WAVELENGTH ELECTRONICS

Environmental Regulation Compliance Guide

August, 2013

INTRODUCTION

The environmental regulatory compliance landscape has changed substantially over the past decade. This Application Note aims to identify the major regulations, clarify their requirements and describe Wavelength's compliance status.

The following laws, directives and guidelines will be covered:

- RoHS
- China RoHS
- WEEE
- REACH
- JIG 101 & JIG 201
- Conflict Minerals

Wavelength Electronics is committed to ensuring compliance with applicable regulatory requirements. We actively work to promote sustainability within our workplace and in our products.

ROHS

RoHS is short for *Restriction of Hazardous Substances Directive 2002/95/EC*, which was adopted by the European Union (EU) in February 2003 and took effect on 1 July 2006. RoHS refers to the EU standard, unless otherwise qualified.

Directive 2002/95/EC restricts (with exceptions) the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment. It is closely linked with the Waste Electrical and Electronic Equipment Directive (WEEE) 2002/96/EC which sets collection, recycling and recovery targets for electrical goods.

The RoHS Directive was replaced by 2008/385/EC (RoHS2 or RoHS Recast), which became law on 21 July 2011 and took effect 2 January 2013. It requires periodic reevaluations that facilitate gradual broadening of its requirements to cover additional electronic and electrical equipment, cables and spare parts.

Under RoHS2, the CE logo indicates compliance and no other marking is required.

RoHS is often referred to as the 'lead-free directive', but it restricts the use of the following six substances:

1. Lead (Pb)
2. Mercury (Hg)
3. Cadmium (Cd)
4. Hexavalent chromium (Cr6+)
5. Polybrominated biphenyls (PBB)
6. Polybrominated diphenyl ether (PBDE)

PBB and PBDE are flame retardants used in several plastics. Hexavalent chromium is used in chrome plating, chromate coatings and primers, and in chromic acid.

The maximum permitted concentrations in non-exempt products are 0.1% or 1000 ppm (except for cadmium, which is limited to 0.01% or 100 ppm) by weight. The restrictions are on each homogeneous material in the product, which means that the limits do not apply to the finished product, or even to a component, but to any single substance that could (theoretically) be separated mechanically—for example, the sheath on a cable or the tinning on a component lead.

Batteries are not included within the scope of RoHS. In Europe, they are covered by 91/157/EEC. Directive 91/157/EEC sets limits of 5 ppm mercury and 20 ppm cadmium, except batteries used in medical, emergency, or portable power-tool devices. Lead, lead-acid, nickel, and nickel-cadmium in batteries do not have quantitative limits, but their use should be restricted and recycling programs established.

For Wavelength products that comply with the RoHS Directive, the packaging is labeled with the icon at left. In addition, Wavelength publishes an RoHS Letter of Compliance, which lists the status of all our products, including the date or lot number that became compliant and whether they are compliant by exemption.

This letter is available as a PDF for download at:
http://www.teamwavelength.com/support/rohs.php

CHINA ROHS

The *Measures for Administration of the Pollution Control of Electronic Information Products* (commonly known as "China RoHS"), was issued by the Ministry of Industry and Information Technology of the People's Republic of China. It aims to restrict the use of toxic and hazardous materials in electronic equipment.

China RoHS affects all Electronic Information Products (EIPs) that are manufactured on or after March 1st, 2007, and sold into China.

There is no broad definition of what encompasses an EIP, but the China RoHS explanatory note includes components as well as finished products. Any product listed in the Key Catalogue is considered an EIP.

If an EIP does not contain any hazardous substances (Pb, Hg, Cd, Cr6+, PBDE, PBBE) above the maximum concentration values (MCV), then the following symbol must be applied on the EIP or the product instructions.

China RoHS provides for three different classifications:

- EIP-A Each Homogenous Material
- EIP-B Metal Plating
- EIP-C Small Components/Materials (generally less than 4.0mm³)

China uses the same MCVs as EU RoHS except for metal plating:

- 0.1% for Pb, Hg, Cr6+, PBDE, PBBE
- 0.01% for Cd

ROHS versus CHINA ROHS

Does compliance with the EU RoHS Directive, also mean compliance with China RoHS?
The China RoHS is similar to the EU RoHS in that it restricts certain hazardous substances in consumer products and in packaging materials. However, the China RoHS was developed entirely separately from the EU regulations. China RoHS includes automotive, medical devices, manufacturing equipment, components, electronics, radar equipment, certain raw materials, and packaging materials.

China RoHS does not acknowledge EU RoHS exemptions. Only those products which are added to the Key Catalogue are subject to material restrictions. If a product is not listed in the Key Catalogue, it is "exempted". So China RoHS does not need to contain exemption rules, as exemptions are granted automatically unless being explicitly revoked.

