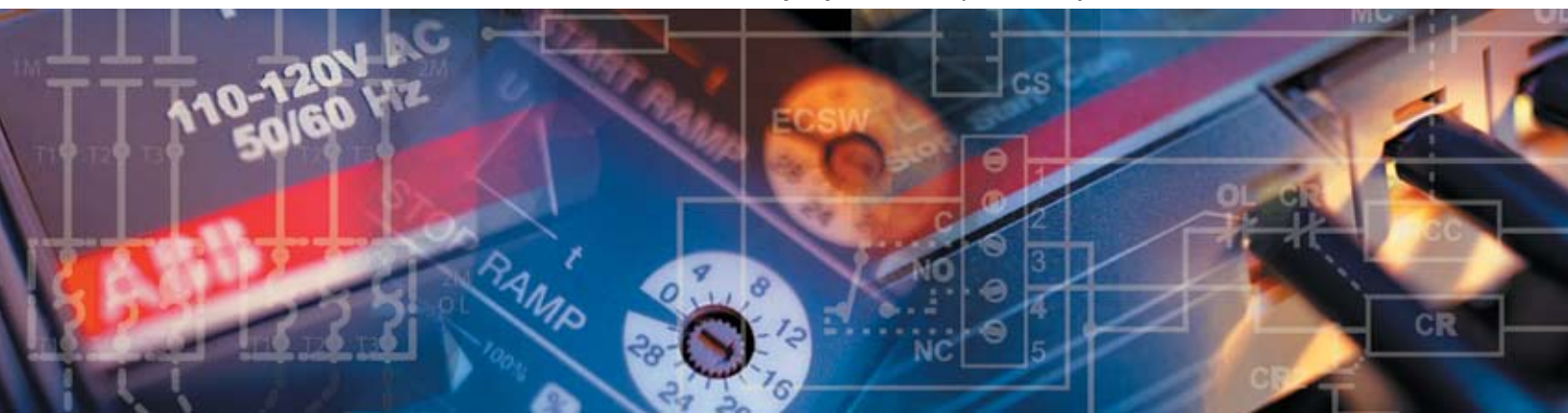


## Understanding RoHS:

- *Restriction of the Use of Certain hazardous Substances in EEE*
- *Waste Electrical and Electronic Equipment (WEEE)*



# Understanding the scope of RoHS

## Introduction

The European Union (EU) directives 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) and 2002/95/EC RoHS (Restrictions in the use of Hazardous Substances) are to be fully implemented by August 2005 and July 2006 respectively. The directives apply to electrical and electronic equipment designed for use with a voltage rating not exceeding 1,000 volts for alternating current and 1,500 volts for direct current. The requirements of these directives are applicable to the Member States of the European Union. The purpose of this paper is intended to provide an overview of these two directives. Information presented here is a short summary for the reader to quickly review and determine what products fall within the scope of these directives.

## What is RoHS?

RoHS, also known as Lead-Free, is the acronym for Restriction of Hazardous Substances. RoHS Directive 2002/95/EC originated in the European Union. The purpose of the directive is to restrict the use of hazardous substances in electrical and electronic equipment and to contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment. RoHS is a harmonizing directive based on EC Treaty article 95, with the same rules applying in all EU countries. The directive restricts the use of six hazardous materials found in electrical and electronic products. All applicable products in the EU market after July 1, 2006 must pass RoHS compliance. RoHS impacts the entire electronics industry.

## What is WEEE?

WEEE is the acronym for Waste from Electrical and Electronic Equipment. WEEE, also known as Directive 2002/96/EC mandates the treatment, recovery and recycling of electric and electronic equipment. The purpose of WEEE directive is, as a first priority, the prevention of waste electrical and electronic equipment, and in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. WEEE is put into force according to article 175, which means that each country develops its own system for take back and financing the collection of WEEE with minimum requirements according to the WEEE directive. All applicable products in the EU market after August 13, 2006 must pass WEEE compliance and carry the "Wheeler Bin" sticker. WEEE does not apply to electrical and electronic equipment that is part of another type of equipment that does not fall within the scope of the directive. EU Member States shall encourage the design and production of electrical and electronic equipment which take into account and facilitate dismantling and recovery, in particular the reuse and recycling of WEEE, their components and materials.

