Products, Large or Medium-scale computer work stations (servers), Networking infrastructure products, consumable

materials associated with EIP (e.g. Floppy disks, CDs, ink cartridges, video tapes, etc), and Electronic components and its parts sold in direct markets.[6]

Fortunately, at the publication of this paper, only Phase One is implemented. Manufacturers are currently only required to mark and disclose where the restricted substances are located; the actual restriction of the substances will be in Phase Two.

DIFFERENCE: Implementation

The European Union passed its RoHS directive in early 2003, with an implementation date of 1 July 2006. The implementation date was when products must restrict the covered substance within products covered by the directive.

In China RoHS, there is a phased approach to implementation. *Phase One* requires marking of products based on the existence or non-existence of the covered substances with a product. Phase two will require specific products undergo pre-market testing and certification to ensure the product does not contain the restricted hazardous substances.

Phase One: Marking & Disclosure

In addition to the phased implementation approach, the labeling requirement is different. In the EU, there is no marking, labeling, or disclosure requirement for products placed on the market. A product is presumed to comply if it is made available for sale with in an EU Member State. In China, Phase One requires all products listed in the EIP listing be labeled for material content.

There are two labeling requirements for China RoHS Phase One: product labeling and hazardous substances materials disclosure table. The Product labels are pictured in Figures 1 and 2. Figure 1 depicts a label which is applied to a product which does not have any of the restricted hazardous substances above the maximum concentration values in the product.

Figure 2 depicts a label for a product which does contain the restricted hazardous substances above the maximum concentration values. The number in the logo indicates the Environmental Protection Use Period. This will be discussed in the next section of the paper.

Figure 1. Logo for product not containing any of the restricted substances at or above the concentration values.

Figure 2. Logo for product containing restricted substances at or above the concentration values; logo shows an E-PUP of 10 years.

Figure 3 shows a disclosure table for a component which has the potential to be sold directly to the end consumer. Parts which have a materials disclosure table are also required to be labeled with the environmentally-friendly use period as part of the label.

Figure 3. Sample Materials Disclosure Table.

有毒有害物质或元素					
铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚
X	O	O	O	O	O

O: [illegible] SJ/T11363-2006 [illegible]。

X: [illegible] SJ/T11363-2006 [illegible]。

（[illegible] "×" [illegible]。）

For the disclosure table, it is required to be placed in the documentation for the product. It is mandated in the regulation the table be in Chinese; having the table formatted with English as well is only an industry recommendation.

Within the table, an "X" indicates the listed substance is present within the listed part or sub-component; an "O" indicates the restricted substance is not present in the part or sub-component.

The level at which the reporting is listed in the table is a company decision. Some examples of materials disclosure tables seen to date are:

- finished product
  - cell phone
  - printer
  - testing equipment
- sub-assembly
  - populated printed circuit board
  - cable
  - plastic enclosure
- individual part level
  - resistor
  - capacitor
  - wire within cable harness

ENVIRONMENTAL PROTECTION USE PERIOD (E-PUP)

The China RoHS regulation requires manufacturers to indicate a period of time which the company will remain legally liable for the product. There is no such requirement within the EU RoHS directive.

The Environmental Protection Use Period (E-PUP) is the time in which the restricted substances will not leak or mutate to cause harm to human health or the environment.[7] This period is to be indicated in multiples of five years (e.g. 5, 10, 25, etc).

A document outlining methods on how to determine the E-PUP is currently under discussion. No document was publicly available at publication of this paper.

PHASE 2: TESTING & CERTIFICATION

The EU RoHS directive does not require testing or certification of any products. *Phase Two* of the China RoHS directive will require pre-market testing and certification for specific products within the EIP list.

The China RoHS regulation will require pre-market testing and certification for a sub-set of the products listed in the categories of EIP. The Product Catalog, as it is commonly referred to as, is not yet published. At last update of this paper, there was not an expected date. Through industry advocacy, the catalog is expected to only have products which easily comply with the regulation.