Are Wavelength products China RoHS compliant?
The web page and datasheet for a product are labeled with both the RoHS and the China RoHS icons. If the China RoHS icon is not shown, the product is NOT compliant.

Wavelength publishes an RoHS Letter of Compliance that is posted on our website at:
http://www.teamwavelength.com/support/rohs.php

If the product is listed as COMPLIANT, then it complies with BOTH the EU RoHS and the China RoHS. If the product is listed as COMPLIANT BY EXEMPTION, then it is ONLY compliant with the EU RoHS, but not the China RoHS. Currently, only thermistors fall into this category.

WEEE

The *Waste Electrical and Electronic Equipment Directive 2002/96/EC* is also known simply as WEEE. It is designed to mitigate the increasing volume of often toxic waste from discarded electrical or electronic devices. This is commonly referred to as electronic waste, e-waste, or e-scrap.

"Electronic waste" may be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets and refrigerators. This definition includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal.

There is a lack of consensus as to whether the term should apply to resale, reuse, and refurbishing industries, or only to a product that cannot be used for its intended purpose.

All electronic scrap components may contain contaminants such as lead, cadmium, beryllium, or brominated flame retardants. Great care must be taken to avoid unsafe exposure in recycling operations and leaching of material such as heavy metals from landfills and incinerator ashes. Scrap industry and USA EPA officials agree that these materials should be managed with caution.

The EU and its member states operate the European Waste Catalogue (EWC), which provides broad definitions of Hazardous Electronic wastes. More information can be obtained by referencing Annex 1A and Annex 1B. Additionally, constituent materials in the waste also require assessment by reference to Annex II and Annex III.

Wavelength marks all product documentation with the following symbol, indicating that WEEE compliant disposal is required:

REACH

The *European Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals* (REACH) was enacted in June of 2007, and is designed to consolidate various pieces of legislation within Europe and improve the level of information available on chemical usage within the supply chain.

REACH Article 33 requires certain chemical information to be supplied to recipients and consumers and Article 7.2 requires notification to the European Chemicals Agency (ECHA) on articles containing Substances of Very High Concern (SVHC) listed on the candidate list. The first candidate list was published on Oct. 28, 2008. The candidate list is periodically revised and updated.

If a substance on the candidate list exceeds the concentration of 0.1% weight in the article, the recipient needs to be informed immediately. In addition, since June 1, 2011, if the quantity of such a substance contained in all articles of a legal entity exceeds the tonnage of 1 ton per year, notification to ECHA becomes mandatory.

REACH regulates chemicals across all industries. Additional screening of products and packaging for the electrotechnical industry is covered under JIG 101 and JIG 201.

Of particular concern are substances which potentially remain in the packaging after its production. This criterion eliminates manufacturing substances that are not part of final packaging (e.g., substances that represent a gas or liquid or substances that are chemically transformed during the manufacturing process).

Wavelength has carefully reviewed the requirements set forth by REACH. The products contain none of the SVHC substances listed on the Candidate List (as of June 20, 2013).

Wavelength is committed to ensuring continuing compliance with REACH initiatives, and pursuing sustainability globally. Changes to the REACH legislation and SVHC Candidate List are monitored regularly. If you require any further information on the impact of REACH on Wavelength products, or if you have questions about REACH compliance, please contact the Sales department.

JIG 101 & JIG 102

Joint Industry Guide 101: Material Composition Declaration for Electrotechnical Products represents industry-wide consensus on materials and substances that must be disclosed by suppliers when they are incorporated into electrotechnical products.

Joint Industry Guide 201: Material Composition Declaration for Packaging of Electrotechnical Products represents industry-wide consensus when the materials and substances are present in packaging that is used to transport and protect electrotechnical products.

These Guides were first published in 2011 and updated in 2012.

The Guides contain:

