



**Supply Chain Quality
Implementing RoHS**

(Restrictions on Hazardous Substances)

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Newark

What does RoHS stand for?

- **RoHS** stands for the **Restriction of the use of certain Hazardous Substances**. It refers to legislation restricting the use of six substances in electrical and electronic equipment (EEE) sold within/to European Union countries.
- Equipment regulated includes items like computers, cell phones, TVs, fluorescent lamps, household appliances, toys and sports equipment.



What is the concern?

- Discarded electronic products are our fastest growing waste stream. Most end up in landfills.
- Electronic equipment contains hazardous substances with the potential to leach when placed in landfills.
- Scrap electronic equipment is often sent to Asia where low wage workers, sometimes children, are paid to disassemble and reclaim materials, exposing themselves to hazardous substances.

Chinese child sitting among a pile of wires and e-waste.



Did you know?

- E-waste is now the fastest growing segment of municipal solid waste.
- We are upgrading our mobile phones, computers, televisions, audio equipment and printers more frequently than ever before.
- The average lifespan of computers dropped from six years in 1997 to just two years in 2005.
- Mobile phones now have a lifespan of less than two years.



What legislation has the EU enacted?



- The EU **RoHS** (Restriction of the use of certain Hazardous Substances) Directive restricts the hazardous substances that can be in new electronic products sold within/to European Union countries after **July 1, 2006**.
- **WEEE** (Waste from Electrical and Electronic Equipment) is a complementary EU directive, which make manufacturers and importers ("producers") of electronic products responsible for meeting the costs of their collection, treatment and recycling starting **July, 2006**.

What is an EU Directive?



- Directives are instructions to EU member states - currently twenty-five countries - to alter or supplement their national laws by a specified time in order to achieve results within another specified time.
- Once a directive has been adopted, member states are required to implement it within a specified time – usually two years.

What are the Expected Benefits of the EU RoHS and WEEE Directives?

- ❁ The RoHS Directive restricts the use of hazardous substances in EEE and that will reduce the need for special handling of e-waste in the future.
- ❁ The WEEE Directive will conserve raw materials and divert e-waste from EU landfills, reducing the threat of soil and water contamination.



Producer Responsibilities under WEEE

- A “**Producer**” is a person who manufactures and sells an electronic product, as well as a distributor who resells it under their brand name or imports or exports it into an EU member state.
- **Producer obligations** under WEEE include:
 - pay for collection, treatment, recovery and recycling of WEEE,
 - meet recycling targets set for the product by a member state,
 - mark products with a “**Wheelie bin**” symbol (shown below) by 1/4/07
 - obtain material declarations / certificates of compliance from suppliers,
 - put producer number on invoices, and
 - comply with WEEE record-keeping and reporting requirements.



Typical WEEE Costs to Producers

Producers will have to cover the costs associated with the WEEE Directives.

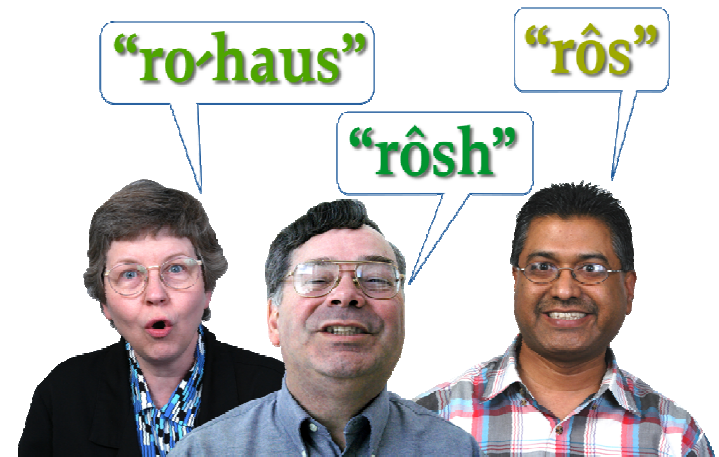
Producers will have to pay to:

- Collect WEEE
- Dismantle, reclaim or recycle WEEE
- Meet member country re-use, recycling and recovery targets
- Mark their products for separate collection
- Provide information to treatment and recycling facilities
- Report compliance information to a local Environment Agency

NOTE: *There already have been fines at retailers in Ireland up to 10,000 Euros for not meeting the WEEE set requirements!*

What is Newark doing about RoHS?