China's regulation also differs from the EU directive by further breaking down the parts and components of covered products into three categories: EIP-A, EIP-B, EIP-C. Table 3 outlines the definitions, based on an unofficial translated version of the regulation.

Table 3. Unofficial translated definitions of EIP-A, EIP-B, and EIP-C.

EIP Category	Definition
EIP-A	Each homogeneous material composing EIP
EIP-B	Metallic Coating of each part in EIP
EIP-C	Small components or materials that cannot be further disassembled under existing conditions in EIP. Generally parts which are equal to or less than 4 mm3 in size.

Once *Phase Two* requirements go into effect (date as yet to be determined), covered EIP must restrict the substances listed previously to the maximum concentration values listed in Table 1; but using table 4 as an additional guideline based on the three types of EIP.

Table 4. Unofficial translated concentration values for restricted substances in EIP.

EIP Category	Definition
EIP-A	Shall not exceed 0.1% for Pb, Hg, Cr_6, PBB, PBDE; 0.01% for Cd.
EIP-B	Pb, Hg, Cd, Cr-6 cannot be intentionally added
EIP-C	Shall not exceed 0.1% for Pb, Hg, Cr_6, PBB, PBDE; 0.01% for Cd.

5 QUICK STEPS TO COMPLIANCE

There are five quick steps to meeting the China RoHS Regulation: assessment, understanding requirements, determining E-PUP, mark and disclose restricted hazardous substance information, and create tracking system for updates.

1: Is the product covered?

The easiest way to determine if a product is covered is to review the EIP listing; several unofficial translations are available on the internet.

2: Determine E-PUP

If a product is covered by the China RoHS regulation, the company needs to determine the environmental protection use period, or E-PUP. This number is to be a multiple of five (5) years.

3: Understand Current and Future Requirements

The only requirement at this time is marking and labeling of products in the EIP listing. Label the product with either an "e" logo or the E-PUP logo. Not until publication of the catalog and a published implementation date for *Phase Two*, is the restriction of hazardous substances required for any EIP. There is no date for publication of the catalog at this time.

4: Mark and Disclose

Create the materials disclosure table for inclusion with all product shipments. Place table in product literature, on packaging materials, as well as on the product website (recommended).

5: Track Regulation

Finally, as Phase 2 has not been given a date of implementation, companies need to keep up to date on what is happening with the various reviews of the regulation.

GOING FORWARD

China is only the second jurisdiction to implement stringent requirements on electronics for the restriction of hazardous substances. Time will tell if the implementation in China of its RoHS regulation is friendlier to industry, as well as the environment for recycling products.

China's decision to require labeling is not only helpful to customs agents checking incoming products, but also to consumer and other parties concerned with eco-conscious decisions when it comes to purchasing electronic products.

With more and more countries contemplating RoHS and WEEE type legislations and regulations, companies need a method to track all eco-compliance directives and regulations.

What jurisdiction will be next to implement formal RoHS or WEEE legislation? Time will tell…

REFERENCES

[1] Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment; pp. L37/19-23

[2] Management Methods for Controlling Pollution by Electronic Information Products (Ministry of Information Industry Order #39) unofficial translation from AeA; accessed March 2007;

member access; p. 1

[3] Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment; pp. L37/19-23

[4] AeA Unofficial Translation; accessed March 2007; members access; http://www.aeanet.org/governmentaffairs/gabl_HK_Art3_EIPTranslation.asp

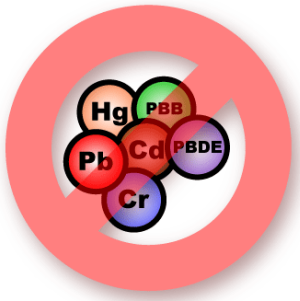
[5] Management Methods for Controlling Pollution by Electronic Information Products (Ministry of Information Industry Order #39) unofficial translation from AeA; accessed March 2007; member access; p. 1

[6] SMTA Webinar – China RoHS: Back to Basics; Krista Botsford; 28 March 2007.

