

[Update on RoHS legislation world-wide \(Jan 08\)](#)

The European Union (EU) RoHS Directive was adopted in 2003 and came into force on 1st July 2006. Since then other countries around the world have begun to consider their own RoHS position and some have already adopted similar legislation. In the EU, the RoHS Directive is now being reviewed and extensive changes could well occur. This article describes the possible changes in Europe and the current status of RoHS-type legislation world-wide.

EU-RoHS

Although RoHS came into force on 1st July 2006, it has not been without its problems. Most products tested by EU RoHS enforcement bodies are not fully compliant and this is usually due to one or two non-compliant components. They have also found that tin / lead solder is being used fairly frequently for re-work. Some manufacturers have discovered that they cannot find substitutes for certain applications and have been forced to request exemptions. However, the exemption process has been very slow and complex with many decisions still appearing to be outstanding. Scope has also caused many difficulties with the status of some products still unclear. Producers have often found that some Member State authorities will accept that a product is excluded from scope while others insist that it does fall within RoHS. Apart from being very frustrating, this should not happen as RoHS is an Article 95 Directive and so should be the same in all EU Member States. The RoHS Directive itself states in Article 6 that the European Commission (EC) will review the RoHS Directive, in particular whether Categories 8 and 9 of the WEEE Directive should be included, and whether or not there should be any additional substance restrictions. ERA Technology (UK) completed the review of Categories 8 and 9 in 2006 and the Oko Institut (Germany) began the review of additional substances in October 2007, and this is due to be completed around mid 2008. In addition, the Commission is reviewing all other aspects of RoHS including all existing exemptions listed in the Annex, scope and enforcement.

EU-RoHS review:

Categories 8 and 9 Review

ERA carried out a review in 2006 to determine whether or not it will be possible to include these categories within the scope of RoHS legislation. The conclusion was that it would be possible but new exemptions would be required and manufacturers would need sufficient time to comply. ERA recommended a date of 2012 which at the time seemed to some to be excessive (~6 years) but it now seems unlikely that inclusion by an earlier date will be possible. ERA's comprehensive report can be downloaded from the Commission's website.

Manufacturers of Category 8 and 9 equipment should note that ERA did not consider additional substances that might be added to the RoHS 6 and also assumed that existing exemptions would continue. However both of these are being reviewed and any changes that occur could affect Categories 8 and 9.

Additional substances review

Environmental groups and some Member States would like to increase the number of substances restricted by RoHS. Hazardous substances that could become restricted are those where significant quantities are used and could be replaced by less harmful substitutes. The Commission's consultants will draw up a list of candidate substances that it believes fulfil these criteria but it will be up to manufacturers to provide technical data that shows that substitution is not possible, or that alternatives have a greater negative impact on the environment, or on human health, than the original substance. Manufacturers must be pro-active to avoid unacceptable restrictions which could be imposed. If everyone assumes that someone else will provide this evidence, then the consultants will assume that manufacturers will have no difficulty changing materials. Some Member States would prefer RoHS restrictions than restrictions using the REACH regulations as they can be imposed more easily and would also restrict substances in imported equipment. At present we do not know which substances will be considered but the following are possible candidates:

- Arsenic – component of infrared LEDs, gallium arsenide ICs, in some alloys
- Beryllium – Copper beryllium (e.g. springs) and beryllium oxide (thermal conductor)
- DEHP – very common PVC plasticiser
- Bisphenol A – component of epoxy resins

Exemptions review

All of the exemptions in the RoHS Directive Annex (items 1 – 29) will be reviewed. If any are no longer required as substitutes now exist, they will be deleted. The Consultants will obtain information from environmental groups and industry. If they find alternatives but receive no input from manufacturers who cannot replace RoHS substances, the exemptions will be deleted. Therefore, it is important for all manufacturers who rely on exemptions, and want them to continue, to submit technical data to the consultants. As with the additional substances study, reliance on others would be very risky and manufacturers should be pro-active. It is well established that almost all electrical equipment relies on at least one RoHS exemption. Lead in ceramics and in glass is widely used in such as chip resistors and lead in high melting solders is used in power semiconductors and these would be very difficult to replace.

Review of scope

It is hoped that the scope of EU-RoHS will be clarified. Most manufacturers do not mind what the scope is, as long as it is clear and the same in all EU States. At present, it is neither which means that manufacturers who comply are at a competitive disadvantage from those that do not. There have been suggestions that the scope of WEEE and RoHS will be defined separately. The review will consider whether large-scale stationary tools should continue to be excluded and also provide a clear definition. The review should also decide on the status of fixed installations although this is likely to state that there

is no exclusion for products installed in buildings. A parallel review of the scope of the WEEE directive is underway and the results of this would affect RoHS if the scope of these two directives continues to be linked.

USA and Canada

The USA and Canada do not have federal legislation that restricts hazardous substances in electrical equipment although some States have adopted limited restrictions, notably California which is described below. Many US States have adopted restrictions on mercury in electrical equipment and some have restrictions on two flame retardants; penta- and octa-bromodiphenyl ether. Further restrictions are planned in States such as Vermont.

California

California has legislation (SB20) that came into force on 1st January 2007 which imposes the EU-RoHS restrictions (same substances, concentration limits and exemptions as EU-RoHS) but is limited to displays larger than four inches measured diagonally. There have been several attempts to broaden the scope to match that of EU-RoHS but so far without success. The most recent draft bill "AB48" was vetoed by California's Governor because of perceived flaws in the legislation. Undoubtedly, there will be another attempt during 2008.