- Providing you with tools to self-select RoHS information, solutions and products easily.
- Adhering to a stringent quality assurance process to assure compliant inventory.
- Flagging all RoHS compliant parts with a special symbol for easy identification.
- Changing part numbers for all new RoHS compliant versions, even if the manufacturers do not change theirs.
- Providing documentation to help customers manage their RoHS inventory.



Understanding RoHS/WEEE

RoHS Inclusions & Exemptions

The Directive applies to:	The Directive does <i>not</i> apply to:
<ul style="list-style-type: none">▪ Large & small household appliances▪ IT/telecom equipment▪ Consumer equipment▪ Lighting equipment (including household light bulbs/luminaries)▪ Electrical/electronic tools▪ Toys, leisure & sports equipment▪ Automatic dispensers	<ul style="list-style-type: none">▪ Military/national security equipment (when that is the sole use)▪ Batteries▪ Electrical and electronic equipment that is part of another type of equipment (e.g. car radios)▪ Large-scale stationary industrial tools▪ Medical devices (Subject to review)▪ Monitoring and control instruments (Subject to review)▪ Maintenance/repair: Spare parts for the repair, or for the re-use of electrical and electronic equipment that was on the market before July 1, 2006

This is meant to be only a general guide. Some exclusions are still under consideration. See RoHS Express for latest information.

Understanding RoHS/WEEE

Substances restricted by RoHS

SUBSTANCE	USE	IMPACT	ALTERNATIVE
Lead	Used as alloy in solder and termination plating. Also CRT glass and ceramics used in active and passive components	63% tin, 37% lead solder melts at 183° C. Pure tin solder fully melts at 232°C. Higher temperatures are therefore required in manufacturing. The use of pure tin solder may also cause whisker formation	Pure tin matte plating on terminations. Variety of solders used including silver and copper alloys with tin. All require higher melt point
Mercury	Batteries, fluorescent lamps, and some switches, sensors, and relays		Gold-plated contacts, although impossible to achieve zero bounce without mercury
Cadmium	Electroplating, NiCd batteries, arching contacts, sensors and color in some plastics		Various alternatives, although none perform as well
Hexavalent Chromium	Plating on metals, primers for coated metals and hard chrome, metallizing plastics		This requires sometimes inferior plating to be used, changing the expected cycles or life expectancies of the product
PBE & PBDE	Flame retardant	Flame retardants are used in many components as well as insulation on wire. These are being reformulated	Alternatives perform differently and may require greater amounts

Understanding RoHS/WEEE

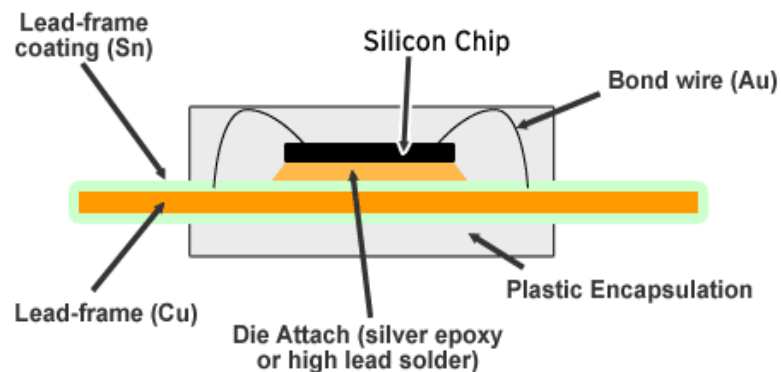
Maximum Allowable Concentration Values

- ❁ **0.1%** by weight in “**homogeneous materials**” for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers
- ❁ **0.01%** by weight for cadmium
- ❁ Compliance required for each homogeneous material, not based on the weight of the entire component or equipment
- ❁ Homogeneous material means a unit that cannot be mechanically disjointed (cutting, grinding, crushing, etc.) into single materials - such as plastic, ceramics, glass, metals, etc.

Understanding RoHS/WEEE

What is a compliant product?

- ❁ Equipment producers will have to take steps to ensure that all parts and materials used in their products do not contain restricted substances (above allowable concentrations).
- ❁ Components such as capacitors, transistors and semiconductor packages are not “homogeneous materials” but contain several different materials.