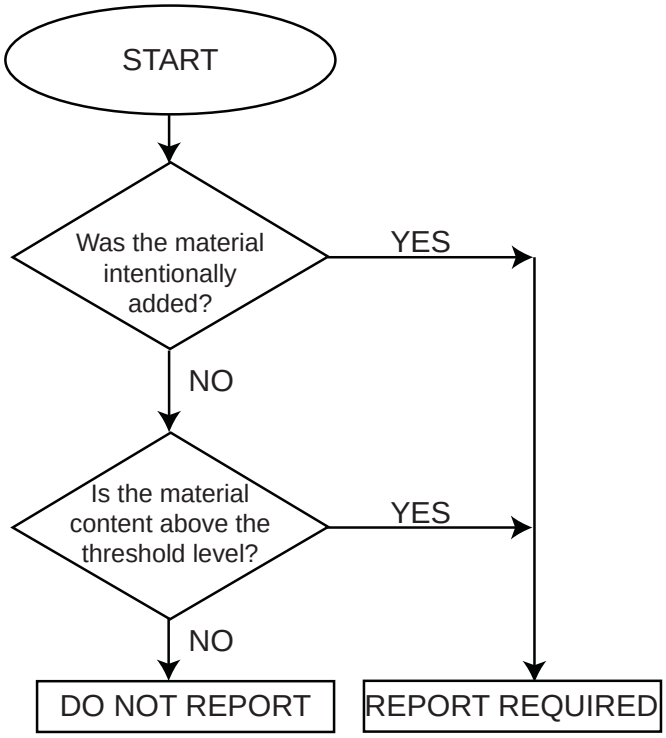
- the lists of substances for disclosure when contained in electrotechnical products or their packaging;
- the threshold levels for substances in electrotechnical products, equal to or above which the quantity of the substance must be disclosed;
- the regulatory requirements that establish threshold levels for electrotechnical products, where appropriate;
- a set of data fields for information exchange.

If a material/substance is present in the product above the threshold level it shall be reported. Where the threshold level is set to “intentionally added”, the presence of substances shall be reported when the substance meets the definition of “intentionally added” regardless of quantity.

The following criteria determine the threshold level for substance/material reporting:

- If a content threshold concentration is set forth by law, it serves as the threshold level for that substance.
- Threshold levels for a substance may be application specific if the law varies by use (e.g., lead in batteries has a different reporting threshold than lead in other applications).
- Where multiple laws/regulations apply to a substance and:
  - all contain numerical content threshold levels, the lowest concentration specified acts as the threshold level.
  - none specifies a numeric content threshold level, “intentionally added” acts as the threshold level
  - several specification methods are used, then the lowest numerical concentration threshold and “intentionally added” both act as dual reporting thresholds per Annex C.
- The default threshold level is set to 0.1 % (1 000 ppm) by weight of the product unless a different limit is specified by the industry standard or agreement.

The reporting process flow is shown below:



Wavelength’s indication of RoHS and China RoHS compliance status serves to satisfy the reporting requirements of JIG 101 and JIG 201.

CONFLICT MINERALS

Section 1502 -- Conflict Minerals Stautory Provision -- of the Dodd-Frank Wall Street Reform and Consumer Protection Act requires publicly held companies to disclose whether they manufacture products containing tin, tantalum, tungsten or gold from the Democratic Republic of Congo or various neighboring countries and to assess whether materials originating in or near the Democratic Republic of the Congo are benefiting armed groups in the area.

This law (Pub.L. 111–203, H.R. 4173) went into effect on July 21, 2010.

Wavelength Electronics uses tin, tantalum or gold only as components of our electronic products. Wavelength has queried the vendors and has determined that none of these minerals have been purchased from or originated in the conflict areas. Wavelength will not knowingly sell these materials from the conflict area and will continue due diligence.

CONCLUSION

Potentially toxic electronic waste is an unfortunate byproduct of the photonics industry. The vast number and variety of regulations relating to electronic waste and environmental protection in the electronics/photonics industry can seem overwhelming. Wavelength is committed to minimizing any negative impact on the environment and assisting customers in their compliance to applicable regulations.

Wavelength marks products in compliance with the major regulations -- RoHS, China RoHS, WEEE, and REACH. In instances where declaration is required, it is done on the product packaging and in the product documentation. If you have any additional questions about the regulatory compliance status of any Wavelength products, please contact Tech Support.

USEFUL LINKS

1. RoHS:
   http://www.bis.gov.uk/nmo/enforcement/rohs-home
   http://ec.europa.eu/environment/waste/rohs_eee/
2. China RoHS:
   http://www.chinarohs.com/
3. WEEE:
   http://ec.europa.eu/environment/waste/weee/index_en.htm
4. REACH
   http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm
5. JIG 101 & JIG 201
   http://www.ce.org/Standards/Standard-Listings/Joint-Industry-Guide/JIG-101-Ed-4-1.aspx
   http://www.ce.org/Standards/Standard-Listings/Joint-Industry-Guide/JIG-201-Ed-1-0.aspx
6. Conflict Minerals
   http://www.sec.gov/News/PressRelease/Detail/PressRelease/1365171484002#.UhJO7z_fKf4

REVISION HISTORY

REV	DATE	NOTES
A	13-Aug-13	Initial Release

KEYWORDS

RoHS, China RoHS, REACH, WEEE, JIG 101, JIG 201, Conflict Minerals, regulatory compliance, environmental compliance