## How are RoHS and WEEE related?

Both the directives apply to the same type of equipment (Electrical and Electronic Equipment). The RoHS directive provides for the elimination upfront (during the design stage) of certain hazardous materials in electrical and electronic equipment (EEE). The WEEE directive provides for the selective collection, treatment and other forms of recovery and disposal of waste electrical and electronic equipment. The WEEE Directive 2002/96/EC refers to the product categories indicated in its Annex IA. The RoHS Directive 2002/95/EC applies to electrical and electronic equipment falling under categories 1 to 7 and 10 listed in Annex IA of the WEEE directive and to electric light bulbs and luminaires in households. A detailed list of the products to be taken into account for the purpose of the WEEE directive and falling under the categories in Annex IA is established in Annex IB of the directive.



European Union

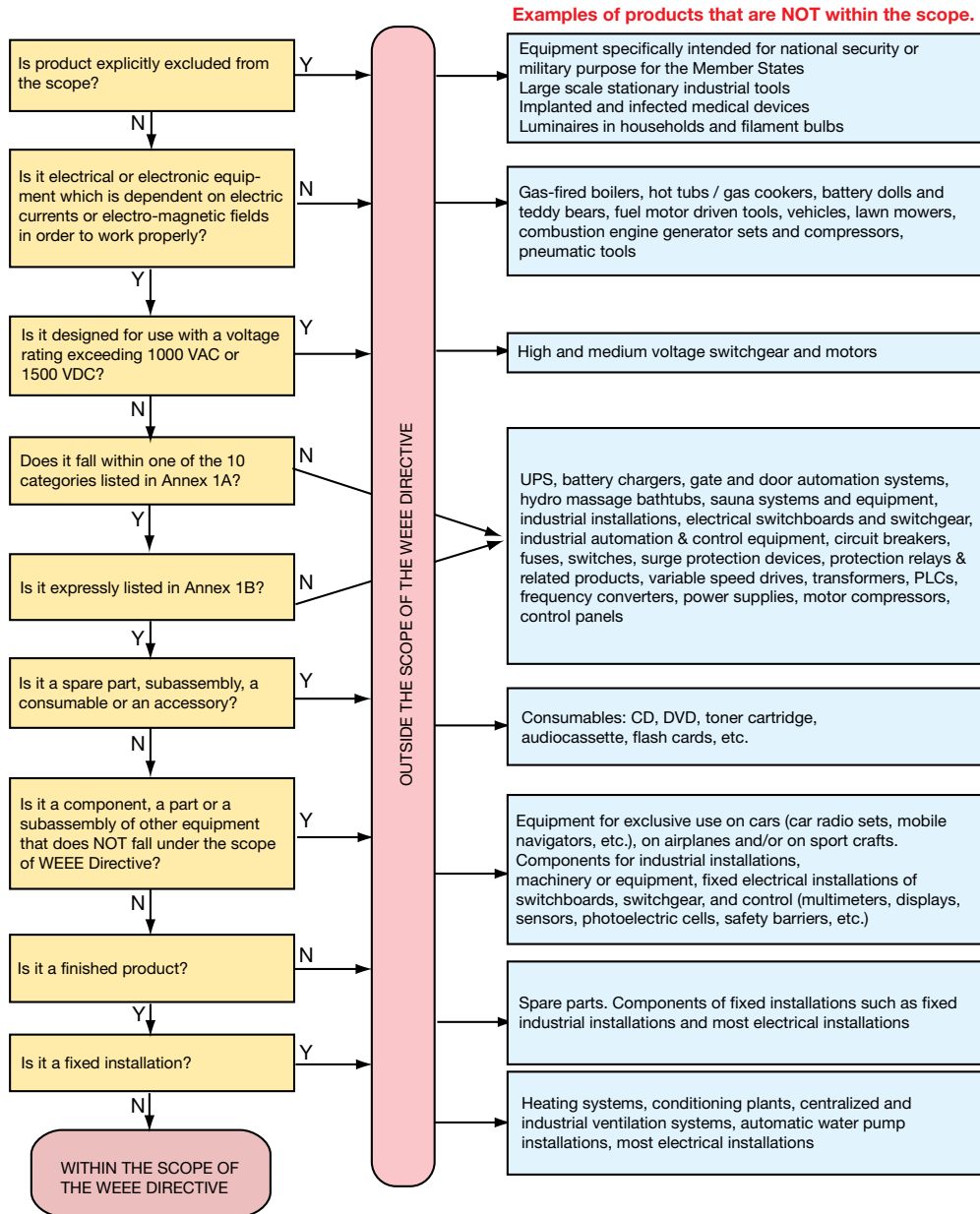
**RoHS... is the acronym for Restriction of Hazardous Substances.**

**WEEE... is the acronym for Waste from Electrical and Electronic Equipment.**

# Understanding the scope of RoHS

## WEEE Decision Tree

The WEEE decision tree can be used to determine whether or not equipment is within the scope of the WEEE directive.