China

China has legislation widely referred to as "Chin-RoHS" which came into effect on 1st March 2007 and applies to a very wide range of electrical equipment sold in China. There are similarities with EU-RoHS but also significant differences. China RoHS has two main phases.

Phase 1 - this started on 1st March 2007 and requires all electrical information products (EIPs) to be marked. There are no substance restrictions in phase 1 but the following information is required:

- Pollution control label which indicates if any RoHS substances are present at concentrations above the maximum concentration limit. If none are present, the symbol has "e" in the centre. If at least one is present then a number is printed in the centre of the label which is the "environmentally friendly use period" or EFUP. This is effectively the "safe use" life of the product, in years, including time following repairs and refurbishment.
- If a RoHS substance is present, then a table of hazardous substances needs to be printed in the instruction manual. This must be in Chinese and indicates which RoHS substances are present and in which part of the equipment.
- The product packaging requires a label that lists the codes for all of the main packaging materials used.

Phase 2 – will start when the Chinese authorities publish a catalogue of products that will be subject to substance restrictions (expected late 2008).

The catalogue will specify:

- The specific products that will have restrictions imposed and the date when these take effect
- The substances that are restricted (could be the EU-RoHS 6, or others) and any exemptions (likely to be similar to EU-RoHS)

- Procedure for demonstrating compliance. All catalogue listed products must be certified by approved Chinese test laboratories before they can be sold. It is likely that further phases will follow. China-WEEE is being planned and the Chinese Act states that compulsory design standards will be published although drafts of these are not yet available.

South Korea

Korea has adopted the “Act for Resource Recycling of Electrical & Electronic Products and Automobiles” and this is due to come into force on 1st January 2008. This legislation is the Korean equivalent of EU-RoHS, EU-WEEE and the EU-ELV directives, but there are differences.

- The Korea RoHS scope will initially be restricted to consumer and some office equipment made in large quantities such as mobile phones, air conditioning, computers and refrigerators.
- The Korean Government recently announced that the substance restrictions will be the same as EU-RoHS, with similar exemptions.
- As in the EU, Korea-RoHS compliance is by self-declaration, but manufacturers and importers will be required to make declarations of compliance on a Korean Government website.

Japan

Japan has no substance restriction legislation but was one of the first countries in the world to adopt voluntary substance restrictions. These were imposed by large Japanese manufacturers of consumer goods because of strict recycling laws that were imposed in 2000. Recycling equipment containing toxic metals is more costly than non-hazardous wastes and so lead and other materials have been phased out wherever possible. In 2006 J-MOSS (Japanese Ministerial Ordinances) was imposed which requires electrical equipment to be labelled to show if RoHS substances are present and if they are, then a table of hazardous substances is also required and is published on manufacturers websites. The China-RoHS tables are based on J-MOSS tables although the Japanese version indicates if materials are present but covered by exemptions.

Thailand

Thailand is proposing to adopt legislation very similar to EU-RoHS. This is at the discussion stage at present and the latest version includes the same restrictions and exemptions and also describes how to comply, which is based on guidance on EU-RoHS compliance.

Australia

The Australian Government has sponsored several studies into the possibility of RoHS legislation. The consultants have considered three approaches:

- No government intervention
- Voluntary code of practice plus some regulation
- National legislation.

The consultants found that no government intervention would be the cheapest but about half of manufacturers will become RoHS compliant anyway, and half of the RoHS substances will be phased out. Interestingly, the consultants found that the reduction in levels of hazardous substances would be similar for the voluntary approach as with national legislation.

This is at an early stage and further discussions are taking place. There is no certainty that Australia will impose legislation although, if it does, it is likely to be similar to EU-RoHS.

Taiwan

Taiwan was one of the first countries to adopt electrical recycling legislation but has no substance restrictions at present. However, this is being considered and although no drafts are available yet, it could well be similar to EU-RoHS.

Norway

Norway is not in the EU but has adopted RoHS legislation. It is also proposing further substance restrictions in consumer products (electrical and non-electrical). This will restrict several materials that are used in electrical equipment although EU-RoHS takes precedence wherever it applies. Substances that would be restricted include lead, cadmium, arsenic, bisphenol A (used in epoxy adhesives) and DEHP (a common PVC plasticiser). This legislation was originally planned to come into force on 1st January 2008 but the Norwegian Government received many responses to their draft legislation and so have delayed the date when this comes into force.

Switzerland

With Norway, this is an EEA country (European Economic Area) that has adopted legislation that is almost identical to EU-RoHS. This is part of one large piece of legislation that includes the Swiss versions of the EU "Marketing and Use", ELV and Battery directives as well as some additional Swiss restrictions.

Conclusions

RoHS was initially developed in the EU but similar legislation is being adopted worldwide. This does not always take the same format with labelling only being required in some parts of the world such as in Japan. California has very similar restrictions to the EU but currently this only covers displays. The EU is already considering changing the RoHS directive and may add new substances to the RoHS6 as well as possibly changing the scope and deleting some of the exemptions. It is worth mentioning that RoHS is not the only substance restriction legislation. In the EU, the "Marketing and Use" Directive has been in place since 1976 and is being replaced by REACH which will probably result in new restrictions. In the USA and Canada, there are State restrictions and, in EU, Norway is planning to restrict up to 18 materials in consumer products.

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