Understanding RoHS/WEEE

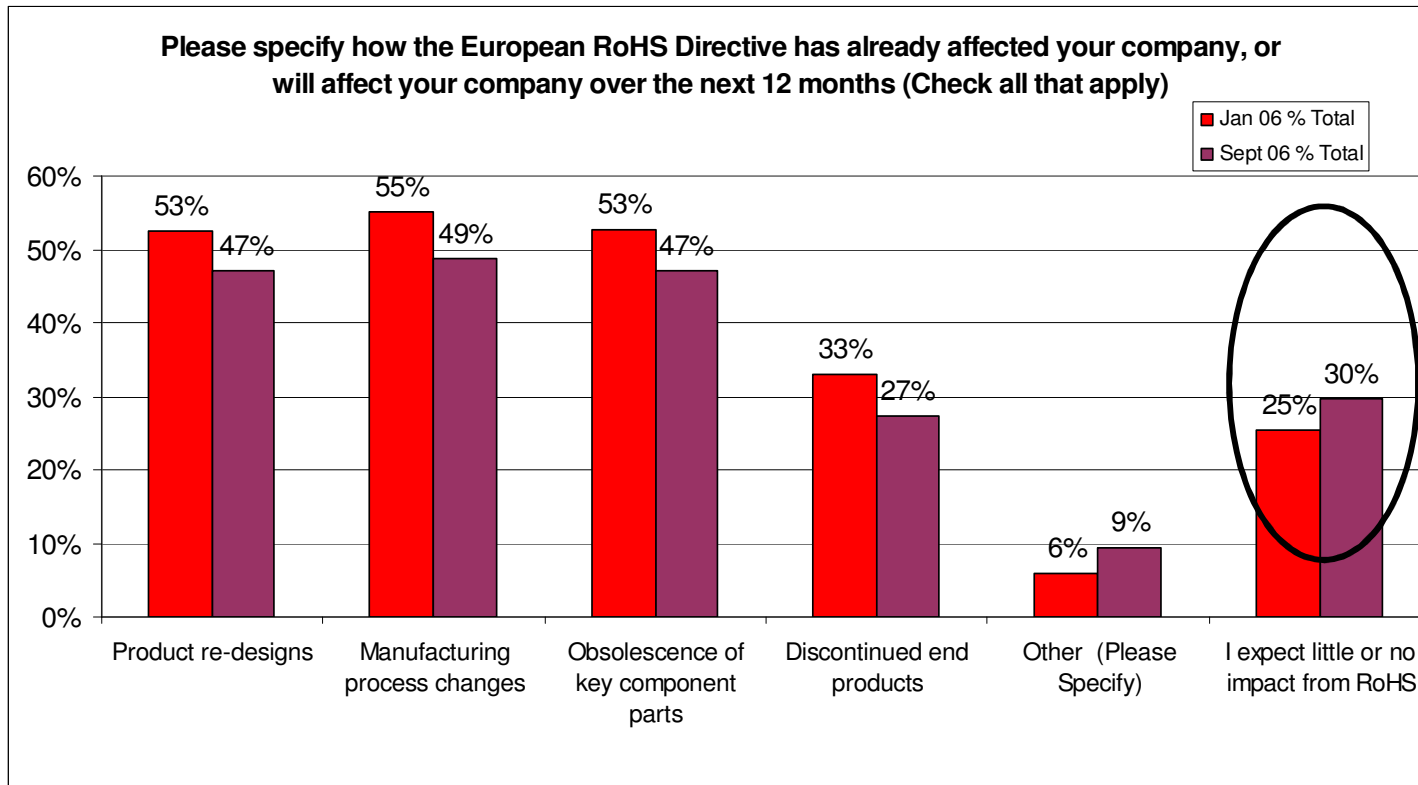
Recommended Compliance Due Diligence

- ❁ Buyer should obtain a **certificate-of-conformity** / compliance from producer or distributor
- ❁ **Distributor Due Diligence**
 - ❁ Obtain manufacturer certificate of compliance
 - ❁ Perform manufacturer risk assessment
 - ❁ Perform random testing