**Products that meet WEEE compliance, carry the "Wheelie Bin" sticker**

# Understanding the scope of RoHS

## RoHS Product Compliance Categories

The following product categories are impacted under the RoHS Directive:  
The categories covered by the WEEE directive are defined in Annex 1A with the exception of categories 8 & 9. Large-scale stationary industrial tools are excluded in category 6 also.

### Annex 1A

(WEEE Directive 2002/96/EC)

\* see Annex 1B (Appendix) for further details

1. Large household appliances: refrigerators, washers, stoves, air conditioners
2. Small household appliances: vacuum cleaners, hair dryers, coffee makers, irons
3. Computing & communications equipment: computers, printers, copiers, phones
4. Consumer electronics: TVs, DVD players, stereos, video cameras
5. Lighting & equipment: lamps, lighting fixtures, light bulbs
6. Electrical & electronic tools: drills, saws, nail guns, sprayers, lathes, trimmers, blowers
7. Toys and sports equipment: videogames, electric trains, treadmills
8. Medical devices:
9. Monitoring and control instruments:
10. Automatic dispensers: vending machines, ATM machines

## The following products are currently exempted from RoHS compliance

1. Large stationary industrial tools (a machine or system consisting of a combination of equipment, systems or products, each of which is manufactured and intended to be used only in fixed industrial applications).
2. Control and monitoring equipment
3. National security use and military equipment
4. Medical devices
5. Some light bulbs and some batteries
6. Spare parts for the repair of electrical and electronic equipment (EEE) put on the market before 1 July 2006 and replacement parts designed to expand the capacity of and/or upgrade EEE placed on the market before 1 July 2006.
7. The reuse of EEE placed on the market before 1 July 2006.
8. Electrical and electronic equipment which is part of another type of equipment or system (e.g. a car radio).

## What are the restricted materials mandated under RoHS?

The following six (6) substances are banned under RoHS are lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (CrVI), polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE).

**Mercury:** in thermostats, sensors, relays in switches and discharge lamps.

**Lead:** solder in printed circuit boards, glass in cathode-ray tubes and electric light bulbs.

**Cadmium:** switches, springs, connectors, housings and printed circuit boards.

**Hexavalent chromium:** Metal coatings for corrosion protection.

**Polybrominated biphenyls and polybrominated diphenyl ethers:** flame retardants in printed circuit boards, connectors and plastic covers.

## Which companies are affected by the RoHS Directive?

The directive applies to all products sold in Europe, irrespective of their place of manufacture. Any business that sells applicable electronic products, sub-assemblies or components directly to EU countries, or sells to resellers, distributors or integrators that in turn sell products to EU countries, is impacted if they utilize any of the restricted materials. There is no federal legislation yet in USA, but there are a number of State electronic waste recycling initiatives to consider. On RoHS side the Environmental Protection Agency (EPA) has proposed a crack-down on lead emissions from plants that may impact the soldering industry.