[7] AeA Environmental Committee; Unofficial Translation of E-PUP document; committee members only access

China RoHS vs. EU RoHS

Myths & Misconceptions



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The Basics

- Official Translation: “Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation”
  - *Even MII refers to it as “China RoHS”.*
- Scope: Electronic Information Products (EIP)
- Phased Implementation:
  - Phase 1: Marking & Disclosure: 1 March 2007
  - Phase 2: Testing & Restrictions: TBD

EU RoHS vs. China RoHS

Trait	EU	China
Publish Date	27 Jan 03 EU Official Journal	28 Feb 06 / 1 Mar 06
Affected Materials	Pb, Hg, Cd, Cr6, PBB, PBDE	Pb, Hg, Cd, Cr_6, PBB, PBDE, Other toxic and hazardous substances or elements as specified by the State.
Effective Date	1 Jul 06	1 Mar 07: Phase 1: Labeling TBD: Phase 2: Testing
Scope	Electronic and Electrical Equipment 10 Categories	1. Electronic Information Products (EIP) 2. Packaging Materials
Marking Requirements / Disclosures	No markings Self-Declaration	• Disclosure of Hazardous materials & locations • Environmentally-Friendly use period (years) • Packaging Materials marks (Recycling) • Date of Manufacture

EU RoHS vs. China RoHS

Trait	EU	China
Effective Date for Products	"Put on the Market" on or after 1 Jul 06	Phase 1: Date of Manufacture 1 Mar 07 Phase 2: TBD
Testing & Certification	Not required Self-Declaration Due Diligence Methods	Phase 2: Required for catalog products Testing/Cert by Authorized Labs only
Packaging Materials	Out of Scope *Packaging Directive	In Scope Recyclable/Reusable Marking required
Exemptions	Set application process Material applications	No Formal Petition process Product Catalog will determine
Enforcement / Clarification	Individual Member States	Directed by National Regulation

Electronics Information Products

- Radar Equipment and Products
- Communications Equipment and Products
- Broadcast and Television Equipment Industry Products
- Computer Industry Products
- Household Electronics Products
- Electronic Measuring Instrument Products
- Electronic Industry Dedicated Equipment and Products
- Electronic Element Products
- Electronic Device Industry
- Electronic Application Products
- Electronic Dedicated Material Products

Source: **AeA Unofficial Translation**
2006
www.AeAnet.org/chinarohs

Common Products in Scope of China RoHS – but not EU RoHS

- Radar Systems (no mention of exclusions)
- Medical Products
- Large or Medium-scale computer work stations (servers)
- Networking infrastructure products
- Consumable materials associated with EIP
  - Floppy disks, CDs, ink cartridges, video tapes, etc
- Electronic components and its parts sold in direct markets
  - Capacitor: foil paper, dielectric, ceramic, etc.
- Upgrades, spare parts sold directly to consumer

Source: **AeA Unofficial Translation**
2006
www.AeAnet.org/chinarohs

China Sample Marking/Disclosure Logos

Logo 1

Logo 2

- Logo 1 implies no hazardous materials at or above maximum concentration levels as listed in SJ/T 11363-2006
  - Recommended color: Green
- Logo 2 implies hazardous materials over the maximum concentration levels as listed in SJ/T 11363-2006
  - Contrasting color with product
  - Orange is only a recommended color
- Number in Logo 2 is the Environmental Protection Use Period (E-PUP)
- Must be placed on product

Material Disclosure Table Additional Information

Table 1 Marking Styles for Names and Contents of Toxic or Hazardous Substances or Elements

Part Name	Toxic or hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.
X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.
(Enterprises may further provide in this box technical explanation for marking "X" based on their actual conditions.)