C-of-C + Robust Procedures = Due Diligence

RoHS Survey Results

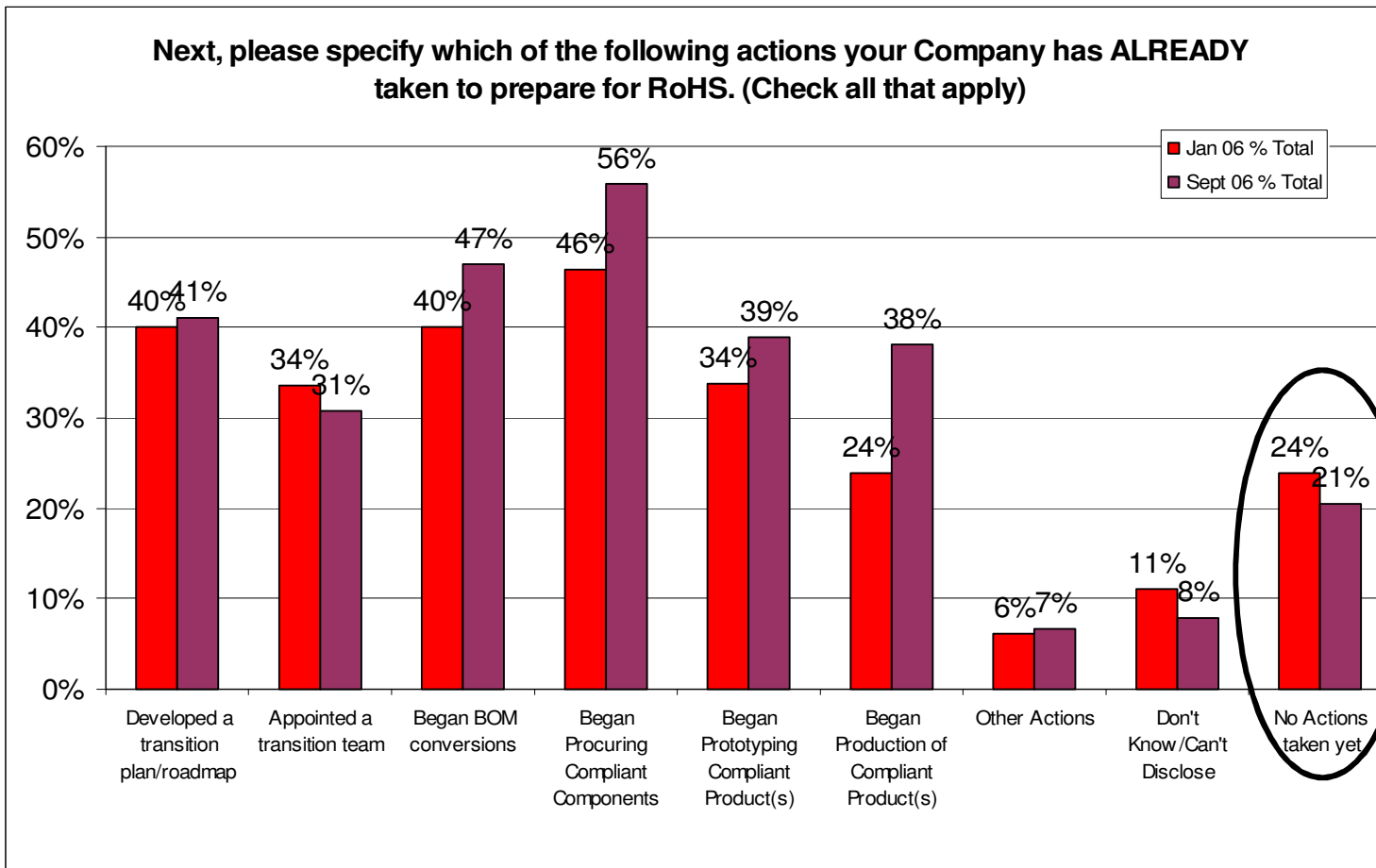
September 2006



- ✓ As July 1st has come and gone, anxiety levels over RoHS impact seem to have declined marginally.
- ✓ Trend may reflect a smoother than expected transition? Apathy until enforcement measures take hold?

RoHS Survey Results

September, 2006



- ✓ Reinforces the notion that many US-based companies are still moving toward compliance...
- ✓ AND many companies still have a long way to go!

RoHS Challenge:

EU's RoHS is just the beginning. It's important to keep up with what other countries are doing.

- Europe – Effective July 1, 2006
- California – Effective January 1, 2007
- Japan – Effective July 1, 2006
- China – Effective March 1, 2007
- Korea – Effective July 1, 2007
- United States & Canada --??????????



Europe RoHS Directive

- Exempt – Defense, Aerospace, Automotive, Medical and parts of Communication.
- Most suppliers only want to run 1 production line and will only make RoHS compliant versions.
- Suppliers that continue to support non-compliant product will consider raising prices from 15% - 40%.
- About 70% of the suppliers are changing their part numbers.
- Only about 50% of the customers have converted to RoHS in North America.
- Currently there is no consideration given to supporting a RoHS initiative/directive here in the U.S. or North America.