**Six substances are banned under RoHS...**

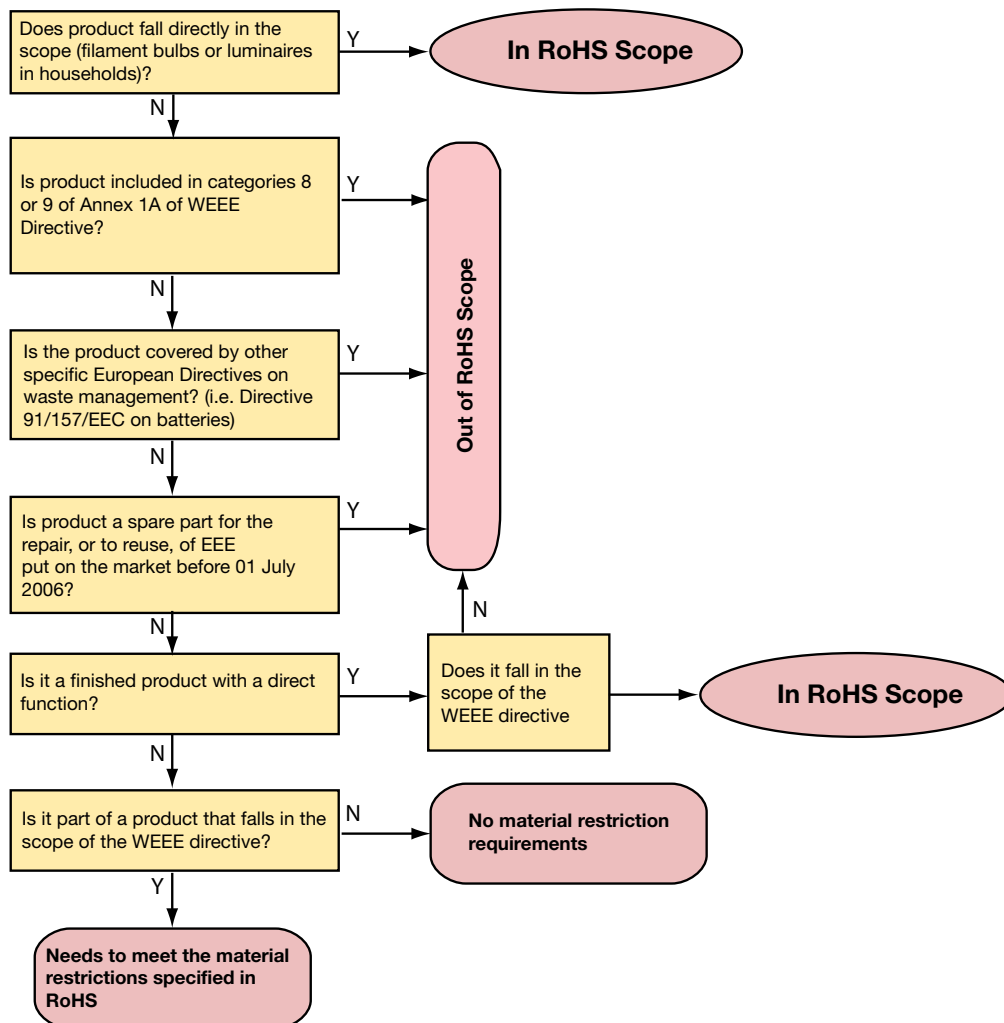
# Understanding the scope of RoHS

## RoHS Decision Tree

The decision tree is used to determine whether or not equipment is within the scope of the RoHS directive. The RoHS Directive only applies to Electrical and Electronic Equipment (EEE) that is “put on the market” as finished product with a direct function. The directive applies to finished products, so that there are no legal requirements on components / parts by themselves. Therefore, components or parts of finished products that are not in the scope of the RoHS Directive are not subject to any RoHS requirements.

However, restriction of substance used in a given finished product indirectly implies the same requirements to all of its parts (material, components, sub-assemblies). Therefore, to determine whether a component/ part/ sub-assembly needs to meet the substance restrictions specified in the RoHS Directive, it is necessary to determine if the finished product into which the component/ part/ sub-assembly will be incorporated is itself within the scope of the RoHS Directive (i.e. including put on the market as a new product after July 1st 2006).

The RoHS decision tree relates to the WEEE decision tree as, with the exception of categories 8 and 9, light bulbs, and luminaires in households, finished products falling within the scope of the WEEE Directive also fall within the scope of the RoHS Directive.



*The decision tree is used to determine whether or not equipment is within the scope of the RoHS directive.*



*How to determine if product needs to be RoHS compliant...*



**ABB is working to... phase out... hazardous substances mentioned in the RoHS directive...**

## Understanding the scope of RoHS

### ABB Position

ABB has studied the scope of the WEEE directive to check the extent to which our products may be affected. Since ABB's activities are mostly business-to-business, our front-line responsibility may not be significant. ABB Low Voltage Products do not directly fall within the scope of the RoHS directive but they could be part of another type of equipment that does fall within the scope of the directive. Conformity is not required where product and equipment do not fall under the scope of the WEEE directive or under categories 8 & 9 of Annex 1A. ABB is working to replace or phase out by internationally agreed deadlines the hazardous substances mentioned in the RoHS directive since our customers are going to be subjected to RoHS compliance. These substances are all included in ABB's internal list of restricted materials. ABB's research and development departments take into account the RoHS and WEEE directives and all relevant legislation and guidelines when designing new products, to facilitate their dismantling, recovery and recycling.