- Required in Chinese
- X – substance is presence
- O – substance is not present
- Part – company decision:
  - examples: part level; sub-assembly;
- Required for parts with concentration levels above restricted levels (e.g. must also have environmentally-friendly use period mark)

Environmental Protection Use Period

- Abbreviated: E-PUP
- The term during which toxic or hazardous substances or elements contained in electronic information products will not leak out or mutate
- Two methods of determining E-PUP:
  - Technical Methodology
    - Practical
    - Experimental
  - Conceptual Methodology
    - Safe Use Period
    - Technology Life Method

Source: **AeA Unofficial Translation**
Draft Feb 2007

Phase 1: Notes & Thoughts

- Supply Chain:
  - Must provide information that enables downstream producers to properly disclose and mark its product
  - If part is placed on open market, it must be marked
- Upgrades & Repairs
  - If covered under service/warranty work, not covered
  - If sold separately, must comply
- Refurbishments / Demo units
  - Not covered

Phase 2: Testing and Certification

- Enforcement Date: TBD
- Requirements:
  - Testing only required for products in EIP Catalog
    - Catalog Publication date: TBD
    - Catalog products will “easily comply” with MCV’s
  - Testing & Certification by certified Chinese lab
  - T&C requirement likely to be added to CCC Mark (CCC – China compulsory Certification)
    - Currently under discussion
  - No technical or application exemptions
    - Exemptions will be handled based on the catalog (once published)

China RoHS:
Steps to Compliance

China RoHS: 5 Steps to Compliance

1. Is the product covered?
   - Review EIP listing; several unofficial translations are available on the internet.
2. Determine E-PUP
   - Determine environmental protection use period – draft direction expected soon
   - Multiple of five (5) years.
3. Understand Current and Future Requirements
   - Marking and disclosure only for EIP
   - Phase Two (Date TBD) will require restriction of hazardous substances for sub-set of products in EIP list – date: TBD
4. Mark and Disclose
   - Adhere “e” logo or E-PUP logo to product
   - Create the materials disclosure table
5. Track Regulation
   - Watch regular publications and industry sites/groups for Phase 2 implementation/enforcement information

China FAQ's

FAQ

- Are components shipped to China for manufacturing purposes considered “sold into Chinese market”?
  - No – if the item is incorporated into a product for export.
  - Yes – if the items are incorporated into a product for sale in China; the information must be given as part of the completed product.
- How are Hong Kong and Taiwan treated?
  - Hong Kong and Taiwan are a separate legal systems from mainland China. EIP manufactured or sold within these regions are not covered.
  - If the EIP is “exported” to mainland China, it would be covered.
- When will the product catalogue be published?
  - It is expected in 2007; but no indication is available at this time as to a more specific date.

FAQ

- Are beta or test or prototype units covered?
  - As the item is not being “sold” into the China Market, therefore they need not be labeled with environmental information.
- Does the label/matrix need to have concentration values of the restricted substances? Or just X and 0’s?
  - The table only needs to indicate the presence or absence of material. If there are no restricted substances within the product, there is no need for a table.
- Where can I get the logos in order to place them on the packaging, product, etc?
  - http://www.mii.gov.cn/art/2006/12/04/art_1221_27273.html
  - http://www.aeanet.org/chinarohs

FAQ

- Do sub-assemblies used to repair products need to meet the labeling standard?
  - If the part is used in maintenance or repair it does not need to be labeled.
  - If the product is sold direct to the consumer, it must comply with the labeling requirement.
- Who can be contacted regarding a particular product being within scope of “China RoHS”?
  - Companies are encouraged to review “Explanation of EIP Classification” document to determine if a product is covered.
    - Unofficial translation at: *www.aeanet.org/chinarohs*.
  - MII has a general contact available at: *chinarohs@mii.gov.cn.*
- Where can I get additional information or information on additional events?
  - http://www.5-trees.com
  - http://www.aeanet.org/chinarohs

RoHS/WEEE Expansion

WEEE/RoHS Expansion World-Wide

- Japan (formal)
- South Korea
- Australia
- New Zealand
- Argentina
- Taiwan
- Russia
- Asia-Pacific Economic Co-op

WEEE/RoHS Expansion World-Wide

- MERCOSUR Countries
  - Argentina, Brazil, Paraguay, Uruguay, Venezuela
- Mexico
- Columbia
- Costa Rica
- Canada – by province
- India

Thank you for your attention.

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