

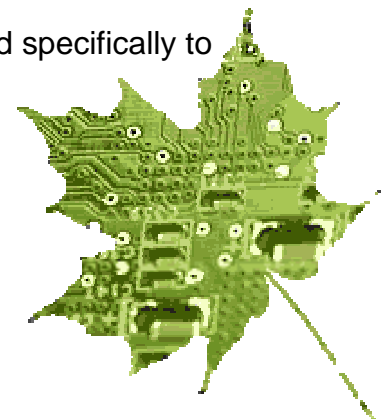
## Understanding the Requirements of the European RoHS Directive and its Impact on Your Business

A Background Overview Prepared by MEC

The RoHS (Restriction of Hazardous Substances) Directive is a European initiative intended to reduce the environmental impact of electrical or electronic products in the waste stream and improve the recyclability of that waste. Under RoHS, electrical and electronic products destined for sale in Europe must be free of six hazardous substances identified by the directive by July 1, 2006. This means companies that manufacture, rebrand, or import electrical or electronic equipment destined for Europe (referred to as “producers” in this overview) must take action now to ensure that their products comply with RoHS requirements by that date.

While compliance with RoHS may be complex and costly for some producers, it will eventually help them comply with similar regulations now emerging in the U.S. and other global regions.

A driving force behind RoHS is the European WEEE Directive, which stands for Waste and Electrical Electronic Equipment. WEEE is being introduced in two phases between mid-2005 and year-end 2006. (In the United Kingdom, some WEEE deadlines have been accelerated.) This directive requires producers of electrical and electronic equipment to assume responsibility for the recovery and recycling of their products. The WEEE Directive is often included in discussions about RoHS because RoHS was enacted specifically to safeguard persons engaged in recycling products governed by WEEE.



## Overview of the RoHS Directive and its Requirements

### The Directive Focuses on Six Substances

The RoHS Directive is sometimes confused with the movement toward “lead-free” electronic assemblies. While lead is an important issue, it is only one of six substances covered by RoHS. Also included are Cadmium, Mercury, Hexavalent Chromium, PBBs, and PBDEs. The table below lists the substances that are banned or restricted under RoHS and describes where they are commonly found in electrical and electronic products.

### *Substances Covered by RoHS*

| <b>Banned/Restricted Substance</b>    | <b>Use/Where Found in Electronics</b>  |
|---------------------------------------|--|
| Cadmium                               | Batteries, paints, yellow pigment, plastics additives (especially PVC used in cable assemblies), phosphorescent coatings, detectors/devices/LEDs.  |
| Mercury                               | Switches, pigments, paints, polyurethane materials (high gloss windows), lamps, bulbs/lighting (displays, scanners, projectors).   |
| Hexavalent Chromium                   | Metal finishes for corrosion protection (chasses, fasteners), aluminum conversion coatings, alloys, pigments paints.   |
| Polybrominated Biphenyls (PBBs)       | Flame retardants (plastics, housings, cables, connectors, fans, components, paints).   |
| Polybrominated Diphenyl Ethers (PBDE) | Same as PBBs.  |
| Lead                                  | Solder and interconnects, batteries, paints, pigments, piezoelectric devices*, discrete components, sealing glasses, CRT glass*, PVC cables (UV/heat stabilizer), metal parts, chasses, washers. |

\*Exempt under RoHS

## **Who is Expected to Comply and What Products are Covered?**

RoHS affects producers of broad classes of products, including:

- IT/Telecom and consumer equipment
- Electrical/electronic tools (large industrial tools are exempted)
- Monitoring and control instruments (some medical products are excluded)
- Toys, leisure, sports, and medical equipment (with exemptions for some medical equipment)

In order to comply, producers may need to change product design specifications and mandate alternative production processes for the components and subassemblies used in these products. For example, power supplies, housings and electrical/mechanical attachments, motors and drives, printed circuit boards, electronic components, displays, as well as switches, sockets, connectors and wiring may all contain banned or restricted substances and, therefore, may disqualify an end product for sale in Europe under RoHS.

### **RoHS holds the end product manufacturer, rebrander, or importer (producers)**

**responsible for product content.** Since the burden of compliance lies with producers, they must direct the actions of component, PCB fabrication, assembly, materials, and other suppliers to ensure all contribute appropriately to end product compliance.

### **Product Exceptions**

Aside from selected medical equipment and industrial tools, the only other exception permitted under RoHS involves replacement parts. The directive allows producers to supply “original equipment” or otherwise non-conforming replacement parts at any time to repair a non-conforming product that was sold into the market prior to the implementation of RoHS.

Non-conforming replacement parts cannot be used to repair products that conform with RoHS, regardless of when they were sold.

### **Typical Producer Compliance Sequence**

Compliance with RoHS cannot be achieved “overnight”. While specifications for new product designs can be prepared early in the product development process to ensure RoHS compliance at launch, producers must also revisit all existing product designs and specifications and take steps necessary to bring those products into compliance.

Depending on the number and complexity of products, this may involve weeks and even months of effort.

As the sequence outlined below suggests, compliance with the RoHS and WEEE directives may be pursued simultaneously since the timeframes for implementation overlap. Taking action to comply with the requirements of both directives at once can also be more efficient for producers and their suppliers. For example, if product redesign is required to enable easy recycling under WEEE, and elimination of hazardous substances under the terms of RoHS also leads to a change in design, combined reengineering and retooling to comply with both directives can save time and money.

A typical sequence for compliance with RoHS and WEEE includes the following steps:

1. Producer understands the terms of the directives and their implications on current and future products.
2. Internal product and marketing teams establish compliance plans based on an assessment of product status.
3. Internal product R&D teams implement product design and specification changes as needed and prepare supporting documentation.

4. New tenders including WEEE and RoHS requirements are issued to suppliers.
5. WEEE registration is submitted. Product disassembly data is supplied to European recycling facilities as detailed in the WEEE Directive. Producers who fail to register are subject to possible fines.
6. All products are in compliance with RoHS on July 1, 2006.
7. All products are in compliance with WEEE on January 1, 2007.

### **The Impact on PCBs**

Although lead is only one of six substances restricted under RoHS, it is a key concern in printed circuit board (PCB) assembly. PCBs must transition to alternative lead-free solders materials to comply with RoHS. Other substances restricted by RoHS may be found in electronic components currently used on PCBs. Replacement of these components will be necessary to achieve compliance.

Unfortunately, the transition to RoHS-compliant PCBs may not be seamless or inexpensive. PCB layout changes may be necessary to accommodate alternative components, resulting in additional engineering and tooling costs. Redesigns may also be necessary if component suppliers discontinue parts during the transition to compliant materials. New components may be more costly than the original parts. Order lead times may be longer if demand for RoHS-compliant components exceeds demand. Component shortages may occur. And any remaining inventories of pre-RoHS components will be rendered obsolete when the directive takes effect, resulting in possible financial loss and disposal expense.



## **Conclusion**

If you are a producer of electrical or electronic products, immediate action is necessary to ensure your products comply with RoHS by the July 1, 2006 deadline. Compliance with RoHS requires coordination and cooperation across your entire organization as well as the full support of your strategic suppliers.

As a leading source of engineering, design and PCB manufacturing services to the electronics industry, MEC stands ready to support your efforts to comply with RoHS. Our publication, "RoHS Compliance Solutions from MEC" outlines what MEC can do to help you meet the requirements of the directive. For additional information, ask your MEC representative or contact us at the numbers shown below.

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