



# RoHS Statement

## XP Power's European Union & China RoHS Policy

### European Union RoHS Directive

The RoHS – Restriction of the use of certain hazardous substances in electrical and electronic equipment – directive came into force in Europe on July 1st 2006. The directive specifies the maximum concentrations of lead, and of five other hazardous substances, that can be present in products that include electronic sub-assemblies and systems. If the limits are exceeded in products sold in Europe after July 1st 2006, the organisation responsible for enforcing the legislation in each country can take the appropriate action. Penalties are yet to be determined but the objective of the European Commission is to ensure that they are 'effective, proportionate and dissuasive' – which sounds potentially daunting. It is important to recognise that there is no 'grandfather period' that will enable products manufactured and stocked before the directive's implementation date to be sold in Europe. Products throughout the supply chain therefore were required to be compliant by July 1st 2006.

The categories of product to which the RoHS directive applies are:

- Large household appliances
- Small household appliances
- IT and telecommunications equipment
- Consumer equipment
- Lighting equipment
- Electrical and electronic tools
- Toys, leisure and sports equipment
- Automatic dispensers
- Electric light bulbs and household luminaires

There are two exemptions: large-scale stationary industrial tools and spare parts for the repair and re-use of appliances brought to the market before July 1st 2006. Also for a number of years, yet to be specified, medical devices and control and monitoring equipment are not required to comply.

The substances to which the RoHS directive applies are:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated biphenyls
- Polybrominated diphenyl ethers

Clearly, 'lead-free' does not mean 'RoHS compliant'

With respect to maximum concentrations of the above materials that are to be permitted, the latest proposal states:

"A maximum concentration of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated ethers and of 0.01% by weight in homogenous materials for cadmium shall be tolerated."

There had been a debate concerning the term 'homogeneous', this however, has now been defined as 'of uniform composition throughout', which basically means down to material level. This definition no longer relates to a percentage of the equipment mass. It doesn't even necessarily refer to a component. For example a semiconductor consists of many homogeneous materials. Its lead frame, gold bonding wires and plastic case must each individually comply with the requirements of the Directive.



For electronic equipment makers, the practical approach is to utilise individual compliant components.

There is no specified marking for RoHS compliance, and no relationship to CE marking. It will be up to component and equipment manufacturer to self-certify that their products are compliant. The effectiveness of the enforcement regime in each country will therefore be the real control over compliance. However, with as yet unspecified penalties that may be imposed, and reputations at stake, manufacturers would be unwise, to say the least, to try to bypass the directive in any way.

With respect to power supply design and construction, and that of most other electronic systems, the overriding issue is the removal of lead from components and from the solder used to assemble them. Component suppliers may also have to change the composition of some flame-retardant plastics, such as those used in capacitor housings and cable sleeves, and some connector terminations have used cadmium, but such components are being changed or substituted with relative ease.

The lead issue is more complex because lead has been fundamental to the way in which components have been made and joined together for decades. Lead-based solders are easy to work with and produce clean, shiny and long-lasting joints of the required low resistance. Unleaded soldering means soldering at higher temperatures, typically up to 260 °C, sometimes requiring new manufacturing lines, and complete re-evaluation of the components used in products to ensure that they can withstand the revised processes to which they will be subjected.

Lead-free solders continue to be developed based on various combinations of tin (Sn), silver (Ag) and copper (Cu). The main concern with lead-free solders has been the tendency for joints to grow 'whiskers' of solder that can cause short-circuits on printed circuit boards. Optimisation of processes and the relative concentrations of solder constituents have largely resolved these issues. A typical multi-core solder will now be composed of 95.5% Sn, 3.8% Ag and 0.7% Cu.

Lead-free soldering also has implications for product inspection. What previously appeared to be a dull, 'dry' joint may be a perfectly good lead-free joint. This information also needs to be communicated, through training, to service and maintenance engineers. All major component suppliers are now embracing the need for RoHS compliance, with Japanese suppliers being particularly advanced in this respect. At present, there is a 5% to 10% premium in the average cost of RoHS-compliant components over traditional parts, but this differential is expected to fall as volume production increases and the new devices become mainstream. One area of confusion still apparent in the market is that of component marking. The Japan Electronics and Information Technology Industries Association has produced guidelines but there is no European legislative requirement for components to be marked as lead-free or RoHS-compliant and component makers are taking widely differing approaches. Some are introducing parallel product lines to their original products with different part numbers, while others are simply dropping manufacture of non-compliant components and using existing part numbers for RoHS-compliant parts. Similar confusion exists with respect to packaging markings.

## XP Power's EU RoHS Policy

Effective July 1, 2006 any XP Power products manufactured will be compliant to the RoHS directive.

XP Power will be marking RoHS-compliant products or packaging differently from its standard products. The marking will take the following form.



Lead free logo (RoHS 5 of 6)



RoHS compliant logo (RoHS 6 of 6)

## China RoHS legislation

On March 1, 2007, the China legislation known as "Management Methods for the Control of Pollution from Electronic Information Products." set forth by the Ministry of Information Industry Order No. 39, officially went into effect. This legislation, also known as China RoHS, is similar to the European Union Directive in regards to the restriction of the use of the six hazardous substances. The China RoHS legislation limits the allowable concentration of the six substances across three categories of Electronic Information products (EIP) being exported into the People's Republic of China. The substances to which the China RoHS legislation applies:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated Biphenyl
- Polybrominated Diphenyl

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The concentration limits are defined in document SJ/T 11363-2006: Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.

One of the significant differences in the European Union and China RoHS requirements is the specific marking and product-labelling requirements set forth by the China legislation. This is defined in the SJ/T 11364-2006: Marking for Control of Pollution Caused by Electronic Information Products.

Product Marking requirements:



Logo 1



Logo 2

Logo 1

This logo indicates that the electronic information product does not contain any toxic or hazardous substances or elements.

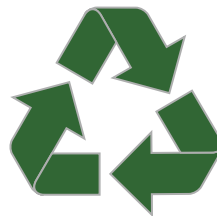
Logo 2 (known as EPUP label)

This logo indicates that the electronic information product contains certain toxic or hazardous substances or elements, and can be used safely during its environmental protection use period. The number within the logo indicates the time frame per years in which hazardous or toxic substances would not cause any environmental concerns. This time frame can be indicated in increments of 5 years.

When using the EPUP label the manufacture must provide a China RoHS disclosure report, which is a table that lists the hazardous substances or elements that exist in the product.

Packaging Marking requirement

China National Standard GB 18455-2001 defines the specific packaging requirements required by the legislation. In summary, the following recycle (or equivalent) mark shall be used for packaging:



Recycle logo

## XP Power's China RoHS Policy

It is the policy of XP Power to identify and offer products to our customers as "China RoHS" compliant, only after an assessment and specific requirements have been met. At this time, some of the products have gone through this process and XP Power has identified these products and updated the packaging and product label with the appropriate China RoHS logo. With that said, there still remains some products that XP Power continues to assess and determine the appropriate China RoHS status. XP Power's target completion for the assessment of all products is December 21, 2007. To determine the timeline of a particular product of concern, please contact your local XP Power sales personnel.