### Appendix

#### ANNEX IB

List of products which must be taken into account for the purpose of this Directive and which fall under the categories of Annex IA

#### 1. Large household appliances

- Large cooling appliances
- Refrigerators
- Freezers
- Other large appliances used for refrigeration, conservation and storage of food
- Washing machines
- Clothes dryers
- Dish washing machines
- Cooking
- Electric stoves
- Electric hot plates
- Microwaves
- Other large appliances used for cooking and other processing of food
- Electric heating appliances
- Electric radiators
- Other large appliances for heating rooms, beds, seating furniture
- Electric fans
- Air conditioner appliances
- Other fanning, exhaust ventilation and conditioning equipment

#### 2. Small household appliances

- Vacuum cleaners
- Carpet sweepers
- Other appliances for cleaning
- Appliances used for sewing, knitting, weaving and other processing for textiles
- Irons and other appliances for ironing, mangling and other care of clothing
- Toasters
- Fryers
- Grinders, coffee machines and equipment for opening or sealing containers or packages
- Electric knives
- Appliances for hair-cutting, hair drying, tooth brushing, shaving, massage and other body care appliances
- Clocks, watches and equipment for the purpose of measuring, indicating or registering time
- Scales

# Understanding the scope of RoHS

## 3. IT and telecommunications equipment

Centralized data processing:

Mainframes

Minicomputers

Printer units

Personal computing:

Personal computers (CPU, mouse, screen and keyboard included)

Laptop computers (CPU, mouse, screen and keyboard included)

Notebook computers

Notepad computers

Printers

Copying equipment

Electrical and electronic typewriters

Pocket and desk calculators and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means

User terminals and systems

Facsimile

Telex

Telephones

Pay telephones

Cordless telephones

Cellular telephones

Answering systems and other products or equipment of transmitting sound, images or other information by telecommunications

## 4. Consumer equipment

Radio sets

Television sets

Videocameras

Video recorders

Hi-fi recorders

Audio amplifiers

Musical instruments

And other products or equipment for the purpose of recording or reproducing sound or images, including signals or other technologies for the distribution of sound and image other than by telecommunications

## 5. Lighting equipment

Luminaires for fluorescent lamps with the exception of luminaires in households

Straight fluorescent lamps

Compact fluorescent lamps

High intensity discharge lamps, including pressure sodium lamps and metal halide lamps

Low pressure sodium lamps

Other lighting or equipment for the purpose of spreading or controlling light with the exception of filament bulbs

## 6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools)

Drills, Saws, Sewing machines

Equipment for turning, milling, sanding, grinding, sawing, cutting, shearing, drilling, making holes, punching, folding, bending or similar processing of wood, metal and other materials

Tools for riveting, nailing or screwing or removing rivets, nails, screws or similar uses

Tools for welding, soldering or similar use

Equipment for spraying, spreading, dispersing or other treatment of liquid or gaseous substances by other means

Tools for mowing or other gardening activities



## **7. Toys, leisure and sports equipment**

- Electric trains or car racing sets
- Hand-held video game consoles
- Video games
- Computers for biking, diving, running, rowing, etc.
- Sports equipment with electric or electronic components
- Coin slot machines

## **8. Medical devices (with the exception of all implanted and infected products)**

- Radiotherapy equipment
- Cardiology
- Dialysis
- Pulmonary ventilators
- Nuclear medicine
- Laboratory equipment for in-vitro diagnosis
- Analysers
- Freezers
- Fertilization tests
- Other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability

## **9. Monitoring and control instruments**

- Smoke detector
- Heating regulators
- Thermostats
- Measuring, weighing or adjusting appliances for household or as laboratory equipment
- Other monitoring and control instruments used in industrial installations (e.g. in control panels)

## **10. Automatic dispensers**

- Automatic dispensers for hot drinks
- Automatic dispensers for hot or cold bottles or cans
- Automatic dispensers for solid products
- Automatic dispensers for money
- All appliances which deliver automatically all kind of products