California RoHS Directive

- California RoHS is similar in nature to the EU RoHS Directive but narrower in scope.
- Restricts the use of lead, mercury, cadmium, and hexavalent chromium, not flame retardants.
- “Covered electronic devices” are restricted.

California ROHS Maximum Concentration Values* (MCVs)

*same as EU RoHS MCVs for metals

Substance	MCV <i>(Percent by weight)</i>
Lead	0.1%
Mercury	0.1%
Cadmium	0.01%
Hexavalent chromium	0.1%

Covered Electronic Devices

Video display devices containing a 4” screen, measured diagonally, and:

- Cathode ray tubes
- Computer monitors containing CRTs
- Laptop computers w/liquid crystal displays (LCDs)
- LCD containing desktop monitors
- Cathode ray tube containing devices (CRT devices)
- TVs containing CRTs
- TVs containing LCD screens
- Plasma TVs
- DVD Players (July 2007)

CA RoHS Exemptions

“Covered electronic device” does not include:

1. A video display device that is a part of a motor vehicle.
2. A video display device in industrial, commercial, or medical equipment.
3. A video display device in home appliances: clothes washer, clothes dryer, refrigerator, refrigerator and freezer, microwave oven, conventional oven or range, dishwasher, room air conditioner, dehumidifier or air purifier.

Japan RoHS Directive

- The Law for the Promotion of Effective Utilization of resources seeks to establish a sustainable society based on the 3R's of reduce, reuse and recycling. Industries are targeted and requirements are instituted on an ad hoc basis, based upon technology that is available to support 3R initiatives.
- Manufacturers and importers of computers, televisions, refrigerators, washers & dryers, microwaves and air conditioners must label their products to indicate presence of the six RoHS substances.
- Importers of computers, copiers, televisions, refrigerators, washers & dryers, microwaves and air conditioners must now meet the Design for Environment (DfE) criteria required of domestic manufacturers.

China RoHS Directive

- Covered products include electronic radar products, electronic communication products, broadcast TV products, electronic measurement instruments, fixed manufacturing equipment, medical and diagnostic equipment, and electronics in vehicles and aircraft.
- There are no exemptions.
- Packaging materials must be non-toxic, and they must be easily degradable or recyclable.
- Manufacturers and importers must specify the time period during which potentially toxic substances in a covered product will not leak or mutate.
- All covered products must be certified by China and testing by Chinese labs will be required to become compliant. No “self declaration” that is allowed per the EU Directive.
- Extensive labeling requirements required on all individual components.



Korea RoHS Directive

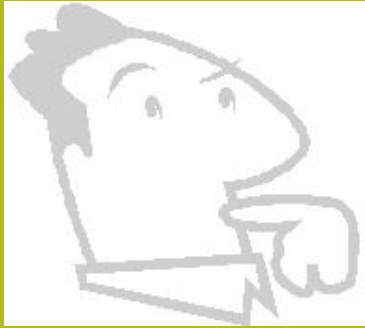
- Very broad RoHS/ELV (End-of Life Vehicles)/WEEE-like legislation proposed.
- Product covered will be anything electrical or electronic (parts too) plus automotive.
- Enforcement date will be July 1, 2007.
- Substances – Not yet specified, but expected to be consistent with EU RoHS.
- Manufacturers will be responsible for collecting and managing composition data.
- **Penalty clear:** failure to provide material composition data could result in 1 year jail time and fine up to \$50,000.

WEEE Challenge:

Canada province & USA State WEEE laws

- California and Alberta make buyers of certain new electronic equipment (including computers and TVs) pay a recycle fee. Contractor hired to recycle e-waste.
- Cell phone take-back laws in CA & ME.
- ME, MD, WA, British Columbia & Saskatchewan have enacted rules requiring manufacturer take-back of e-waste.
- State rules restricting mercury in consumer products appearing in CT, ME, MA, NH, NJ and NY.
- Pressure building for national WEEE laws in Canada and USA.





Review

- 1. True or False:** An EU Directive is an instruction to a member state.
- 2. Fill in the Blank:** The initials RoHS stand for the Restriction of the use of certain _____.
- 3. How many substances are restricted under the RoHS Directive? 4, 6, 8, or 10**
- 4. Fill in the Blank:** The initials WEEE refer to the _____ and Electronic Equipment Directive.
- 5. True or False:** Producers will have to cover the costs associated with the WEEE Directive.
- 6. True or False:** A Producer must be the manufacturer of electrical and electronic equipment.

Questions?

